

INTERSECTION ALTERNATIVES STUDY
CITY OF DELAWARE, DELAWARE COUNTY, OHIO

CENTRAL AVENUE (S.R. 37) / LAKE STREET (U.S. 42) INTERSECTION

PREPARED BY GPD GROUP FOR: CITY OF DELAWARE
JANUARY 2024

GPD GROUP®
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

INTERSECTION ALTERNATIVES STUDY

Central Avenue (SR 37) / Lake Street (US 42)

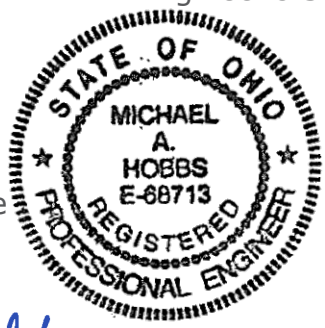
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January 2024

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January 29, 2024
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I. Purpose:

This Intersection Alternatives Study is being prepared at the request of the City of Delaware with regards to the Central Avenue (SR 37) / Lake Street (US 42) intersection located in the City of Delaware, Delaware County, Ohio. The purpose of this Intersection Alternatives Study is to analyze the vehicular operating conditions of the Central Avenue (SR 37) / Lake Street (US 42) intersection under existing conditions and under several lane configuration scenarios to determine what, if any, improvements can be made to decrease the congestion experienced at this intersection.

II. Project Setting:

Study Area

The existing land use within the study area is a mix of commercial and residential properties; with residential development located on the western leg of the study intersection and commercial development located on the eastern and southern legs of the subject intersection. Also located on the east leg of the study intersection is the CSX Railroad's Great Lakes Division – Columbus Line Subdivision – Delaware Cutoff. See **Figure 1** for a project location map and **Figure 2** for an aerial photograph of the study area.

Central Avenue (SR 37) exists as a two (2) lane asphalt roadway with one (1) travel lane in each direction. Additionally, Lake Street (US 42) exists as a two (2) lane asphalt roadway with one (1) travel lane in each direction. The posted speed limit along Central Avenue (SR 37) is 35 mph, whereas the posted speed limit along Lake Street (US 42) is 25 mph south of the study intersection and 35 mph north of the study intersection. According to information obtained from the Ohio Department of Transportation (ODOT), Central Avenue (SR 37) is classified as a Principal Arterial Other and Lake Street (US 42) is classified as a Minor Arterial.

The intersection is currently signalized using a simple span wire configuration with strain poles located on the northwest and southeast corners of the intersection. The intersection consists of four (4) approaches with the following lane configurations: NB Lake Street (US 42) – one (1) lane (left-thru-right), SB Lake Street (US 42) – two (2) lanes (left-thru, right), EB Central Avenue (SR 37) – two (2) lanes (left, thru-right), and WB Central Avenue (SR 37) – two (2) lanes (left, thru-right). Despite the shared southbound left-thru lane, the intersection currently does not utilize split phased operation for the northbound / southbound movements.

III. Traffic Volumes:

Existing Traffic Volumes

For this traffic analysis, Cummins Consulting Services, LLC performed turning movement traffic counts at the Central Avenue (SR 37) / Lake Street (US 42) intersection. The traffic counts were performed from 7:00 AM – 7:00 PM on Wednesday, May 3, 2023; and were conducted as part of the Delaware – East Side Model project. The counts included truck volumes and these percentages were applied for all scenarios of the traffic analysis. See **Appendix A** for printouts of the turning movement counts.

Opening Year / Design Year Traffic Volumes

Design hour volumes (DHVs) were developed for the study area using the peak hour to design hour factors that are published by the ODOT Office of Statewide Planning and Research. The design hour factors utilized to develop the DHVs are dependent upon the roadway's functional classification as well as the day of the week and month the count was performed. These design hour factors were then applied to the raw turning movement counts to convert the existing volumes to design hour volumes. The purpose of this is to take counts collected on any day and approximate the 30th highest hourly traffic volume in the year. For this study, a design hour factor of 1.10 was applied for all volumes counted at the study intersection.

The construction of the chosen alternative is anticipated to be completed in the year 2027 which will serve as the 'Opening Year' for the study, while the 'Design Year' will be 2047 (twenty [20] year design criteria). According to ODOT's Traffic Forecast Modeling System (TFMS), the Central Avenue (SR 37) / Lake Street (US 42) intersection is expected to experience roughly +0.85% growth per year for the next twenty (20) years. The +0.85% annual growth rate was then used to calculate the estimated future traffic volumes within the study area. See **Appendix B** for a printout of the TFMS report. The annual growth rate accounts for general unidentified development which can result in traffic increases. The annual growth rate was applied to the design hour volumes to develop the future Opening Year 2027 and Design Year 2047 traffic volumes. The City also provided GPD Group with a Traffic Impact Study (TIS) that was conducted by Advanced Civil Design for the proposed Greenwood Commons housing development located north of the study intersection as well as a TIS for a proposed mixed-use development (MUD) on Flax Street northwest of the Central Avenue (SR 37) / Lake Street (US 42) intersection. Using the projected trips and traffic distribution percentages, traffic volumes associated with the Greenwood Commons housing development were added to the Opening Year 2027 and Design Year 2047 volumes. Traffic from the Flax Street MUD entering the intersection is of lower magnitude and can be considered part of the background growth already applied. **Figures 3, 4, and 5** show the Existing Year 2023, Opening Year 2027, and Design Year 2047 traffic volumes, respectively.

IV. Existing Operating Conditions

In order to identify what type and level of improvements are needed, it is important to understand the problem. The intersection of Central Avenue (SR 37) and Lake Street (US 42) is known to have long queues of vehicles and lengthy delays for motorists. As mentioned earlier, a site visit revealed the extent of queuing. Additionally, the railroad crossing on the east leg, though only serving trains rarely, affects the speed of motorists. Buses and trucks slow down considerably or stop (as required by law) prior to crossing, which impacts all east-west traffic on Central Avenue. Northbound traffic on Lake Street is hampered by the slight offset of lanes as they proceed through the intersection, which also leads to slower operating speeds. A photo log of the existing intersection can be found in **Appendix C**.

The City has undertaken a large-scale retiming of signalized intersections on the east side of Delaware, including the study intersection. However, limitations of both the existing signal equipment and the geometry of the intersection control how much improvement can be realized without a more robust solution.

V. Alternative Analysis

Intersection capacity analyses were performed for the Existing Year 2023, Opening Year 2027, and Design Year 2047 traffic conditions under the 'No-Build' and intersection alternatives traffic conditions to determine the operating conditions that would be expected at the study intersection. The quality of the operating conditions experienced by an intersection is measured in terms of Level-of-Service (LOS). Levels-of-Service can range from LOS A to LOS F.

Level-of-Service A,B,C,D, and E are generally considered acceptable in an area within a Metropolitan Planning Organization (MPO) for movements and approaches while the overall intersection must operate at LOS D or better. This intersection is located within the Mid-Ohio Regional Planning Commission (MORPC) MPO area. Level-of-Service F is considered unacceptable with significant levels of delay experienced by vehicles. The thresholds related to average control delay for signalized intersections are as follows.

Level-of- Service	***Delay Threshold - Signalized (Sec)***
A	<10
B	>10 - 20
C	>20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

The analysis was performed utilizing the computer program Synchro 11 which is developed by Trafficware and based on the Highway Capacity Manual, 6th Edition. The existing peak hour factors and heavy vehicle percentage were utilized throughout the capacity analysis.

'No-Build' Scenario

A capacity analysis of the intersection's existing conditions was conducted to determine if the proposed intersection alternatives improved the intersection's operating conditions.

Capacity Analysis

Table 1 summarizes the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under the 'No-Build' scenario. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 1: HCM Intersection Capacity Analysis Summary - 'No-Build' Scenario

Intersection / Movement	Existing Year 2023 Conditions				Opening Year 2027 Conditions				Design Year 2047 Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Central Avenue (SR 37) / Lake Street (US 42)												
Eastbound Left	B	11.3	C	27.0	B	16.0	F*	150.8	C	21.7	F*	257.8
Eastbound Thru-Right	B	16.3	B	16.5	C	21.5	B	18.3	C	27.8	C	22.5
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*C*	*20.8*	*E*	*56.4*	*C*	*27.0*	*F*	*88.5*
Westbound Left	B	10.6	B	11.8	B	13.9	B	13.4	B	17.2	B	15.7
Westbound Thru-Right	B	17.8	C	27.7	C	24.7	D	48.2	C	32.8	F*	94.1
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*C*	*24.2*	*D*	*47.5*	*C*	*32.1*	*F*	*92.5*
Northbound Left-Thru-Right	D	38.8	E	55.8	D	45.0	F	439.0	E	68.4	F*	628.1
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*D*	*45.0*	*F*	*439.0*	*E*	*68.4*	*F*	*628.1*
Southbound Left-Thru	D	45.4	D	39.3	F	134.1	E*	68.6	F*	192.6	F*	99.5
Southbound Right	D	40.9	D	39.2	D	41.1	D	41.0	D	48.3	D	44.2
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*F*	*93.5*	*E*	*55.8*	*F*	*129.8*	*E*	*73.7*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***D***	***44.5***	***F***	***102.7***	***E***	***60.6***	***F***	***157.2***

*Queue does not clear

Table 1 above shows that most movements and approaches are anticipated to operate at acceptable LOS E or better during the AM Peak Hour in Existing Year 2023, Opening Year 2027, and Design Year 2047. However, the southbound left-thru movement faces unacceptable LOS F in the AM Peak Hour in Opening Year 2027 and Design Year 2047 due to the expected increase in southbound traffic as a result of the proposed Greenwood Commons housing development.

Regarding the PM Peak Hour, **Table 1** shows that all movements and approaches operate at acceptable LOS E or better during Existing Year 2023. However, the

eastbound left and northbound left-thru-right movements are expected to operate at unacceptable LOS F in Opening Year 2027 with the northbound approach experiencing very long delays and the overall intersection failing. Additionally, most movements and approaches are anticipated to operate at unacceptable LOS F in Design Year 2047. The eastbound left, westbound thru-right, southbound left-thru and northbound left-thru-right movements also have queuing that takes more than two (2) cycles to clear. The overall intersection experiences LOS F in the PM peak hour of all analysis years.

Additional analysis was performed to determine the direct impacts of the Greenwood Commons housing development. Opening Year 2027 volumes based on background growth without Greenwood Commons were analyzed and compared to Opening Year 2027 volumes with Greenwood Commons. The results, shown in **Table 2**, indicate that the southbound left-thru movement and overall northbound approach are impacted the most due to increased southbound traffic related to the development. The southbound left-thru movement degrades from LOS D or better to failing in both the AM and PM peak hours. The northbound approach degrades from LOS D to LOS F with several minutes of delay in the PM peak, and the overall intersection experiences LOS F in the PM peak due to the increased southbound traffic volumes.

Table 2: HCM Intersection Capacity Analysis Summary – Greenwood Commons Impacts

Intersection / Movement	Opening Year 2027 Conditions – without Greenwood Commons				Opening Year 2027 Conditions – with Greenwood Commons			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Eastbound Left	B	10.8	C	27.3	B	16.0	F*	150.8
Eastbound Thru-Right	B	16.9	B	16.5	C	21.5	B	18.3
Eastbound Approach	*B*	*16.2*	*B*	*19.1*	*C*	*20.8*	*E*	*56.4*
Westbound Left	B	10.2	B	10.7	B	13.9	B	13.4
Westbound Thru-Right	B	19.0	D	38.0	C	24.7	D	48.2
Westbound Approach	*B*	*18.6*	*D*	*37.4*	*C*	*24.2*	*D*	*47.5*
Northbound Left-Thru-Right	C	30.7	D	38.1	D	45.0	F	439.0
Northbound Approach	*C*	*30.7*	*D*	*38.1*	*D*	*45.0*	*F*	*439.0*
Southbound Left-Thru	D	36.1	C	28.5	F	134.1	E*	68.6
Southbound Right	C	33.6	C	28.9	D	41.1	D	41.0
Southbound Approach	*D*	*35.0*	*C*	*28.6*	*F*	*93.5*	*E*	*55.8*
Overall Intersection	***C***	***22.7***	***C***	***29.5***	***D***	***44.5***	***F***	***102.7***

The Greenwood Commons TIS provided by the City does not indicate the same degradation of the southbound and northbound approaches but shows substantially worse conditions for the westbound movements under existing conditions. The TIS

indicates that the westbound approach is currently failing and identified a need for a second thru lane. However, that analysis was completed prior to recent signal timing changes that were used as the basis for analysis in this study. All 'Build' analysis in the TIS assumes a second westbound lane which allows for more green time to be allotted to the north-south movements and results in acceptable Levels-of-Service. If the updated signal timing is taken into consideration, a second westbound lane is not needed under Existing or Opening Year traffic volumes, and the impacts due to Greenwood Commons are apparent. As later discussion of alternatives will show, construction of a southbound left-turn lane mitigates the impact to both the southbound and northbound approaches created by the construction of the Greenwood Commons development.

Proposed Alternatives

To decrease the congestion experienced by drivers at the Central Avenue (SR 37) / Lake Street (US 42) intersection, several alternatives were evaluated. As previously mentioned, the presence of the railroad east of the subject intersection and of structures along the right-of-way limit horizontal and vertical improvements that could be made to the subject intersection. Note that truck turning templates were evaluated for the southbound and eastbound right-turn movements only, as these have the most restrictions to improving curb returns. All truck movements were included in the capacity analysis. A WB-67 semi-truck was used as the design vehicle for all scenarios. All scenarios will require utility pole relocations, except 'Scenario 1' and 'Scenario 2'. Full depth pavement replacement east of the CSX Railroad Crossing will occur for Scenarios 2-10A. The following improvement scenarios were considered:

'Scenario 1' – Signal Timing Only

'Scenario 1' consists of adjusting the existing signal timings at the intersection. This scenario would allow for improvements to be made while minimizing reconstruction at the intersection. Due to the limitations of the existing signal equipment, a new mast arm signal would be installed that meets current design standards and allows for future phase changes should they become necessary. Additionally, this alternative would require minor right-of-way acquisition on the southwest corner, existing sidewalks are not impacted, and there is no loss of on-street parking.

The timing adjustments for this Scenario started with the recently implemented East Side Model Timings, and increased the green time allotted to the east-west approaches on Central Avenue (SR 37). This is the heavier volume street and the goal was to reduce delays and queues for the larger amount of traffic without sacrificing the minor street movements excessively.

Capacity Analysis

Table 3 summarizes the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 1'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 3: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 1'

Intersection / Movement	'No-Build'				'Scenario 1'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	B	14.6	C	22.5
Eastbound Thru-Right	B	16.3	B	16.5	A	9.4	A	9.9
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*B*	*10.0*	*B*	*12.9*
Westbound Left	B	10.6	B	11.8	B	13.1	B	13.5
Westbound Thru-Right	B	17.8	C	27.7	A	9.4	C	26.0
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*9.5*	*C*	*25.8*
Northbound Left-Thru-Right	D	38.8	E	55.8	D	35.6	D	44.4
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*D*	*35.6*	*D*	*44.4*
Southbound Left-Thru	D	45.4	D	39.3	D	39.6	C	33.9
Southbound Right	D	40.9	D	39.2	D	37.5	C	27.4
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*38.7*	*C*	*30.9*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***18.9***	***C***	***24.4***
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	C	30.8	F*	92.2
Eastbound Thru-Right	C	21.5	B	18.3	B	17.5	B	13.4
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*19.3*	*D*	*36.1*
Westbound Left	B	13.9	B	13.4	C	24.6	B	18.5
Westbound Thru-Right	C	24.7	D	48.2	B	17.9	F*	86.0
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*B*	*18.2*	*F*	*84.6*
Northbound Left-Thru-Right	D	45.0	F	439.0	C	33.9	F	95.4
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*33.9*	*F*	*95.4*
Southbound Left-Thru	F	134.1	E*	68.6	E	66.1	D	40.4
Southbound Right	D	41.1	D	41.0	C	29.1	C	22.0
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*D*	*49.9*	*C*	*31.8*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***C***	***28.8***	***E***	***59.7***

*Queue does not clear

Table 3: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 1'

Intersection / Movement	'No-Build'				'Scenario 1'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	D	45.3	F*	133.6
Eastbound Thru-Right	C	27.8	C	22.5	C	21.5	B	16.2
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*C*	*24.7*	*D*	*49.1*
Westbound Left	B	17.2	B	15.7	C	31.9	C	23.6
Westbound Thru-Right	C	32.8	F*	94.1	C	22.2	F*	153.4
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*C*	*22.7*	*F*	*150.8*
Northbound Left-Thru-Right	E	68.4	F*	628.1	D	43.4	F	375.0
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*D*	*43.4*	*F*	*375.0*
Southbound Left-Thru	F*	192.6	F*	99.5	F	101.1	D	51.3
Southbound Right	D	48.3	D	44.2	C	31.4	C	22.6
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*E*	*70.8*	*D*	*37.9*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***D***	***38.4***	***F***	***124.4***

*Queue does not clear

As shown in **Table 3**, most movements and approaches for 'Scenario 1' are anticipated to operate at acceptable LOS E or better during the AM Peak Hour in the Existing Year 2023, Opening Year 2027, and Design Year 2047. However, the southbound left-thru movement is anticipated to operate at unacceptable LOS F during the AM Peak Hour in Design Year 2047.

Regarding the PM Peak Hour, most movements and approaches are anticipated to operate at acceptable LOS D or better in Existing Year 2023. However, **Table 3** also shows that most movements and approaches are anticipated to operate at unacceptable LOS F in Opening Year 2027 and Design Year 2047. This indicates that modifying the signal timing with no geometric changes will not resolve the congestion issues. Signal timing changes alone improve the overall LOS of the intersection but the westbound movements degrade in both the Opening and Design Years, therefore this option is not a viable long-term solution.

'Scenario 2' – Minor Widening of Lake Street (US 42)

'Scenario 2' consists primarily of restriping and installing additional signage, as well as slightly widening the northbound pavement on the intersection's north leg. This widening would improve Lake Street's (US 42) alignment, which creates additional striping / repurposing opportunities. Additionally, the existing roadway width allows the south leg to be restriped to include a northbound left-turn lane. This scenario

would improve the roadway alignment for northbound thru traffic. Additionally, this scenario would redistribute the northbound left turning traffic into a separate lane, thus decreasing the northbound thru-right movement's queue.

This scenario may require minor right-of-way acquisitions on the northeast and southern corners of the intersection to accommodate the widened roadway, as well as anticipated WB-67 truck turning behavior. All right-of-way acquisitions would be strip takes. There will be a loss of parking along the northbound approach; and the sidewalk on the intersection's northeast and southern corners are impacted and will need to be reconstructed. See **Figure 6** for a conceptual horizontal layout for 'Scenario 2'.

Capacity Analysis

Table 4 summarizes the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 2'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 4: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 2'

Intersection / Movement	'No-Build'				'Scenario 2'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	B	14.3	C	23.4
Eastbound Thru-Right	B	16.3	B	16.5	A	9.3	B	10.2
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*9.8*	*B*	*13.4*
Westbound Left	B	10.6	B	11.8	B	12.8	B	13.9
Westbound Thru-Right	B	17.8	C	27.7	A	9.2	C	26.9
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*9.4*	*C*	*26.6*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	45.0	D	44.6
Northbound Thru-Right	-	-	-	-	C	33.3	D	38.5
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*C*	*34.9*	*D*	*39.0*
Southbound Left-Thru	D	45.4	D	39.3	D	39.2	D	35.6
Southbound Right	D	40.9	D	39.2	D	38.0	C	27.0
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*38.7*	*C*	*31.6*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***18.7***	***C***	***24.2***

*Queue does not clear

Table 4: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 2'

Intersection / Movement	'No-Build'				'Scenario 2'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	C	26.9	F*	92.2
Eastbound Thru-Right	C	21.5	B	18.3	B	15.3	B	13.4
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*16.9*	*D*	*36.1*
Westbound Left	B	13.9	B	13.4	C	21.7	B	18.5
Westbound Thru-Right	C	24.7	D	48.2	B	15.7	F*	86.0
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*B*	*15.9*	*F*	*84.6*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	45.2	D	51.5
Northbound Thru-Right	-	-	-	-	C	26.5	C	34.6
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*28.9*	*D*	*36.0*
Southbound Left-Thru	F	134.1	E*	68.6	D	39.8	D	52.8
Southbound Right	D	41.1	D	41.0	C	31.9	C	22.0
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*D*	*36.3*	*D*	*38.4*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***C***	***23.0***	***D***	***53.1***
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	D	45.3	F*	133.6
Eastbound Thru-Right	C	27.8	C	22.5	C	21.5	B	16.2
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*C*	*24.7*	*D*	*49.1*
Westbound Left	B	17.2	B	15.7	C	31.9	C	23.6
Westbound Thru-Right	C	32.8	F*	94.1	C	22.2	F*	153.4
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*C*	*22.7*	*F*	*150.8*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	48.1	D	53.3
Northbound Thru-Right	-	-	-	-	C	25.0	D	39.1
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*28.1*	*D*	*40.3*
Southbound Left-Thru	F*	192.6	F*	99.5	D	44.4	F*	138.1
Southbound Right	D	48.3	D	44.2	C	31.4	C	22.6
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*D*	*38.7*	*F*	*84.3*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***28.2***	***F***	***89.0***

*Queue does not clear

Table 4 shows that all movements and approaches for 'Scenario 2' are anticipated to operate at acceptable LOS D or better during the AM Peak Hour in Existing Year 2023, Opening Year 2027, and Design Year 2047. The southbound left-thru movement is anticipated to have acceptable operating conditions in the AM Peak Hour because the northbound approach has a left-turn lane and the northbound

thru movement has better lane alignment. This creates more gaps between northbound vehicles for southbound vehicles to safely conduct permissive left-turns and allows northbound traffic to traverse the intersection faster.

As shown in **Table 4**, most movements and approaches are anticipated to operate at acceptable LOS D or better during the PM Peak Hour in Existing Year 2023 and Opening Year 2027. However, the eastbound left and westbound thru-right movements are anticipated to operate at unacceptable LOS F during the PM Peak Hour in these analysis years. Additionally, most movements and approaches are anticipated to operate at unacceptable LOS F during the PM Peak Hour in Design Year 2047. While providing a northbound left-turn lane and widening the northeast corner for better lane alignment improves some movements, the westbound approach actually degrades in both the Opening and Design Years, therefore this is not a viable long-term solution.

'Scenario 3' – Major Widening for Left-Turn Lanes on Lake Street (US 42)

'Scenario 3' consists of widening the Lake Street (US 42) southbound approach, as well as the northbound restriping and lane alignment elements of 'Scenario 2'. Left-turn lanes are provided for the northbound and southbound approaches while increasing the length of the existing southbound right-turn lane. No widening will occur on the intersection's south leg since the existing pavement is wide enough to restripe the northbound approach. As with 'Scenario 2', this scenario would redistribute the northbound left traffic into a separate lane and improve the roadway alignment for northbound thru vehicles.

However, this scenario requires a total take of the intersection's northeast quadrant (including the small vacant structure) since Lake Street (US 42) would be widened to accommodate new lanes and anticipated WB-67 truck turning patterns. Minor right-of-way acquisitions (strip takes) will occur along the southern and northwestern quadrants. In addition to a loss of on-street parking along the northbound approach, a loss of on-street parking along the southbound approach will occur due to the longer southbound right-turn lane. Due to the intersection's new geometry, sidewalks located on all four corners are impacted and will need to be reconstructed with new curb ramps. See **Figure 7** for a conceptual horizontal layout for 'Scenario 3'.

Capacity Analysis

Table 5 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 3'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 5: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 3'

Intersection / Movement	'No-Build'				'Scenario 3'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	B	12.4	C	20.7
Eastbound Thru-Right	B	16.3	B	16.5	A	8.1	A	9.3
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*8.6*	*B*	*12.0*
Westbound Left	B	10.6	B	11.8	B	11.2	B	12.5
Westbound Thru-Right	B	17.8	C	27.7	A	8.1	C	24.2
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*8.2*	*C*	*23.9*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	45.1	D	37.9
Northbound Thru-Right	-	-	-	-	D	35.4	D	41.7
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*D*	*36.7*	*D*	*41.4*
Southbound Left-Thru	D	45.4	D	39.3	-	-	-	-
Southbound Left	-	-	-	-	D	38.5	D	44.4
Southbound Thru	-	-	-	-	D	43.6	C	34.1
Southbound Right	D	40.9	D	39.2	D	42.6	C	28.4
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*42.9*	*C*	*32.2*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***19.1***	***C***	***23.2***

*Queue does not clear

Table 5: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 3'

Intersection / Movement	'No-Build'				'Scenario 3'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	17.5	F*	92.7
Eastbound Thru-Right	C	21.5	B	18.3	B	10.2	B	12.0
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*11.1*	*D*	*35.2*
Westbound Left	B	13.9	B	13.4	B	14.3	B	16.7
Westbound Thru-Right	C	24.7	D	48.2	B	10.4	F*^	69.7
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*B*	*10.6*	*E*	*68.6*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	43.4	D	35.1
Northbound Thru-Right	-	-	-	-	C	32.7	D	37.5
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*34.1*	*D*	*37.3*
Southbound Left-Thru	F	134.1	E*	68.6	-	-	-	-
Southbound Left	-	-	-	-	D	38.6	D	44.2
Southbound Thru	-	-	-	-	D	40.6	C	31.0
Southbound Right	D	41.1	D	41.0	D	49.2	C	23.4
Southbound Approach			*E*	*55.8*	*D*	*44.1*	*C*	*29.3*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***C***	***22.1***	***D***	***45.9***
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	C	27.0	F*	133.6
Eastbound Thru-Right	C	27.8	C	22.5	B	13.6	B	16.2
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*15.4*	*D*	*49.1*
Westbound Left	B	17.2	B	15.7	C	20.7	C	23.6
Westbound Thru-Right	C	32.8	F*	94.1	B	13.9	F*	153.4
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*B*	*14.2*	*F*	*150.8*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	44.4	C	34.9
Northbound Thru-Right	-	-	-	-	C	31.6	D	39.1
Northbound Approach	*E*	*68.4*			*C*	*33.3*	*D*	*38.8*
Southbound Left-Thru	F*	192.6	F*	99.5	-	-	-	-
Southbound Left	-	-	-	-	D	38.2	D	45.9
Southbound Thru	-	-	-	-	D	42.3	C	30.0
Southbound Right	D	48.3	D	44.2	D	52.4	C	22.6
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*D*	*46.2*	*C*	*28.6*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***25.0***	***E***	***79.3***

*Queue does not clear
^Although delay is below LOS F threshold, v/c > 1.0

As shown in **Table 5**, all movements and approaches are anticipated to operate at acceptable LOS D or better during the AM Peak Hour for Existing Year 2023, Opening Year 2027, and Design Year 2047.

In the PM Peak Hour of all analysis years most movements and approaches operate at acceptable LOS. However, **Table 5** shows that the eastbound left and westbound thru-right movements are anticipated to operate at unacceptable LOS F during the PM Peak Hour in Opening Year 2027, and Design Year 2047. The addition of a southbound left-turn lane shows greater improvement in conditions over 'Scenario 2', but still does not provide adequate operations for the intersection. While the overall intersection shows improved LOS, the westbound approach degrades to unacceptable levels in both the Opening and Design Years, therefore this is not a viable long-term solution.

'Scenario 4' – Major Widening for Right and Left-Turn Lanes on Lake Street (US 42)

'Scenario 4' requires widening both Lake Street (US 42) approaches. This scenario includes the improvements from 'Scenario 3' with the addition of a northbound right-turn lane. This scenario would remove more vehicles from the northbound thru movement queue and introduce the ability to create both northbound and southbound right-turn overlaps with the eastbound and westbound left-turn phases.

Additional minor right-of-way acquisitions will be required along the southeastern portion of the intersection since Lake Street (US 42) widens to the east to accommodate the additional right-turn lane and anticipated WB-67 truck turning movements. These acquisitions would be strip takes. A strip take of the property on the intersection's northwest corner will occur. Additionally, a total take of the vacant property (including the vacant structure) on the northeast corner will occur. Due to the additional turn lanes, sidewalks for all four corners of the intersection are impacted and will need to be reconstructed. Again, there will be a loss of on-street parking along the intersection's north leg to accommodate the longer southbound right-turn lane; as well as a loss of on-street parking along the intersection's south leg. See **Figure 8** for a conceptual horizontal layout for 'Scenario 4'.

Capacity Analysis

Table 6 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 4'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 6: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 4'

Intersection / Movement	'No-Build'				'Scenario 4'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	B	12.4	B	18.9
Eastbound Thru-Right	B	16.3	B	16.5	A	8.1	A	8.9
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*8.6*	*B*	*11.2*
Westbound Left	B	10.6	B	11.8	B	11.2	B	11.9
Westbound Thru-Right	B	17.8	C	27.7	A	8.1	C	23.1
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*8.2*	*C*	*22.8*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	45.1	D	38.6
Northbound Thru	-	-	-	-	D	35.0	D	41.1
Northbound Right	-	-	-	-	C	31.6	C	30.7
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*D*	*36.2*	*D*	*40.4*
Southbound Left-Thru	D	45.4	D	39.3	-	-	-	-
Southbound Left	-	-	-	-	D	38.0	D	44.3
Southbound Thru	-	-	-	-	D	43.6	C	34.8
Southbound Right	D	40.9	D	39.2	D	42.6	C	29.0
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*42.8*	*C*	*32.9*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***19.1***	***C***	***22.5***
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	17.5	F*	92.9
Eastbound Thru-Right	C	21.5	B	18.3	B	10.2	B	11.6
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*11.1*	*C*	*35.0*
Westbound Left	B	13.9	B	13.4	B	14.3	B	16.0
Westbound Thru-Right	C	24.7	D	48.2	B	10.4	F*^	64.9
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*B*	*10.6*	*E*	*63.8*
Northbound Left-Thru-Right	D	45.0			-	-	-	-
Northbound Left	-	-	-	-	D	43.4	D	35.8
Northbound Thru	-	-	-	-	C	32.4	D	37.1
Northbound Right	-	-	-	-	C	29.1	C	27.7
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*33.6*	*D*	*36.6*
Southbound Left-Thru	F	134.1	E*	68.6	-	-	-	-
Southbound Left	-	-	-	-	D	38.0	D	44.0
Southbound Thru	-	-	-	-	D	40.6	C	31.6
Southbound Right	D	41.1	D	41.0	D	49.2	C	23.9
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*D*	*44.0*	*C*	*29.7*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***C***	***22.0***	***D***	***44.2***

*Queue does not clear
^Although delay is below LOS F threshold, v/c > 1.0

Table 6: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 4'

Intersection / Movement	'No-Build'				'Scenario 4'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	C	27.0	F*	133.7
Eastbound Thru-Right	C	27.8	C	22.5	B	13.6	B	16.0
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*15.4*	*D*	*49.0*
Westbound Left	B	17.2	B	15.7	C	20.7	C	23.3
Westbound Thru-Right	C	32.8	F*	94.1	B	13.9	F*	150.7
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*B*	*14.2*	*F*	*148.1*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	44.4	D	35.1
Northbound Thru	-	-	-	-	C	31.2	D	37.5
Northbound Right	-	-	-	-	C	27.7	C	26.0
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*32.7*	*D*	*36.8*
Southbound Left-Thru	F*	192.6	F*	99.5	-	-	-	-
Southbound Left	-	-	-	-	D	37.4	D	44.7
Southbound Thru	-	-	-	-	D	42.3	C	30.2
Southbound Right	D	48.3	D	44.2	D	52.4	C	22.7
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*D*	*46.1*	*C*	*28.6*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***25.0***	***E***	***78.1***

* Queue does not clear

As shown in **Table 6**, most movements and approaches are anticipated to operate at acceptable LOS E or better during the AM and PM Peak Hours in Existing Year 2023, Opening Year 2027, and Design Year 2047.

However, as under previous scenarios, **Table 6** shows that the westbound thru-right and eastbound left-turn movements for 'Scenario 4' are anticipated to have unacceptable LOS F during the PM Peak Hour in Opening Year 2027 and Design Year 2047. The addition of a northbound right-turn lane doesn't improve conditions for the high-volume movements. The overall intersection shows improved LOS but the westbound approach degrades in both the Opening and Design Years, therefore this is not a viable long-term solution.

'Scenario 5' – 'Scenario 3' Plus Right-Turn Lanes on Central Avenue (SR 37)

'Scenario 5' consists of the 'Scenario 3' widening of the southbound Lake Street (US 42) approach, restriping of the northbound Lake Street (US 42) approach and widening of the eastbound/westbound Central Avenue (SR 37) approaches to provide right-turn lanes. Additionally, the lengths of the existing westbound left-turn lane and existing southbound right-turn lane are increased. The length of the existing eastbound left-turn lane is decreased due to relocating the stop bar to account for anticipated truck turn movements. 'Scenario 5' would remove the majority of turning vehicles from the thru movement queues.

This scenario would require right-of-way acquisitions in order to widen Central Avenue (SR 37) and Lake Street (US 42). These acquisitions would largely be strip takes of various parcels; however, total takes of the vacant property on the intersection's northeast corner and of the residential property (including the structure) on the intersection's northwest quadrant will occur. Additionally, sidewalks on all four corners of the intersection are impacted by the new roadway geometry and will need to be reconstructed with new curb ramps. This scenario also results in a loss of on-street parking along the southbound Lake Street (US 42) approach, northbound Lake Street (US 42) approach, and eastbound Central Avenue (SR 37) east of the subject intersection. See **Figure 9** for a conceptual horizontal layout for 'Scenario 5'.

Capacity Analysis

Table 7 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 5'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 7: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 5'

Intersection / Movement	'No-Build'				'Scenario 5'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	B	11.9	B	18.5
Eastbound Thru	-	-	-	-	A	7.7	A	8.7
Eastbound Right	-	-	-	-	A	4.2	A	4.8
Eastbound Thru-Right	B	16.3	B	16.5	-	-	-	-
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*8.0*	*B*	*10.8*
Westbound Left	B	10.6	B	11.8	B	10.4	B	11.5
Westbound Thru	-	-	-	-	A	7.8	C	22.4
Westbound Right	-	-	-	-	A	4.1	A	9.1
Westbound Thru-Right	B	17.8	C	27.7	-	-	-	-
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*7.8*	*C*	*21.7*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	45.1	D	37.9
Northbound Thru-Right	-	-	-	-	D	35.4	D	41.7
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*D*	*36.7*	*D*	*41.4*
Southbound Left-Thru	D	45.4	D	39.3	-	-	-	-
Southbound Left	-	-	-	-	D	38.5	D	44.4
Southbound Thru	-	-	-	-	D	43.6	C	34.1
Southbound Right	D	40.9	D	39.2	D	42.6	C	28.4
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*42.9*	*C*	*32.2*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***18.8***	***C***	***22.0***

*Queue does not clear

Table 7: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 5'

Intersection / Movement	'No-Build'				'Scenario 5'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	16.1	E*	59.7
Eastbound Thru	-	-	-	-	A	9.6	B	11.2
Eastbound Right	-	-	-	-	A	5.2	A	6.1
Eastbound Thru-Right	C	21.5	B	18.3	-	-	-	-
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*10.3*	*C*	*24.9*
Westbound Left	B	13.9	B	13.4	B	13.3	B	15.1
Westbound Thru	-	-	-	-	A	9.7	D	42.5
Westbound Right	-	-	-	-	A	5.2	B	13.2
Westbound Thru-Right	C	24.7	D	48.2	-	-	-	-
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*A*	*9.6*	*D*	*39.4*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	43.4	D	35.1
Northbound Thru-Right	-	-	-	-	C	32.7	D	37.5
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*34.1*	*D*	*37.3*
Southbound Left-Thru			E*	68.6	-	-	-	-
Southbound Left	-	-	-	-	D	38.6	D	44.2
Southbound Thru	-	-	-	-	D	40.6	C	31.0
Southbound Right	D	41.1	D	41.0	D	49.2	C	23.4
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*D*	*44.1*	*C*	*29.3*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***C***	***21.5***	***C***	***32.2***

*Queue does not clear

Table 7: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 5'

Intersection / Movement	'No-Build'				'Scenario 5'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	C	24.2	F*	133.6
Eastbound Thru	-	-	-	-	B	12.6	B	14.5
Eastbound Right	-	-	-	-	A	5.8	A	6.9
Eastbound Thru-Right	C	27.8	C	22.5	-	-	-	-
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*13.8*	*D*	*47.6*
Westbound Left	B	17.2	B	15.7	B	18.8	C	20.8
Westbound Thru	-	-	-	-	B	12.8	F*	104.5
Westbound Right	-	-	-	-	A	5.9	B	14.3
Westbound Thru-Right	C	32.8	F*	94.1	-	-	-	-
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*B*	*12.7*	*F*	*95.7*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	44.4	C	34.9
Northbound Thru-Right	-	-	-	-	C	31.6	D	39.1
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*33.3*	*D*	*38.8*
Southbound Left-Thru	F*	192.6	F*	99.5	-	-	-	-
Southbound Left	-	-	-	-	D	38.2	D	45.9
Southbound Thru	-	-	-	-	D	42.3	C	30.0
Southbound Right	D	48.3	D	44.2	D	52.4	C	22.6
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*D*	*46.2*	*C*	*28.6*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***24.0***	***E***	***59.8***

*Queue does not clear

As shown in **Table 7**, all movements are anticipated to operate at acceptable LOS E or better during the AM Peak Hour of all analysis years as well as during the PM Peak Hour of Existing Year 2023 and Opening Year 2027. While the eastbound left movement has an acceptable level-of-service, queuing that takes longer than two (2) cycles to clear occurs in Opening Year 2027.

Table 7 also shows that the eastbound left-turn and westbound thru movements are expected to operate at unacceptable LOS F during the PM Peak Hour in Design Year 2047. The addition of right-turn lanes on the Central Avenue (SR 37) approaches and southbound Lake Street (US 42), along with left-turn lanes on both Lake Street approaches alleviates much of the poor LOS and queuing but some movements still fail. As the westbound approach continues to exhibit LOS F in the PM Peak Hour of the Design Year, this option in not a viable long-term solution.

'Scenario 6' – Left and Right-Turn Lanes on All Approaches

'Scenario 6' consists of widening all four approaches at the subject intersection. This incorporates the same improvements as 'Scenario 5' as well as a northbound right-turn lane on Lake Street (US 42). These additional lanes allow traffic to be redistributed so that vehicles completing turning movements are removed from the thru movement queues on all approaches.

Due to widening the intersection's north, east, and west legs to accommodate new turning lanes and WB-67 truck turning movements, right-of-way acquisitions are required. These acquisitions would be primarily strip takes of the occupied lots on the intersection's southern corners, as well as the vacant lot on the intersection's northwest corner. Note that total takes of the vacant lot on intersection's northeast corner and of the occupied residential lot on the intersection's northwest quadrant will occur. On-street parking located along the Lake Street (US 42) approaches and along the eastbound Central Avenue (SR 37) travel lane east of the intersection will also be lost. This scenario impacts existing sidewalk in all of the intersection's quadrants. Therefore, the sidewalk will need to be reconstructed. See **Figure 10** for a conceptual horizontal layout for 'Scenario 6'.

Capacity Analysis

Table 8 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 6'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 8: HCM Intersection Capacity Analysis Summary – 'No-Build' vs. 'Scenario 6'

Intersection / Movement	'No-Build'				'Scenario 6'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	B	11.8	B	17.6
Eastbound Thru	-	-	-	-	A	7.8	A	8.3
Eastbound Right	-	-	-	-	A	4.2	A	4.6
Eastbound Thru-Right	B	16.3	B	16.5	-	-	-	-
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*8.1*	*B*	*10.3*
Westbound Left	B	10.6	B	11.8	B	10.3	B	10.9
Westbound Thru	-	-	-	-	A	7.9	C	21.4
Westbound Right	-	-	-	-	A	4.1	A	8.8
Westbound Thru-Right	B	17.8	C	27.7	-	-	-	-
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*7.9*	*C*	*20.8*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	37.4	D	38.6
Northbound Thru	-	-	-	-	C	29.3	D	41.1
Northbound Right	-	-	-	-	C	26.3	C	30.7
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*C*	*30.2*	*D*	*40.4*
Southbound Left-Thru	D	45.4	D	39.3	-	-	-	-
Southbound Left	-	-	-	-	C	31.6	D	44.3
Southbound Thru	-	-	-	-	D	35.5	C	34.8
Southbound Right	D	40.9	D	39.2	D	35.2	C	29.0
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*35.1*	*C*	*32.9*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***16.4***	***C***	***21.5***

*Queue does not clear

Table 8: HCM Intersection Capacity Analysis Summary – 'No-Build' vs. 'Scenario 6'

Intersection / Movement	'No-Build'				'Scenario 6'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	16.4	D	53.7
Eastbound Thru	-	-	-	-	A	10.0	B	10.8
Eastbound Right	-	-	-	-	A	5.2	A	5.9
Eastbound Thru-Right	C	21.5	B	18.3	-	-	-	-
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*10.6*	*C*	*22.9*
Westbound Left	B	13.9	B	13.4	B	13.5	B	14.6
Westbound Thru	-	-	-	-	B	10.1	D	39.9
Westbound Right	-	-	-	-	A	5.3	B	12.9
Westbound Thru-Right	C	24.7	D	48.2	-	-	-	-
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*A*	*10.0*	*D*	*37.1*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	35.3	D	35.8
Northbound Thru	-	-	-	-	C	26.5	D	37.1
Northbound Right	-	-	-	-	C	23.8	C	27.7
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*27.5*	*D*	*36.6*
Southbound Left-Thru	F	134.1	E*	68.6	-	-	-	-
Southbound Left	-	-	-	-	C	31.0	D	44.0
Southbound Thru	-	-	-	-	C	31.7	C	31.6
Southbound Right	D	41.1	D	41.0	D	36.8	C	23.9
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*C*	*33.8*	*C*	*29.7*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***B***	***18.3***	***C***	***30.7***

*Queue does not clear

Table 8: HCM Intersection Capacity Analysis Summary – 'No-Build' vs. 'Scenario 6'

Intersection / Movement	'No-Build'				'Scenario 6'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	C	24.2	F*	133.7
Eastbound Thru	-	-	-	-	B	12.6	B	14.4
Eastbound Right	-	-	-	-	A	5.8	A	6.8
Eastbound Thru-Right	C	27.8	C	22.5	-	-	-	-
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*13.8*	*D*	*47.5*
Westbound Left	B	17.2	B	15.7	B	18.8	C	20.6
Westbound Thru	-	-	-	-	B	12.8	F*	102.2
Westbound Right	-	-	-	-	A	5.9	B	14.2
Westbound Thru-Right	C	32.8	F*	94.1	-	-	-	-
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*B*	*12.7*	*F*	*93.7*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	44.4	D	35.1
Northbound Thru	-	-	-	-	C	31.2	D	37.5
Northbound Right	-	-	-	-	C	27.7	C	26.0
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*32.7*	*D*	*36.8*
Southbound Left-Thru	F*	192.6	F*	99.5	-	-	-	-
Southbound Left	-	-	-	-	D	37.4	D	44.7
Southbound Thru	-	-	-	-	D	42.3	C	30.2
Southbound Right	D	48.3	D	44.2	D	52.4	C	22.7
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*D*	*46.1*	*C*	*28.6*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***24.0***	***E***	***58.8***

*Queue does not clear

As shown in **Table 8**, most movements and approaches are anticipated to operate at acceptable LOS D or better during the AM and PM Peak Hours in Existing Year 2023, Opening Year 2027, and Design Year 2047.

However, **Table 8** shows that the eastbound left and westbound thru movements are anticipated to operate at unacceptable LOS F during the PM Peak Hour in Design Year 2047. Providing left and right-turn lanes on all approaches resolves many of the issues but does not allow for reallocation of green time between the two heavy volume movements.

'Scenario 7' – Two Westbound Lanes on Central Avenue (SR 37) and Northbound Left-Turn Lane on Lake Street (US 42)

This scenario consists of widening Central Avenue (SR 37) both east and west of the subject intersection to provide two (2) westbound travel lanes from Richardson Street to US 23 while increasing the length of the existing westbound left-turn lane to conform to Design Year 2047 traffic conditions. This results in the westbound lane configuration being (left, thru, thru-right). Additionally, the existing eastbound left-turn lane length will increase. The southbound lane configuration will remain (left-thru, right) with increased right-turn lane storage. The northbound approach will be restriped to include a northbound left-turn lane within the existing pavement; which results in a northbound lane configuration of (left, thru-right).

To accommodate the additional thru lane, right-of-way acquisition will be required along the north side of Central Avenue (SR 37), which are mostly strip takes. However, a total take of an occupied residential structure will occur. This is in addition to right-of-way takes at the intersection itself to construct the turn lanes and accommodate truck turns. Strip takes will occur on all four corners of the intersection; however, a total take of a residential property (including the structure) on the northwest quadrant of the intersection will occur. The existing sidewalk on the intersection's northern and southwestern corners will be impacted and will need to be reconstructed. There is a loss of on-street parking located along the Lake Street (US 42) approaches and along the eastbound travel lane east of the intersection. Note that significant utility relocation will occur along Central Avenue (SR 37). See **Figure 11** for a conceptual horizontal layout for 'Scenario 7'.

Capacity Analysis

Table 9 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 7'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 9: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 7'

Intersection / Movement	'No-Build'				'Scenario 7'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	A	8.7	A	9.7
Eastbound Thru-Right	B	16.3	B	16.5	A	9.3	B	10.4
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*9.2*	*B*	*10.2*
Westbound Left	B	10.6	B	11.8	B	12.8	B	14.2
Westbound Thru	-	-	-	-	A	6.4	B	14.3
Westbound Thru-Right	B	17.8	C	27.7	A	6.3	B	14.3
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*6.7*	*B*	*14.3*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	45.0	D	44.0
Northbound Thru-Right	-	-	-	-	C	33.3	D	36.7
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*C*	*34.9*	*D*	*37.3*
Southbound Left-Thru	D	45.4	D	39.3	D	39.2	C	34.9
Southbound Right	D	40.9	D	39.2	D	38.0	C	26.7
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*38.7*	*C*	*31.1*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***17.6***	***B***	***18.5***
Opening Year 2027								
Eastbound Left	B	15.0	F*	150.8	B	15.2	B	17.8
Eastbound Thru-Right	C	21.5	B	18.3	B	15.3	B	15.7
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*15.3*	*B*	*16.3*
Westbound Left	B	13.9	B	13.4	C	21.7	C	21.6
Westbound Thru	-	-	-	-	B	10.3	C	23.3
Westbound Thru-Right	C	24.7	D	48.2	B	10.3	C	23.2
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*B*	*10.8*	*C*	*23.2*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	45.2	D	44.8
Northbound Thru-Right	-	-	-	-	C	26.5	C	30.3
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*28.9*	*C*	*31.5*
Southbound Left-Thru	F	134.1	E*	68.6	D	39.8	D	36.1
Southbound Right	D	41.1	D	41.0	C	31.9	C	20.1
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*D*	*36.3*	*C*	*28.7*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***C***	***20.9***	***C***	***22.8***

*Queue does not clear

Table 9: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 7'

Intersection / Movement	'No-Build'				'Scenario 7'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	C	20.2	C	32.1
Eastbound Thru-Right	C	27.8	C	22.5	C	21.5	C	22.1
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*C*	*21.3*	*C*	*24.9*
Westbound Left	B	17.2	B	15.7	C	31.9	C	31.0
Westbound Thru	-	-	-	-	B	12.4	C	31.5
Westbound Thru-Right	C	32.8	F*	94.1	B	12.4	C	31.3
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*B*	*13.3*	*C*	*31.4*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	48.1	D	48.6
Northbound Thru-Right	-	-	-	-	C	25.0	C	30.1
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*28.1*	*C*	*31.7*
Southbound Left-Thru	F*	192.6	F*	99.5	D	44.4	D	41.7
Southbound Right	D	48.3	D	44.2	C	31.4	B	18.0
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*D*	*38.7*	*C*	*30.7*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***24.2***	***C***	***29.0***

*Queue does not clear

As shown in **Table 9**, all movements and approaches are anticipated to operate at acceptable LOS D or better during the AM and PM Peak Hours in Existing Year 2023, Opening Year 2027, and Design Year 2047.

The additional westbound thru lane provides additional capacity for high traffic volumes. This also creates more opportunities for eastbound drivers to safely conduct permissive left-turns; which results in acceptable operating conditions for the eastbound left movement. While this scenario results in sufficient capacity, delays for the southbound left-thru movement may still occur.

'Scenario 8' – 'Scenario 7' Plus Eastbound Right-Turn Lane

'Scenario 8' consists of widening all four approaches at the subject intersection. This scenario consists of the same lane improvements as 'Scenario 7' with the addition of an eastbound right-turn lane. This results in the eastbound approach lane configuration being (left, thru, right). The north-south and westbound approaches are the same as under 'Scenario 7'.

To accommodate the additional lanes, right-of-way acquisitions are required along the north side of Central Avenue (SR 37), which are mostly strip takes. However, a total take of an occupied residential lot will occur. Additionally, strip takes will occur on all four corners of the intersection; however, a total take of a residential lot (including the structure) will occur. There is also a loss of on-street parking located along the Lake Street (US 42) approaches and along the eastbound travel lane east of the intersection. Existing sidewalk for all four corners of the intersection is impacted and will need to be reconstructed with curb ramps. Like 'Scenario 7', significant utility relocation would occur along Central Avenue (SR 37). See **Figure 12** for a conceptual horizontal layout for 'Scenario 8'.

Capacity Analysis

Table 10 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 8'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 10: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 8'

Intersection / Movement	'No-Build'				'Scenario 8'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	A	8.4	A	9.7
Eastbound Thru	-	-	-	-	A	8.7	A	9.7
Eastbound Right	-	-	-	-	A	4.7	A	5.4
Eastbound Thru-Right	B	16.3	B	16.5	-	-	-	-
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*8.5*	*A*	*9.5*
Westbound Left	B	10.6	B	11.8	B	11.6	B	13.0
Westbound Thru	-	-	-	-	A	6.2	B	14.3
Westbound Thru-Right	B	17.8	C	27.7	A	6.2	B	14.3
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*6.5*	*B*	*14.3*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	37.5	D	44.0
Northbound Thru-Right	-	-	-	-	C	28.0	D	36.7
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*C*	*29.2*	*D*	*37.3*
Southbound Left-Thru	D	45.4	D	39.3	C	32.9	C	34.9
Southbound Right	D	40.9	D	39.2	C	32.1	C	26.7
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*C*	*32.5*	*C*	*31.1*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***15.4***	***B***	***18.2***

*Queue does not clear

Table 10: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 8'

Intersection / Movement	'No-Build'				'Scenario 8'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	13.9	B	17.8
Eastbound Thru	-	-	-	-	B	13.5	B	14.5
Eastbound Right	-	-	-	-	A	7.0	A	7.9
Eastbound Thru-Right	C	21.5	B	18.3	-	-	-	-
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*13.3*	*B*	*15.2*
Westbound Left	B	13.9	B	13.4	B	18.3	B	19.6
Westbound Thru	-	-	-	-	A	9.5	C	23.3
Westbound Thru-Right	C	24.7	D	48.2	A	9.5	C	23.2
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*A*	*9.9*	*C*	*23.2*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	37.6	D	44.8
Northbound Thru-Right	-	-	-	-	C	22.7	C	30.3
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*24.6*	*C*	*31.5*
Southbound Left-Thru	F	134.1	E*	68.6	C	33.3	D	36.1
Southbound Right	D	41.1	D	41.0	C	27.8	C	20.1
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*C*	*30.9*	*C*	*28.7*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***B***	***18.1***	***C***	***22.4***
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	B	18.6	C	32.1
Eastbound Thru	-	-	-	-	B	18.9	B	19.4
Eastbound Right	-	-	-	-	A	8.0	A	8.9
Eastbound Thru-Right	C	27.8	C	22.5	-	-	-	-
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*18.4*	*C*	*22.5*
Westbound Left	B	17.2	B	15.7	C	26.5	C	27.3
Westbound Thru	-	-	-	-	B	11.5	C	31.5
Westbound Thru-Right	C	32.8	F*	94.1	B	11.5	C	31.3
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*B*	*12.2*	*C*	*31.3*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	39.4	D	48.6
Northbound Thru-Right	-	-	-	-	C	21.3	C	30.1
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*23.7*	*C*	*31.7*
Southbound Left-Thru	F*	192.6	F*	99.5	D	36.2	D	41.7
Southbound Right	D	48.3	D	44.2	C	27.3	C	18.0
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*C*	*32.3*	*C*	*30.7*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***C***	***20.8***	***C***	***28.1***

*Queue does not clear

As shown in **Table 10**, all movements and approaches are anticipated to operate at acceptable LOS D or better during the AM and PM Peak Hours in Existing Year 2023, Opening Year 2027, and Design Year 2047. As with 'Scenario 7', this scenario has sufficient capacity, however, the southbound left-thru movement may still face delays. An additional difference is that an eastbound right-turn lane that results in minor reductions in delay but no overall improvement to operations. There is little appreciable operational difference between Scenarios 7 and 8. The only difference in improvements is the addition of an eastbound right-turn lane in scenario 8, which would serve a low volume of traffic relative to the increased footprint.

'Scenario 9' – 'Scenario 3' and 'Scenario 8' Combined

'Scenario 9' consists of widening all four approaches at the subject intersection. This scenario consists of the 'Scenario 3' improvements for the Lake Street (US 42) approaches and the 'Scenario 8' improvements for the Central Avenue (SR 37) approaches, providing an additional westbound thru lane, eastbound right-turn lane, and left and right-turn lanes north-south.

To accommodate the additional lanes and anticipated WB-67 truck turning patterns, right-of-way acquisitions are required along the north side of Central Avenue (SR 37). These acquisitions will mostly consist of strip takes, though a total take of an occupied residential lot will occur. In addition to strip takes on all four corners of the intersection, a total take of a residential lot (including the structure) on the intersection's northwest quadrant will occur. Additionally, on-street parking is lost along the Lake Street (US 42) approaches and along the eastbound Central Avenue (SR 37) travel lanes east of the intersection. Existing sidewalk located on the intersection's northern and southern corners are impacted and will need to be reconstructed with curb ramps. Like 'Scenario 7', utility relocation would occur along Central Avenue (SR 37). See **Figure 13** for a conceptual horizontal layout for 'Scenario 9'.

Capacity Analysis

Table 11 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 9'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 11: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 9'

Intersection / Movement	'No-Build'				'Scenario 9'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	A	7.5	B	12.6
Eastbound Thru	-	-	-	-	A	7.8	B	10.6
Eastbound Right	-	-	-	-	A	4.2	A	5.9
Eastbound Thru-Right	B	16.3	B	16.5	-	-	-	-
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*7.6*	*B*	*11.0*
Westbound Left	B	10.6	B	11.8	B	10.3	B	14.1
Westbound Thru	-	-	-	-	A	5.6	B	17.4
Westbound Thru-Right	B	17.8	C	27.7	A	5.5	B	17.3
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*5.8*	*B*	*17.3*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	37.4	D	35.2
Northbound Thru-Right	-	-	-	-	C	29.6	D	37.5
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*C*	*30.6*	*D*	*37.3*
Southbound Left-Thru	D	45.4	D	39.3	-	-	-	-
Southbound Left	-	-	-	-	C	32.1	D	44.1
Southbound Thru	-	-	-	-	D	35.5	C	31.2
Southbound Right	D	40.9	D	39.2	D	35.2	C	24.8
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*D*	*35.2*	*C*	*30.0*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***15.6***	***B***	***19.8***

*Queue does not clear

Table 11: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 9'

Intersection / Movement	'No-Build'				'Scenario 9'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	10.3	B	13.7
Eastbound Thru	-	-	-	-	A	10.0	B	11.2
Eastbound Right	-	-	-	-	A	5.2	A	6.1
Eastbound Thru-Right	C	21.5	B	18.3	-	-	-	-
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*A*	*9.8*	*B*	*11.7*
Westbound Left	B	13.9	B	13.4	B	13.5	B	15.1
Westbound Thru	-	-	-	-	A	7.1	B	18.3
Westbound Thru-Right	C	24.7	D	48.2	A	7.1	B	18.2
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*A*	*7.4*	*B*	*18.2*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	35.3	D	35.1
Northbound Thru-Right	-	-	-	-	C	26.8	D	37.5
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*27.9*	*D*	*37.3*
Southbound Left-Thru	F	134.1	E*	68.6	-	-	-	-
Southbound Left	-	-	-	-	C	31.5	D	44.2
Southbound Thru	-	-	-	-	C	31.7	C	31.0
Southbound Right	D	41.1	D	41.0	D	36.8	C	24.3
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*C*	*33.9*	*C*	*29.7*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***B***	***17.3***	***C***	***20.3***

Table 11: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 9'

Intersection / Movement	'No-Build'				'Scenario 9'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	B	13.7	C	23.7
Eastbound Thru	-	-	-	-	B	13.4	B	14.5
Eastbound Right	-	-	-	-	A	5.9	A	6.9
Eastbound Thru-Right	C	27.8	C	22.5	-	-	-	-
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*13.1*	*B*	*16.8*
Westbound Left	B	17.2	B	15.7	B	19.3	C	20.8
Westbound Thru	-	-	-	-	A	8.5	C	23.4
Westbound Thru-Right	C	32.8	F*	94.1	A	8.5	C	23.3
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*A*	*9.0*	*C*	*23.3*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	35.8	C	34.9
Northbound Thru-Right	-	-	-	-	C	25.7	D	39.1
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*27.0*	*D*	*38.8*
Southbound Left-Thru	F*	192.6	F*	99.5	-	-	-	-
Southbound Left	-	-	-	-	C	30.8	D	45.9
Southbound Thru	-	-	-	-	C	32.3	C	30.0
Southbound Right	D	48.3	D	44.2	D	38.1	C	22.3
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*C*	*34.6*	*C*	*28.5*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***B***	***18.9***	***C***	***23.9***

*Queue does not clear

Table 11 shows that all movements and approaches are anticipated to operate at acceptable LOS D or better during the AM and PM Peak Hours in Existing Year 2023, Opening Year 2027, and Design Year 2047. As under the previous two scenarios, Scenario 9 provides additional capacity for the westbound thru movement, while also providing a southbound left-turn lane that reduces the delays and potential queuing on that approach.

'Scenario 10' – 'Scenario 7' and 'Scenario 9' Combined

'Scenario 10' consists of widening all four approaches at the subject intersection. This scenario consists of the 'Scenario 3' improvements for the Lake Street (US 42) approaches and the 'Scenario 7' improvements for the Central Avenue (SR 37) approaches.

Strip take right-of-way acquisitions along the north side of Central Avenue (SR 37) will occur, as well as a total take of an occupied residential property. Additionally, strip takes along the northwest, northeast, and southwest corners of the intersection are required to accommodate additional lanes and WB-67 truck turning patterns. Total takes of the property on the intersection's northeast quadrant, including the small vacant structure, and the residential property on the intersection's northwest quadrant will occur. The existing sidewalk on the intersection's northern and southern corners will be impacted and will need to be reconstructed. There is a loss of on-street parking located along the Lake Street (US 42) approaches and along the eastbound travel lane east of the intersection. Note that significant utility relocation will occur along Central Avenue (SR 37). See **Figure 14** for a conceptual horizontal layout for 'Scenario 10'.

A sub-alternative, 'Scenario 10A' was developed that incorporates the same lane configuration at the intersection of Central Avenue (SR 37) and Lake Street (US 42) but eliminates the eastbound left-turn lane to Potter Street. This would allow for the additional westbound thru lane to be developed with fewer right-of-way impacts. Access to Potter Street would be available via Channing Street and Fair Avenue. See **Figure 15** for a conceptual horizontal layout of 'Scenario 10A'. Note that this change does not affect capacity analysis, so 'Scenario 10' and 'Scenario 10A' do not appear as separate alternatives in terms of that evaluation.

Capacity Analysis

Table 12 on the following pages summarize the results of the capacity analysis for the subject intersection for the Existing Year, Opening Year, and Design Year for traffic conditions under 'Scenario 10'. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 12: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 10'

Intersection / Movement	'No-Build'				'Scenario 10'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Existing Year 2023								
Eastbound Left	B	11.3	C	27.0	A	9.8	B	13.0
Eastbound Thru-Right	B	16.3	B	16.5	B	10.0	B	11.8
Eastbound Approach	*B*	*15.7*	*B*	*19.0*	*A*	*10.0*	*B*	*12.1*
Westbound Left	B	10.6	B	11.8	B	13.6	B	16.1
Westbound Thru	-	-	-	-	A	6.8	B	17.9
Westbound Thru-Right	B	17.8	C	27.7	A	6.8	B	17.9
Westbound Approach	*B*	*17.4*	*C*	*27.3*	*A*	*7.1*	*B*	*17.9*
Northbound Left-Thru-Right	D	38.8	E	55.8	-	-	-	-
Northbound Left	-	-	-	-	D	35.2	C	34.6
Northbound Thru-Right	-	-	-	-	C	27.0	D	35.2
Northbound Approach	*D*	*38.8*	*E*	*55.8*	*C*	*28.0*	*D*	*35.2*
Southbound Left-Thru	D	45.4	D	39.3	-	-	-	-
Southbound Left	-	-	-	-	C	31.6	D	43.2
Southbound Thru	-	-	-	-	C	31.6	C	30.6
Southbound Right	D	40.9	D	39.2	D	36.7	C	24.2
Southbound Approach	*D*	*43.5*	*D*	*39.2*	*C*	*33.8*	*C*	*29.4*
Overall Intersection	***C***	***24.9***	***C***	***29.9***	***B***	***17.3***	***C***	***20.1***

*Queue does not clear

Table 12: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 10'

Intersection / Movement	'No-Build'				'Scenario 10'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Opening Year 2027								
Eastbound Left	B	16.0	F*	150.8	B	10.3	B	14.2
Eastbound Thru-Right	C	21.5	B	18.3	B	10.6	B	12.5
Eastbound Approach	*C*	*20.8*	*E*	*56.4*	*B*	*10.6*	*B*	*13.0*
Westbound Left	B	13.9	B	13.4	B	14.6	B	17.4
Westbound Thru	-	-	-	-	A	7.1	B	19.0
Westbound Thru-Right	C	24.7	D	48.2	A	7.1	B	18.9
Westbound Approach	*C*	*24.2*	*D*	*47.5*	*A*	*7.4*	*B*	*18.9*
Northbound Left-Thru-Right	D	45.0	F	439.0	-	-	-	-
Northbound Left	-	-	-	-	D	35.3	C	34.4
Northbound Thru-Right	-	-	-	-	C	26.8	D	35.1
Northbound Approach	*D*	*45.0*	*F*	*439.0*	*C*	*27.9*	*D*	*35.1*
Southbound Left-Thru	F	134.1	E*	68.6	-	-	-	-
Southbound Left	-	-	-	-	C	31.5	D	43.1
Southbound Thru	-	-	-	-	C	31.7	C	30.3
Southbound Right	D	41.1	D	41.0	D	36.8	C	23.6
Southbound Approach	*F*	*93.5*	*E*	*55.8*	*C*	*33.9*	*C*	*29.0*
Overall Intersection	***D***	***44.5***	***F***	***102.7***	***B***	***17.6***	***C***	***20.7***

Table 12: HCM Intersection Capacity Analysis Summary - 'No-Build' vs. 'Scenario 10'

Intersection / Movement	'No-Build'				'Scenario 10'			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Design Year 2047								
Eastbound Left	C	21.7	F*	257.8	B	13.7	C	25.9
Eastbound Thru-Right	C	27.8	C	22.5	B	14.6	B	17.8
Eastbound Approach	*C*	*27.0*	*F*	*88.5*	*B*	*14.5*	*C*	*20.1*
Westbound Left	B	17.2	B	15.7	C	21.2	C	25.7
Westbound Thru	-	-	-	-	A	8.5	C	25.5
Westbound Thru-Right	C	32.8	F*	94.1	A	8.5	C	25.4
Westbound Approach	*C*	*32.1*	*F*	*92.5*	*A*	*9.1*	*C*	*25.4*
Northbound Left-Thru-Right	E	68.4	F*	628.1	-	-	-	-
Northbound Left	-	-	-	-	D	35.8	C	33.3
Northbound Thru-Right	-	-	-	-	C	25.7	C	34.8
Northbound Approach	*E*	*68.4*	*F*	*628.1*	*C*	*27.0*	*C*	*34.6*
Southbound Left-Thru	F*	192.6	F*	99.5	-	-	-	-
Southbound Left	-	-	-	-	C	30.8	D	43.2
Southbound Thru	-	-	-	-	C	32.3	C	28.6
Southbound Right	D	48.3	D	44.2	D	38.1	C	21.0
Southbound Approach	*F*	*129.8*	*E*	*73.7*	*C*	*34.6*	*C*	*26.9*
Overall Intersection	***E***	***60.6***	***F***	***157.2***	***B***	***19.4***	***C***	***25.0***

*Queue does not clear

As shown in **Table 12**, all movements and approaches are anticipated to operate at acceptable LOS D or better during the AM and PM Peak Hours in Existing Year 2023, Opening Year 2027, and Design Year 2047. Scenario 10 provides adequate capacity for all movements, incorporating the north-south left-turn lanes as well as the additional westbound thru lane.

Turn Lane Length Calculations

Turn lane length calculations were performed to determine the required length for each turn lane based on the Design Year 2047 peak hour traffic volumes. The required storage length is a function of site conditions, lane assignments, design speed, and the vehicular demand of the individual movement and is based on Figures 401-9 and 401-10 of the ODOT Location and Design Manual, Volume 1. See **Appendix E** for the storage length calculation printouts.

A queuing analysis for all scenarios was performed for the AM and PM Peak Hours utilizing the computer program SimTraffic, which is developed by TrafficWare. SimTraffic is a supplemental program to Synchro 11 that creates a visual microscopic simulation of the traffic model created in Synchro 11. This program allows the user to visualize how the intersection will operate in the field with the type of detection, volumes, and signal timings that could be expected in the future. SimTraffic produces queuing printouts that report the average queue, 95th percentile queue, and maximum queue. The 95th percentile queue lengths will be used for the queuing evaluation. See **Appendix F** for the queuing analysis reports.

Using the turn lane storage lengths from the ODOT calculations, SimTraffic simulations were conducted to determine if northbound left turning traffic queue blocked northbound thru-right traffic. While the calculated northbound left-turn lane storage length was sufficient, this lane length was increased to ensure northbound thru-right traffic was not blocked. Additionally, turn lanes cannot develop in intersections. As such, the presence of the Lake Street (US 42) / Flax Street intersection causes the southbound right-turn lane length to be less than the calculated length. Due to stop bar relocation the eastbound left-turn lane length is less than the calculated length.

The westbound left-turn lane is longer than the calculated length since there was additional space over the railroad crossing to allow for a longer turn lane. Additionally, the westbound left-turn lane length was increased so that it fits back-to-back with the eastbound left-turn lane at the Central Avenue (SR 37) / Potter Street intersection.

Table 13 on the following page shows the recommended turn lane lengths under the Design Year 2047 traffic conditions.

Table 13: Storage Lengths

Movement	Recommended Storage Length (ft.)										
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 10A
Eastbound Left-Turn Lane	-	-	-	-	265’	265’	318’	318’	318’	318’	318’
Eastbound Right-Turn Lane	-	-	-	-	150’	150’	-	150’	150’	150’	150’
Westbound Left-Turn Lane	-	-	-	-	200’	190’	220’	220’	220’	220’	100’
Westbound Right-Turn Lane	-	-	-	-	200’	200’	-	-	-	-	-
Northbound Left-Turn Lane	-	150’	150’	150’	150’	150’	150’	150’	150’	150’	150’
Northbound Right-Turn Lane	-	-	-	100’	-	100’	-	-	-	-	-
Southbound Left-Turn Lane	-	-	200’	200’	200’	200’	-	-	200’	200’	200’
Southbound Right-Turn Lane	-	-	265’	265’	265’	265’	265’	265’	265’	265’	265’

*Storage lengths include 50’ taper

As shown in **Table 13**, it is recommended that if an intersection widening project is undertaken, the existing turn lanes should be modified to include the above storage lengths. Additionally, any new turn lanes should use the lengths indicated in **Table 13**. Note that lengthening of the westbound left-turn lane will extend beyond the railroad tracks east of the intersection, and additional signs and pavement markings should be installed so that vehicles do not stop on the tracks. Note that the westbound left-turn lane for ‘Scenario 10A’ is shorter due to the elimination of the eastbound left-turn lane at Potter Street.

Railroad Impacts

Due to the proximity of the railroad crossing for the CSX Railroad’s Great Lakes Division – Columbus Line Subdivision – Delaware Cutoff, railroad interconnect will limit the effect of queuing at the subject intersection when a train is present. The railroad interconnect would operate as follows:

1. Gates down signal gets sent from the train to the railroad circuit.
2. Controller times out of current phase and turns westbound Central Avenue (SR 37) green to clear vehicles that are stopped on the tracks.
3. Once the westbound clearance phase is complete, traffic signals for the Lake Street (US 42) approaches will turn green for the duration of the train.

4. Normal traffic signal operations would resume once the train is past the crossing.

This limits queuing for the Lake Street (US 42) approaches since the northbound/southbound movements can continue to be served rather than the signal cycling when east-west traffic is unable to proceed across the tracks. To limit queuing between the subject intersection and the railroad crossing, a blank out "No Left Turn" and a blank out "No Right Turn" sign should be installed for the southbound left-turning traffic and northbound right-turning traffic respectively to prevent southbound left-turn and northbound right-turn vehicles from blocking the intersection.

Another option that the City could pursue with regard to the railroad crossing would be to have it declared an exempt crossing by the Public Utilities Commission of Ohio (PUCO). This would improve operations since hazardous materials vehicles and buses would not be required to stop at the crossing. It is recognized that the adjacent railroad crossing has some impact on operations at the intersection of Central Avenue (SR 37) / Lake Street (US 42). This cannot be factored into the capacity analysis due to software limitations, although it is understood that vehicles slow or stop approaching the tracks. None of the options analyzed are restricted by the railroad, but geometric improvements to minimize elevation differences could be considered during detailed design of a project.

Bypass Evaluation

The City of Delaware 2020-2040 Thoroughfare Plan identifies completed and proposed roadway improvements that include projects on existing roads and intersections, roadway extensions, and new roadways. Two projects on the Thoroughfare Plan that could impact traffic operations at the intersection of Central Avenue (SR 37) / Lake Street (US 42) are the Byxbe Parkway Extension and the Northeast US 36 / SR 37 / US 23 Bypass. Byxbe Parkway would be a joint project between the City of Delaware and Delaware County to extend the existing road as a two-lane controlled access road to US 23 on the north side of the City. The Northeast Bypass is a proposed ODOT project that would create a limited access road around the northeast quadrant of the City to connect US 36 / SR 37 to US 23. While both of these projects are currently conceptual with no detailed plans developed or funding allocated for construction, if either one develops the thru traffic on Central Avenue (SR 37) could be reduced since motorists traveling to/from US 23 would divert to avoid driving through town if they are truly thru traffic with no local intermediate destination.

The City requested that traffic diversions related to these potential roadways be investigated to determine how much redistribution would be necessary for Central Avenue (SR 37) to operate efficiently while maintaining a single thru lane westbound. The goal would be to improve the study intersection to acceptable levels under Design Year 2047 traffic while minimizing project costs, assuming only thru east-west traffic would be diverted. Based on this, 'Scenario 4' was evaluated

under varying levels of traffic redistribution to determine how much traffic diversion would need to occur to reach acceptable Levels-of-Service, as well as to match the operations of Option 10/10A.

Since the controlling time period is the PM Peak Hour in Design Year 2047, adjustments to the east-west volumes were analyzed for that scenario only. Synchro analysis was performed maintaining the same signal cycle length but with optimized phase splits to identify when adequate LOS could be achieved. **Table 14** below provides a comparison of the results for Option 4 with full traffic volumes, 20% reduction in east-west traffic, and 35% reduction in east-west traffic. Note that while the northbound thru and right-turn movements show LOS D with the 35% reduction, the delays are just above the threshold for LOS C, so this would operate virtually the same as 'Scenario 10'. Copies of the analysis worksheets are provided in **Appendix D**.

Table 14: HCM Intersection Capacity Analysis Summary - 'Scenario 4' Traffic Reduction Evaluation

Intersection / Movement	'Scenario 4' Full Volumes		'Scenario 4' 20% Reduction		'Scenario 4' 35% Reduction	
	PM Peak Hour		PM Peak Hour		PM Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Eastbound Left	F	133.7	E	54.0	C	34.1
Eastbound Thru-Right	B	16.0	A	9.5	B	10.9
Eastbound Approach	*D*	*49.0*	*C*	*27.1*	*B*	*19.4*
Westbound Left	C	23.3	B	12.8	B	14.1
Westbound Thru-Right	F	150.7	D	51.8	C	33.3
Westbound Approach	*F*	*148.1*	*D*	*50.9*	*C*	*32.7*
Northbound Left-Thru-Right	-	-	-	-	-	-
Northbound Left	D	35.1	D	40.3	D	35.1
Northbound Thru	D	37.5	E	59.1	D	37.5
Northbound Right	C	26.0	C	29.7	C	26.0
Northbound Approach	*D*	*36.8*	*E*	*56.4*	*D*	*36.8*
Southbound Left-Thru	-	-	-	-	-	-
Southbound Left	D	44.7	E	65.2	D	44.7
Southbound Thru	C	30.2	D	35.7	C	30.2
Southbound Right	C	22.7	C	24.2	C	22.7
Southbound Approach	*C*	*28.6*	*C*	*34.2*	*C*	*28.6*
Overall Intersection	***E***	***78.1***	***D***	***40.2***	***C***	***28.0***

VI. Conceptual Cost Estimates:

Utilizing the proposed renderings for the scenarios presented above, conceptual cost estimates were created, which are summarized in **Table 15** below. Note that the following estimates are preliminary and should not be used for construction, bid, reliance, recording purposes, or implementation. See **Appendix F** for full cost estimate breakdowns for each scenario.

Table 15: Conceptual Cost Estimates

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
$527,310	$1,375,378	$1,880,156	$1,910,004	$3,455,021	$3,523,767
Scenario 7	**Scenario 8**	**Scenario 9**	**Scenario 10**	**Scenario 10A**	
$5,306,628	$5,489,115	$5,886,531	$5,744,050	$5,739,199	

VII. Scenario Comparison / Evaluation:

Several performance measures were evaluated to compare the various scenarios. A rating system based on the level of impact was developed, as depicted in the legend below:

Evaluation Matrix Legend
Very Good/Positive Impact/Low Cost
Good/Somewhat Positive Impact/Medium Cost
Fair/Neutral
Poor/Somewhat Negative Impact/High Cost
Very Poor/Negative Impact/Significant Cost

The evaluation matrix comparing the No-Build and various improvement scenarios is shown in **Table 16** below. Note that non-marked on-street parking was assumed to be 22’ long; and marked parking spaces were assumed to be 20’ per ODOT OMUTCD Figure 3B-21. Minor right-of-way takes include strip takes along property frontages and small acquisitions at the corners of the intersection. Total takes are those that would impact structures and therefore require acquiring the entire parcel.

Table 16: Scenario Comparison Matrix

Performance Measures	No-Build	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overall LOS/Delay (sec)	F/157.2	F/124.4	E/89.0	E/79.3	E/78.1	E/59.8
Queuing	Yes	Yes	Yes	Yes	Yes	Yes
Type of Right-of-Way Acquisition (Number of Parcels)	N/A	Min. Comm. (1)	Min. Comm. (5)	Min. Comm. (4) Min. Res. (1) Tot. Comm. (1)	Min. Comm. (4) Min. Res. (1) Tot. Comm. (1)	Min. Comm. (5) Min. Res. (2) Tot. Comm. (1) Tot. Res. (1)
Right-of-Way Costs	N/A	$25,000	$221,500	$310,650	$310,650	$688,400
Parking Impacts (Number of Spaces Lost)	N/A	No (0)	Yes (10)	Yes (15)	Yes (15)	Yes (22)
Utility Impacts	N/A	No	Yes	Yes	Yes	Yes
Total Project Costs	N/A	$527,310	$1,375,378	$1,880,156	$1,910,004	$3,455,021

Performance Measures	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 10A
Overall LOS/Delay (sec)	E/58.8	C/29.0	C/28.1	C/23.9	C/25.0	C/25.0
Queuing	Yes	No	No	No	No	No
Type of Right-of-Way Acquisition (Number of Parcels)	Min. Comm. (5) Min. Res. (2) Tot. Comm. (1) Tot. Res. (1)	Min. Comm. (6) Min. Res. (12) Tot. Res. (2)	Min. Comm. (6) Min. Res. (12) Tot. Res. (2)	Min. Comm. (5) Min. Res. (12) Tot. Comm. (1) Tot. Res. (2)	Min. Comm. (5) Min. Res. (12) Tot. Comm. (1) Tot. Res. (2)	Min. Comm. (5) Min. Res. (12) Tot. Comm. (1) Tot. Res. (2)
Right-of-Way Costs	$688,400	$1,195,700	$1,195,700	$1,258,550	$1,258,550	$1,258,550
Parking Impacts (Number of Spaces Lost)	Yes (22)	Yes (28)	Yes (28)	Yes (28)	Yes (28)	Yes (28)
Utility Impacts	Yes	Yes	Yes	Yes	Yes	Yes
Total Project Costs	$3,523,767	$5,306,628	$5,489,115	$5,886,531	$5,744,050	$5,739,199

Based on **Table 16** above, 'Scenario 1' yields minimal impacts to the intersection/surrounding area and has the lowest construction cost. However, as previously mentioned, this scenario yields significant queuing due to insufficient green time and capacity for the westbound thru movement. Progressing through the various scenarios, both the construction costs and impacts to the intersection/surrounding area increase. However, when more lanes are added anticipated queuing and congestion decreases. This culminates in 'Scenario 10', which does not suffer from significant queuing nor failing LOS. However, this scenario impacts the intersection and surrounding area due to utility relocations, right-of-way acquisitions, on-street parking impacts, and has high construction costs.

VIII. Summary and Recommendations:

This Intersection Alternatives Study is being prepared at the request of the City of Delaware with regards to the Central Avenue (SR 37) / Lake Street (US 42) intersection in the City of Delaware, Delaware County, Ohio. The purpose of this study is to analyze the vehicular operating conditions of the subject intersection under existing conditions and several lane configuration scenarios to determine what, if any, improvements can be implemented to decrease congestion.

In summary, the intersection's existing conditions do not provide sufficient capacity for several movements in Design Year 2047. For 'Scenario 1' – 'Scenario 6', the eastbound left-turn movement and westbound thru movements are anticipated to operate at unacceptable LOS F. Sufficient green time cannot be provided for the high-volume westbound thru movement without negatively impacting the other approaches, regardless of whether designated turn lanes are provided.

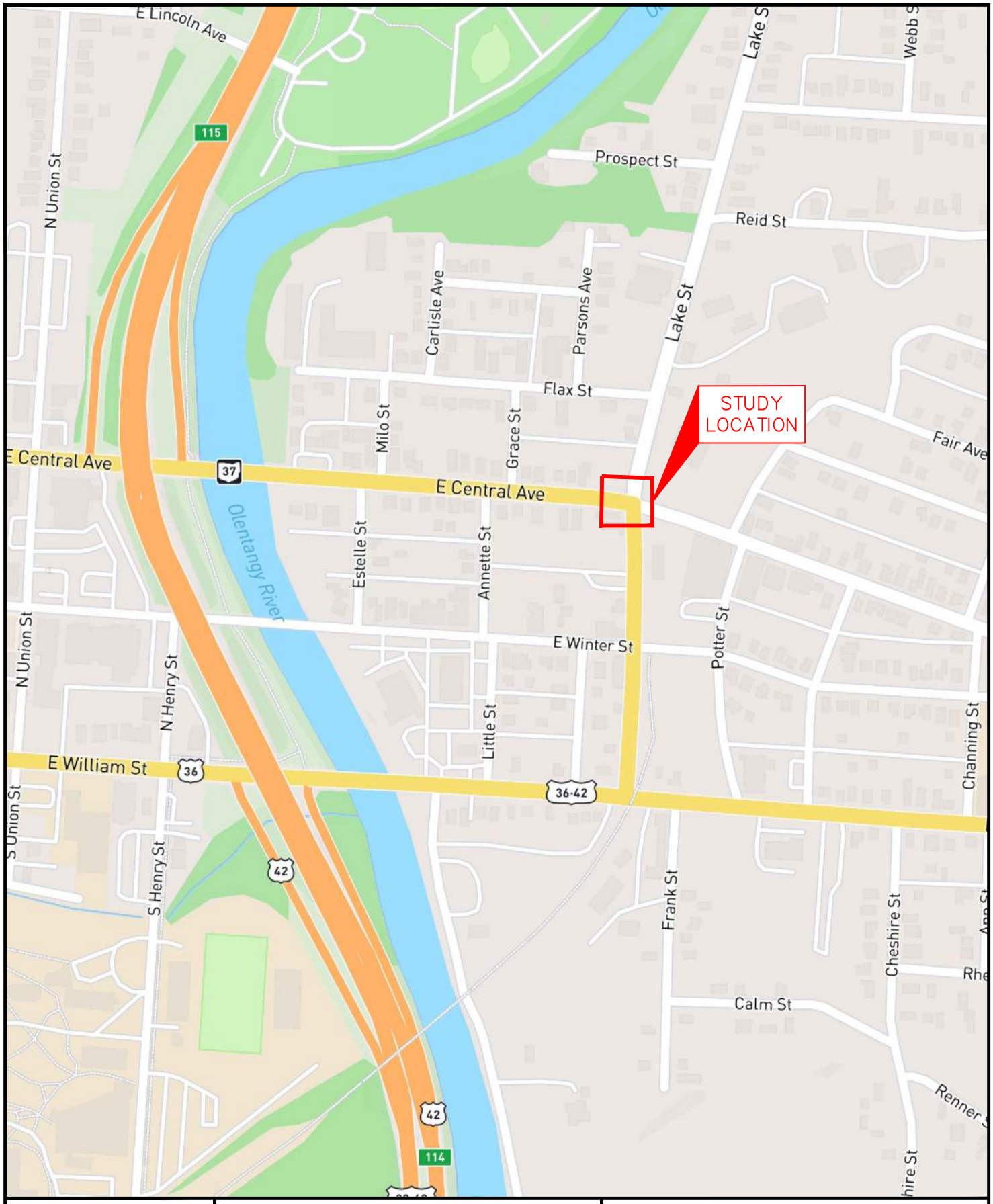
However, if Central Avenue (SR 37) is widened to two (2) westbound travel lanes, traffic can be accommodated without excessive green time. The westbound thru vehicles being distributed over two lanes also creates more opportunities for eastbound drivers to safely conduct permissive left-turns. For 'Scenario 7' and 'Scenario 8', delays for the southbound movements may occur.

Based on the information and analyses in this study, if the City decides to move forward with an intersection improvement, GPD Group recommends that 'Scenario 10A' be selected. As previously mentioned, this scenario consists of widening Central Avenue (SR 37) to include two (2) westbound travel lanes, which yields a westbound lane configuration of (left, thru, thru-right) and an eastbound lane configuration of (left, thru-right). 'Scenario 10A' eliminates the existing eastbound left-turn lane to Potter Street, allowing for easier development of the second westbound thru lane and lessening the right-of-way impacts east of the intersection and improving safety by eliminating a left-turn at an unsignalized intersection across multiple opposing lanes. Eastbound traffic that wishes to turn left at Potter Street would be redirected to Channing Street, where an eastbound left-turn lane and signal already exist. The southbound Lake Street (US 42) approach should be widened to include a southbound left-turn lane, which yields a southbound lane configuration of (left, thru, right). The existing southbound right-turn lane can be lengthened within the existing pavement. The northbound Lake Street (US 42) approach should be restriped to allow a northbound left-turn lane, which results in a northbound lane configuration of (left, thru-right). Lengths for all existing turn lanes should be increased according to the information provided in **Table 13**. The traffic signal should be reconstructed to meet current design standards, allow for potential future phasing changes, and possible railroad interconnect.

If either the Byxbe Parkway Extension or Northeast Bypass are constructed and traffic diverts from Central Avenue (SR 37) to the new roadway, the City could opt for 'Scenario 4', which has a substantially lower total project cost. However, 20% of east-west traffic would have to redistribute to achieve acceptable operations and 35% to achieve similar operations as 'Scenario 10A'.



FIGURES



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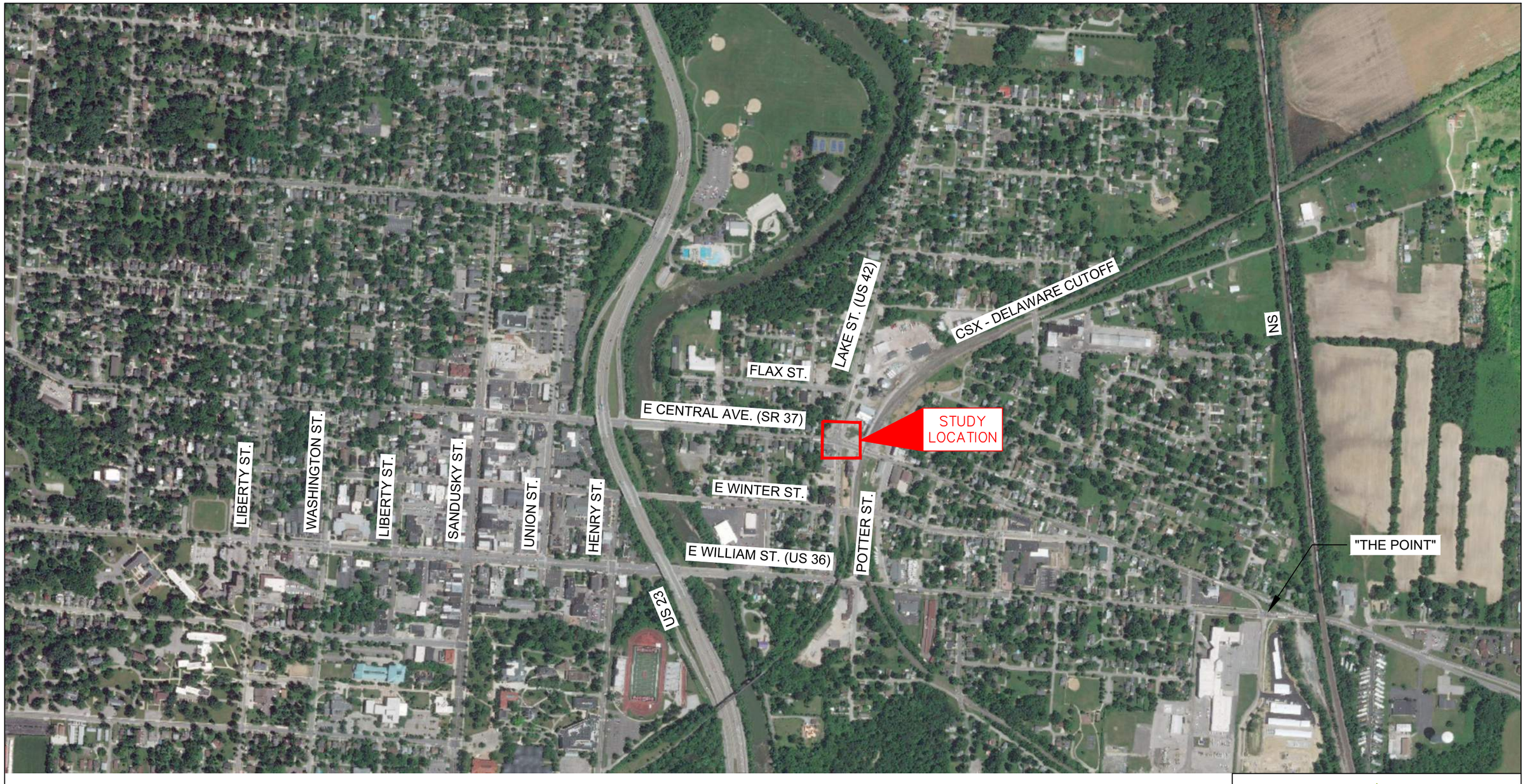
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FIGURE 1

PROJECT LOCATION MAP

OCTOBER 2023

CAD FILE: G:\2023\2023061\54 - TASK ORDER 4 (SR 37 & US 42 INTERSECTION STUDY)\FIGURES\FIGURE 1_PROJECT LOCATION MAP.DWG
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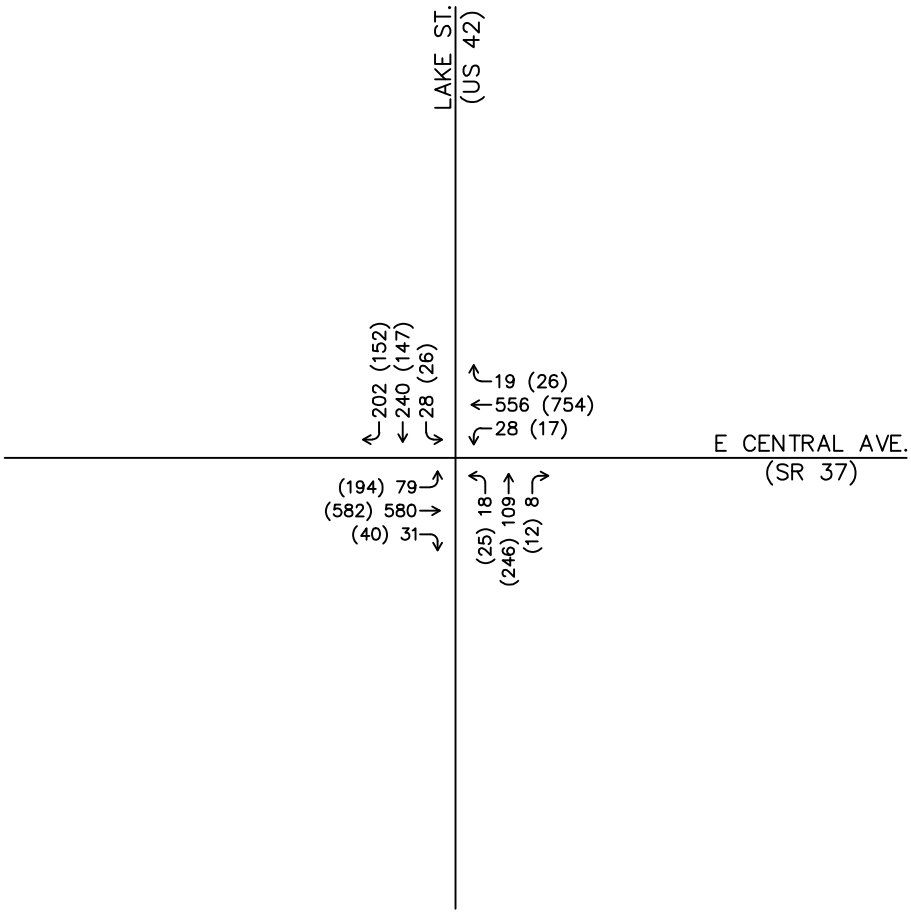
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FIGURE 2

AERIAL PHOTOGRAPH

NOVEMBER 2023

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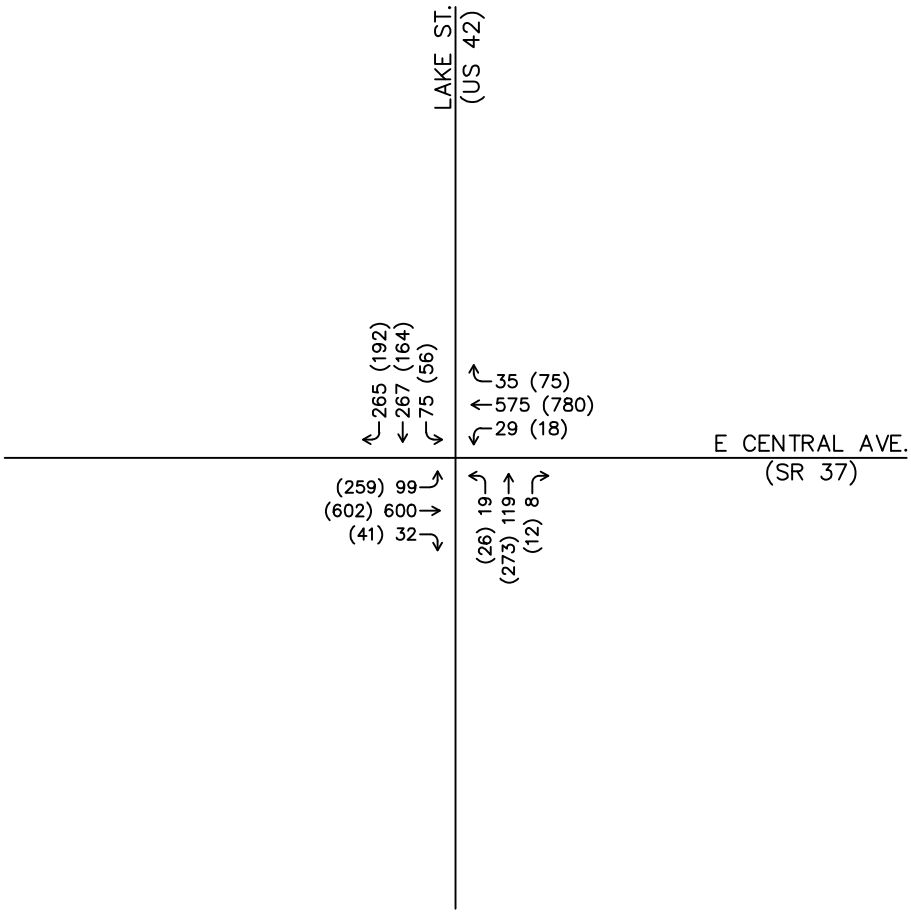
N.T.S.

FIGURE 3

EXISTING YEAR 2023
PEAK HOUR TRAFFIC VOLUMES

OCTOBER 2023

CAD FILE: G:\2023\2023061\54 - TASK ORDER 4 (SR 37 & US 42 INTERSECTION STUDY)\FIGURES\FIGURE 3_VOLUMES.DWG
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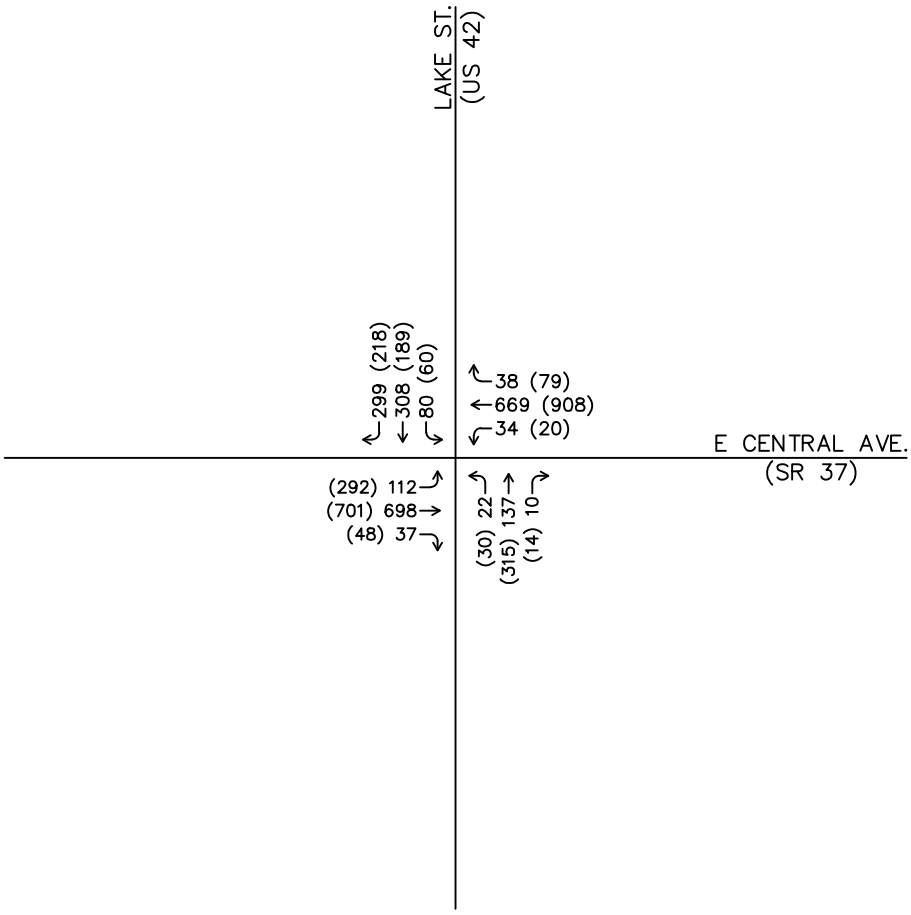
N.T.S.

FIGURE 4

OPENING YEAR 2027
PEAK HOUR TRAFFIC VOLUMES

OCTOBER 2023

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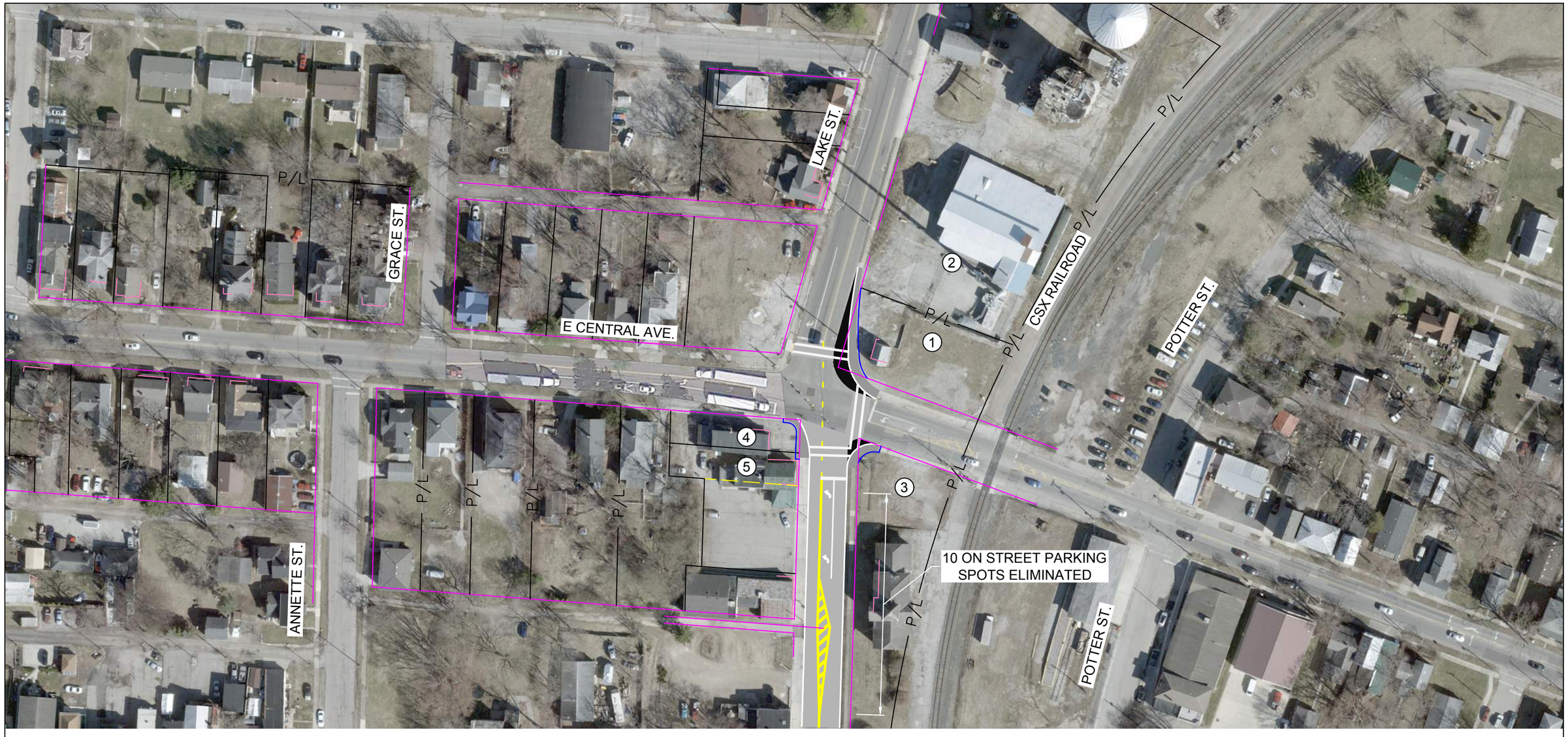
N.T.S.

FIGURE 5

DESIGN YEAR 2047
PEAK HOUR TRAFFIC VOLUMES

OCTOBER 2023

CAD FILE: G:\2023\2023061\54 - TASK ORDER 4 (SR 37 & US 42 INTERSECTION STUDY)\FIGURES\FIGURE 3_VOLUMES.DWG
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TECHNICIAN: MLESSITER



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0 100

50 200

Horizontal Scale in Feet

ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	MINOR COMMERCIAL/ TEMPORARY
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY

LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

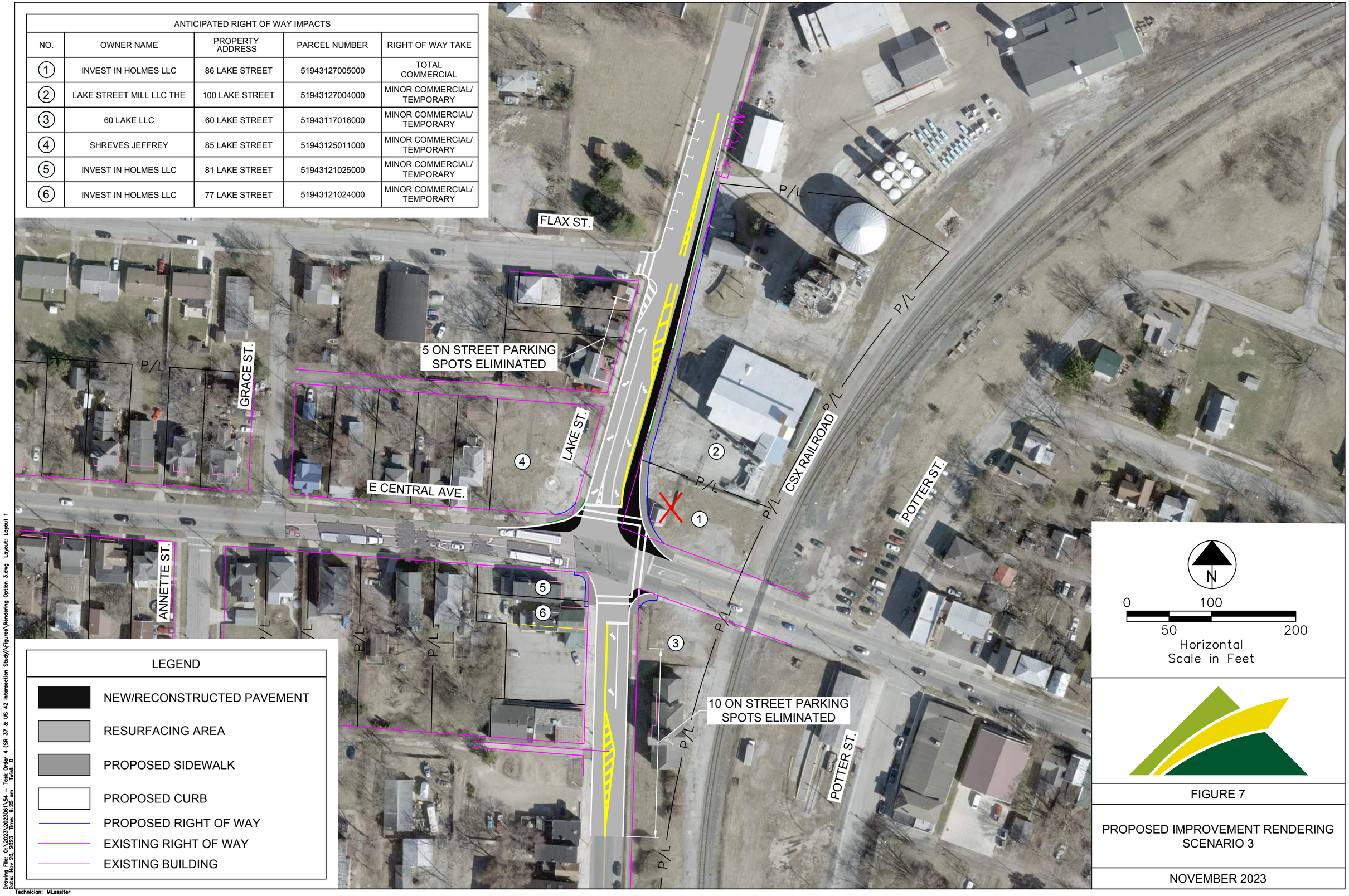
FIGURE 6

PROPOSED IMPROVEMENT RENDERING SCENARIO 2

NOVEMBER 2023

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NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY



LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

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Horizontal Scale in Feet

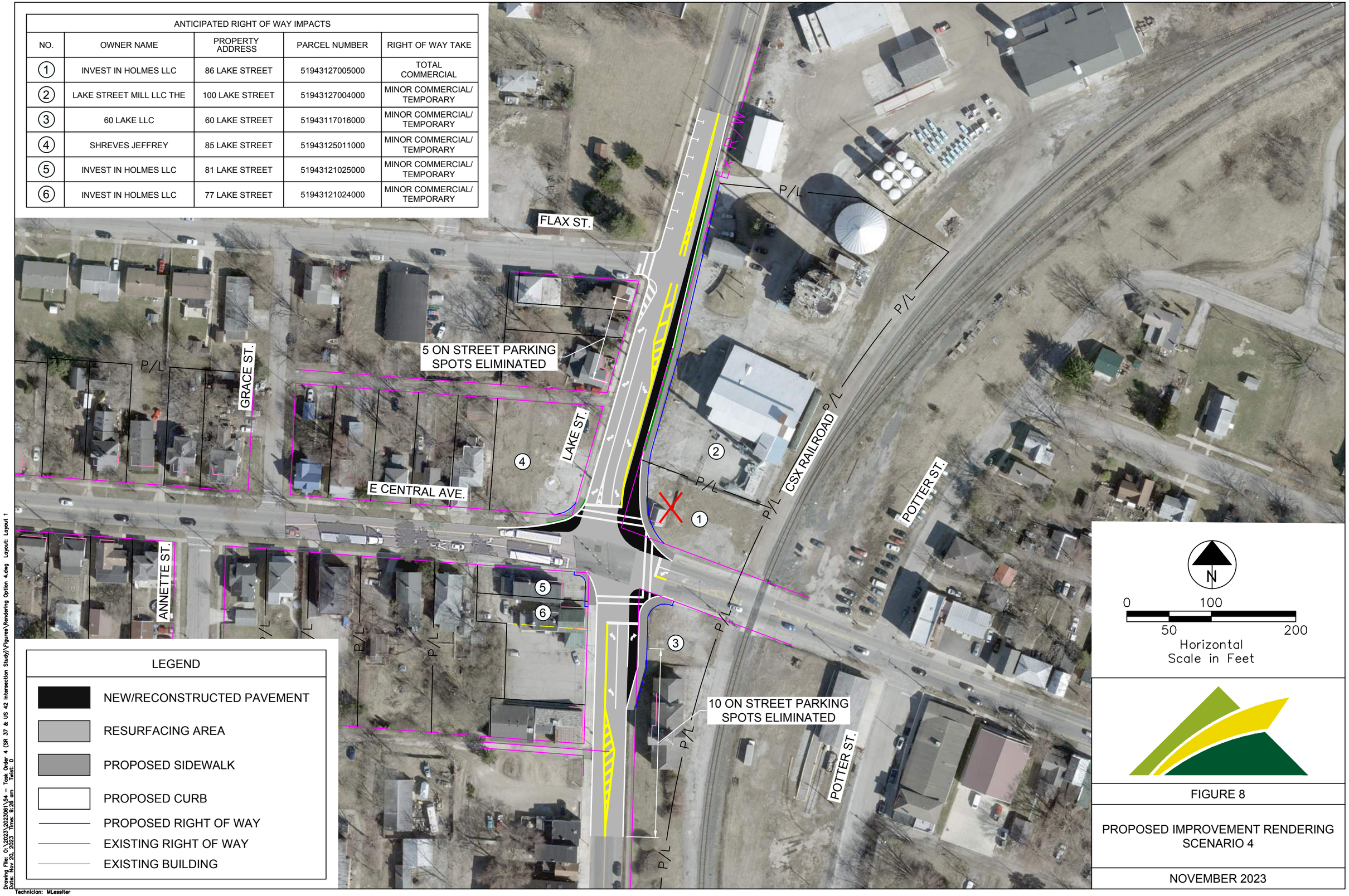
FIGURE 7

PROPOSED IMPROVEMENT RENDERING SCENARIO 3

NOVEMBER 2023

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ANTICIPATED RIGHT OF WAY IMPACTS				
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1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY



LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

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Horizontal Scale in Feet

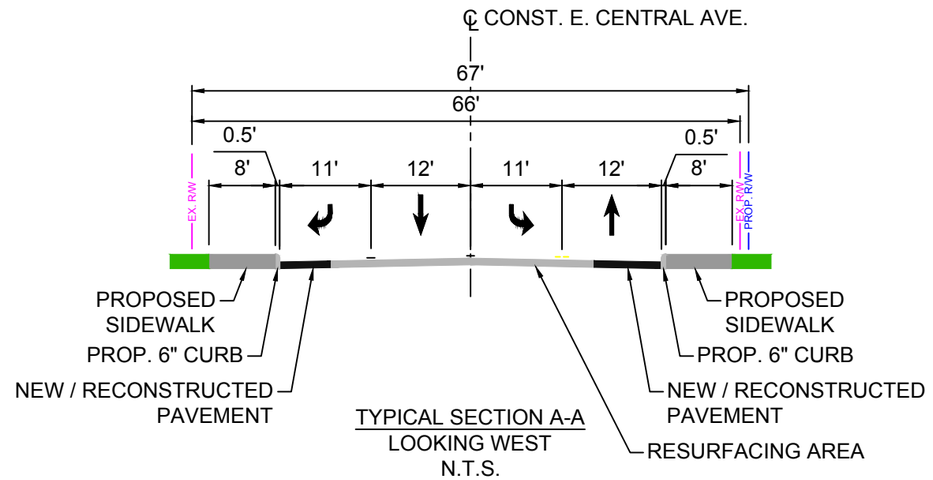
FIGURE 8

PROPOSED IMPROVEMENT RENDERING SCENARIO 4

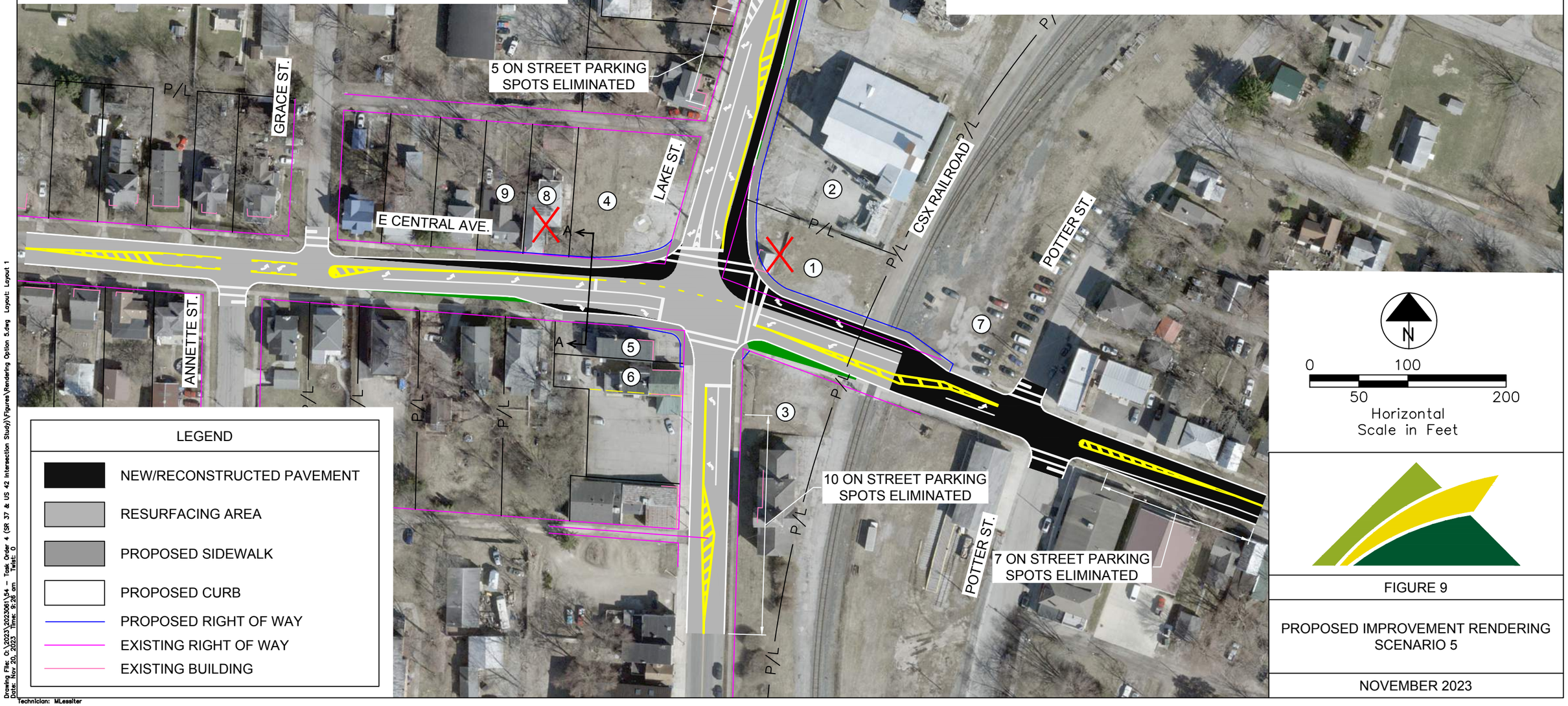
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Technician: MLessiter

ANTICIPATED RIGHT OF WAY IMPACTS				
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1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL
9	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY



TYPICAL SECTION A-A
LOOKING WEST
N.T.S.



LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

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Horizontal Scale in Feet

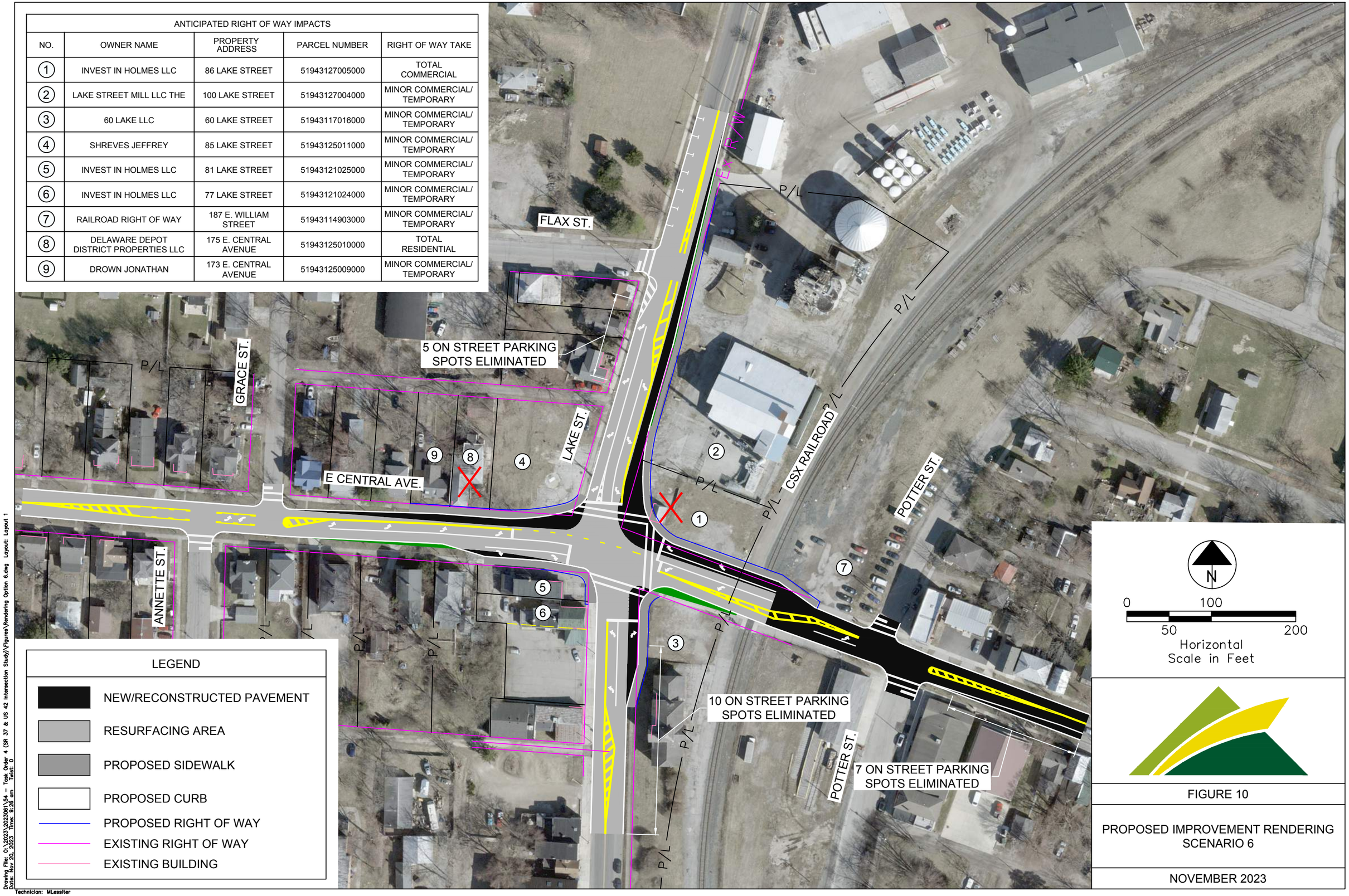
FIGURE 9

PROPOSED IMPROVEMENT RENDERING SCENARIO 5

NOVEMBER 2023

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ANTICIPATED RIGHT OF WAY IMPACTS				
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1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL
9	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY



LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

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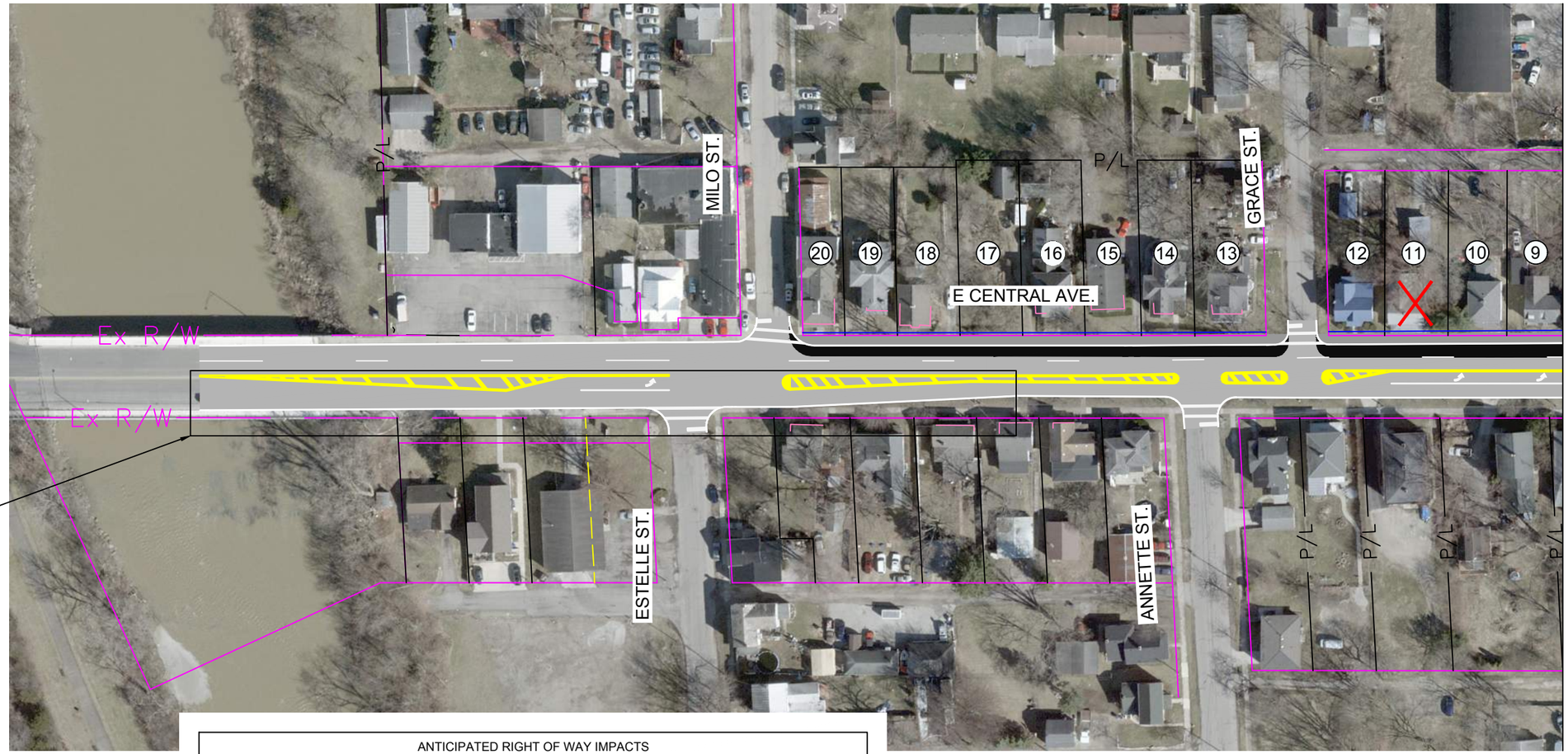
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FIGURE 10

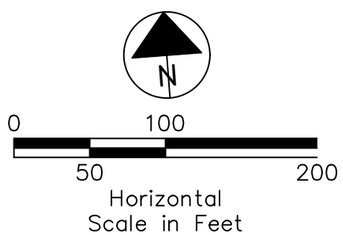
PROPOSED IMPROVEMENT RENDERING SCENARIO 6

NOVEMBER 2023

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Date: Nov 20, 2023 Time: 9:26 am Tw1et: 0
Technician: MLessiter



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
⑨	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY
⑩	S5-169 E. CENTRAL LLC	169 E. CENTRAL AVENUE	51943125008000	MINOR COMMERCIAL/ TEMPORARY
⑪	DTKS PROPERTIES LLC	163 E. CENTRAL AVENUE	51943125007000	TOTAL RESIDENTIAL
⑫	HURSEY DOUGLAS M	157 E. CENTRAL AVENUE	51943125006000	MINOR COMMERCIAL/ TEMPORARY
⑬	GRILLIO RICHARD J	155 E. CENTRAL AVENUE	51943124017000	MINOR COMMERCIAL/ TEMPORARY
⑭	SMITH FAMILY ENTERPRISES LTD	151 E. CENTRAL AVENUE	51943124016000	MINOR COMMERCIAL/ TEMPORARY
⑮	SMITH FAMILY ENTERPRISES LTD	149 E. CENTRAL AVENUE	51943124015000	MINOR COMMERCIAL/ TEMPORARY
⑯	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124014000	MINOR COMMERCIAL/ TEMPORARY
⑰	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124013000	MINOR COMMERCIAL/ TEMPORARY
⑱	GREENWOOD STEPHANIE M	127 E. CENTRAL AVENUE	51943124012000	MINOR COMMERCIAL/ TEMPORARY
⑲	LDH PROPERTIES LLC	123 E. CENTRAL AVENUE	51943124011000	MINOR COMMERCIAL/ TEMPORARY
⑳	CENTRAL & MILO LLC	119 E. CENTRAL AVENUE APT 1	51943124010000	MINOR COMMERCIAL/ TEMPORARY



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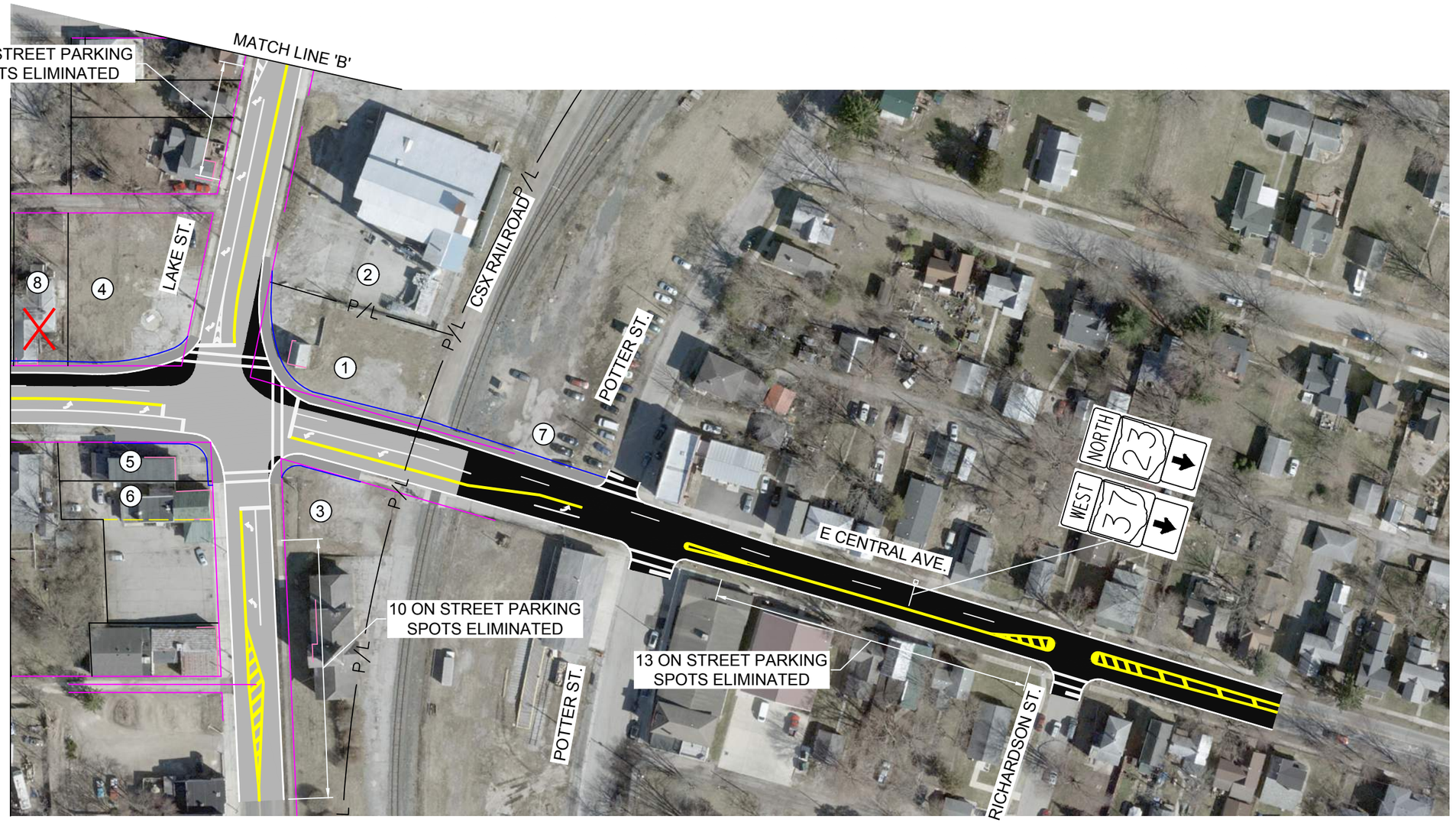
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 11

PROPOSED IMPROVEMENT RENDERING
SCENARIO 7
SHEET 1 OF 3

NOVEMBER 2023

Drawing File: C:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 7.dwg Layout: Sheet 1 of 3
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1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	MINOR COMMERCIAL/ TEMPORARY
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL

LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING
- OVERHEAD LANE USE SIGN

N

0 100

50 200

Horizontal Scale in Feet

FIGURE 11

PROPOSED IMPROVEMENT RENDERING
SCENARIO 7
SHEET 2 OF 3

NOVEMBER 2023

Drawing File: G:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 7.dwg Layout: Sheet 2 of 3
Date: Nov 20, 2023 Time: 9:27 am Twist: 0
Technician: MLessiter



0 100
50 200
Horizontal
Scale in Feet

LEGEND

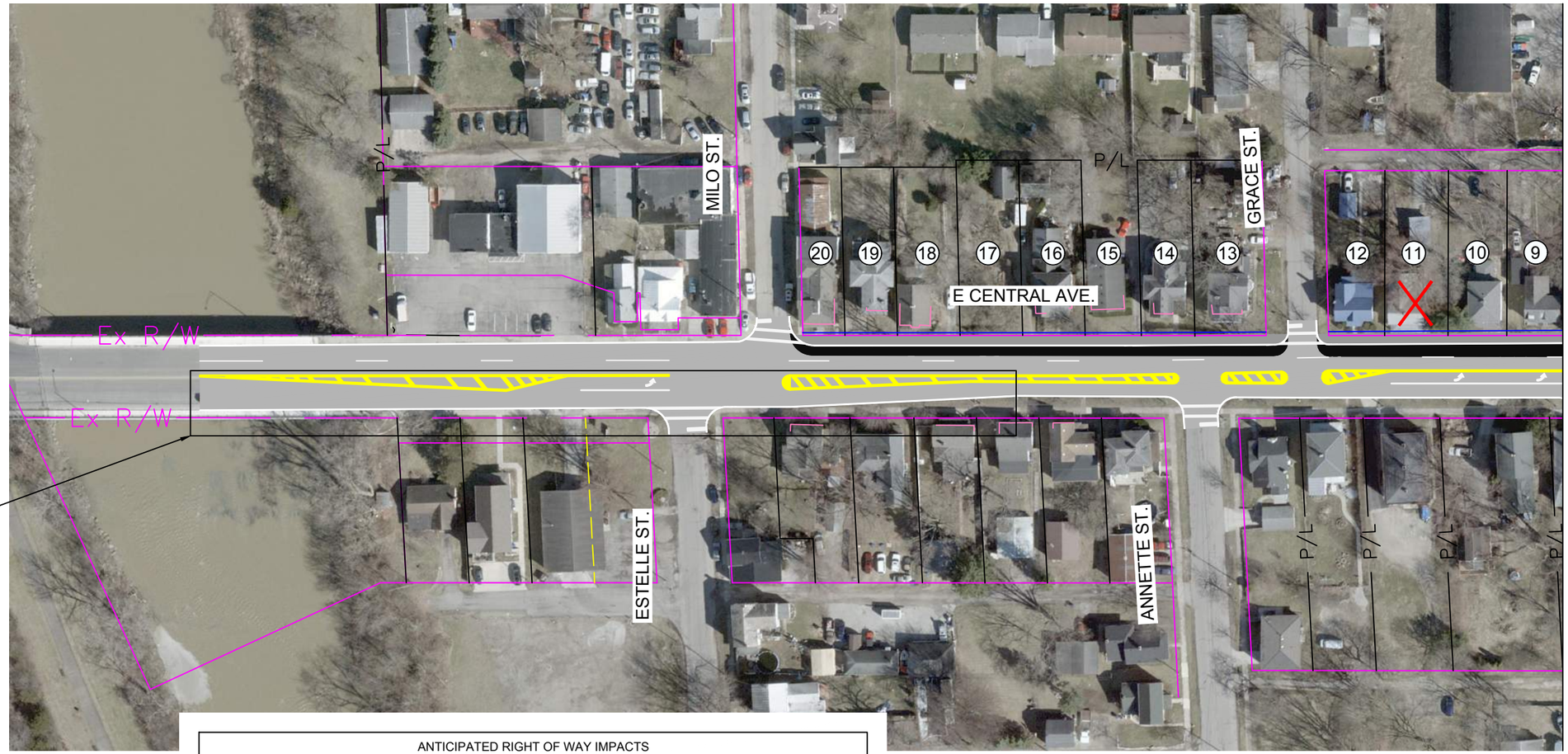
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 11

PROPOSED IMPROVEMENT RENDERING
SCENARIO 7
SHEET 3 OF 3

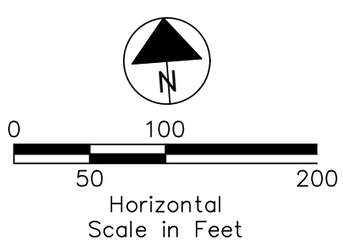
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Date: Nov 16, 2023 Time: 11:55 am Twist: 0
Technician: ddombrosky



MILO STREET TURN LANE PROJECT

ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
⑨	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY
⑩	S5-169 E. CENTRAL LLC	169 E. CENTRAL AVENUE	51943125008000	MINOR COMMERCIAL/ TEMPORARY
⑪	DTKS PROPERTIES LLC	163 E. CENTRAL AVENUE	51943125007000	TOTAL RESIDENTIAL
⑫	HURSEY DOUGLAS M	157 E. CENTRAL AVENUE	51943125006000	MINOR COMMERCIAL/ TEMPORARY
⑬	GRILLIO RICHARD J	155 E. CENTRAL AVENUE	51943124017000	MINOR COMMERCIAL/ TEMPORARY
⑭	SMITH FAMILY ENTERPRISES LTD	151 E. CENTRAL AVENUE	51943124016000	MINOR COMMERCIAL/ TEMPORARY
⑮	SMITH FAMILY ENTERPRISES LTD	149 E. CENTRAL AVENUE	51943124015000	MINOR COMMERCIAL/ TEMPORARY
⑯	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124014000	MINOR COMMERCIAL/ TEMPORARY
⑰	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124013000	MINOR COMMERCIAL/ TEMPORARY
⑱	GREENWOOD STEPHANIE M	127 E. CENTRAL AVENUE	51943124012000	MINOR COMMERCIAL/ TEMPORARY
⑲	LDH PROPERTIES LLC	123 E. CENTRAL AVENUE	51943124011000	MINOR COMMERCIAL/ TEMPORARY
⑳	CENTRAL & MILO LLC	119 E. CENTRAL AVENUE APT 1	51943124010000	MINOR COMMERCIAL/ TEMPORARY



LEGEND

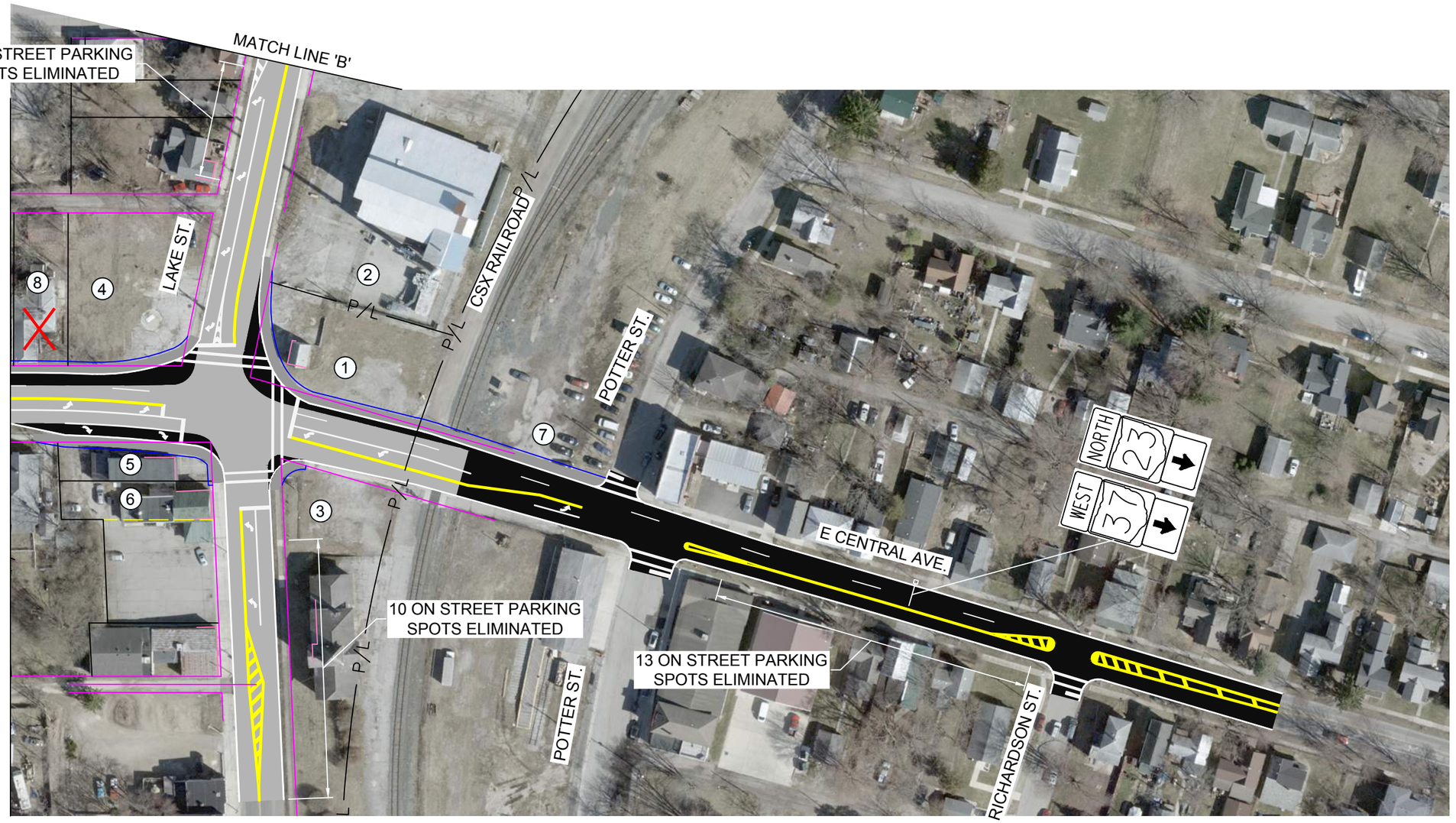
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 12

PROPOSED IMPROVEMENT RENDERING
SCENARIO 8
SHEET 1 OF 3

NOVEMBER 2023

Drawing File: C:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 8.dwg Layout: Sheet 1 of 3
Date: Nov 20, 2023 Time: 9:27 am Twist: 0
Technician: MLessiter



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	MINOR COMMERCIAL/ TEMPORARY
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL

LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING
- OVERHEAD LANE USE SIGN

N

0 100

50 200

Horizontal Scale in Feet

FIGURE 12

PROPOSED IMPROVEMENT RENDERING
SCENARIO 8
SHEET 2 OF 3

NOVEMBER 2023

Drawing File: G:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 8.dwg Layout: Sheet 2 of 3
Date: Nov 20, 2023 Time: 9:27 am Twist: 0
Technician: MLessiter



0 100
50 200
Horizontal
Scale in Feet

LEGEND

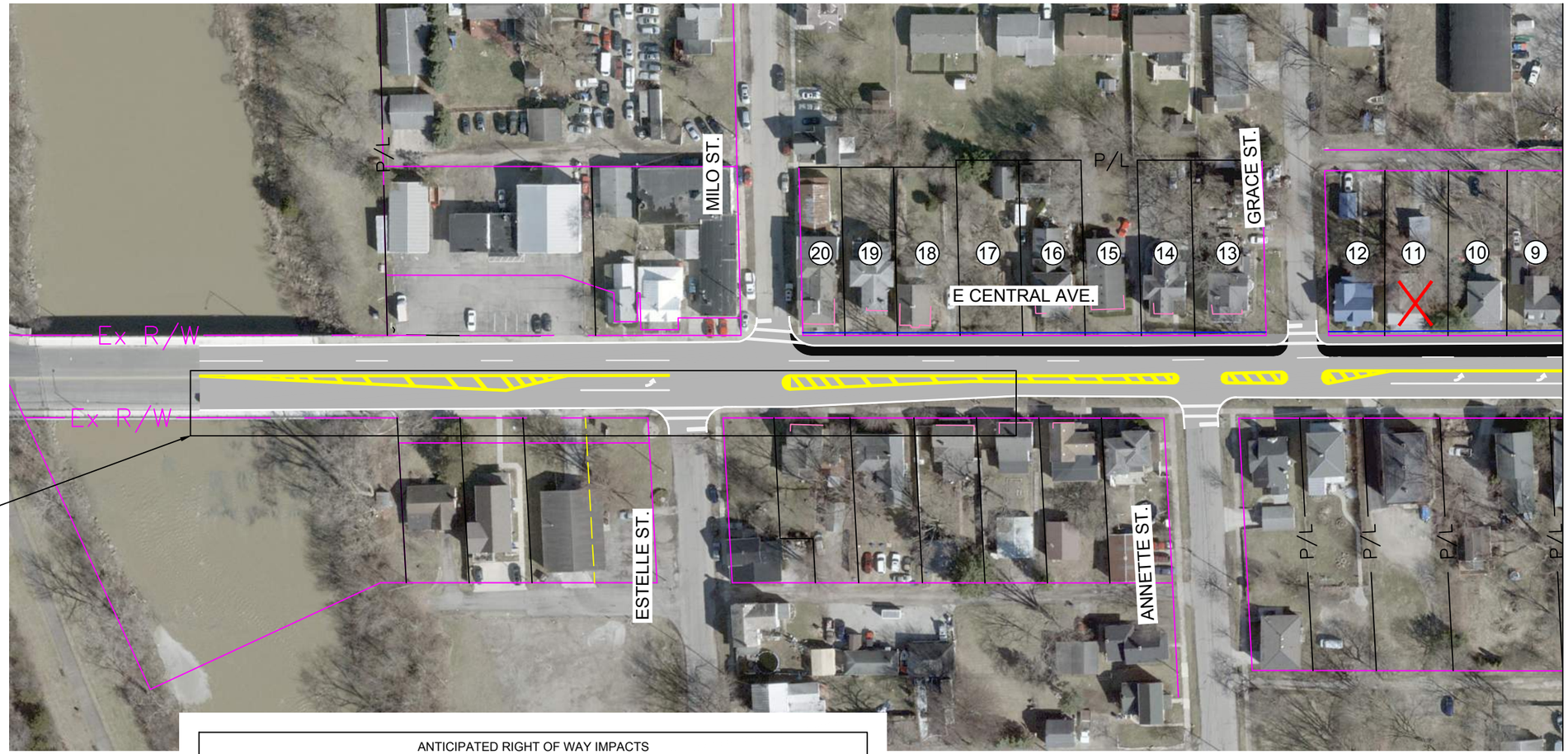
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 12

PROPOSED IMPROVEMENT RENDERING
SCENARIO 8
SHEET 3 OF 3

NOVEMBER 2023

Drawing File: \\gpdco.com\DATA\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option B.dwg Layout: Sheet 3 of 3
Date: Nov 16, 2023 Time: 12:04 pm Twist: 0
Technician: ddombrosky



MILO STREET TURN LANE PROJECT

ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
⑨	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY
⑩	S5-169 E. CENTRAL LLC	169 E. CENTRAL AVENUE	51943125008000	MINOR COMMERCIAL/ TEMPORARY
⑪	DTKS PROPERTIES LLC	163 E. CENTRAL AVENUE	51943125007000	TOTAL RESIDENTIAL
⑫	HURSEY DOUGLAS M	157 E. CENTRAL AVENUE	51943125006000	MINOR COMMERCIAL/ TEMPORARY
⑬	GRILLIO RICHARD J	155 E. CENTRAL AVENUE	51943124017000	MINOR COMMERCIAL/ TEMPORARY
⑭	SMITH FAMILY ENTERPRISES LTD	151 E. CENTRAL AVENUE	51943124016000	MINOR COMMERCIAL/ TEMPORARY
⑮	SMITH FAMILY ENTERPRISES LTD	149 E. CENTRAL AVENUE	51943124015000	MINOR COMMERCIAL/ TEMPORARY
⑯	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124014000	MINOR COMMERCIAL/ TEMPORARY
⑰	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124013000	MINOR COMMERCIAL/ TEMPORARY
⑱	GREENWOOD STEPHANIE M	127 E. CENTRAL AVENUE	51943124012000	MINOR COMMERCIAL/ TEMPORARY
⑲	LDH PROPERTIES LLC	123 E. CENTRAL AVENUE	51943124011000	MINOR COMMERCIAL/ TEMPORARY
⑳	CENTRAL & MILO LLC	119 E. CENTRAL AVENUE APT 1	51943124010000	MINOR COMMERCIAL/ TEMPORARY

N

0 100

50 200

Horizontal Scale in Feet

LEGEND

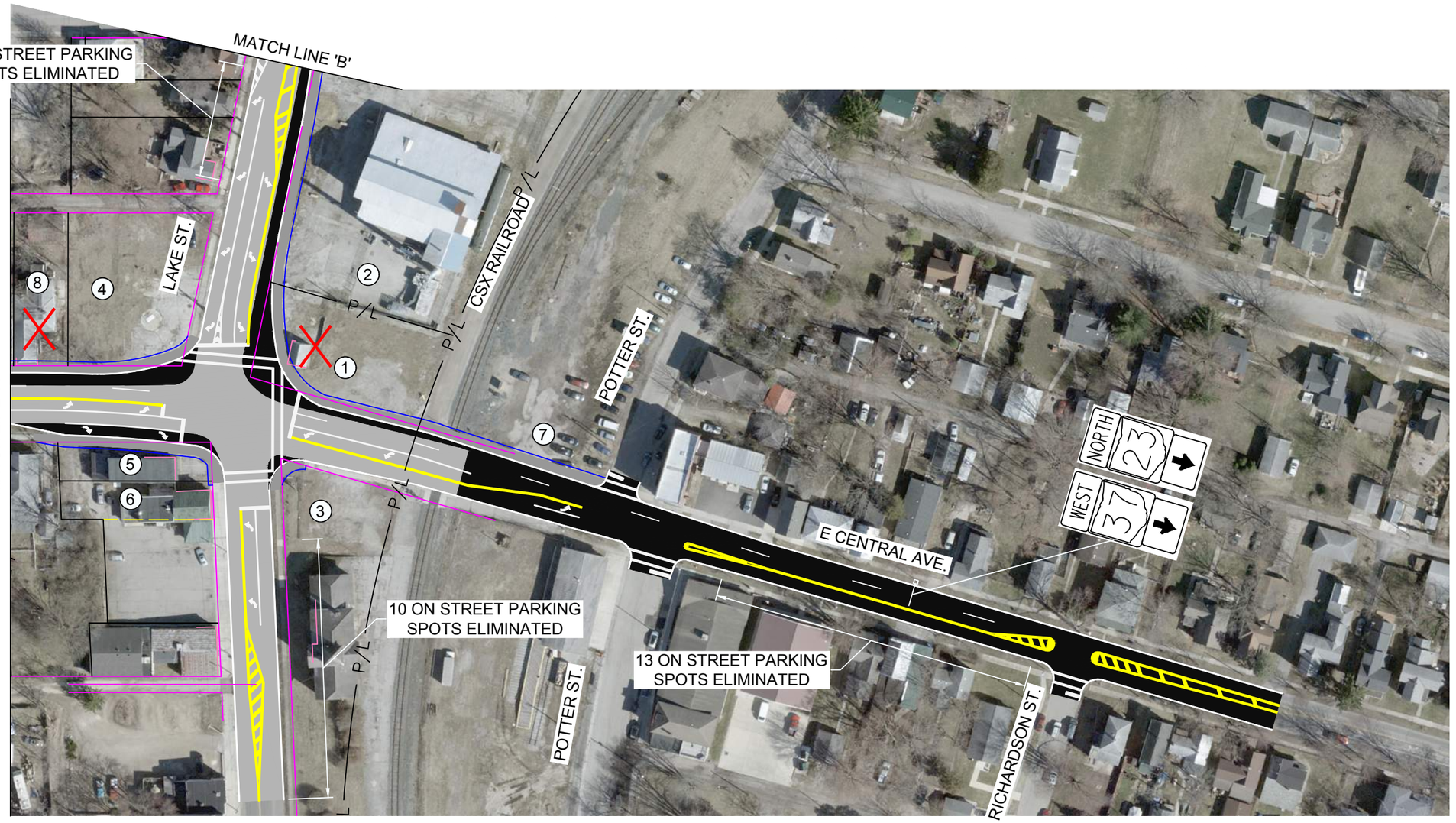
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 13

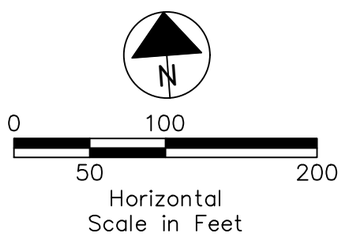
PROPOSED IMPROVEMENT RENDERING
SCENARIO 9
SHEET 1 OF 3

NOVEMBER 2023

Drawing File: C:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 9.dwg Layout: Sheet 1 of 3
Date: Nov 20, 2023 Time: 9:28 am Twist: 0
Technician: MLessiter



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL



LEGEND

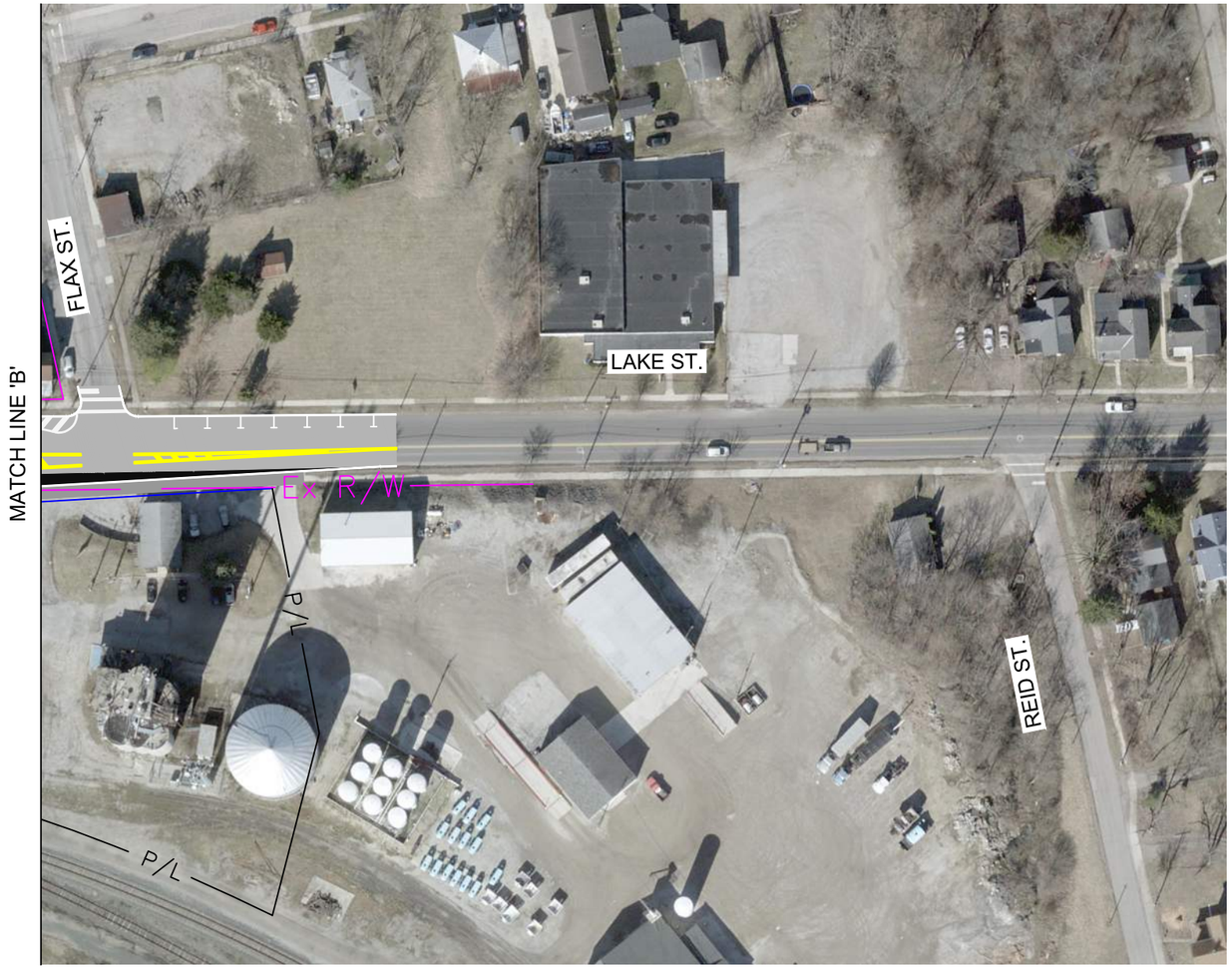
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING
- OVERHEAD LANE USE SIGN

FIGURE 13

PROPOSED IMPROVEMENT RENDERING
SCENARIO 9
SHEET 2 OF 3

NOVEMBER 2023

Drawing File: G:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 9.dwg Layout: Sheet 2 of 3
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0 100 50 200

Horizontal Scale in Feet

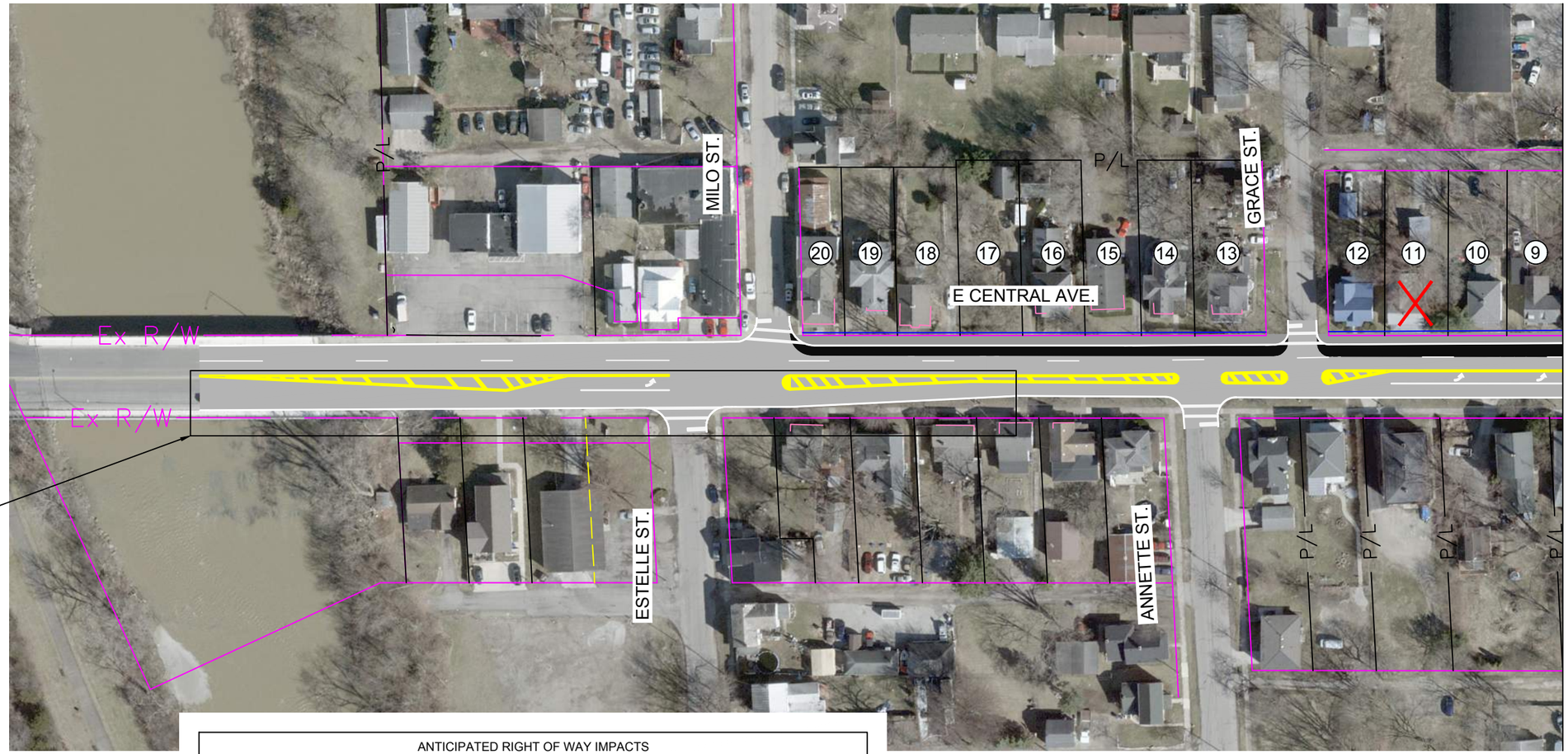
LEGEND
NEW/RECONSTRUCTED PAVEMENT
RESURFACING AREA
PROPOSED SIDEWALK
PROPOSED CURB
PROPOSED RIGHT OF WAY
EXISTING RIGHT OF WAY
EXISTING BUILDING

FIGURE 13

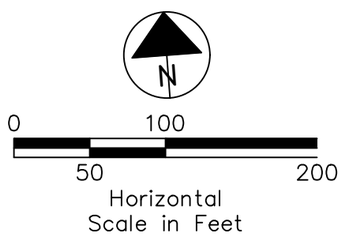
PROPOSED IMPROVEMENT RENDERING
SCENARIO 9
SHEET 3 OF 3

NOVEMBER 2023

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Technician: ddombrosky



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
⑨	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY
⑩	S5-169 E. CENTRAL LLC	169 E. CENTRAL AVENUE	51943125008000	MINOR COMMERCIAL/ TEMPORARY
⑪	DTKS PROPERTIES LLC	163 E. CENTRAL AVENUE	51943125007000	TOTAL RESIDENTIAL
⑫	HURSEY DOUGLAS M	157 E. CENTRAL AVENUE	51943125006000	MINOR COMMERCIAL/ TEMPORARY
⑬	GRILLIO RICHARD J	155 E. CENTRAL AVENUE	51943124017000	MINOR COMMERCIAL/ TEMPORARY
⑭	SMITH FAMILY ENTERPRISES LTD	151 E. CENTRAL AVENUE	51943124016000	MINOR COMMERCIAL/ TEMPORARY
⑮	SMITH FAMILY ENTERPRISES LTD	149 E. CENTRAL AVENUE	51943124015000	MINOR COMMERCIAL/ TEMPORARY
⑯	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124014000	MINOR COMMERCIAL/ TEMPORARY
⑰	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124013000	MINOR COMMERCIAL/ TEMPORARY
⑱	GREENWOOD STEPHANIE M	127 E. CENTRAL AVENUE	51943124012000	MINOR COMMERCIAL/ TEMPORARY
⑲	LDH PROPERTIES LLC	123 E. CENTRAL AVENUE	51943124011000	MINOR COMMERCIAL/ TEMPORARY
⑳	CENTRAL & MILO LLC	119 E. CENTRAL AVENUE APT 1	51943124010000	MINOR COMMERCIAL/ TEMPORARY



LEGEND

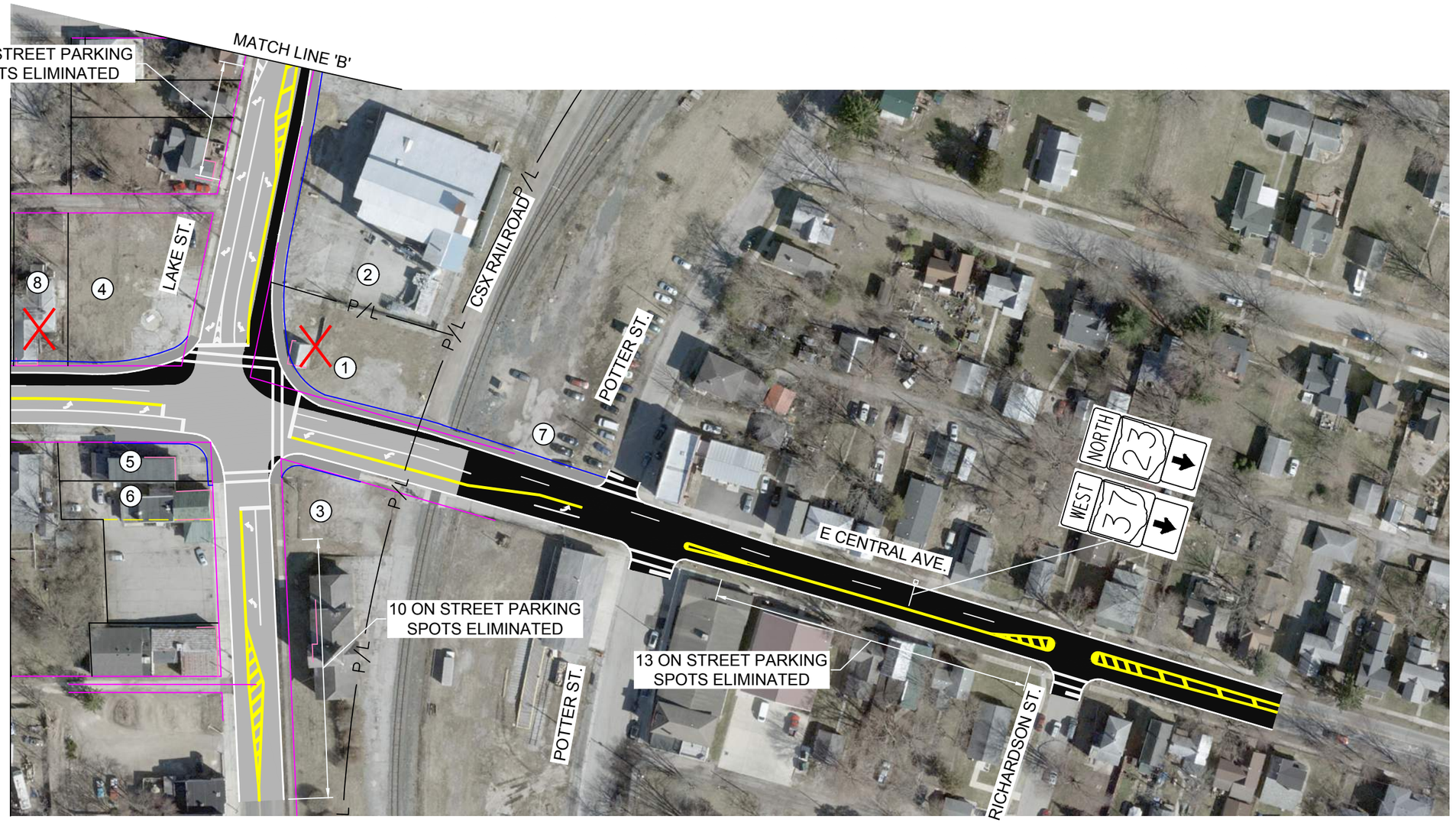
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 14

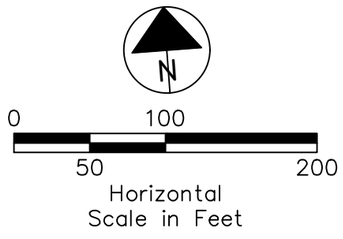
PROPOSED IMPROVEMENT RENDERING
SCENARIO 10
SHEET 1 OF 3

NOVEMBER 2023

Drawing File: C:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 10.dwg Layout: Sheet 1 of 3
Date: Nov 20, 2023 Time: 9:28 am Twist: 0
Technician: MLessiter



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL



LEGEND

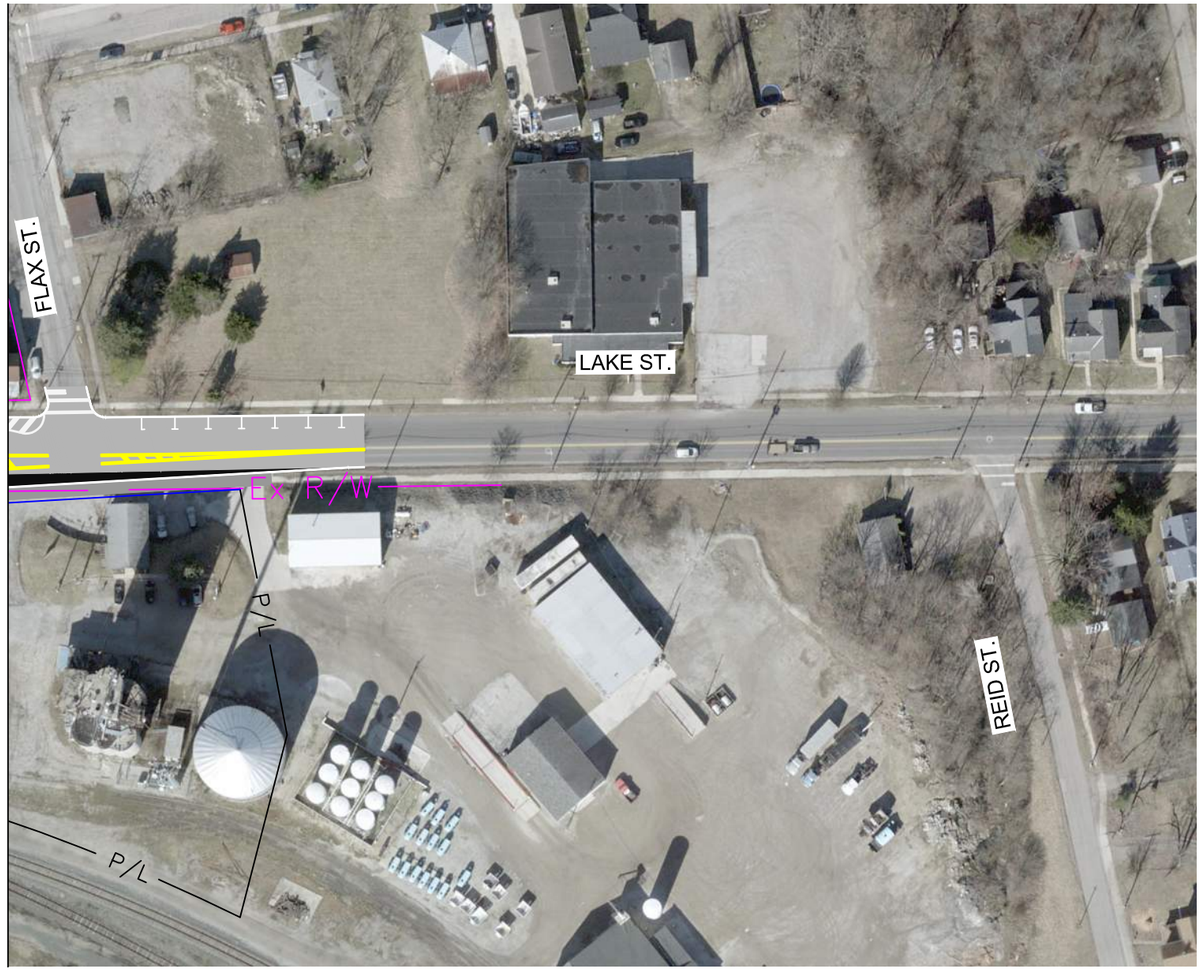
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING
- OVERHEAD LANE USE SIGN

FIGURE 14

PROPOSED IMPROVEMENT RENDERING
SCENARIO 10
SHEET 2 OF 3

NOVEMBER 2023

Drawing File: G:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 10.dwg Layout: Sheet 2 of 3
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0 100 50 200

Horizontal Scale in Feet

LEGEND

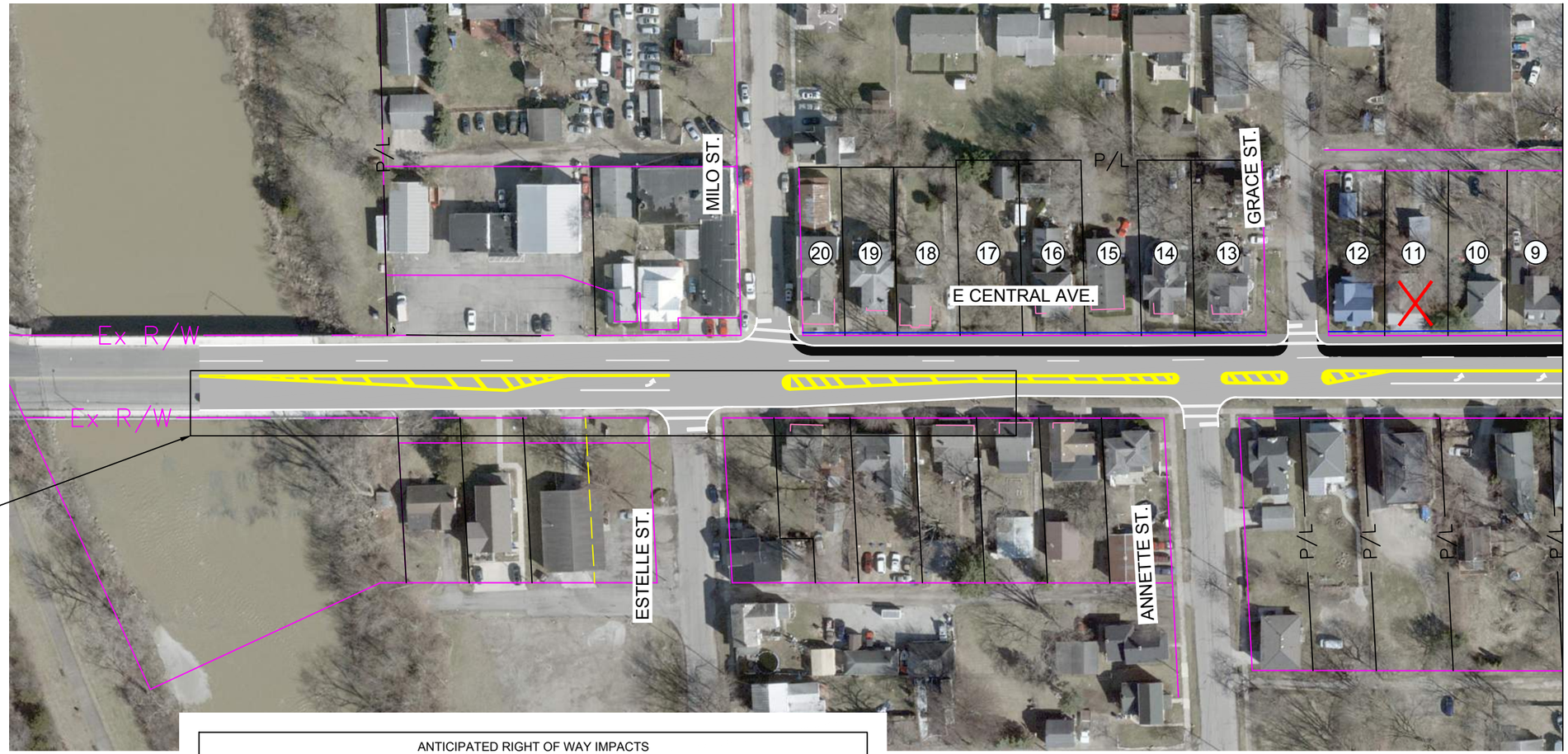
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 14

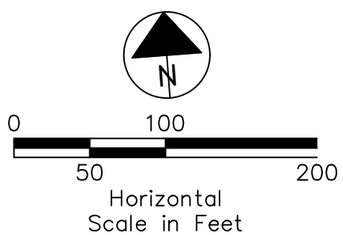
PROPOSED IMPROVEMENT RENDERING
SCENARIO 10
SHEET 3 OF 3

NOVEMBER 2023

Drawing File: \\gpdco.com\DATA\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 10.dwg Layout: Sheet 3 of 3
Date: Nov 16, 2023 Time: 12:21 pm Twist: 0
Technician: ddombrosky



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
⑨	DROWN JONATHAN	173 E. CENTRAL AVENUE	51943125009000	MINOR COMMERCIAL/ TEMPORARY
⑩	S5-169 E. CENTRAL LLC	169 E. CENTRAL AVENUE	51943125008000	MINOR COMMERCIAL/ TEMPORARY
⑪	DTKS PROPERTIES LLC	163 E. CENTRAL AVENUE	51943125007000	TOTAL RESIDENTIAL
⑫	HURSEY DOUGLAS M	157 E. CENTRAL AVENUE	51943125006000	MINOR COMMERCIAL/ TEMPORARY
⑬	GRILLIO RICHARD J	155 E. CENTRAL AVENUE	51943124017000	MINOR COMMERCIAL/ TEMPORARY
⑭	SMITH FAMILY ENTERPRISES LTD	151 E. CENTRAL AVENUE	51943124016000	MINOR COMMERCIAL/ TEMPORARY
⑮	SMITH FAMILY ENTERPRISES LTD	149 E. CENTRAL AVENUE	51943124015000	MINOR COMMERCIAL/ TEMPORARY
⑯	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124014000	MINOR COMMERCIAL/ TEMPORARY
⑰	OBRIEN JOHN A	145 E. CENTRAL AVENUE	51943124013000	MINOR COMMERCIAL/ TEMPORARY
⑱	GREENWOOD STEPHANIE M	127 E. CENTRAL AVENUE	51943124012000	MINOR COMMERCIAL/ TEMPORARY
⑲	LDH PROPERTIES LLC	123 E. CENTRAL AVENUE	51943124011000	MINOR COMMERCIAL/ TEMPORARY
⑳	CENTRAL & MILO LLC	119 E. CENTRAL AVENUE APT 1	51943124010000	MINOR COMMERCIAL/ TEMPORARY



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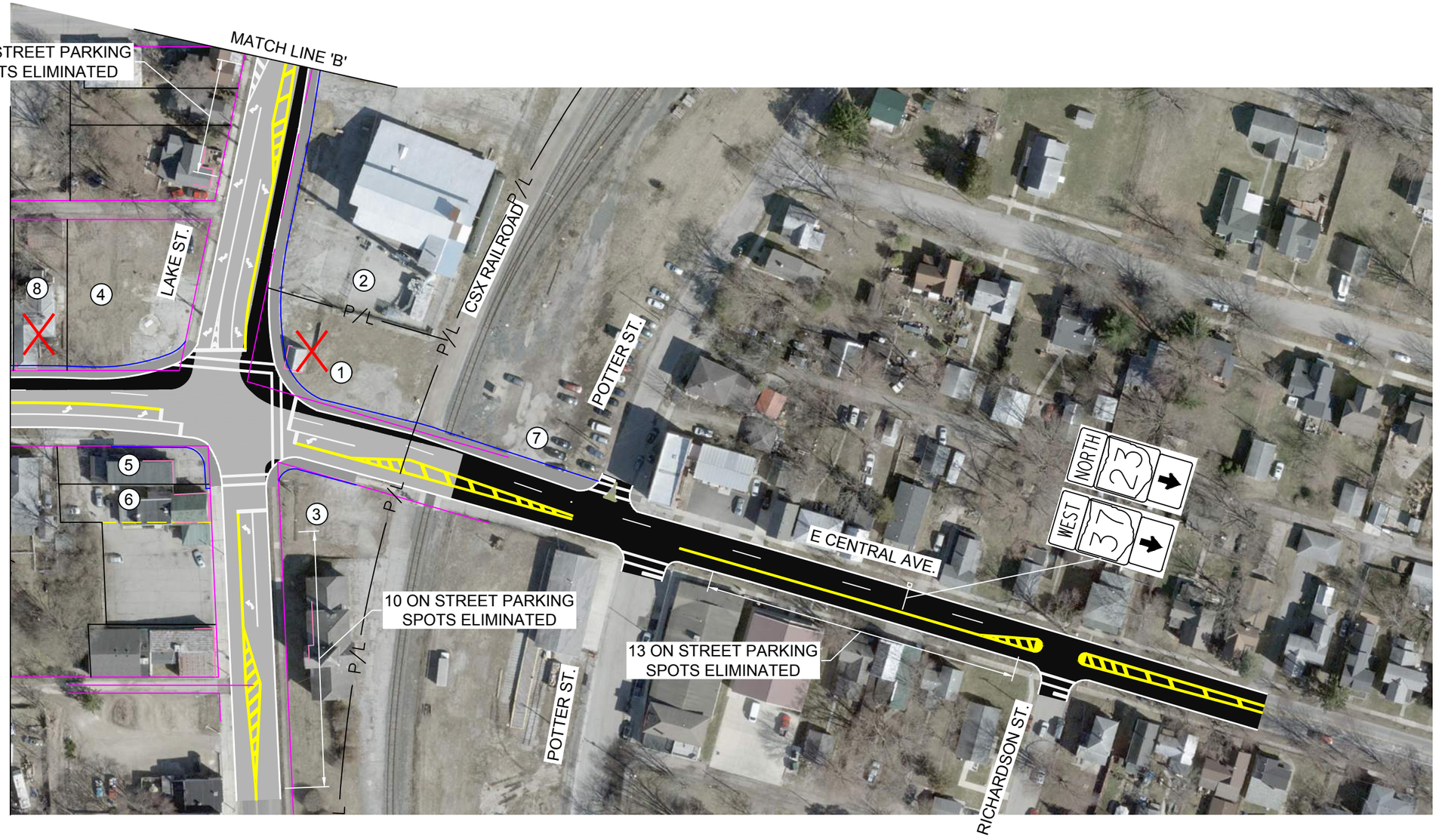
- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- RAISED PAVEMENT
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

FIGURE 15

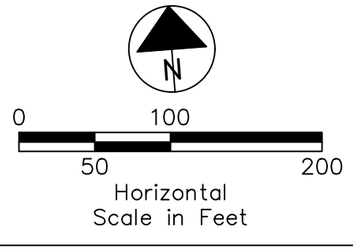
PROPOSED IMPROVEMENT RENDERING
SCENARIO 10A
SHEET 1 OF 3

NOVEMBER 2023

Drawing File: C:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 10a.dwg Layout: Sheet 1 of 3
Date: Nov 20, 2023 Time: 9:29 am Twist: 0
Technician: MLessiter



ANTICIPATED RIGHT OF WAY IMPACTS				
NO.	OWNER NAME	PROPERTY ADDRESS	PARCEL NUMBER	RIGHT OF WAY TAKE
1	INVEST IN HOLMES LLC	86 LAKE STREET	51943127005000	TOTAL COMMERCIAL
2	LAKE STREET MILL LLC THE	100 LAKE STREET	51943127004000	MINOR COMMERCIAL/ TEMPORARY
3	60 LAKE LLC	60 LAKE STREET	51943117016000	MINOR COMMERCIAL/ TEMPORARY
4	SHREVES JEFFREY	85 LAKE STREET	51943125011000	MINOR COMMERCIAL/ TEMPORARY
5	INVEST IN HOLMES LLC	81 LAKE STREET	51943121025000	MINOR COMMERCIAL/ TEMPORARY
6	INVEST IN HOLMES LLC	77 LAKE STREET	51943121024000	MINOR COMMERCIAL/ TEMPORARY
7	RAILROAD RIGHT OF WAY	187 E. WILLIAM STREET	51943114903000	MINOR COMMERCIAL/ TEMPORARY
8	DELAWARE DEPOT DISTRICT PROPERTIES LLC	175 E. CENTRAL AVENUE	51943125010000	TOTAL RESIDENTIAL



LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING
- OVERHEAD LANE USE SIGN

FIGURE 15

PROPOSED IMPROVEMENT RENDERING
SCENARIO 10A
SHEET 2 OF 3

NOVEMBER 2023

Drawing File: O:\2023\2023061\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 10a.dwg Layout: Sheet 2 of 3
Date: Nov 20, 2023 Time: 12:29 pm Twist: 0
Technician: MLessiter



LEGEND

- NEW/RECONSTRUCTED PAVEMENT
- RESURFACING AREA
- PROPOSED SIDEWALK
- PROPOSED CURB
- RAISED PAVEMENT
- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- EXISTING BUILDING

N

0 100

50 200

Horizontal
Scale in Feet

FIGURE 15

PROPOSED IMPROVEMENT RENDERING
SCENARIO 10A
SHEET 3 OF 3

NOVEMBER 2023

Drawing File: \\gpdco.com\DATA\2023\20230661\54 - Task Order 4 (SR 37 & US 42 Intersection Study)\Figures\Rendering Option 10a.dwg Layout: Sheet 3 of 3
Date: Nov 16, 2023 Time: 12:26 pm Twist: 0
Technician: ddombrosky

APPENDIX A
TURNING MOVEMENT COUNTS

Cummins Consulting Services, LLC
138 Mahin Trail, Versailles, KY 40383
859-361-2589
"simplifying Data Collection since 2004"

File Name : 9_SR37-E Central_Avenue_at_US42-Lake_Street_05032023
Sunny
Site Code : Wed
Schools in Session
Start Date : 5/3/2023
9XT

Groups Printed- Cars - Buses - Trucks - Pedestrians

	US42 - Lake Street From North					SR37- E Central Avenue From East					US42 - Lake Street From South					SR37- E Central Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	62	44	0	109	5	108	3	0	116	2	11	1	0	14	16	114	2	0	132	371
07:15 AM	4	72	43	0	119	4	108	4	0	116	4	19	2	0	25	15	148	4	0	167	427
07:30 AM	6	53	54	0	113	5	134	2	0	141	1	29	2	0	32	20	138	9	0	167	453
07:45 AM	5	57	51	0	113	9	139	6	1	155	6	22	1	0	29	20	120	8	0	148	445
Total	18	244	192	0	454	23	489	15	1	528	13	81	6	0	100	71	520	23	0	614	1696
08:00 AM	10	36	36	0	82	7	124	5	0	136	5	29	2	0	36	17	121	7	0	145	399
08:15 AM	6	46	33	0	85	7	131	3	1	142	3	20	0	0	23	22	119	8	0	149	399
08:30 AM	5	38	41	0	84	2	111	2	1	116	4	29	4	1	38	17	104	12	0	133	371
08:45 AM	3	35	22	0	60	4	128	7	0	139	2	40	3	0	45	15	70	11	0	96	340
Total	24	155	132	0	311	20	494	17	2	533	14	118	9	1	142	71	414	38	0	523	1509
09:00 AM	7	35	29	0	71	0	106	6	0	112	3	24	7	0	34	16	93	6	0	115	332
09:15 AM	5	30	16	1	52	4	101	2	1	108	2	20	9	0	31	14	83	5	0	102	293
09:30 AM	4	32	22	0	58	5	131	4	0	140	1	22	2	0	25	11	83	5	0	99	322
09:45 AM	4	34	31	0	69	2	95	5	0	102	2	25	5	0	32	21	84	6	1	112	315
Total	20	131	98	1	250	11	433	17	1	462	8	91	23	0	122	62	343	22	1	428	1262
10:00 AM	6	21	21	0	48	8	101	7	0	116	3	20	4	0	27	17	103	9	0	129	320
10:15 AM	4	26	27	0	57	6	92	7	0	105	2	19	4	0	25	14	84	4	1	103	290
10:30 AM	6	43	24	0	73	5	87	9	0	101	1	22	0	0	23	30	79	8	0	117	314
10:45 AM	10	25	17	0	52	4	101	6	0	111	2	24	5	0	31	16	78	5	0	99	293
Total	26	115	89	0	230	23	381	29	0	433	8	85	13	0	106	77	344	26	1	448	1217
11:00 AM	7	25	22	0	54	5	97	8	0	110	5	22	2	0	29	15	103	12	0	130	323
11:15 AM	2	31	29	0	62	4	113	5	0	122	1	33	3	0	37	16	108	6	0	130	351
11:30 AM	4	41	22	0	67	2	115	5	0	122	7	28	3	0	38	15	122	8	0	145	372
11:45 AM	1	39	17	0	57	3	104	5	0	112	5	36	7	0	48	23	92	9	0	124	341
Total	14	136	90	0	240	14	429	23	0	466	18	119	15	0	152	69	425	35	0	529	1387
12:00 PM	6	30	21	0	57	4	115	4	0	123	1	32	3	0	36	18	94	4	0	116	332
12:15 PM	7	21	18	0	46	5	94	7	0	106	7	38	4	0	49	17	115	7	0	139	340
12:30 PM	5	29	23	1	58	2	134	6	0	142	6	33	8	0	47	20	105	5	0	130	377
12:45 PM	6	25	20	0	51	6	127	10	1	144	1	43	2	1	47	19	109	14	0	142	384
Total	24	105	82	1	212	17	470	27	1	515	15	146	17	1	179	74	423	30	0	527	1433
01:00 PM	7	30	16	0	53	5	129	5	0	139	6	37	3	0	46	15	99	5	0	119	357
01:15 PM	6	35	20	0	61	5	128	7	1	141	6	36	3	1	46	28	77	6	0	111	359
01:30 PM	6	35	16	0	57	2	110	7	0	119	5	42	3	0	50	31	106	5	0	142	368
01:45 PM	5	36	21	0	62	7	144	7	1	159	5	37	5	0	47	21	119	1	0	141	409
Total	24	136	73	0	233	19	511	26	2	558	22	152	14	1	189	95	401	17	0	513	1493
02:00 PM	4	28	26	0	58	2	140	4	0	146	1	42	5	0	48	27	96	4	0	127	379
02:15 PM	6	38	30	1	75	6	140	7	1	154	3	46	5	1	55	32	94	3	0	129	413
02:30 PM	5	38	21	0	64	3	140	6	0	149	9	46	2	0	57	26	110	3	0	139	409
02:45 PM	4	44	26	0	74	4	123	6	1	134	2	44	1	0	47	29	122	7	0	158	413
Total	19	148	103	1	271	15	543	23	2	583	15	178	13	1	207	114	422	17	0	553	1614
03:00 PM	6	37	29	0	72	2	142	6	1	151	9	37	4	0	50	42	142	5	1	190	463
03:15 PM	2	31	35	0	68	2	150	6	0	158	4	65	2	0	71	40	104	5	1	150	447
03:30 PM	5	37	31	0	73	5	136	9	0	150	5	65	2	0	72	46	119	5	0	170	465
03:45 PM	5	35	40	1	81	4	89	4	1	98	9	54	1	0	64	44	112	22	0	178	421
Total	18	140	135	1	294	13	517	25	2	557	27	221	9	0	257	172	477	37	2	688	1796

Cummins Consulting Services, LLC

138 Mahin Trail, Versailles, KY 40383

859-361-2589

"simplifying Data Collection since 2004"

File Name : 9_SR37-E Central_Avenue_at_US42-Lake_Street_05032023
Site Code : Wed
Start Date : 5/3/2023
Page No : 2

Groups Printed- Cars - Buses - Trucks - Pedestrians

	US42 - Lake Street From North					SR37- E Central Avenue From East					US42 - Lake Street From South					SR37- E Central Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	7	40	38	0	85	3	34	2	0	39	23	32	2	0	57	65	127	23	0	215	396
04:15 PM	1	31	30	2	64	6	83	4	0	93	19	47	3	0	69	51	120	15	0	186	412
04:30 PM	5	22	28	0	55	6	185	6	1	198	11	60	3	0	74	49	133	5	0	187	514
04:45 PM	7	32	47	0	86	1	176	7	0	184	5	53	2	0	60	32	132	5	1	170	500
Total	20	125	143	2	290	16	478	19	1	514	58	192	10	0	260	197	512	48	1	758	1822
05:00 PM	7	34	32	0	73	6	155	5	0	166	5	57	3	0	65	57	137	7	0	201	505
05:15 PM	5	46	31	0	82	2	169	6	0	177	2	54	3	0	59	38	127	19	0	184	502
05:30 PM	2	25	28	0	55	6	167	8	0	181	7	45	6	0	58	39	124	9	0	172	466
05:45 PM	6	26	35	0	67	4	159	7	0	170	4	50	6	0	60	29	116	4	0	149	446
Total	20	131	126	0	277	18	650	26	0	694	18	206	18	0	242	163	504	39	0	706	1919
06:00 PM	2	30	35	0	67	4	166	11	0	181	4	52	7	0	63	23	108	8	0	139	450
06:15 PM	5	34	18	0	57	7	140	8	2	157	6	43	4	0	53	18	84	3	1	106	373
06:30 PM	3	25	20	1	49	5	136	7	0	148	7	39	6	0	52	19	87	8	0	114	363
06:45 PM	4	18	22	0	44	3	102	4	1	110	3	31	4	1	39	14	70	1	0	85	278
Total	14	107	95	1	217	19	544	30	3	596	20	165	21	1	207	74	349	20	1	444	1464
Grand Total	241	1673	1358	7	3279	208	5939	277	15	6439	236	1754	168	5	2163	1239	5134	352	6	6731	18612
Apprch %	7.3	51	41.4	0.2		3.2	92.2	4.3	0.2		10.9	81.1	7.8	0.2		18.4	76.3	5.2	0.1		
Total %	1.3	9	7.3	0	17.6	1.1	31.9	1.5	0.1	34.6	1.3	9.4	0.9	0	11.6	6.7	27.6	1.9	0	36.2	
Cars	224	1548	1321	0	3093	194	5471	257	0	5922	214	1621	163	0	1998	1196	4658	321	0	6175	17188
% Cars	92.9	92.5	97.3	0	94.3	93.3	92.1	92.8	0	92	90.7	92.4	97	0	92.4	96.5	90.7	91.2	0	91.7	92.3
Buses	1	19	9	0	29	2	22	1	0	25	1	16	2	0	19	7	25	2	0	34	107
% Buses	0.4	1.1	0.7	0	0.9	1	0.4	0.4	0	0.4	0.4	0.9	1.2	0	0.9	0.6	0.5	0.6	0	0.5	0.6
Trucks	16	106	28	0	150	12	446	19	0	477	21	117	3	0	141	36	451	29	0	516	1284
% Trucks	6.6	6.3	2.1	0	4.6	5.8	7.5	6.9	0	7.4	8.9	6.7	1.8	0	6.5	2.9	8.8	8.2	0	7.7	6.9
Pedestrians	0	0	0	7	7	0	0	0	15	15	0	0	0	5	5	0	0	0	6	6	33
% Pedestrians	0	0	0	100	0.2	0	0	0	100	0.2	0	0	0	100	0.2	0	0	0	100	0.1	0.2

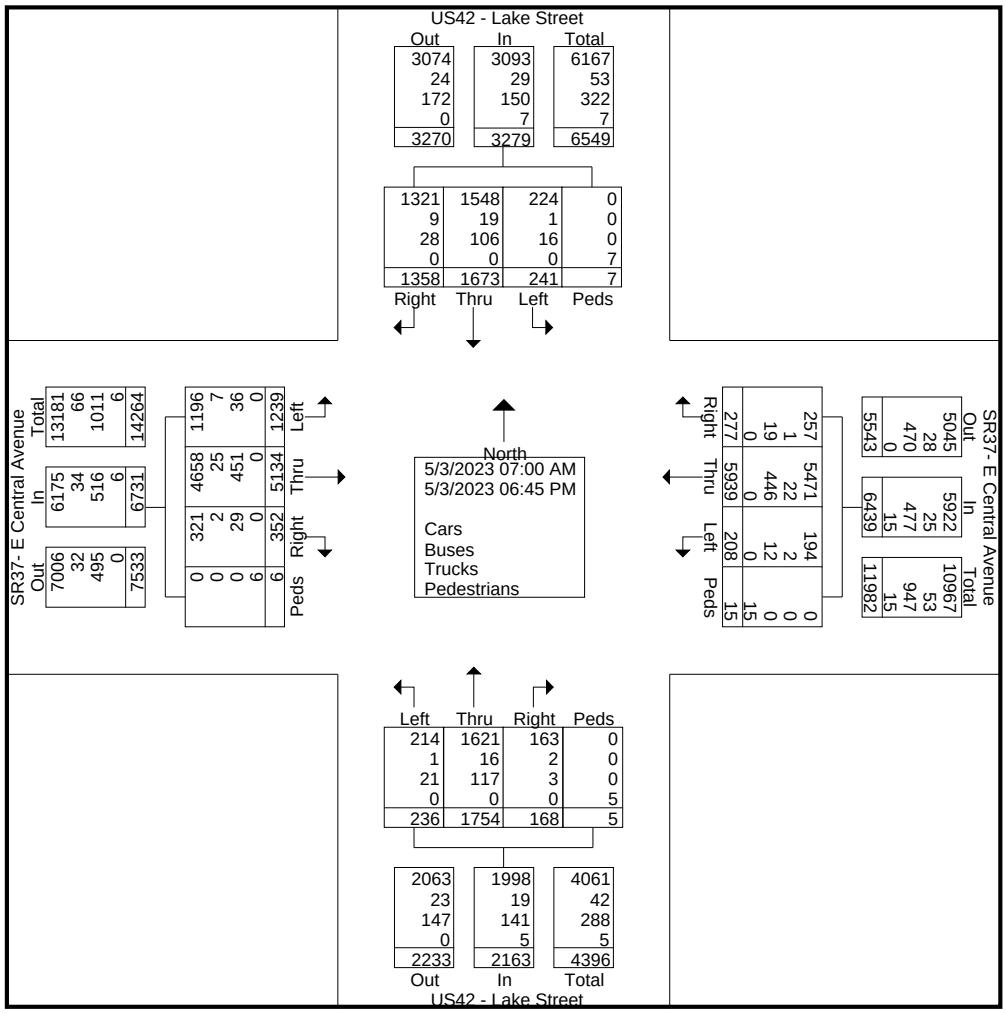
Cummins Consulting Services, LLC

138 Mahin Trail, Versailles, KY 40383

859-361-2589

"simplifying Data Collection since 2004"

File Name : 9_SR37-E Central_Avenue_at_US42-Lake_Street_05032023
Site Code : Wed
Start Date : 5/3/2023
Page No : 3



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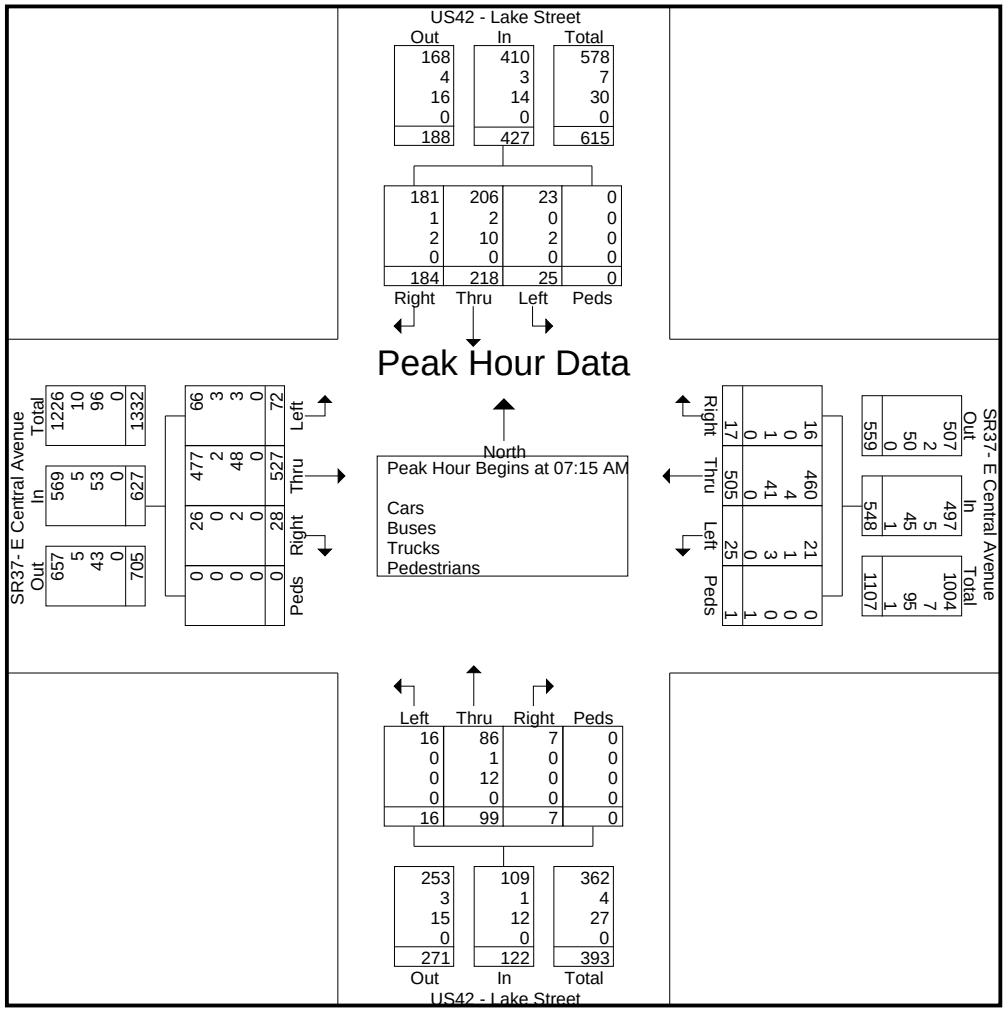
138 Mahin Trail, Versailles, KY 40383

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"simplifying Data Collection since 2004"

File Name : 9_SR37-E Central_Avenue_at_US42-Lake_Street_05032023
Site Code : Wed
Start Date : 5/3/2023
Page No : 4

	US42 - Lake Street From North					SR37- E Central Avenue From East					US42 - Lake Street From South					SR37- E Central Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	4	**72**	43	0	**119**	4	108	4	0	116	4	19	**2**	0	25	15	**148**	4	0	**167**	427
07:30 AM	6	53	**54**	0	113	5	134	2	0	141	1	**29**	2	0	32	**20**	138	**9**	0	167	**453**
07:45 AM	5	57	51	0	113	**9**	**139**	**6**	**1**	**155**	**6**	22	1	0	29	20	120	8	0	148	445
08:00 AM	**10**	36	36	0	82	7	124	5	0	136	5	29	2	0	**36**	17	121	7	0	145	399
Total Volume	25	218	184	0	427	25	505	17	1	548	16	99	7	0	122	72	527	28	0	627	1724
% App. Total	5.9	51.1	43.1	0		4.6	92.2	3.1	0.2		13.1	81.1	5.7	0		11.5	84.1	4.5	0		
PHF	.625	.757	.852	.000	.897	.694	.908	.708	.250	.884	.667	.853	.875	.000	.847	.900	.890	.778	.000	.939	.951
Cars	23	206	181	0	410	21	460	16	0	497	16	86	7	0	109	66	477	26	0	569	1585
% Cars	92.0	94.5	98.4	0	96.0	84.0	91.1	94.1	0	90.7	100	86.9	100	0	89.3	91.7	90.5	92.9	0	90.7	91.9
Buses	0	2	1	0	3	1	4	0	0	5	0	1	0	0	1	3	2	0	0	5	14
% Buses	0	0.9	0.5	0	0.7	4.0	0.8	0	0	0.9	0	1.0	0	0	0.8	4.2	0.4	0	0	0.8	0.8
Trucks	2	10	2	0	14	3	41	1	0	45	0	12	0	0	12	3	48	2	0	53	124
% Trucks	8.0	4.6	1.1	0	3.3	12.0	8.1	5.9	0	8.2	0	12.1	0	0	9.8	4.2	9.1	7.1	0	8.5	7.2
Pedestrians																					
% Pedestrians	0	0	0	0	0	0	0	0	100	0.2	0	0	0	0	0	0	0	0	0	0	0.1



Cummins Consulting Services, LLC

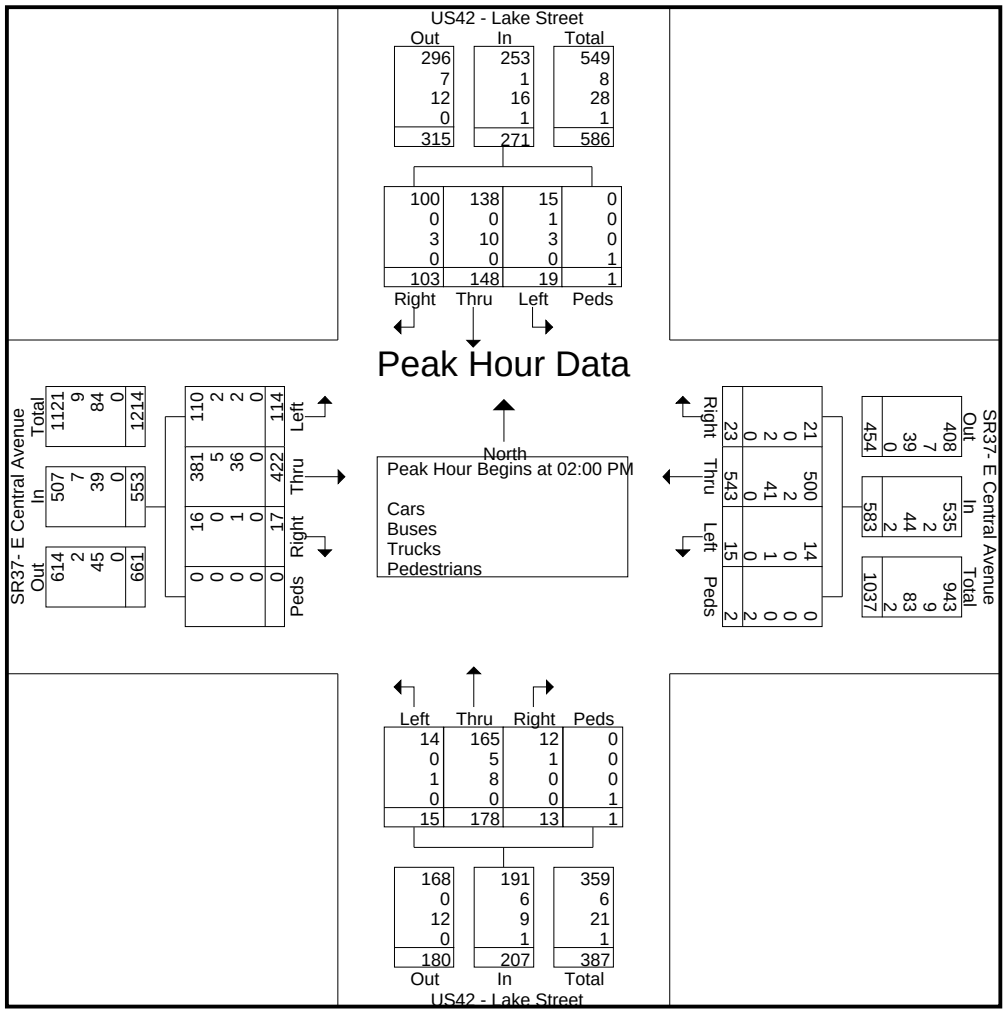
138 Mahin Trail, Versailles, KY 40383

859-361-2589

"simplifying Data Collection since 2004"

File Name : 9_SR37-E Central_Avenue_at_US42-Lake_Street_05032023
Site Code : Wed
Start Date : 5/3/2023
Page No : 5

	US42 - Lake Street From North					SR37- E Central Avenue From East					US42 - Lake Street From South					SR37- E Central Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	4	28	26	0	58	2	**140**	4	0	146	1	42	**5**	0	48	27	96	4	0	127	379
02:15 PM	**6**	38	**30**	**1**	**75**	**6**	140	**7**	**1**	**154**	3	**46**	5	**1**	55	**32**	94	3	0	129	**413**
02:30 PM	5	38	21	0	64	3	140	6	0	149	**9**	46	2	0	**57**	26	110	3	0	139	409
02:45 PM	4	**44**	26	0	74	4	123	6	1	134	2	44	1	0	47	29	**122**	**7**	0	**158**	413
Total Volume	19	148	103	1	271	15	543	23	2	583	15	178	13	1	207	114	422	17	0	553	1614
% App. Total	7	54.6	38	0.4		2.6	93.1	3.9	0.3		7.2	86	6.3	0.5		20.6	76.3	3.1	0		
PHF	.792	.841	.858	.250	.903	.625	.970	.821	.500	.946	.417	.967	.650	.250	.908	.891	.865	.607	.000	.875	.977
Cars	15	138	100	0	253	14	500	21	0	535	14	165	12	0	191	110	381	16	0	507	1486
% Cars	78.9	93.2	97.1	0	93.4	93.3	92.1	91.3	0	91.8	93.3	92.7	92.3	0	92.3	96.5	90.3	94.1	0	91.7	92.1
Buses	1	0	0	0	1	0	2	0	0	2	0	5	1	0	6	2	5	0	0	7	16
% Buses	5.3	0	0	0	0.4	0	0.4	0	0	0.3	0	2.8	7.7	0	2.9	1.8	1.2	0	0	1.3	1.0
Trucks	3	10	3	0	16	1	41	2	0	44	1	8	0	0	9	2	36	1	0	39	108
% Trucks	15.8	6.8	2.9	0	5.9	6.7	7.6	8.7	0	7.5	6.7	4.5	0	0	4.3	1.8	8.5	5.9	0	7.1	6.7
Pedestrians																					
% Pedestrians	0	0	0	100	0.4	0	0	0	100	0.3	0	0	0	100	0.5	0	0	0	0	0	0.2



Cummins Consulting Services, LLC

138 Mahin Trail, Versailles, KY 40383

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Site Code : Wed
Start Date : 5/3/2023
Page No : 6

	US42 - Lake Street From North					SR37- E Central Avenue From East					US42 - Lake Street From South					SR37- E Central Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	5	22	28	0	55	**6**	**185**	6	**1**	**198**	**11**	**60**	**3**	0	**74**	49	133	5	0	187	**514**
04:45 PM	**7**	32	**47**	0	**86**	1	176	**7**	0	184	5	53	2	0	60	32	132	5	**1**	170	500
05:00 PM	7	34	32	0	73	6	155	5	0	166	5	57	3	0	65	**57**	**137**	7	0	**201**	505
05:15 PM	5	**46**	31	0	82	2	169	6	0	177	2	54	3	0	59	38	127	**19**	0	184	502
Total Volume	24	134	138	0	296	15	685	24	1	725	23	224	11	0	258	176	529	36	1	742	2021
% App. Total	8.1	45.3	46.6	0		2.1	94.5	3.3	0.1		8.9	86.8	4.3	0		23.7	71.3	4.9	0.1		
PHF	.857	.728	.734	.000	.860	.625	.926	.857	.250	.915	.523	.933	.917	.000	.872	.772	.965	.474	.250	.923	.983
Cars	24	127	137	0	288	14	649	24	0	687	21	222	11	0	254	174	492	34	0	700	1929
% Cars	100	94.8	99.3	0	97.3	93.3	94.7	100	0	94.8	91.3	99.1	100	0	98.4	98.9	93.0	94.4	0	94.3	95.4
Buses	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	1	6	0	0	7	11
% Buses	0	0.7	0	0	0.3	0	0.3	0	0	0.3	0	0.4	0	0	0.4	0.6	1.1	0	0	0.9	0.5
Trucks	0	6	1	0	7	1	34	0	0	35	2	1	0	0	3	1	31	2	0	34	79
% Trucks	0	4.5	0.7	0	2.4	6.7	5.0	0	0	4.8	8.7	0.4	0	0	1.2	0.6	5.9	5.6	0	4.6	3.9
Pedestrians																					
% Pedestrians	0	0	0	0	0	0	0	0	100	0.1	0	0	0	0	0	0	0	0	100	0.1	0.1



Table 1. Trip Generation

Trip Generation							
Description	Land Use Code (LUC)	Total Trips	Enter	Exit		Total IN	Total OUT
Multi-Family Residential - Section 1 (276 units)	220	110	24%	76%	AM	26	84
		141	63%	37%	PM	89	52
Town Homes - Section 1 (64 units)	215	31	25%	75%	AM	8	23
		36	59%	41%	PM	21	15
Single Family Residential - Section 1 (1 Unit)	210	1	25%	75%	AM	0	1
		1	63%	37%	PM	1	0
Multi-Family Residential - Section 2 (252 units)	220	101	24%	76%	AM	24	77
		129	63%	37%	PM	81	48
Total Section 1 (South)					AM	34	108
					PM	111	67
Total Section 2 (North)					AM	24	77
					PM	81	48

Table 2. Directional Approach %

Approach Direction	To/From the Site
E Central Ave W/o Lake St	30%
Lake St S/o E Central Ave	10%
E Central Ave E/o Lake St	25%
Horseshoe Rd N/o Lake St	10%
Lake St E/o Horseshoe Rd	25%

APPENDIX B
TFMS OUTPUT

TFMS - Segment Forecast Report

Username	Email	Script Import Date	Script Version	Model Version
Curtis.Deibel	cdeibel@gpdgroup.com	4/14/2020 5:30:19 PM	2020.001	2023.1900

Forecast Summary

Project ID	Project Name	Opening Year	Design Year
		2027	2047

Project Description

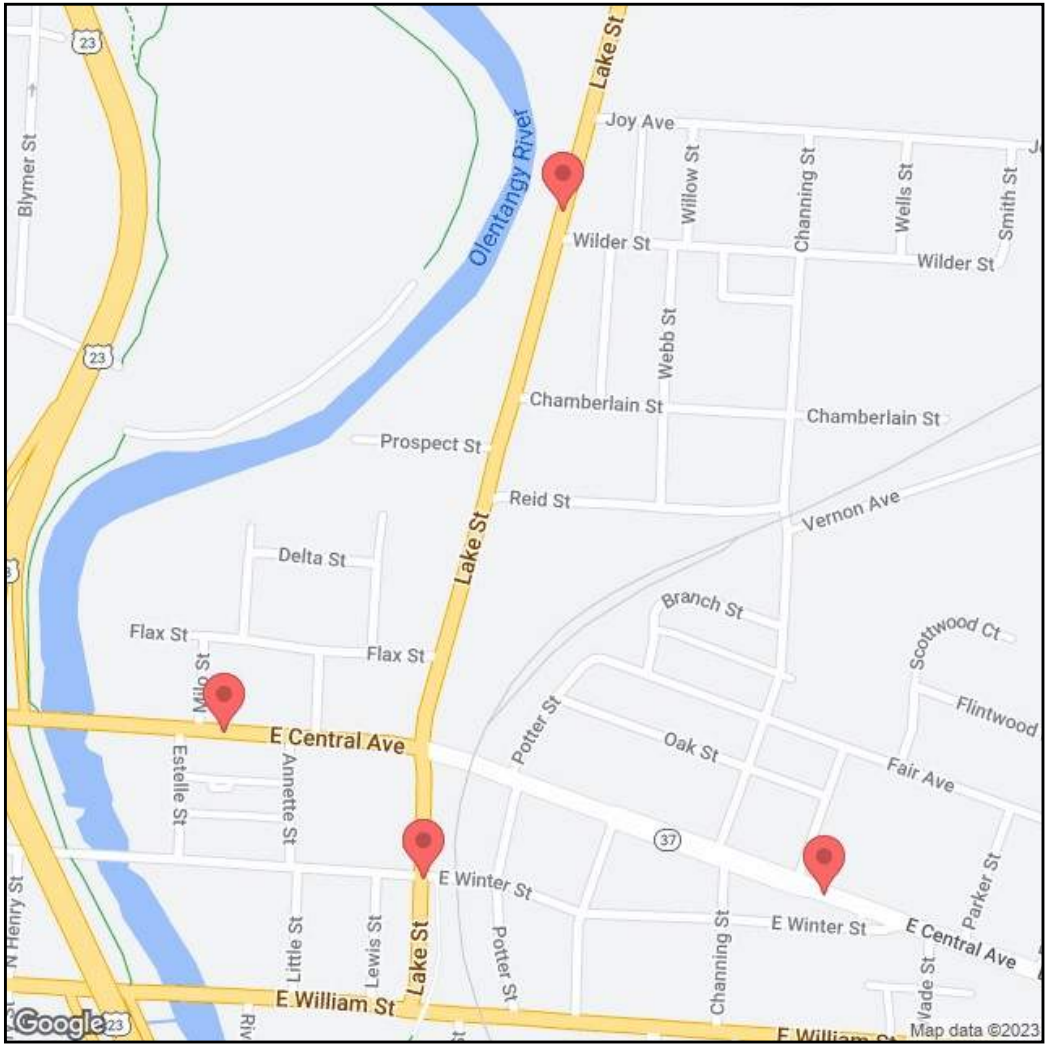
*Users of this data need to be aware that there are limitations to the forecasts generated by this product that make it suitable only for roadway design projects which are low risk.

Segment Information

Segment ID	LRS ID	BMP	EMP	Length	Latitude	Longitude
1833328	SDELSR00037**C	10.518	10.796	0.278	-83.0614128890659	40.3011719944118
1833330	SDELSR00037**C	10.796	11.395	0.599	-83.0534566954282	40.2995302797286
1833807	SDELUS00042**C	8.767	8.948	0.181	-83.0587749981342	40.2996872220349
1833809	SDELUS00042**C	8.948	9.722	0.774	-83.0569153976112	40.3064074367281

Forecast Information

Segment ID	2027 AADT	2047 AADT	DHV-30	K%	D%	T24%	TD%
1833328	18,500	23,500	2,700	11.4	50.0	6	5
1833330	14,500	17,000	2,000	11.7	56.8	5	4
1833807	5,000	5,700	650	11.6	56.5	9	7
1833809	6,600	6,900	900	13.2	65.5	10	7



Definitions:

- AADT – Annual Average Daily Traffic
- DHV30 – Design Hour Volume for 30th highest hour of the year
- DHV30 – K * AADT
- K % – Design Hour Factor
- D % – Peak Direction Factor
- T24 % – Percent Daily Trucks
- TD % – Percent Design Hour Trucks

Forecast Segment ID	Route	BMP	EMP
1833328	SDELSR00037**C	10.518	10.796

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 11.4	7	23,000	Model	1.500	1.500
AADT	**D%**	**TD % (Existing)**	**BC AADT**	**BC Method**	**BC Growth Rate %**	**BC Calculated Rate %**
24,300	◆ 50.0	6	1,300	Model	0.100	0.100

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	24,075	1,028	25,103

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
13834	37795	-1741	5009	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	1.82	-0.50	0	0	24,600	1,197	24,429	1,121
2	1.74	-0.75	4	4	23,886	1,009	24,075	1,028
3	2.15	1.77	0	0	26,322	2,138	25,938	1,946
4	2.22	2.00	4	4	26,312	2,135	26,233	2,030
5	2.09	0.69	0	0	25,993	1,713	25,636	1,555
6	2.50	2.03	4	4	27,674	2,147	27,518	2,041

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	3,912	23,494	-1,480	1,393	1.31	0.25
2	RAT	1.29	25,226	0.47	1,344	1.70	0.12
3	MRAT	1.44	24,694	1.03	1,346	1.58	0.12
4	RAF		24,094		1,369	1.44	0.18

Adjust Method AADT	Adjust Method BC	Selected PA Growth Rate %	Selected BC Growth Rate %
Average	Model Ratio	1.500	0.100

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
22101	23882	1344	1393	23445	25275

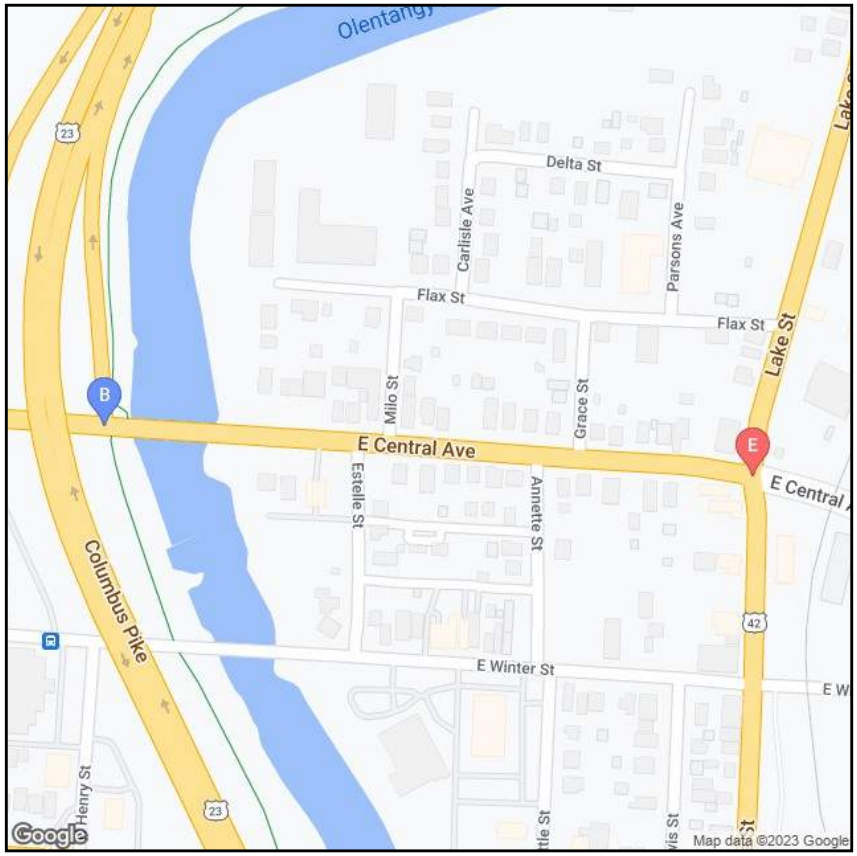
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2008	14,380	12,670	1,710
2012	14,140	12,990	1,150
2013	13,730	12,613	1,117
2016	17,695	15,924	1,770
2019	16,841	15,354	1,487
* 2022	17,482	16,180	1,302

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2027 AADT	Yr 2047 AADT	DHV30	K %	D %	T24 %	TD %
1833328	SDELSR00037**C	10.518	10.796	0.278	18,500	23,500	2700	11.4	50.0	6	5

Forecast Segment ID	Route	BMP	EMP
1833330	SDELSR00037**C	10.796	11.395

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 11.7	6	17,000	Model	1.000	1.000
AADT	**D%**	**TD % (Existing)**	**BC AADT**	**BC Method**	**BC Growth Rate %**	**BC Calculated Rate %**
17,900	◆ 56.8	5	900	Model	0.100	0.100

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	17,035	-347	16,688

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
-8352	60333	-4292	5284	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	0.72	-5.72	0	0	13,325	-678	15,678	-527
2	1.09	-4.99	4	4	16,055	-315	17,035	-347
3	2.07	-3.87	0	0	18,923	-161	20,583	-74
4	1.80	-4.41	4	4	18,958	-156	19,618	-205
5	3.70	-1.48	0	0	25,422	478	26,559	514
6	2.24	-4.60	4	4	20,653	-206	21,217	-252

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	1,905	17,282	-1,752	935	0.91	0.24
2	RAT	1.16	17,815	0.33	896	1.06	0.08
3	MRAT	1.28	17,698	1.02	896	1.03	0.08
4	RAF		17,490		916	0.97	0.16

Adjust Method AADT	Adjust Method BC	Selected PA Growth Rate %	Selected BC Growth Rate %
Average	Model Ratio	1.000	0.100

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
16347	16919	896	935	17243	17854

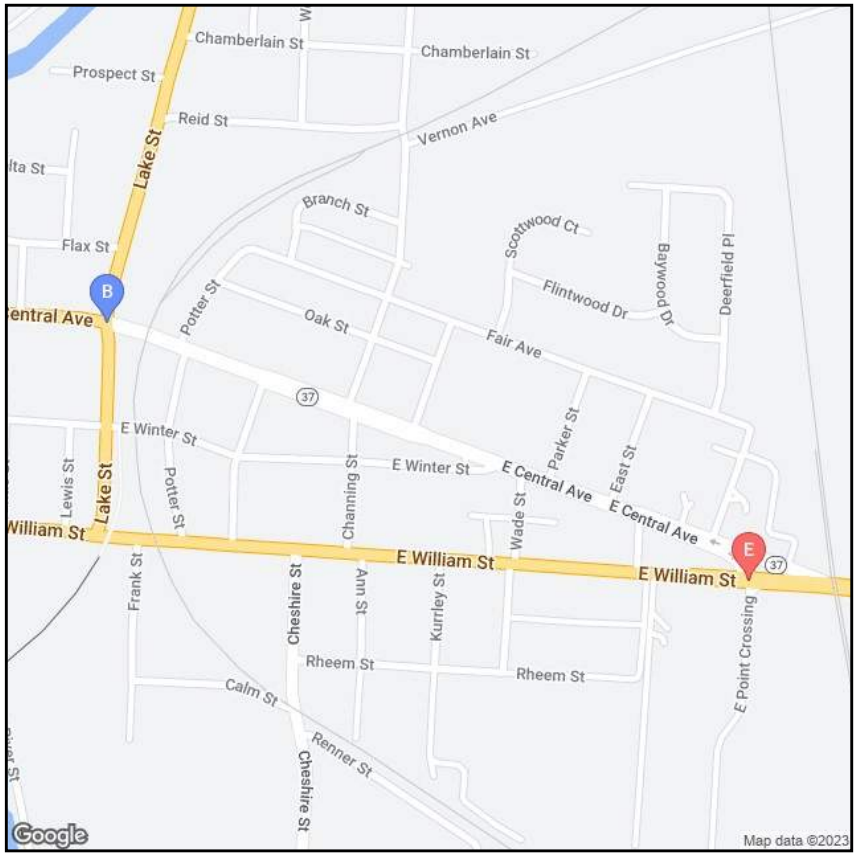
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2008	12,370	10,810	1,560
2012	11,730	10,430	1,300
2013	11,390	10,128	1,262
2016	5,343	4,999	343
2019	11,865	10,752	1,113
* 2022	13,915	13,039	876

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2027 AADT	Yr 2047 AADT	DHV30	K %	D %	T24 %	TD %
1833330	SDELSR00037**C	10.796	11.395	0.599	14,500	17,000	2000	11.7	56.8	5	4

Forecast Segment ID	Route	BMP	EMP
1833807	SDELUS00042**C	8.767	8.948

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 11.6	7	5,300	Model	0.700	0.700
AADT	**D%**	**TD % (Existing)**	**BC AADT**	**BC Method**	**BC Growth Rate %**	**BC Calculated Rate %**
5,850	◆ 56.5	5	550	Model	2.200	2.200

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
1	5,329	993	6,322

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
-1972	9700	-969	3331	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	0.71	6.83	0	0	5,960	1,117	5,329	993
2	0.56	3.52	4	5	5,599	662	5,150	677
3	-1.08	7.95	0	0	3,414	1,239	3,098	1,100
4	-1.00	3.99	4	5	3,410	714	3,202	722
5	-1.48	8.06	0	0	2,874	1,251	2,602	1,111
6	-1.00	4.53	4	5	3,410	770	3,202	774

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	-2,751	6,030	-319	592	0.80	2.63
2	RAT	0.64	5,577	0.52	471	0.53	1.36
3	MRAT	1.16	5,641	1.38	504	0.55	1.71
4	RAF		5,836		548	0.68	2.17

Adjust Method AADT	Adjust Method BC	Selected PA Growth Rate %	Selected BC Growth Rate %
Average	Average	0.700	2.200

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
5106	5438	471	592	5577	6030

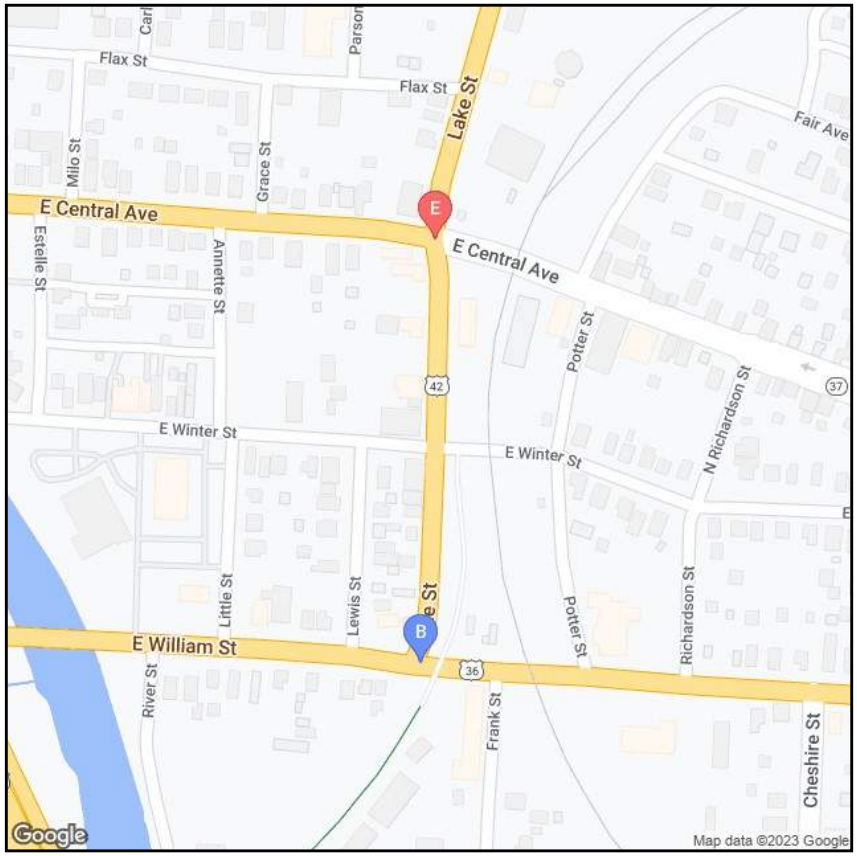
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2008	4,150	3,980	170
2012	5,311	5,099	212
2013	5,157	4,951	206
2016	5,796	5,565	231
2019	5,751	5,100	651
* 2022	4,788	4,447	341

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2027 AADT	Yr 2047 AADT	DHV30	K %	D %	T24 %	TD %
1833807	SDELUS00042**C	8.767	8.948	0.181	5,000	5,700	650	11.6	56.5	9	7

Forecast Segment ID	Route	BMP	EMP
1833809	SDELUS00042**C	8.948	9.722

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 13.2	7	6,300	Average	0.100	0.100
AADT	**D%**	**TD % (Existing)**	**BC AADT**	**BC Method**	**BC Growth Rate %**	**BC Calculated Rate %**
7,000	◆ 65.5	5	700	Model	1.900	1.900

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	3,518	971	4,489

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
938	9469	-130	2794	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	-1.19	4.51	0	0	4,260	1,099	4,046	1,045
2	-1.50	3.93	5	3	3,499	1,035	3,518	971
3	-0.92	7.01	0	0	4,777	1,469	4,499	1,369
4	-1.29	7.24	5	4	3,919	1,468	3,882	1,398
5	-0.92	6.01	0	0	4,778	1,329	4,500	1,240
6	-1.25	7.29	5	4	3,993	1,476	3,951	1,405

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	-3,497	10,219	-362	750	2.00	2.23
2	RAT	0.65	8,934	0.56	624	1.32	1.25
3	MRAT	1.37	9,279	1.35	657	1.50	1.51
4	RAF		9,749		704	1.75	1.87

Adjust Method AADT	Adjust Method BC	Selected PA Growth Rate %	Selected BC Growth Rate %
Average	Average	1.800	1.900

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
8310	9469	624	750	8934	10219

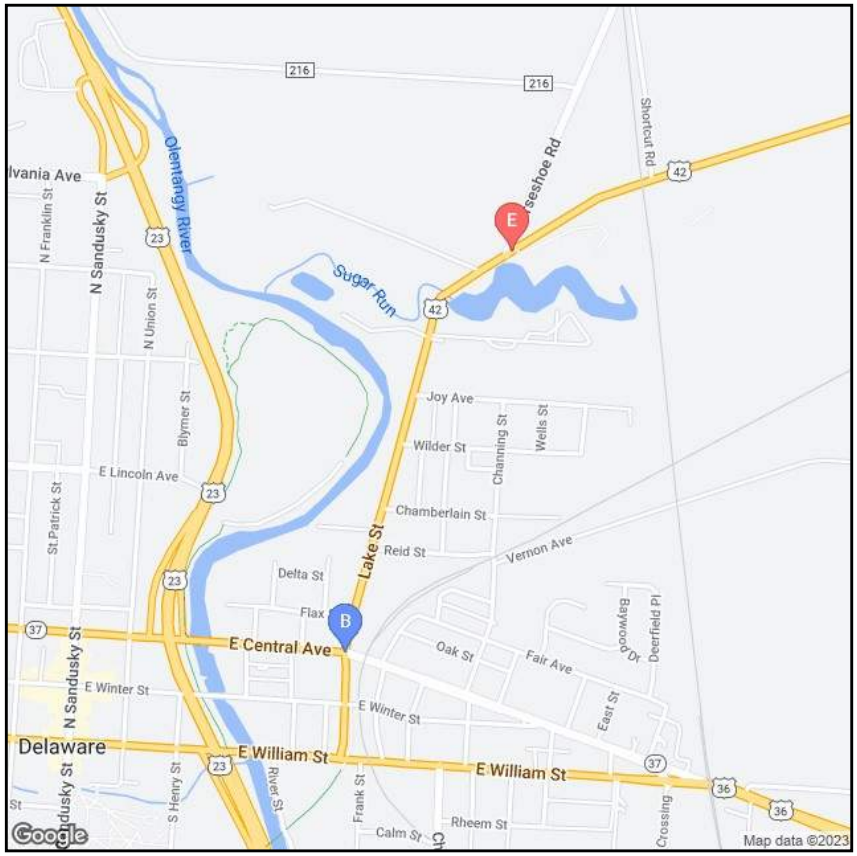
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2008	7,750	7,430	320
2012	7,110	6,910	200
2013	6,904	6,710	194
2016	7,204	6,694	508
2019	7,467	6,929	538
* 2022	6,533	6,071	462

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2027 AADT	Yr 2047 AADT	DHV30	K %	D %	T24 %	TD %
1833809	SDELUS00042**C	8.948	9.722	0.774	6,600	6,900	900	13.2	65.5	10	7

APPENDIX C
INTERSECTION PHOTO LOG



Looking west on Central Avenue (SR 37) toward Central Avenue (SR 37) / Lake Street (US 42) intersection



Looking east on Central Avenue (SR 37) toward Central Avenue (SR 37) / Lake Street (US 42) intersection



Looking east along Central Avenue (SR 37)



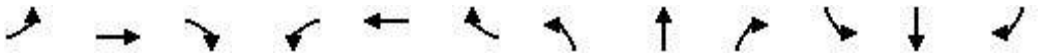
Looking north along Lake Street (US 42) toward Central Avenue (SR 37) / Lake Street (US 42) Intersection



Looking south on Lake Street (US 42) toward Central Avenue (SR 37) / Lake Street (US 42) intersection

APPENDIX D
HCM INTERSECTION CAPACITY ANALYSIS

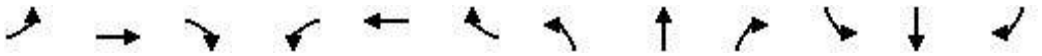
'NO-BUILD' CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	401	976	52	370	973	34	48	189	12	62	323	329
Arrive On Green	0.05	0.59	0.59	0.04	0.57	0.57	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1697	1648	88	1584	1697	59	33	908	57	106	1556	1585
Grp Volume(v), veh/h	84	0	650	32	0	654	158	0	0	298	0	224
Grp Sat Flow(s),veh/h/ln	1697	0	1736	1584	0	1756	998	0	0	1662	0	1585
Q Serve(g_s), s	1.9	0.0	24.4	0.8	0.0	25.3	1.0	0.0	0.0	0.0	0.0	13.0
Cycle Q Clear(g_c), s	1.9	0.0	24.4	0.8	0.0	25.3	18.3	0.0	0.0	17.3	0.0	13.0
Prop In Lane	1.00		0.05	1.00		0.03	0.13		0.06	0.10		1.00
Lane Grp Cap(c), veh/h	401	0	1028	370	0	1006	248	0	0	385	0	329
V/C Ratio(X)	0.21	0.00	0.63	0.09	0.00	0.65	0.64	0.00	0.00	0.77	0.00	0.68
Avail Cap(c_a), veh/h	453	0	1028	448	0	1006	318	0	0	466	0	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	13.3	10.5	0.0	14.5	35.0	0.0	0.0	37.9	0.0	36.6
Incr Delay (d2), s/veh	0.4	0.0	3.0	0.1	0.0	3.3	3.8	0.0	0.0	7.5	0.0	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	9.4	0.3	0.0	10.0	3.6	0.0	0.0	7.6	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	0.0	16.3	10.6	0.0	17.8	38.8	0.0	0.0	45.4	0.0	40.9
LnGrp LOS	B	A	B	B	A	B	D	A	A	D	A	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		15.7			17.4			38.8			43.5	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	64.7		26.3	10.9	62.8		26.3				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	8.5	49.5		25.5	8.5	49.5		25.5				
Max Q Clear Time (g_c+I1), s	2.8	26.4		19.3	3.9	27.3		20.3				
Green Ext Time (p_c), s	0.0	3.8		1.4	0.1	3.7		0.3				

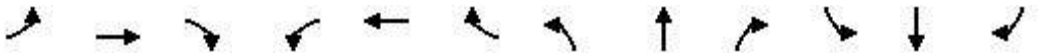
Intersection Summary												
HCM 6th Ctrl Delay			24.9									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	319	897	48	303	862	53	41	180	10	94	237	404
Arrive On Green	0.06	0.54	0.54	0.04	0.52	0.52	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1697	1648	88	1584	1648	101	0	704	39	197	928	1585
Grp Volume(v), veh/h	105	0	672	33	0	693	171	0	0	380	0	294
Grp Sat Flow(s),veh/h/ln	1697	0	1736	1584	0	1748	743	0	0	1126	0	1585
Q Serve(g_s), s	2.8	0.0	28.8	0.9	0.0	31.3	0.0	0.0	0.0	0.0	0.0	17.0
Cycle Q Clear(g_c), s	2.8	0.0	28.8	0.9	0.0	31.3	25.5	0.0	0.0	25.5	0.0	17.0
Prop In Lane	1.00		0.05	1.00		0.06	0.13		0.05	0.22		1.00
Lane Grp Cap(c), veh/h	319	0	944	303	0	915	230	0	0	331	0	404
V/C Ratio(X)	0.33	0.00	0.71	0.11	0.00	0.76	0.74	0.00	0.00	1.15	0.00	0.73
Avail Cap(c_a), veh/h	367	0	944	381	0	915	230	0	0	331	0	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.1	0.0	17.0	13.7	0.0	18.8	31.9	0.0	0.0	38.1	0.0	34.1
Incr Delay (d2), s/veh	0.9	0.0	4.5	0.2	0.0	5.8	13.1	0.0	0.0	96.0	0.0	7.0
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	1.0	0.0	11.7	0.3	0.0	13.1	4.3	0.0	0.0	17.0	0.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	0.0	21.5	13.9	0.0	24.7	45.0	0.0	0.0	134.1	0.0	41.1
LnGrp LOS	B	A	C	B	A	C	D	A	A	F	A	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		20.8			24.2			45.0			93.5	
Approach LOS		C			C			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	59.9		31.0	11.2	57.8		31.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	8.5	49.5		25.5	8.5	49.5		25.5				
Max Q Clear Time (g_c+I1), s	2.9	30.8		27.5	4.8	33.3		27.5				
Green Ext Time (p_c), s	0.0	3.7		0.0	0.1	3.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		44.5	
HCM 6th LOS		D	



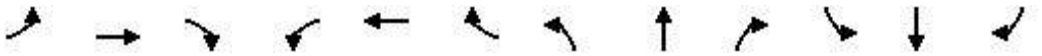
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	600	32	29	575	20	19	113	8	29	248	209
Future Volume (veh/h)	82	600	32	29	575	20	19	113	8	29	248	209
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1885
Adj Flow Rate, veh/h	89	652	35	33	653	23	22	133	9	32	276	232
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	1
Cap, veh/h	392	927	50	347	903	32	59	203	12	72	341	339
Arrive On Green	0.08	0.56	0.56	0.05	0.53	0.53	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1697	1647	88	1584	1696	60	37	960	58	106	1608	1598
Grp Volume(v), veh/h	89	0	687	33	0	676	164	0	0	308	0	232
Grp Sat Flow(s),veh/h/ln	1697	0	1736	1584	0	1756	1055	0	0	1714	0	1598
Q Serve(g_s), s	1.7	0.0	22.9	0.7	0.0	23.4	0.7	0.0	0.0	0.0	0.0	10.7
Cycle Q Clear(g_c), s	1.7	0.0	22.9	0.7	0.0	23.4	14.5	0.0	0.0	13.8	0.0	10.7
Prop In Lane	1.00		0.05	1.00		0.03	0.13		0.05	0.10		1.00
Lane Grp Cap(c), veh/h	392	0	976	347	0	935	275	0	0	413	0	339
V/C Ratio(X)	0.23	0.00	0.70	0.10	0.00	0.72	0.60	0.00	0.00	0.75	0.00	0.68
Avail Cap(c_a), veh/h	487	0	976	483	0	935	336	0	0	485	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.4	0.0	12.7	10.0	0.0	14.2	27.8	0.0	0.0	30.1	0.0	29.1
Incr Delay (d2), s/veh	0.4	0.0	4.2	0.2	0.0	4.8	2.9	0.0	0.0	6.0	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	8.6	0.2	0.0	9.3	2.9	0.0	0.0	6.1	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.8	0.0	16.9	10.2	0.0	19.0	30.7	0.0	0.0	36.1	0.0	33.6
LnGrp LOS	B	A	B	B	A	B	C	A	A	D	A	C
Approach Vol, veh/h		776			709			164			540	
Approach Delay, s/veh		16.2			18.6			30.7			35.0	
Approach LOS		B			B			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	50.2		21.7	10.5	47.8		21.7				
Change Period (Y+Rc), s	4.5	5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s	10.5	34.8		* 20	10.5	34.8		* 20				
Max Q Clear Time (g_c+I1), s	2.7	24.9		15.8	3.7	25.4		16.5				
Green Ext Time (p_c), s	0.0	2.8		1.2	0.1	2.7		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		22.7	
HCM 6th LOS		C	

Notes

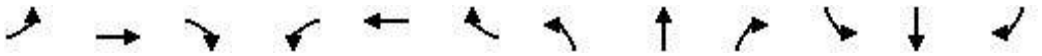
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	246	891	47	235	865	49	41	169	11	93	239	404
Arrive On Green	0.06	0.54	0.54	0.04	0.52	0.52	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1697	1650	87	1584	1656	94	0	663	43	194	938	1585
Grp Volume(v), veh/h	119	0	782	39	0	803	199	0	0	431	0	332
Grp Sat Flow(s),veh/h/ln	1697	0	1736	1584	0	1750	706	0	0	1132	0	1585
Q Serve(g_s), s	3.2	0.0	37.7	1.1	0.0	40.5	0.0	0.0	0.0	0.0	0.0	19.7
Cycle Q Clear(g_c), s	3.2	0.0	37.7	1.1	0.0	40.5	25.5	0.0	0.0	25.5	0.0	19.7
Prop In Lane	1.00		0.05	1.00		0.05	0.13		0.06	0.21		1.00
Lane Grp Cap(c), veh/h	246	0	938	235	0	914	221	0	0	332	0	404
V/C Ratio(X)	0.48	0.00	0.83	0.17	0.00	0.88	0.90	0.00	0.00	1.30	0.00	0.82
Avail Cap(c_a), veh/h	292	0	938	307	0	914	221	0	0	332	0	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	0.0	19.2	16.7	0.0	21.1	32.6	0.0	0.0	38.2	0.0	35.1
Incr Delay (d2), s/veh	2.1	0.0	8.6	0.5	0.0	11.8	35.8	0.0	0.0	154.4	0.0	13.2
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	1.3	0.0	16.0	0.4	0.0	18.1	6.3	0.0	0.0	22.4	0.0	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	0.0	27.8	17.2	0.0	32.8	68.4	0.0	0.0	192.6	0.0	48.3
LnGrp LOS	C	A	C	B	A	C	E	A	A	F	A	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		27.0			32.1			68.4			129.8	
Approach LOS		C			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	59.5		31.0	11.3	57.7		31.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	8.5	49.5		25.5	8.5	49.5		25.5				
Max Q Clear Time (g_c+I1), s	3.1	39.7		27.5	5.2	42.5		27.5				
Green Ext Time (p_c), s	0.0	3.3		0.0	0.1	2.7		0.0				

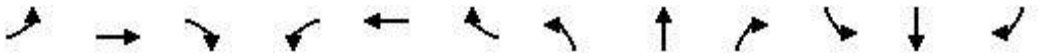
Intersection Summary			
HCM 6th Ctrl Delay		60.6	
HCM 6th LOS		E	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	303	1009	69	372	987	34	54	322	15	67	312	352
Arrive On Green	0.07	0.61	0.61	0.02	0.56	0.56	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1795	1663	113	1711	1755	60	82	1460	69	135	1417	1598
Grp Volume(v), veh/h	211	0	676	18	0	848	326	0	0	201	0	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	1711	0	1815	1612	0	0	1552	0	1598
Q Serve(g_s), s	5.2	0.0	26.6	0.5	0.0	42.2	10.6	0.0	0.0	0.0	0.0	10.7
Cycle Q Clear(g_c), s	5.2	0.0	26.6	0.5	0.0	42.2	22.0	0.0	0.0	11.4	0.0	10.7
Prop In Lane	1.00		0.06	1.00		0.03	0.09		0.04	0.15		1.00
Lane Grp Cap(c), veh/h	303	0	1077	372	0	1020	391	0	0	380	0	352
V/C Ratio(X)	0.70	0.00	0.63	0.05	0.00	0.83	0.83	0.00	0.00	0.53	0.00	0.50
Avail Cap(c_a), veh/h	337	0	1077	480	0	1020	411	0	0	398	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.7	0.0	13.7	11.8	0.0	19.8	41.9	0.0	0.0	37.6	0.0	37.6
Incr Delay (d2), s/veh	6.2	0.0	2.8	0.1	0.0	7.9	13.9	0.0	0.0	1.7	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	10.6	0.2	0.0	18.6	10.2	0.0	0.0	4.9	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	16.5	11.8	0.0	27.7	55.8	0.0	0.0	39.3	0.0	39.2
LnGrp LOS	C	A	B	B	A	C	E	A	A	D	A	D
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		19.0			27.3			55.8			39.2	
Approach LOS		B			C			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	72.2		29.7	12.9	67.3		29.7				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	58.5		25.5	9.5	58.5		25.5				
Max Q Clear Time (g_c+I1), s	2.5	28.6		13.4	7.2	44.2		24.0				
Green Ext Time (p_c), s	0.0	4.2		1.5	0.2	4.5		0.3				

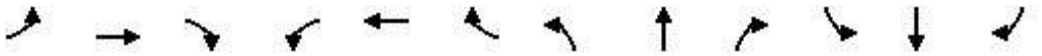
Intersection Summary			
HCM 6th Ctrl Delay		29.9	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	239	986	68	344	872	84	35	152	6	87	201	370
Arrive On Green	0.09	0.59	0.59	0.02	0.53	0.53	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1795	1661	114	1711	1639	158	0	656	27	197	868	1598
Grp Volume(v), veh/h	282	0	699	20	0	930	358	0	0	256	0	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	1711	0	1797	682	0	0	1066	0	1598
Q Serve(g_s), s	9.5	0.0	29.0	0.6	0.0	55.2	0.0	0.0	0.0	0.0	0.0	13.7
Cycle Q Clear(g_c), s	9.5	0.0	29.0	0.6	0.0	55.2	25.5	0.0	0.0	25.5	0.0	13.7
Prop In Lane	1.00		0.06	1.00		0.09	0.08		0.04	0.25		1.00
Lane Grp Cap(c), veh/h	239	0	1053	344	0	956	194	0	0	288	0	370
V/C Ratio(X)	1.18	0.00	0.66	0.06	0.00	0.97	1.85	0.00	0.00	0.89	0.00	0.60
Avail Cap(c_a), veh/h	239	0	1053	449	0	956	194	0	0	288	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.5	0.0	15.0	13.3	0.0	25.0	38.0	0.0	0.0	41.3	0.0	37.7
Incr Delay (d2), s/veh	116.3	0.0	3.3	0.1	0.0	23.3	401.1	0.0	0.0	27.3	0.0	3.2
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	14.1	0.0	11.7	0.2	0.0	27.7	26.1	0.0	0.0	9.0	0.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	150.8	0.0	18.3	13.4	0.0	48.2	439.0	0.0	0.0	68.6	0.0	41.0
LnGrp LOS	F	A	B	B	A	D	F	A	A	E	A	D
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		56.4			47.5			439.0			55.8	
Approach LOS		E			D			F			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	70.8		31.0	15.0	64.0		31.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	58.5		25.5	9.5	58.5		25.5				
Max Q Clear Time (g_c+I1), s	2.6	31.0		27.5	11.5	57.2		27.5				
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	0.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		102.7	
HCM 6th LOS		F	



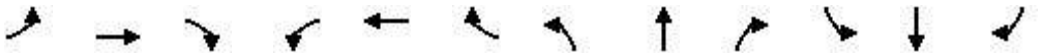
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	201	602	41	18	780	27	26	254	12	27	152	157
Future Volume (veh/h)	201	602	41	18	780	27	26	254	12	27	152	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	218	654	45	20	848	29	30	292	14	31	177	183
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	279	939	65	347	895	31	68	345	16	83	343	357
Arrive On Green	0.09	0.57	0.57	0.03	0.51	0.51	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1795	1661	114	1711	1755	60	85	1543	71	142	1533	1598
Grp Volume(v), veh/h	218	0	699	20	0	877	336	0	0	208	0	183
Grp Sat Flow(s),veh/h/ln	1795	0	1776	1711	0	1815	1699	0	0	1675	0	1598
Q Serve(g_s), s	4.2	0.0	22.6	0.4	0.0	36.7	7.2	0.0	0.0	0.0	0.0	8.0
Cycle Q Clear(g_c), s	4.2	0.0	22.6	0.4	0.0	36.7	15.4	0.0	0.0	8.2	0.0	8.0
Prop In Lane	1.00		0.06	1.00		0.03	0.09		0.04	0.15		1.00
Lane Grp Cap(c), veh/h	279	0	1003	347	0	925	429	0	0	426	0	357
V/C Ratio(X)	0.78	0.00	0.70	0.06	0.00	0.95	0.78	0.00	0.00	0.49	0.00	0.51
Avail Cap(c_a), veh/h	358	0	1003	517	0	925	481	0	0	476	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	0.0	12.5	10.6	0.0	18.6	30.0	0.0	0.0	27.2	0.0	27.2
Incr Delay (d2), s/veh	9.7	0.0	4.0	0.1	0.0	19.4	8.2	0.0	0.0	1.2	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	8.7	0.2	0.0	18.2	7.1	0.0	0.0	3.5	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	16.5	10.7	0.0	38.0	38.1	0.0	0.0	28.5	0.0	28.9
LnGrp LOS	C	A	B	B	A	D	D	A	A	C	A	C
Approach Vol, veh/h		917			897			336			391	
Approach Delay, s/veh		19.1			37.4			38.1			28.6	
Approach LOS		B			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	50.4		22.6	11.4	46.0		22.6				
Change Period (Y+Rc), s	4.5	5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s	10.5	34.8		* 20	10.5	34.8		* 20				
Max Q Clear Time (g_c+I1), s	2.4	24.6		10.2	6.2	38.7		17.4				
Green Ext Time (p_c), s	0.0	2.9		1.4	0.4	0.0		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		29.5	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

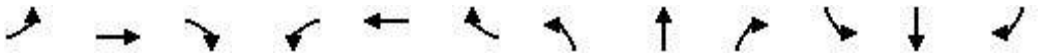


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	221	983	67	269	881	77	35	140	6	86	201	370
Arrive On Green	0.09	0.59	0.59	0.03	0.53	0.53	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1795	1662	113	1711	1656	144	0	605	24	194	866	1598
Grp Volume(v), veh/h	317	0	814	22	0	1073	412	0	0	290	0	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	1711	0	1800	629	0	0	1060	0	1598
Q Serve(g_s), s	9.5	0.0	38.0	0.6	0.0	58.5	0.0	0.0	0.0	0.0	0.0	15.9
Cycle Q Clear(g_c), s	9.5	0.0	38.0	0.6	0.0	58.5	25.5	0.0	0.0	25.5	0.0	15.9
Prop In Lane	1.00		0.06	1.00		0.08	0.08		0.04	0.24		1.00
Lane Grp Cap(c), veh/h	221	0	1050	269	0	957	181	0	0	286	0	370
V/C Ratio(X)	1.44	0.00	0.77	0.08	0.00	1.12	2.27	0.00	0.00	1.01	0.00	0.68
Avail Cap(c_a), veh/h	221	0	1050	372	0	957	181	0	0	286	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	16.9	15.5	0.0	25.7	37.9	0.0	0.0	43.0	0.0	38.6
Incr Delay (d2), s/veh	220.8	0.0	5.6	0.2	0.0	68.3	590.2	0.0	0.0	56.5	0.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.5	0.0	15.7	0.2	0.0	41.0	33.9	0.0	0.0	12.3	0.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	257.8	0.0	22.5	15.7	0.0	94.1	628.1	0.0	0.0	99.5	0.0	44.2
LnGrp LOS	F	A	C	B	A	F	F	A	A	F	A	D
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		88.5			92.5			628.1			73.7	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	70.6		31.0	15.0	64.0		31.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	9.5	58.5		25.5	9.5	58.5		25.5				
Max Q Clear Time (g_c+I1), s	2.6	40.0		27.5	11.5	60.5		27.5				
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		157.2
HCM 6th LOS		F

'SCENARIO 1'



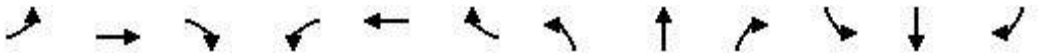
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	443	1126	60	419	1160	40	52	206	13	65	337	336
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	742	1648	88	695	1697	59	41	970	61	107	1586	1585
Grp Volume(v), veh/h	84	0	650	32	0	654	158	0	0	298	0	224
Grp Sat Flow(s),veh/h/ln	742	0	1736	695	0	1756	1072	0	0	1693	0	1585
Q Serve(g_s), s	6.1	0.0	18.0	2.3	0.0	17.8	0.8	0.0	0.0	0.0	0.0	12.3
Cycle Q Clear(g_c), s	24.0	0.0	18.0	20.3	0.0	17.8	16.8	0.0	0.0	16.0	0.0	12.3
Prop In Lane	1.00		0.05	1.00		0.03	0.13		0.06	0.10		1.00
Lane Grp Cap(c), veh/h	443	0	1187	419	0	1200	270	0	0	401	0	336
V/C Ratio(X)	0.19	0.00	0.55	0.08	0.00	0.54	0.58	0.00	0.00	0.74	0.00	0.67
Avail Cap(c_a), veh/h	443	0	1187	419	0	1200	429	0	0	585	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	7.6	12.7	0.0	7.6	32.8	0.0	0.0	35.5	0.0	34.3
Incr Delay (d2), s/veh	0.9	0.0	1.8	0.4	0.0	1.8	2.8	0.0	0.0	4.0	0.0	3.2
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(95%),veh/ln	2.0	0.0	10.1	0.7	0.0	10.1	6.1	0.0	0.0	11.1	0.0	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	0.0	9.4	13.1	0.0	9.4	35.6	0.0	0.0	39.6	0.0	37.5
LnGrp LOS	B	A	A	B	A	A	D	A	A	D	A	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		10.0			9.5			35.6			38.7	
Approach LOS		B			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		70.1		24.9		70.1		24.9				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		26.0		18.0		22.3		18.8				
Green Ext Time (p_c), s		4.9		2.2		4.4		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			18.9									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



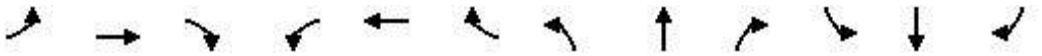
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	290	951	51	287	950	58	43	200	11	104	293	506
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	715	1648	88	681	1648	101	0	627	35	183	919	1585
Grp Volume(v), veh/h	105	0	672	33	0	693	171	0	0	380	0	294
Grp Sat Flow(s),veh/h/ln	715	0	1736	681	0	1748	662	0	0	1102	0	1585
Q Serve(g_s), s	11.5	0.0	25.4	3.3	0.0	26.4	0.0	0.0	0.0	0.0	0.0	14.7
Cycle Q Clear(g_c), s	37.9	0.0	25.4	28.7	0.0	26.4	30.3	0.0	0.0	30.3	0.0	14.7
Prop In Lane	1.00		0.05	1.00		0.06	0.13		0.05	0.22		1.00
Lane Grp Cap(c), veh/h	290	0	1001	287	0	1009	254	0	0	398	0	506
V/C Ratio(X)	0.36	0.00	0.67	0.12	0.00	0.69	0.67	0.00	0.00	0.96	0.00	0.58
Avail Cap(c_a), veh/h	290	0	1001	287	0	1009	254	0	0	398	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	13.9	23.8	0.0	14.1	26.3	0.0	0.0	32.2	0.0	27.0
Incr Delay (d2), s/veh	3.5	0.0	3.6	0.8	0.0	3.8	7.6	0.0	0.0	33.9	0.0	2.1
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(95%),veh/ln	3.9	0.0	15.0	1.1	0.0	15.6	6.2	0.0	0.0	18.1	0.0	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	17.5	24.6	0.0	17.9	33.9	0.0	0.0	66.1	0.0	29.1
LnGrp LOS	C	A	B	C	A	B	C	A	A	E	A	C
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		19.3			18.2			33.9			49.9	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		35.0		60.0		35.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		39.9		32.3		30.7		32.3				
Green Ext Time (p_c), s		4.3		0.0		4.5		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



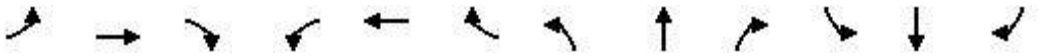
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	216	952	50	217	955	54	43	196	13	103	296	506
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	646	1650	87	615	1656	94	0	614	39	180	928	1585
Grp Volume(v), veh/h	119	0	782	39	0	803	199	0	0	431	0	332
Grp Sat Flow(s),veh/h/ln	646	0	1736	615	0	1750	653	0	0	1108	0	1585
Q Serve(g_s), s	16.8	0.0	32.9	5.0	0.0	34.1	0.0	0.0	0.0	0.0	0.0	17.1
Cycle Q Clear(g_c), s	50.9	0.0	32.9	37.9	0.0	34.1	30.3	0.0	0.0	30.3	0.0	17.1
Prop In Lane	1.00		0.05	1.00		0.05	0.13		0.06	0.21		1.00
Lane Grp Cap(c), veh/h	216	0	1002	217	0	1009	251	0	0	399	0	506
V/C Ratio(X)	0.55	0.00	0.78	0.18	0.00	0.80	0.79	0.00	0.00	1.08	0.00	0.66
Avail Cap(c_a), veh/h	216	0	1002	217	0	1009	251	0	0	399	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	15.5	30.1	0.0	15.7	26.8	0.0	0.0	33.0	0.0	27.9
Incr Delay (d2), s/veh	9.7	0.0	6.0	1.8	0.0	6.5	16.6	0.0	0.0	68.1	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	0.0	19.1	1.5	0.0	19.8	8.1	0.0	0.0	24.7	0.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	0.0	21.5	31.9	0.0	22.2	43.4	0.0	0.0	101.1	0.0	31.4
LnGrp LOS	D	A	C	C	A	C	D	A	A	F	A	C
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		24.7			22.7			43.4			70.8	
Approach LOS		C			C			D			E	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		35.0		60.0		35.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		52.9		32.3		39.9		32.3				
Green Ext Time (p_c), s		1.1		0.0		4.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	38.4	
HCM 6th LOS	D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



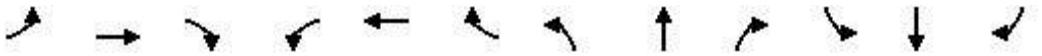
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	316	1125	76	426	975	33	60	333	16	74	327	468
Arrive On Green	0.07	0.68	0.68	0.56	0.56	0.56	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1795	1663	113	733	1755	60	84	1516	72	140	1489	1598
Grp Volume(v), veh/h	211	0	676	18	0	848	326	0	0	201	0	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	733	0	1815	1672	0	0	1629	0	1598
Q Serve(g_s), s	4.4	0.0	18.9	1.3	0.0	37.0	8.6	0.0	0.0	0.0	0.0	8.4
Cycle Q Clear(g_c), s	4.4	0.0	18.9	8.7	0.0	37.0	18.1	0.0	0.0	9.5	0.0	8.4
Prop In Lane	1.00		0.06	1.00		0.03	0.09		0.04	0.15		1.00
Lane Grp Cap(c), veh/h	316	0	1201	426	0	1008	408	0	0	401	0	468
V/C Ratio(X)	0.67	0.00	0.56	0.04	0.00	0.84	0.80	0.00	0.00	0.50	0.00	0.38
Avail Cap(c_a), veh/h	383	0	1201	426	0	1008	490	0	0	478	0	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	8.0	13.3	0.0	17.6	35.9	0.0	0.0	32.5	0.0	26.7
Incr Delay (d2), s/veh	4.2	0.0	1.9	0.2	0.0	8.4	8.6	0.0	0.0	1.4	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.0	0.0	10.8	0.4	0.0	22.7	13.0	0.0	0.0	7.4	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	0.0	9.9	13.5	0.0	26.0	44.4	0.0	0.0	33.9	0.0	27.4
LnGrp LOS	C	A	A	B	A	C	D	A	A	C	A	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		12.9			25.8			44.4			30.9	
Approach LOS		B			C			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		69.5		25.5	11.5	58.0		25.5				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		20.9		11.5	6.4	39.0		20.1				
Green Ext Time (p_c), s		4.3		1.6	0.3	2.6		0.7				

Intersection Summary												
HCM 6th Ctrl Delay			24.4									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



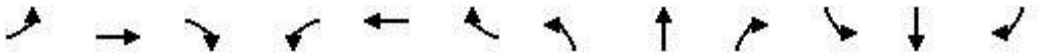
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1046	72	355	773	75	50	281	12	99	246	602
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1661	114	717	1639	158	33	1057	44	194	923	1598
Grp Volume(v), veh/h	282	0	699	20	0	930	358	0	0	256	0	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	717	0	1797	1134	0	0	1116	0	1598
Q Serve(g_s), s	10.5	0.0	22.9	1.7	0.0	44.8	5.7	0.0	0.0	0.0	0.0	9.6
Cycle Q Clear(g_c), s	10.5	0.0	22.9	9.5	0.0	44.8	25.3	0.0	0.0	19.6	0.0	9.6
Prop In Lane	1.00		0.06	1.00		0.09	0.08		0.04	0.25		1.00
Lane Grp Cap(c), veh/h	274	0	1118	355	0	848	343	0	0	345	0	602
V/C Ratio(X)	1.03	0.00	0.63	0.06	0.00	1.10	1.04	0.00	0.00	0.74	0.00	0.37
Avail Cap(c_a), veh/h	274	0	1118	355	0	848	343	0	0	345	0	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	10.8	18.2	0.0	25.1	34.9	0.0	0.0	31.5	0.0	21.4
Incr Delay (d2), s/veh	61.9	0.0	2.6	0.3	0.0	60.9	60.4	0.0	0.0	9.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	16.6	0.0	13.3	0.5	0.0	43.9	20.5	0.0	0.0	10.2	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.2	0.0	13.4	18.5	0.0	86.0	95.4	0.0	0.0	40.4	0.0	22.0
LnGrp LOS	F	A	B	B	A	F	F	A	A	D	A	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		36.1			84.6			95.4			31.8	
Approach LOS		D			F			F			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.0	50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		24.9		21.6	12.5	46.8		27.3				
Green Ext Time (p_c), s		4.5		0.9	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		59.7
HCM 6th LOS		E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1046	71	279	781	68	42	189	8	98	245	602
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1662	113	644	1656	144	4	710	29	191	919	1598
Grp Volume(v), veh/h	317	0	814	22	0	1073	412	0	0	290	0	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	644	0	1800	743	0	0	1109	0	1598
Q Serve(g_s), s	10.5	0.0	29.8	2.3	0.0	44.8	0.8	0.0	0.0	0.0	0.0	11.1
Cycle Q Clear(g_c), s	10.5	0.0	29.8	17.1	0.0	44.8	25.3	0.0	0.0	24.5	0.0	11.1
Prop In Lane	1.00		0.06	1.00		0.08	0.08		0.04	0.24		1.00
Lane Grp Cap(c), veh/h	274	0	1118	279	0	849	239	0	0	342	0	602
V/C Ratio(X)	1.16	0.00	0.73	0.08	0.00	1.26	1.73	0.00	0.00	0.85	0.00	0.42
Avail Cap(c_a), veh/h	274	0	1118	279	0	849	239	0	0	342	0	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	12.0	23.0	0.0	25.1	31.6	0.0	0.0	33.2	0.0	21.9
Incr Delay (d2), s/veh	103.3	0.0	4.2	0.6	0.0	128.3	343.4	0.0	0.0	18.1	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.5	0.0	16.8	0.7	0.0	69.3	45.1	0.0	0.0	12.7	0.0	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.6	0.0	16.2	23.6	0.0	153.4	375.0	0.0	0.0	51.3	0.0	22.6
LnGrp LOS	F	A	B	C	A	F	F	A	A	D	A	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		49.1			150.8			375.0			37.9	
Approach LOS		D			F			F			D	

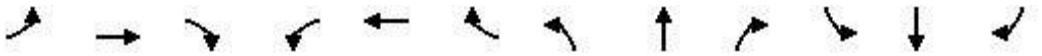
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.0	50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		31.8		26.5	12.5	46.8		27.3				
Green Ext Time (p_c), s		5.5		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	124.4	
HCM 6th LOS	F	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 2'



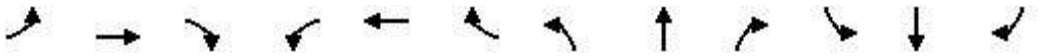
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	447	1131	61	423	1165	41	120	330	23	66	343	332
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	742	1648	88	695	1697	59	920	1577	111	114	1641	1585
Grp Volume(v), veh/h	84	0	650	32	0	654	21	0	137	298	0	224
Grp Sat Flow(s),veh/h/ln	742	0	1736	695	0	1756	920	0	1687	1755	0	1585
Q Serve(g_s), s	6.1	0.0	17.8	2.3	0.0	17.7	2.1	0.0	6.6	8.0	0.0	12.4
Cycle Q Clear(g_c), s	23.7	0.0	17.8	20.1	0.0	17.7	17.4	0.0	6.6	15.3	0.0	12.4
Prop In Lane	1.00		0.05	1.00		0.03	1.00		0.07	0.10		1.00
Lane Grp Cap(c), veh/h	447	0	1192	423	0	1206	120	0	353	409	0	332
V/C Ratio(X)	0.19	0.00	0.55	0.08	0.00	0.54	0.17	0.00	0.39	0.73	0.00	0.68
Avail Cap(c_a), veh/h	447	0	1192	423	0	1206	221	0	538	598	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	0.0	7.5	12.5	0.0	7.4	44.0	0.0	32.3	35.7	0.0	34.6
Incr Delay (d2), s/veh	0.9	0.0	1.8	0.3	0.0	1.8	1.0	0.0	1.0	3.5	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	0.0	10.0	0.7	0.0	10.0	0.9	0.0	5.1	11.0	0.0	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	9.3	12.8	0.0	9.2	45.0	0.0	33.3	39.2	0.0	38.0
LnGrp LOS	B	A	A	B	A	A	D	A	C	D	A	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		9.8			9.4			34.9			38.7	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		70.4		24.6		70.4		24.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		25.7		17.3		22.1		19.4				
Green Ext Time (p_c), s		4.9		2.2		4.4		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			18.7									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



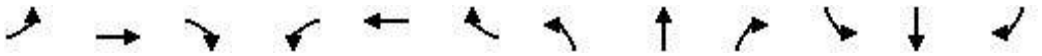
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	320	993	53	315	992	61	117	466	30	126	362	465
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	715	1648	88	681	1648	101	839	1587	102	273	1232	1585
Grp Volume(v), veh/h	105	0	672	33	0	693	22	0	149	380	0	294
Grp Sat Flow(s),veh/h/ln	715	0	1736	681	0	1748	839	0	1689	1505	0	1585
Q Serve(g_s), s	10.8	0.0	23.9	3.1	0.0	24.8	2.4	0.0	6.5	16.7	0.0	15.3
Cycle Q Clear(g_c), s	35.6	0.0	23.9	27.0	0.0	24.8	25.7	0.0	6.5	23.2	0.0	15.3
Prop In Lane	1.00		0.05	1.00		0.06	1.00		0.06	0.22		1.00
Lane Grp Cap(c), veh/h	320	0	1046	315	0	1053	117	0	496	488	0	465
V/C Ratio(X)	0.33	0.00	0.64	0.10	0.00	0.66	0.19	0.00	0.30	0.78	0.00	0.63
Avail Cap(c_a), veh/h	320	0	1046	315	0	1053	138	0	539	529	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	12.3	21.0	0.0	12.4	44.1	0.0	26.0	32.4	0.0	29.1
Incr Delay (d2), s/veh	2.7	0.0	3.0	0.7	0.0	3.2	1.1	0.0	0.5	7.4	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.6	0.0	13.9	1.0	0.0	14.4	1.0	0.0	4.8	13.9	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	15.3	21.7	0.0	15.7	45.2	0.0	26.5	39.8	0.0	31.9
LnGrp LOS	C	A	B	C	A	B	D	A	C	D	A	C
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		16.9			15.9			28.9			36.3	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		62.4		32.6		62.4		32.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		37.6		25.2		29.0		27.7				
Green Ext Time (p_c), s		4.6		1.7		4.6		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			23.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



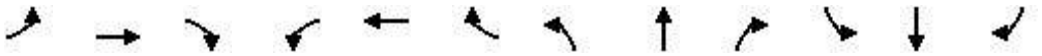
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	216	952	50	217	955	54	100	501	37	127	387	506
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	646	1650	87	615	1656	94	777	1569	117	254	1213	1585
Grp Volume(v), veh/h	119	0	782	39	0	803	26	0	173	431	0	332
Grp Sat Flow(s),veh/h/ln	646	0	1736	615	0	1750	777	0	1686	1467	0	1585
Q Serve(g_s), s	16.8	0.0	32.9	5.0	0.0	34.1	2.9	0.0	7.4	20.0	0.0	17.1
Cycle Q Clear(g_c), s	50.9	0.0	32.9	37.9	0.0	34.1	30.3	0.0	7.4	27.4	0.0	17.1
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.07	0.21		1.00
Lane Grp Cap(c), veh/h	216	0	1002	217	0	1009	100	0	538	514	0	506
V/C Ratio(X)	0.55	0.00	0.78	0.18	0.00	0.80	0.26	0.00	0.32	0.84	0.00	0.66
Avail Cap(c_a), veh/h	216	0	1002	217	0	1009	100	0	538	514	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	15.5	30.1	0.0	15.7	46.1	0.0	24.6	32.2	0.0	27.9
Incr Delay (d2), s/veh	9.7	0.0	6.0	1.8	0.0	6.5	1.9	0.0	0.5	12.2	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	0.0	19.1	1.5	0.0	19.8	1.2	0.0	5.4	16.3	0.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	0.0	21.5	31.9	0.0	22.2	48.1	0.0	25.0	44.4	0.0	31.4
LnGrp LOS	D	A	C	C	A	C	D	A	C	D	A	C
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		24.7			22.7			28.1			38.7	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		35.0		60.0		35.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		52.9		29.4		39.9		32.3				
Green Ext Time (p_c), s		1.1		0.4		4.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			28.2									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



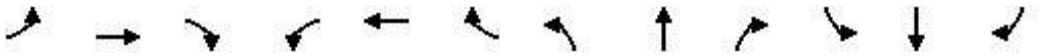
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	310	1117	76	419	967	33	133	399	20	63	265	475
Arrive On Green	0.07	0.67	0.67	0.55	0.55	0.55	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1795	1663	113	733	1755	60	976	1781	88	86	1183	1598
Grp Volume(v), veh/h	211	0	676	18	0	848	29	0	297	201	0	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	733	0	1815	976	0	1869	1269	0	1598
Q Serve(g_s), s	4.5	0.0	19.2	1.3	0.0	37.4	2.7	0.0	13.9	1.9	0.0	8.3
Cycle Q Clear(g_c), s	4.5	0.0	19.2	9.1	0.0	37.4	18.5	0.0	13.9	15.8	0.0	8.3
Prop In Lane	1.00		0.06	1.00		0.03	1.00		0.05	0.15		1.00
Lane Grp Cap(c), veh/h	310	0	1193	419	0	1000	133	0	419	328	0	475
V/C Ratio(X)	0.68	0.00	0.57	0.04	0.00	0.85	0.22	0.00	0.71	0.61	0.00	0.37
Avail Cap(c_a), veh/h	376	0	1193	419	0	1000	174	0	498	397	0	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	8.3	13.7	0.0	18.0	43.4	0.0	34.0	32.9	0.0	26.4
Incr Delay (d2), s/veh	4.7	0.0	2.0	0.2	0.0	8.9	1.2	0.0	4.5	2.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.1	0.0	10.9	0.4	0.0	23.0	1.3	0.0	11.1	7.5	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	0.0	10.2	13.9	0.0	26.9	44.6	0.0	38.5	35.6	0.0	27.0
LnGrp LOS	C	A	B	B	A	C	D	A	D	D	A	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		13.4			26.6			39.0			31.6	
Approach LOS		B			C			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		69.1		25.9	11.5	57.6		25.9				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		21.2		17.8	6.5	39.4		20.5				
Green Ext Time (p_c), s		4.3		1.1	0.3	2.5		0.7				

Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



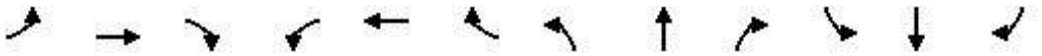
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1046	72	355	773	75	80	477	21	90	220	602
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1661	114	717	1639	158	918	1791	80	160	825	1598
Grp Volume(v), veh/h	282	0	699	20	0	930	30	0	328	256	0	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	717	0	1797	918	0	1871	986	0	1598
Q Serve(g_s), s	10.5	0.0	22.9	1.7	0.0	44.8	0.5	0.0	14.8	10.0	0.0	9.6
Cycle Q Clear(g_c), s	10.5	0.0	22.9	9.5	0.0	44.8	25.3	0.0	14.8	24.8	0.0	9.6
Prop In Lane	1.00		0.06	1.00		0.09	1.00		0.04	0.25		1.00
Lane Grp Cap(c), veh/h	274	0	1118	355	0	848	80	0	498	310	0	602
V/C Ratio(X)	1.03	0.00	0.63	0.06	0.00	1.10	0.37	0.00	0.66	0.83	0.00	0.37
Avail Cap(c_a), veh/h	274	0	1118	355	0	848	80	0	498	310	0	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	10.8	18.2	0.0	25.1	47.5	0.0	31.0	35.6	0.0	21.4
Incr Delay (d2), s/veh	61.9	0.0	2.6	0.3	0.0	60.9	4.0	0.0	3.6	17.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	16.6	0.0	13.3	0.5	0.0	43.9	1.4	0.0	11.5	11.7	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.2	0.0	13.4	18.5	0.0	86.0	51.5	0.0	34.6	52.8	0.0	22.0
LnGrp LOS	F	A	B	B	A	F	D	A	C	D	A	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		36.1			84.6			36.0			38.4	
Approach LOS		D			F			D			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.0	50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		24.9		26.8	12.5	46.8		27.3				
Green Ext Time (p_c), s		4.5		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		53.1
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1046	71	279	781	68	76	477	21	76	178	602
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1662	113	644	1656	144	870	1792	79	110	667	1598
Grp Volume(v), veh/h	317	0	814	22	0	1073	34	0	378	290	0	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	644	0	1800	870	0	1871	777	0	1598
Q Serve(g_s), s	10.5	0.0	29.8	2.3	0.0	44.8	0.0	0.0	17.6	7.7	0.0	11.1
Cycle Q Clear(g_c), s	10.5	0.0	29.8	17.1	0.0	44.8	25.3	0.0	17.6	25.3	0.0	11.1
Prop In Lane	1.00		0.06	1.00		0.08	1.00		0.04	0.24		1.00
Lane Grp Cap(c), veh/h	274	0	1118	279	0	849	76	0	498	254	0	602
V/C Ratio(X)	1.16	0.00	0.73	0.08	0.00	1.26	0.45	0.00	0.76	1.14	0.00	0.42
Avail Cap(c_a), veh/h	274	0	1118	279	0	849	76	0	498	254	0	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	12.0	23.0	0.0	25.1	47.5	0.0	32.0	37.9	0.0	21.9
Incr Delay (d2), s/veh	103.3	0.0	4.2	0.6	0.0	128.3	5.8	0.0	7.1	100.2	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.5	0.0	16.8	0.7	0.0	69.3	1.7	0.0	13.8	20.3	0.0	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.6	0.0	16.2	23.6	0.0	153.4	53.3	0.0	39.1	138.1	0.0	22.6
LnGrp LOS	F	A	B	C	A	F	D	A	D	F	A	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		49.1			150.8			40.3			84.3	
Approach LOS		D			F			D			F	

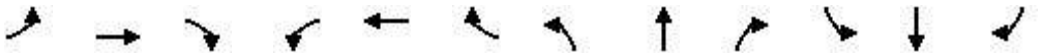
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.0	50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		31.8		27.3	12.5	46.8		27.3				
Green Ext Time (p_c), s		5.5		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		89.0
HCM 6th LOS		F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 3'



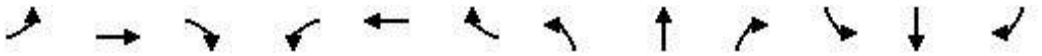
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	472	1166	62	446	1201	42	119	296	21	214	340	298
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	742	1648	88	695	1697	59	920	1577	111	1193	1811	1585
Grp Volume(v), veh/h	84	0	650	32	0	654	21	0	137	31	267	224
Grp Sat Flow(s),veh/h/ln	742	0	1736	695	0	1756	920	0	1687	1193	1811	1585
Q Serve(g_s), s	5.6	0.0	16.6	2.1	0.0	16.5	2.1	0.0	6.8	2.2	13.3	12.7
Cycle Q Clear(g_c), s	22.1	0.0	16.6	18.8	0.0	16.5	15.5	0.0	6.8	9.1	13.3	12.7
Prop In Lane	1.00		0.05	1.00		0.03	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	472	0	1229	446	0	1243	119	0	317	214	340	298
V/C Ratio(X)	0.18	0.00	0.53	0.07	0.00	0.53	0.18	0.00	0.43	0.14	0.78	0.75
Avail Cap(c_a), veh/h	472	0	1229	446	0	1243	192	0	449	308	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	6.5	10.9	0.0	6.5	44.1	0.0	34.1	38.1	36.7	36.5
Incr Delay (d2), s/veh	0.8	0.0	1.6	0.3	0.0	1.6	1.0	0.0	1.3	0.4	6.9	6.1
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(95%),veh/ln	1.8	0.0	9.1	0.6	0.0	9.1	0.9	0.0	5.2	1.2	10.5	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	8.1	11.2	0.0	8.1	45.1	0.0	35.4	38.5	43.6	42.6
LnGrp LOS	B	A	A	B	A	A	D	A	D	D	D	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		8.6			8.2			36.7			42.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.5		22.5		72.5		22.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		24.1		15.3		20.8		17.5				
Green Ext Time (p_c), s		5.1		1.9		4.5		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



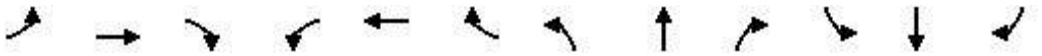
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	408	1115	59	397	1114	68	131	348	22	246	397	348
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	715	1648	88	681	1648	101	839	1587	102	1180	1811	1585
Grp Volume(v), veh/h	105	0	672	33	0	693	22	0	149	83	297	294
Grp Sat Flow(s),veh/h/ln	715	0	1736	681	0	1748	839	0	1689	1180	1811	1585
Q Serve(g_s), s	8.8	0.0	19.4	2.6	0.0	20.2	2.4	0.0	7.2	6.2	14.5	16.9
Cycle Q Clear(g_c), s	29.0	0.0	19.4	22.0	0.0	20.2	16.9	0.0	7.2	13.3	14.5	16.9
Prop In Lane	1.00		0.05	1.00		0.06	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	408	0	1174	397	0	1183	131	0	371	246	397	348
V/C Ratio(X)	0.26	0.00	0.57	0.08	0.00	0.59	0.17	0.00	0.40	0.34	0.75	0.85
Avail Cap(c_a), veh/h	408	0	1174	397	0	1183	171	0	450	301	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	8.1	13.9	0.0	8.2	42.5	0.0	31.7	37.4	34.6	35.5
Incr Delay (d2), s/veh	1.5	0.0	2.0	0.4	0.0	2.1	0.8	0.0	1.0	1.1	6.0	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.8	0.0	10.8	0.8	0.0	11.3	0.9	0.0	5.5	3.3	11.2	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	10.2	14.3	0.0	10.4	43.4	0.0	32.7	38.6	40.6	49.2
LnGrp LOS	B	A	B	B	A	B	D	A	C	D	D	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		11.1			10.6			34.1			44.1	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		69.4		25.6		69.4		25.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		31.0		18.9		24.0		18.9				
Green Ext Time (p_c), s		5.4		2.0		4.9		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		22.1
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



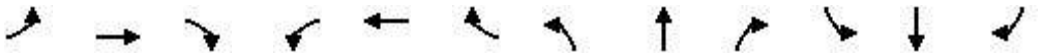
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	311	1082	57	306	1087	61	124	376	28	252	434	380
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	646	1650	87	615	1656	94	777	1569	117	1154	1811	1585
Grp Volume(v), veh/h	119	0	782	39	0	803	26	0	173	89	342	332
Grp Sat Flow(s),veh/h/ln	646	0	1736	615	0	1750	777	0	1686	1154	1811	1585
Q Serve(g_s), s	13.6	0.0	26.8	4.0	0.0	27.7	3.1	0.0	8.3	6.7	16.8	19.1
Cycle Q Clear(g_c), s	41.3	0.0	26.8	30.8	0.0	27.7	19.9	0.0	8.3	15.0	16.8	19.1
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	311	0	1139	306	0	1148	124	0	404	252	434	380
V/C Ratio(X)	0.38	0.00	0.69	0.13	0.00	0.70	0.21	0.00	0.43	0.35	0.79	0.87
Avail Cap(c_a), veh/h	311	0	1139	306	0	1148	145	0	449	283	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	10.2	19.8	0.0	10.4	43.2	0.0	30.6	37.0	33.9	34.7
Incr Delay (d2), s/veh	3.5	0.0	3.4	0.9	0.0	3.6	1.2	0.0	1.0	1.2	8.5	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	0.0	14.6	1.1	0.0	15.2	1.1	0.0	6.2	3.5	12.9	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	13.6	20.7	0.0	13.9	44.4	0.0	31.6	38.2	42.3	52.4
LnGrp LOS	C	A	B	C	A	B	D	A	C	D	D	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		15.4			14.2			33.3			46.2	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.5		27.5		67.5		27.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		43.3		21.1		32.8		21.9				
Green Ext Time (p_c), s		5.6		1.6		5.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



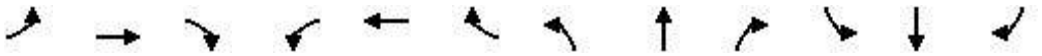
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	330	1144	78	439	995	34	199	370	18	140	380	449
Arrive On Green	0.07	0.69	0.69	0.57	0.57	0.57	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1795	1663	113	733	1755	60	976	1781	88	1099	1826	1598
Grp Volume(v), veh/h	211	0	676	18	0	848	29	0	297	30	171	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	733	0	1815	976	0	1869	1099	1826	1598
Q Serve(g_s), s	4.3	0.0	18.2	1.2	0.0	36.1	2.5	0.0	14.2	2.5	7.8	8.5
Cycle Q Clear(g_c), s	4.3	0.0	18.2	8.0	0.0	36.1	10.3	0.0	14.2	16.7	7.8	8.5
Prop In Lane	1.00		0.06	1.00		0.03	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	330	0	1222	439	0	1029	199	0	389	140	380	449
V/C Ratio(X)	0.64	0.00	0.55	0.04	0.00	0.82	0.15	0.00	0.76	0.21	0.45	0.39
Avail Cap(c_a), veh/h	397	0	1222	439	0	1029	256	0	498	204	486	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	7.5	12.4	0.0	16.7	37.4	0.0	35.4	43.3	32.9	27.6
Incr Delay (d2), s/veh	3.3	0.0	1.8	0.2	0.0	7.5	0.5	0.0	6.3	1.1	1.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	0.0	10.3	0.4	0.0	21.8	1.1	0.0	11.5	1.3	6.3	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	0.0	9.3	12.5	0.0	24.2	37.9	0.0	41.7	44.4	34.1	28.4
LnGrp LOS	C	A	A	B	A	C	D	A	D	D	C	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		12.0			23.9			41.4			32.2	
Approach LOS		B			C			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		70.5		24.5	11.5	59.1		24.5				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		20.2		18.7	6.3	38.1		16.2				
Green Ext Time (p_c), s		4.3		1.0	0.3	2.9		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



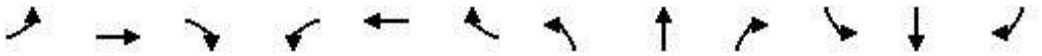
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1078	74	378	805	78	222	442	20	169	451	571
Arrive On Green	0.11	0.65	0.65	0.49	0.49	0.49	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1795	1661	114	717	1639	158	918	1791	80	1069	1826	1598
Grp Volume(v), veh/h	282	0	699	20	0	930	30	0	328	65	191	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	717	0	1797	918	0	1871	1069	1826	1598
Q Serve(g_s), s	10.5	0.0	21.7	1.6	0.0	46.6	2.7	0.0	15.2	5.6	8.4	9.9
Cycle Q Clear(g_c), s	10.5	0.0	21.7	8.2	0.0	46.6	11.1	0.0	15.2	20.8	8.4	9.9
Prop In Lane	1.00		0.06	1.00		0.09	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	274	0	1152	378	0	882	222	0	462	169	451	571
V/C Ratio(X)	1.03	0.00	0.61	0.05	0.00	1.05	0.14	0.00	0.71	0.39	0.42	0.39
Avail Cap(c_a), veh/h	274	0	1152	378	0	882	240	0	498	189	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	9.7	16.4	0.0	24.2	34.7	0.0	32.7	42.2	30.1	22.8
Incr Delay (d2), s/veh	61.9	0.0	2.4	0.3	0.0	45.5	0.4	0.0	4.8	2.0	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	16.6	0.0	12.5	0.5	0.0	39.5	1.1	0.0	11.9	2.8	6.6	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.7	0.0	12.0	16.7	0.0	69.7	35.1	0.0	37.5	44.2	31.0	23.4
LnGrp LOS	F	A	B	B	A	F	D	A	D	D	C	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		35.2			68.6			37.3			29.3	
Approach LOS		D			E			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		66.8		28.2	15.0	51.8		28.2				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		23.7		22.8	12.5	48.6		17.2				
Green Ext Time (p_c), s		4.5		0.6	0.0	0.0		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			45.9									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1046	71	279	781	68	220	477	21	158	486	602
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1662	113	644	1656	144	870	1792	79	1021	1826	1598
Grp Volume(v), veh/h	317	0	814	22	0	1073	34	0	378	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	644	0	1800	870	0	1871	1021	1826	1598
Q Serve(g_s), s	10.5	0.0	29.8	2.3	0.0	44.8	3.2	0.0	17.6	6.4	9.5	11.1
Cycle Q Clear(g_c), s	10.5	0.0	29.8	17.1	0.0	44.8	12.8	0.0	17.6	24.1	9.5	11.1
Prop In Lane	1.00		0.06	1.00		0.08	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	274	0	1118	279	0	849	220	0	498	158	486	602
V/C Ratio(X)	1.16	0.00	0.73	0.08	0.00	1.26	0.15	0.00	0.76	0.44	0.45	0.42
Avail Cap(c_a), veh/h	274	0	1118	279	0	849	220	0	498	158	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	12.0	23.0	0.0	25.1	34.4	0.0	32.0	43.1	29.1	21.9
Incr Delay (d2), s/veh	103.3	0.0	4.2	0.6	0.0	128.3	0.5	0.0	7.1	2.8	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.5	0.0	16.8	0.7	0.0	69.3	1.3	0.0	13.8	3.1	7.5	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.6	0.0	16.2	23.6	0.0	153.4	34.9	0.0	39.1	45.9	30.0	22.6
LnGrp LOS	F	A	B	C	A	F	C	A	D	D	C	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		49.1			150.8			38.8			28.6	
Approach LOS		D			F			D			C	

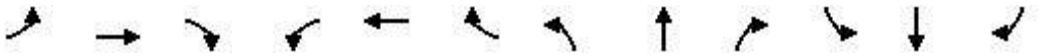
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.0	50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		31.8		26.1	12.5	46.8		19.6				
Green Ext Time (p_c), s		5.5		0.0	0.0	0.0		1.1				

Intersection Summary		
HCM 6th Ctrl Delay	79.3	
HCM 6th LOS	E	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 4'



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	472	1167	62	446	1201	42	119	321	303	221	340	298
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	742	1648	88	695	1697	59	920	1707	1610	1193	1811	1585
Grp Volume(v), veh/h	84	0	650	32	0	654	21	128	9	31	267	224
Grp Sat Flow(s),veh/h/ln	742	0	1736	695	0	1756	920	1707	1610	1193	1811	1585
Q Serve(g_s), s	5.6	0.0	16.6	2.1	0.0	16.5	2.1	6.3	0.4	2.2	13.3	12.7
Cycle Q Clear(g_c), s	22.1	0.0	16.6	18.8	0.0	16.5	15.5	6.3	0.4	8.5	13.3	12.7
Prop In Lane	1.00		0.05	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	472	0	1229	446	0	1243	119	321	303	221	340	298
V/C Ratio(X)	0.18	0.00	0.53	0.07	0.00	0.53	0.18	0.40	0.03	0.14	0.78	0.75
Avail Cap(c_a), veh/h	472	0	1229	446	0	1243	192	455	429	315	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	6.5	10.9	0.0	6.5	44.1	33.9	31.5	37.6	36.7	36.5
Incr Delay (d2), s/veh	0.8	0.0	1.6	0.3	0.0	1.6	1.0	1.1	0.1	0.4	6.9	6.1
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(95%),veh/ln	1.8	0.0	9.1	0.6	0.0	9.1	0.9	4.9	0.3	1.2	10.5	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	8.1	11.2	0.0	8.1	45.1	35.0	31.6	38.0	43.6	42.6
LnGrp LOS	B	A	A	B	A	A	D	D	C	D	D	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		8.6			8.2			36.2			42.8	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.5		22.5		72.5		22.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		24.1		15.3		20.8		17.5				
Green Ext Time (p_c), s		5.1		1.9		4.5		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	408	1115	59	397	1114	68	131	375	353	252	397	348
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	715	1648	88	681	1648	101	839	1707	1610	1180	1811	1585
Grp Volume(v), veh/h	105	0	672	33	0	693	22	140	9	83	297	294
Grp Sat Flow(s),veh/h/ln	715	0	1736	681	0	1748	839	1707	1610	1180	1811	1585
Q Serve(g_s), s	8.8	0.0	19.4	2.6	0.0	20.2	2.4	6.6	0.4	6.1	14.5	16.9
Cycle Q Clear(g_c), s	29.0	0.0	19.4	22.0	0.0	20.2	16.9	6.6	0.4	12.7	14.5	16.9
Prop In Lane	1.00		0.05	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	408	0	1174	397	0	1183	131	375	353	252	397	348
V/C Ratio(X)	0.26	0.00	0.57	0.08	0.00	0.59	0.17	0.37	0.03	0.33	0.75	0.85
Avail Cap(c_a), veh/h	408	0	1174	397	0	1183	171	455	429	308	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	8.1	13.9	0.0	8.2	42.5	31.5	29.1	36.9	34.6	35.5
Incr Delay (d2), s/veh	1.5	0.0	2.0	0.4	0.0	2.1	0.8	0.9	0.0	1.1	6.0	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.8	0.0	10.8	0.8	0.0	11.3	0.9	5.1	0.3	3.2	11.2	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	10.2	14.3	0.0	10.4	43.4	32.4	29.1	38.0	40.6	49.2
LnGrp LOS	B	A	B	B	A	B	D	C	C	D	D	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		11.1			10.6			33.6			44.0	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		69.4		25.6		69.4		25.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		31.0		18.9		24.0		18.9				
Green Ext Time (p_c), s		5.4		2.0		4.9		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		22.0
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

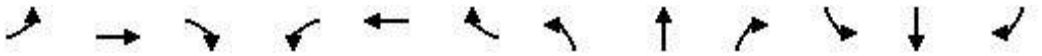
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	311	1082	57	306	1087	61	124	409	386	261	434	380
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	646	1650	87	615	1656	94	777	1707	1610	1154	1811	1585
Grp Volume(v), veh/h	119	0	782	39	0	803	26	161	12	89	342	332
Grp Sat Flow(s),veh/h/ln	646	0	1736	615	0	1750	777	1707	1610	1154	1811	1585
Q Serve(g_s), s	13.6	0.0	26.8	4.0	0.0	27.7	3.1	7.5	0.5	6.7	16.8	19.1
Cycle Q Clear(g_c), s	41.3	0.0	26.8	30.8	0.0	27.7	19.9	7.5	0.5	14.2	16.8	19.1
Prop In Lane	1.00		0.05	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	0	1139	306	0	1148	124	409	386	261	434	380
V/C Ratio(X)	0.38	0.00	0.69	0.13	0.00	0.70	0.21	0.39	0.03	0.34	0.79	0.87
Avail Cap(c_a), veh/h	311	0	1139	306	0	1148	145	455	429	292	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	10.2	19.8	0.0	10.4	43.2	30.3	27.7	36.3	33.9	34.7
Incr Delay (d2), s/veh	3.5	0.0	3.4	0.9	0.0	3.6	1.2	0.9	0.0	1.1	8.5	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	0.0	14.6	1.1	0.0	15.2	1.1	5.7	0.4	3.4	12.9	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	13.6	20.7	0.0	13.9	44.4	31.2	27.7	37.4	42.3	52.4
LnGrp LOS	C	A	B	C	A	B	D	C	C	D	D	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		15.4			14.2			32.7			46.1	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.5		27.5		67.5		27.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		43.3		21.1		32.8		21.9				
Green Ext Time (p_c), s		5.6		1.6		5.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	340	1156	79	448	1009	34	191	378	323	141	366	437
Arrive On Green	0.07	0.70	0.70	0.57	0.57	0.57	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1795	1663	113	733	1755	60	976	1885	1610	1099	1826	1598
Grp Volume(v), veh/h	211	0	676	18	0	848	29	283	14	30	171	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	733	0	1815	976	1885	1610	1099	1826	1598
Q Serve(g_s), s	4.2	0.0	17.8	1.2	0.0	35.4	2.6	13.4	0.7	2.5	7.8	8.6
Cycle Q Clear(g_c), s	4.2	0.0	17.8	7.5	0.0	35.4	10.4	13.4	0.7	15.9	7.8	8.6
Prop In Lane	1.00		0.06	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	0	1235	448	0	1043	191	378	323	141	366	437
V/C Ratio(X)	0.62	0.00	0.55	0.04	0.00	0.81	0.15	0.75	0.04	0.21	0.47	0.40
Avail Cap(c_a), veh/h	406	0	1235	448	0	1043	255	502	429	213	486	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	7.1	11.8	0.0	16.1	38.1	35.7	30.6	43.2	33.5	28.2
Incr Delay (d2), s/veh	2.1	0.0	1.7	0.2	0.0	6.9	0.5	5.4	0.1	1.1	1.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.4	0.0	10.0	0.4	0.0	21.3	1.2	11.0	0.5	1.3	6.3	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9	0.0	8.9	11.9	0.0	23.1	38.6	41.1	30.7	44.3	34.8	29.0
LnGrp LOS	B	A	A	B	A	C	D	D	C	D	C	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		11.2			22.8			40.4			32.9	
Approach LOS		B			C			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		71.3		23.7	11.5	59.8		23.7				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		19.8		17.9	6.2	37.4		15.4				
Green Ext Time (p_c), s		4.3		1.1	0.2	3.1		1.1				

Intersection Summary		
HCM 6th Ctrl Delay		22.5
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

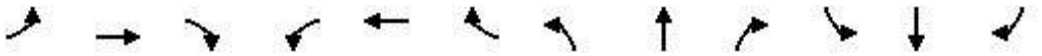
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1089	75	385	815	79	215	453	387	170	439	561
Arrive On Green	0.11	0.66	0.66	0.50	0.50	0.50	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1795	1661	114	717	1639	158	918	1885	1610	1069	1826	1598
Grp Volume(v), veh/h	282	0	699	20	0	930	30	314	14	65	191	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	717	0	1797	918	1885	1610	1069	1826	1598
Q Serve(g_s), s	10.5	0.0	21.3	1.5	0.0	47.3	2.7	14.4	0.6	5.6	8.4	10.0
Cycle Q Clear(g_c), s	10.5	0.0	21.3	7.8	0.0	47.3	11.2	14.4	0.6	20.0	8.4	10.0
Prop In Lane	1.00		0.06	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	274	0	1164	385	0	894	215	453	387	170	439	561
V/C Ratio(X)	1.03	0.00	0.60	0.05	0.00	1.04	0.14	0.69	0.04	0.38	0.44	0.40
Avail Cap(c_a), veh/h	274	0	1164	385	0	894	239	502	429	198	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	9.3	15.8	0.0	23.9	35.3	32.9	27.6	42.0	30.6	23.3
Incr Delay (d2), s/veh	61.9	0.0	2.3	0.3	0.0	41.0	0.4	4.2	0.1	2.0	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	16.6	0.0	12.2	0.5	0.0	38.2	1.1	11.4	0.5	2.8	6.7	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.9	0.0	11.6	16.0	0.0	64.9	35.8	37.1	27.7	44.0	31.6	23.9
LnGrp LOS	F	A	B	B	A	F	D	D	C	D	C	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		35.0			63.8			36.6			29.7	
Approach LOS		C			E			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		67.5		27.5	15.0	52.5		27.5				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		23.3		22.0	12.5	49.3		16.4				
Green Ext Time (p_c), s		4.5		0.8	0.0	0.0		1.2				

Intersection Summary		
HCM 6th Ctrl Delay		44.2
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



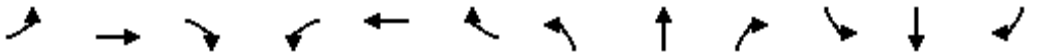
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1050	72	282	784	68	218	498	425	167	482	599
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1795	1662	113	644	1656	144	870	1885	1610	1021	1826	1598
Grp Volume(v), veh/h	317	0	814	22	0	1073	34	362	16	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	644	0	1800	870	1885	1610	1021	1826	1598
Q Serve(g_s), s	10.5	0.0	29.6	2.3	0.0	45.0	3.2	16.6	0.7	6.4	9.6	11.2
Cycle Q Clear(g_c), s	10.5	0.0	29.6	16.9	0.0	45.0	12.8	16.6	0.7	23.0	9.6	11.2
Prop In Lane	1.00		0.06	1.00		0.08	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	274	0	1122	282	0	853	218	498	425	167	482	599
V/C Ratio(X)	1.16	0.00	0.73	0.08	0.00	1.26	0.16	0.73	0.04	0.42	0.46	0.42
Avail Cap(c_a), veh/h	274	0	1122	282	0	853	220	502	429	169	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	11.9	22.7	0.0	25.0	34.6	31.8	26.0	42.3	29.2	22.1
Incr Delay (d2), s/veh	103.3	0.0	4.1	0.5	0.0	125.7	0.5	5.7	0.1	2.4	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.5	0.0	16.7	0.7	0.0	68.6	1.3	13.0	0.5	3.0	7.6	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.7	0.0	16.0	23.3	0.0	150.7	35.1	37.5	26.0	44.7	30.2	22.7
LnGrp LOS	F	A	B	C	A	F	D	D	C	D	C	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		49.0			148.1			36.8			28.6	
Approach LOS		D			F			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.2		29.8	15.0	50.2		29.8				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		31.6		25.0	12.5	47.0		18.6				
Green Ext Time (p_c), s		5.5		0.1	0.0	0.0		1.2				

Intersection Summary		
HCM 6th Ctrl Delay	78.1	
HCM 6th LOS	E	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



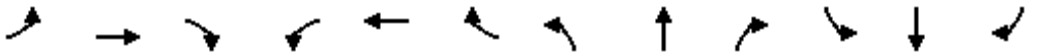
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	561	48	20	726	79	30	315	14	60	189	218
Future Volume (veh/h)	292	561	48	20	726	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	610	52	22	789	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	337	1113	95	441	797	87	168	403	344	103	390	568
Arrive On Green	0.14	0.68	0.68	0.49	0.49	0.49	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1795	1632	139	742	1618	176	870	1885	1610	1021	1826	1598
Grp Volume(v), veh/h	317	0	662	22	0	875	34	362	16	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	0	1771	742	0	1794	870	1885	1610	1021	1826	1598
Q Serve(g_s), s	12.2	0.0	18.0	1.5	0.0	45.9	3.5	17.8	0.7	2.5	10.2	11.5
Cycle Q Clear(g_c), s	12.2	0.0	18.0	1.5	0.0	45.9	13.7	17.8	0.7	20.3	10.2	11.5
Prop In Lane	1.00		0.08	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	0	1208	441	0	884	168	403	344	103	390	568
V/C Ratio(X)	0.94	0.00	0.55	0.05	0.00	0.99	0.20	0.90	0.05	0.68	0.56	0.45
Avail Cap(c_a), veh/h	337	0	1208	441	0	884	168	403	344	103	390	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	0.0	7.7	12.6	0.0	23.9	39.5	36.3	29.7	47.0	33.4	23.4
Incr Delay (d2), s/veh	33.8	0.0	1.8	0.2	0.0	27.9	0.8	22.7	0.1	18.2	2.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	15.5	0.0	10.2	0.5	0.0	32.5	1.4	16.0	0.5	3.9	8.2	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	0.0	9.5	12.8	0.0	51.8	40.3	59.1	29.7	65.2	35.7	24.2
LnGrp LOS	E	A	A	B	A	D	D	E	C	E	D	C
Approach Vol, veh/h		979			897			412			543	
Approach Delay, s/veh		27.1			50.9			56.4			34.2	
Approach LOS		C			D			E			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		70.0		25.0	18.0	52.0		25.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		64.8		* 20	13.5	46.8		* 20				
Max Q Clear Time (g_c+I1), s		20.0		22.3	14.2	47.9		19.8				
Green Ext Time (p_c), s		4.2		0.0	0.0	0.0		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	40.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	456	48	20	590	79	30	315	14	60	189	218
Future Volume (veh/h)	292	456	48	20	590	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	496	52	22	641	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	358	1010	106	460	746	100	218	498	425	167	482	600
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1795	1599	168	825	1576	211	870	1885	1610	1021	1826	1598
Grp Volume(v), veh/h	317	0	548	22	0	727	34	362	16	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	0	1766	825	0	1788	870	1885	1610	1021	1826	1598
Q Serve(g_s), s	8.0	0.0	15.7	1.4	0.0	34.3	3.2	16.6	0.7	6.4	9.6	11.2
Cycle Q Clear(g_c), s	8.0	0.0	15.7	2.1	0.0	34.3	12.8	16.6	0.7	23.0	9.6	11.2
Prop In Lane	1.00		0.09	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	0	1116	460	0	846	218	498	425	167	482	600
V/C Ratio(X)	0.89	0.00	0.49	0.05	0.00	0.86	0.16	0.73	0.04	0.42	0.46	0.42
Avail Cap(c_a), veh/h	470	0	1116	460	0	846	220	502	429	169	486	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	9.3	13.9	0.0	22.2	34.6	31.8	26.0	42.3	29.2	22.0
Incr Delay (d2), s/veh	14.9	0.0	1.5	0.2	0.0	11.1	0.5	5.7	0.1	2.4	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	0.0	9.7	0.5	0.0	22.4	1.3	13.0	0.5	3.0	7.6	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	0.0	10.9	14.1	0.0	33.3	35.1	37.5	26.0	44.7	30.2	22.7
LnGrp LOS	C	A	B	B	A	C	D	D	C	D	C	C
Approach Vol, veh/h		865			749			412			543	
Approach Delay, s/veh		19.4			32.7			36.8			28.6	
Approach LOS		B			C			D			C	

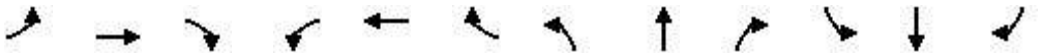
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.2		29.8	15.1	50.1		29.8				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	16.5	38.8		* 25				
Max Q Clear Time (g_c+I1), s		17.7		25.0	10.0	36.3		18.6				
Green Ext Time (p_c), s		3.2		0.1	0.5	1.1		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			28.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 5'



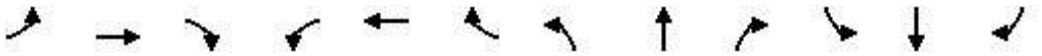
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	480	1240	1078	457	1251	1086	119	296	21	214	340	298
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	742	1752	1522	695	1767	1535	920	1577	111	1193	1811	1585
Grp Volume(v), veh/h	84	617	33	32	632	22	21	0	137	31	267	224
Grp Sat Flow(s),veh/h/ln	742	1752	1522	695	1767	1535	920	0	1687	1193	1811	1585
Q Serve(g_s), s	5.5	15.1	0.6	2.1	15.5	0.4	2.1	0.0	6.8	2.2	13.3	12.7
Cycle Q Clear(g_c), s	21.0	15.1	0.6	17.2	15.5	0.4	15.5	0.0	6.8	9.1	13.3	12.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	480	1240	1078	457	1251	1086	119	0	317	214	340	298
V/C Ratio(X)	0.17	0.50	0.03	0.07	0.51	0.02	0.18	0.00	0.43	0.14	0.78	0.75
Avail Cap(c_a), veh/h	480	1240	1078	457	1251	1086	192	0	449	308	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	6.3	4.1	10.1	6.3	4.1	44.1	0.0	34.1	38.1	36.7	36.5
Incr Delay (d2), s/veh	0.8	1.4	0.1	0.3	1.5	0.0	1.0	0.0	1.3	0.4	6.9	6.1
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(95%),veh/ln	1.7	8.5	0.3	0.6	8.7	0.2	0.9	0.0	5.2	1.2	10.5	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.9	7.7	4.2	10.4	7.8	4.1	45.1	0.0	35.4	38.5	43.6	42.6
LnGrp LOS	B	A	A	B	A	A	D	A	D	D	D	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		8.0			7.8			36.7			42.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.5		22.5		72.5		22.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		23.0		15.3		19.2		17.5				
Green Ext Time (p_c), s		5.0		1.9		4.4		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			18.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



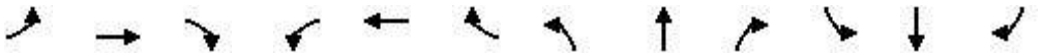
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	424	1185	1030	410	1195	1038	131	348	22	246	397	348
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	715	1752	1522	681	1767	1535	839	1587	102	1180	1811	1585
Grp Volume(v), veh/h	105	638	34	33	653	40	22	0	149	83	297	294
Grp Sat Flow(s),veh/h/ln	715	1752	1522	681	1767	1535	839	0	1689	1180	1811	1585
Q Serve(g_s), s	8.4	17.6	0.7	2.5	18.0	0.8	2.4	0.0	7.2	6.2	14.5	16.9
Cycle Q Clear(g_c), s	26.4	17.6	0.7	20.1	18.0	0.8	16.9	0.0	7.2	13.3	14.5	16.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	424	1185	1030	410	1195	1038	131	0	371	246	397	348
V/C Ratio(X)	0.25	0.54	0.03	0.08	0.55	0.04	0.17	0.00	0.40	0.34	0.75	0.85
Avail Cap(c_a), veh/h	424	1185	1030	410	1195	1038	171	0	450	301	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	7.8	5.1	12.9	7.9	5.1	42.5	0.0	31.7	37.4	34.6	35.5
Incr Delay (d2), s/veh	1.4	1.8	0.1	0.4	1.8	0.1	0.8	0.0	1.0	1.1	6.0	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	10.1	0.4	0.7	10.3	0.4	0.9	0.0	5.5	3.3	11.2	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	9.6	5.2	13.3	9.7	5.2	43.4	0.0	32.7	38.6	40.6	49.2
LnGrp LOS	B	A	A	B	A	A	D	A	C	D	D	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		10.3			9.6			34.1			44.1	
Approach LOS		B			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		69.4		25.6		69.4		25.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		28.4		18.9		22.1		18.9				
Green Ext Time (p_c), s		5.4		2.0		4.7		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			21.5									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



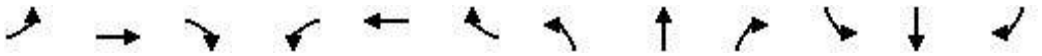
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	332	1150	999	323	1159	1007	124	376	28	252	434	380
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	646	1752	1522	615	1767	1535	777	1569	117	1154	1811	1585
Grp Volume(v), veh/h	119	743	39	39	760	43	26	0	173	89	342	332
Grp Sat Flow(s),veh/h/ln	646	1752	1522	615	1767	1535	777	0	1686	1154	1811	1585
Q Serve(g_s), s	13.0	24.1	0.9	3.8	24.7	0.9	3.1	0.0	8.3	6.7	16.8	19.1
Cycle Q Clear(g_c), s	37.6	24.1	0.9	27.9	24.7	0.9	19.9	0.0	8.3	15.0	16.8	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	332	1150	999	323	1159	1007	124	0	404	252	434	380
V/C Ratio(X)	0.36	0.65	0.04	0.12	0.66	0.04	0.21	0.00	0.43	0.35	0.79	0.87
Avail Cap(c_a), veh/h	332	1150	999	323	1159	1007	145	0	449	283	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	9.7	5.8	18.1	9.9	5.8	43.2	0.0	30.6	37.0	33.9	34.7
Incr Delay (d2), s/veh	3.0	2.8	0.1	0.8	2.9	0.1	1.2	0.0	1.0	1.2	8.5	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.9	13.4	0.5	1.1	13.8	0.5	1.1	0.0	6.2	3.5	12.9	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	12.6	5.8	18.8	12.8	5.9	44.4	0.0	31.6	38.2	42.3	52.4
LnGrp LOS	C	B	A	B	B	A	D	A	C	D	D	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		13.8			12.7			33.3			46.2	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.5		27.5		67.5		27.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		39.6		21.1		29.9		21.9				
Green Ext Time (p_c), s		6.0		1.6		5.8		0.3				

Intersection Summary		
HCM 6th Ctrl Delay		24.0
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



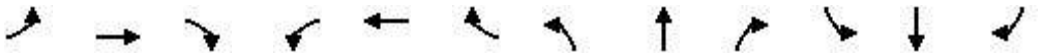
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	348	1236	1056	455	1035	913	199	370	18	140	380	449
Arrive On Green	0.07	0.69	0.69	0.57	0.57	0.57	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1795	1796	1535	733	1826	1610	976	1781	88	1099	1826	1598
Grp Volume(v), veh/h	211	633	43	18	820	28	29	0	297	30	171	177
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	733	1826	1610	976	0	1869	1099	1826	1598
Q Serve(g_s), s	4.3	16.1	0.9	1.2	33.5	0.7	2.5	0.0	14.2	2.5	7.8	8.5
Cycle Q Clear(g_c), s	4.3	16.1	0.9	5.8	33.5	0.7	10.3	0.0	14.2	16.7	7.8	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	348	1236	1056	455	1035	913	199	0	389	140	380	449
V/C Ratio(X)	0.61	0.51	0.04	0.04	0.79	0.03	0.15	0.00	0.76	0.21	0.45	0.39
Avail Cap(c_a), veh/h	415	1236	1056	455	1035	913	256	0	498	204	486	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	7.1	4.8	11.3	16.2	9.1	37.4	0.0	35.4	43.3	32.9	27.6
Incr Delay (d2), s/veh	2.5	1.5	0.1	0.2	6.2	0.1	0.5	0.0	6.3	1.1	1.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.2	9.4	0.4	0.4	20.4	0.5	1.1	0.0	11.5	1.3	6.3	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	8.7	4.8	11.5	22.4	9.1	37.9	0.0	41.7	44.4	34.1	28.4
LnGrp LOS	B	A	A	B	C	A	D	A	D	D	C	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		10.8			21.7			41.4			32.2	
Approach LOS		B			C			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		70.5		24.5	11.5	59.1		24.5				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		18.1		18.7	6.3	35.5		16.2				
Green Ext Time (p_c), s		4.2		1.0	0.3	3.6		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			22.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



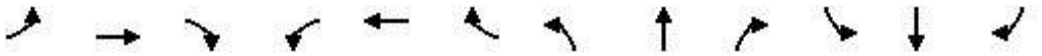
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	304	1165	996	397	896	790	222	442	20	169	451	571
Arrive On Green	0.11	0.65	0.65	0.49	0.49	0.49	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1795	1796	1535	717	1826	1610	918	1791	80	1069	1826	1598
Grp Volume(v), veh/h	282	654	45	20	848	82	30	0	328	65	191	223
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	717	1826	1610	918	0	1871	1069	1826	1598
Q Serve(g_s), s	9.1	19.1	1.0	1.5	41.9	2.6	2.7	0.0	15.2	5.6	8.4	9.9
Cycle Q Clear(g_c), s	9.1	19.1	1.0	5.6	41.9	2.6	11.1	0.0	15.2	20.8	8.4	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	304	1165	996	397	896	790	222	0	462	169	451	571
V/C Ratio(X)	0.93	0.56	0.05	0.05	0.95	0.10	0.14	0.00	0.71	0.39	0.42	0.39
Avail Cap(c_a), veh/h	304	1165	996	397	896	790	240	0	498	189	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	9.2	6.0	14.9	23.0	13.0	34.7	0.0	32.7	42.2	30.1	22.8
Incr Delay (d2), s/veh	33.4	2.0	0.1	0.2	19.5	0.3	0.4	0.0	4.8	2.0	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.1	11.3	0.6	0.5	28.8	1.7	1.1	0.0	11.9	2.8	6.6	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.7	11.2	6.1	15.1	42.5	13.2	35.1	0.0	37.5	44.2	31.0	23.4
LnGrp LOS	E	B	A	B	D	B	D	A	D	D	C	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		24.9			39.4			37.3			29.3	
Approach LOS		C			D			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		66.8		28.2	15.0	51.8		28.2				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		21.1		22.8	11.1	43.9		17.2				
Green Ext Time (p_c), s		4.3		0.6	0.0	0.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			32.2									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1131	966	305	861	759	220	477	21	158	486	602
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1796	1535	644	1826	1610	870	1792	79	1021	1826	1598
Grp Volume(v), veh/h	317	762	52	22	987	86	34	0	378	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	644	1826	1610	870	0	1871	1021	1826	1598
Q Serve(g_s), s	10.5	25.9	1.2	2.2	44.8	2.8	3.2	0.0	17.6	6.4	9.5	11.1
Cycle Q Clear(g_c), s	10.5	25.9	1.2	13.1	44.8	2.8	12.8	0.0	17.6	24.1	9.5	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	274	1131	966	305	861	759	220	0	498	158	486	602
V/C Ratio(X)	1.16	0.67	0.05	0.07	1.15	0.11	0.15	0.00	0.76	0.44	0.45	0.42
Avail Cap(c_a), veh/h	274	1131	966	305	861	759	220	0	498	158	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	11.3	6.7	20.4	25.1	14.0	34.4	0.0	32.0	43.1	29.1	21.9
Incr Delay (d2), s/veh	103.3	3.2	0.1	0.5	79.4	0.3	0.5	0.0	7.1	2.8	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.5	15.0	0.7	0.6	51.5	1.9	1.3	0.0	13.8	3.1	7.5	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.6	14.5	6.9	20.8	104.5	14.3	34.9	0.0	39.1	45.9	30.0	22.6
LnGrp LOS	F	B	A	C	F	B	C	A	D	D	C	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		47.6			95.7			38.8			28.6	
Approach LOS		D			F			D			C	

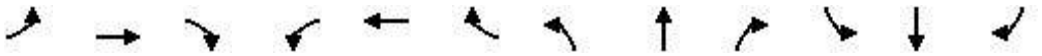
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.0	50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		27.9		26.1	12.5	46.8		19.6				
Green Ext Time (p_c), s		5.3		0.0	0.0	0.0		1.1				

Intersection Summary		
HCM 6th Ctrl Delay	59.8	
HCM 6th LOS	E	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 6'



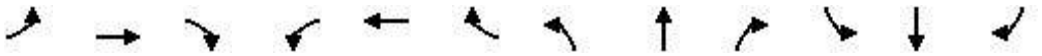
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	466	1197	1041	445	1208	1049	139	329	310	242	349	305
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	742	1752	1522	695	1767	1535	920	1707	1610	1193	1811	1585
Grp Volume(v), veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Grp Sat Flow(s),veh/h/ln	742	1752	1522	695	1767	1535	920	1707	1610	1193	1811	1585
Q Serve(g_s), s	5.0	13.8	0.6	1.9	14.1	0.4	1.8	5.2	0.4	1.9	11.2	10.6
Cycle Q Clear(g_c), s	19.1	13.8	0.6	15.7	14.1	0.4	12.9	5.2	0.4	7.1	11.2	10.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	466	1197	1041	445	1208	1049	139	329	310	242	349	305
V/C Ratio(X)	0.18	0.52	0.03	0.07	0.52	0.02	0.15	0.39	0.03	0.13	0.77	0.73
Avail Cap(c_a), veh/h	466	1197	1041	445	1208	1049	253	540	509	389	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	6.2	4.1	10.0	6.2	4.1	36.7	28.2	26.2	31.3	30.6	30.4
Incr Delay (d2), s/veh	0.8	1.6	0.1	0.3	1.6	0.0	0.7	1.1	0.1	0.3	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	7.7	0.3	0.5	7.9	0.2	0.8	4.0	0.3	1.0	8.8	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	7.8	4.2	10.3	7.9	4.1	37.4	29.3	26.3	31.6	35.5	35.2
LnGrp LOS	B	A	A	B	A	A	D	C	C	C	D	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		8.1			7.9			30.2			35.1	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		59.9		20.1		59.9		20.1				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		21.1		13.2		17.7		14.9				
Green Ext Time (p_c), s		4.6		2.1		4.2		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			16.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



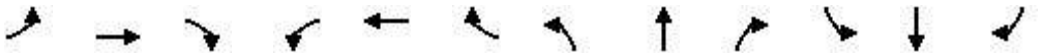
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	402	1130	982	391	1139	990	157	395	372	282	419	367
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	715	1752	1522	681	1767	1535	839	1707	1610	1180	1811	1585
Grp Volume(v), veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Grp Sat Flow(s),veh/h/ln	715	1752	1522	681	1767	1535	839	1707	1610	1180	1811	1585
Q Serve(g_s), s	7.8	16.3	0.6	2.3	16.7	0.8	2.0	5.5	0.3	5.1	12.1	14.0
Cycle Q Clear(g_c), s	24.4	16.3	0.6	18.5	16.7	0.8	14.0	5.5	0.3	10.6	12.1	14.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	402	1130	982	391	1139	990	157	395	372	282	419	367
V/C Ratio(X)	0.26	0.56	0.03	0.08	0.57	0.04	0.14	0.35	0.02	0.29	0.71	0.80
Avail Cap(c_a), veh/h	402	1130	982	391	1139	990	229	540	509	382	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.9	7.9	5.2	13.1	8.0	5.2	34.7	25.8	23.8	30.2	28.3	29.0
Incr Delay (d2), s/veh	1.6	2.0	0.1	0.4	2.1	0.1	0.6	0.8	0.0	0.8	3.4	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	9.3	0.3	0.7	9.5	0.4	0.8	4.1	0.2	2.6	9.1	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.4	10.0	5.2	13.5	10.1	5.3	35.3	26.5	23.8	31.0	31.7	36.8
LnGrp LOS	B	A	A	B	B	A	D	C	C	C	C	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		10.6			10.0			27.5			33.8	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		56.8		23.2		56.8		23.2				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		26.4		16.0		20.5		16.0				
Green Ext Time (p_c), s		4.6		2.5		4.4		0.5				

Intersection Summary		
HCM 6th Ctrl Delay		18.3
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



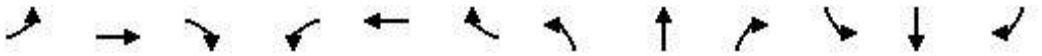
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	332	1150	999	323	1159	1007	124	409	386	261	434	380
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	646	1752	1522	615	1767	1535	777	1707	1610	1154	1811	1585
Grp Volume(v), veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Grp Sat Flow(s),veh/h/ln	646	1752	1522	615	1767	1535	777	1707	1610	1154	1811	1585
Q Serve(g_s), s	13.0	24.1	0.9	3.8	24.7	0.9	3.1	7.5	0.5	6.7	16.8	19.1
Cycle Q Clear(g_c), s	37.6	24.1	0.9	27.9	24.7	0.9	19.9	7.5	0.5	14.2	16.8	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	1150	999	323	1159	1007	124	409	386	261	434	380
V/C Ratio(X)	0.36	0.65	0.04	0.12	0.66	0.04	0.21	0.39	0.03	0.34	0.79	0.87
Avail Cap(c_a), veh/h	332	1150	999	323	1159	1007	145	455	429	292	482	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	9.7	5.8	18.1	9.9	5.8	43.2	30.3	27.7	36.3	33.9	34.7
Incr Delay (d2), s/veh	3.0	2.8	0.1	0.8	2.9	0.1	1.2	0.9	0.0	1.1	8.5	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.9	13.4	0.5	1.1	13.8	0.5	1.1	5.7	0.4	3.4	12.9	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	12.6	5.8	18.8	12.8	5.9	44.4	31.2	27.7	37.4	42.3	52.4
LnGrp LOS	C	B	A	B	B	A	D	C	C	D	D	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		13.8			12.7			32.7			46.1	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.5		27.5		67.5		27.5				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25		59.8		* 25				
Max Q Clear Time (g_c+I1), s		39.6		21.1		29.9		21.9				
Green Ext Time (p_c), s		6.0		1.6		5.8		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			24.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



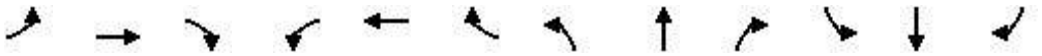
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	357	1249	1067	464	1049	925	191	378	323	141	366	437
Arrive On Green	0.07	0.70	0.70	0.57	0.57	0.57	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1795	1796	1535	733	1826	1610	976	1885	1610	1099	1826	1598
Grp Volume(v), veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	733	1826	1610	976	1885	1610	1099	1826	1598
Q Serve(g_s), s	4.2	15.7	0.8	1.1	32.9	0.7	2.6	13.4	0.7	2.5	7.8	8.6
Cycle Q Clear(g_c), s	4.2	15.7	0.8	5.4	32.9	0.7	10.4	13.4	0.7	15.9	7.8	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	357	1249	1067	464	1049	925	191	378	323	141	366	437
V/C Ratio(X)	0.59	0.51	0.04	0.04	0.78	0.03	0.15	0.75	0.04	0.21	0.47	0.40
Avail Cap(c_a), veh/h	423	1249	1067	464	1049	925	255	502	429	213	486	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	6.8	4.5	10.8	15.6	8.7	38.1	35.7	30.6	43.2	33.5	28.2
Incr Delay (d2), s/veh	2.2	1.5	0.1	0.2	5.8	0.1	0.5	5.4	0.1	1.1	1.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	9.1	0.4	0.3	19.9	0.4	1.2	11.0	0.5	1.3	6.3	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	8.3	4.6	10.9	21.4	8.8	38.6	41.1	30.7	44.3	34.8	29.0
LnGrp LOS	B	A	A	B	C	A	D	D	C	D	C	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		10.3			20.8			40.4			32.9	
Approach LOS		B			C			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		71.3		23.7	11.5	59.8		23.7				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		17.7		17.9	6.2	34.9		15.4				
Green Ext Time (p_c), s		4.2		1.1	0.3	3.7		1.1				

Intersection Summary		
HCM 6th Ctrl Delay		21.5
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



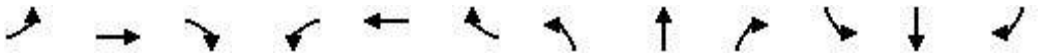
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	312	1177	1006	404	908	801	215	453	387	170	439	561
Arrive On Green	0.11	0.66	0.66	0.50	0.50	0.50	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1795	1796	1535	717	1826	1610	918	1885	1610	1069	1826	1598
Grp Volume(v), veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	717	1826	1610	918	1885	1610	1069	1826	1598
Q Serve(g_s), s	8.6	18.7	1.0	1.5	41.4	2.6	2.7	14.4	0.6	5.6	8.4	10.0
Cycle Q Clear(g_c), s	8.6	18.7	1.0	5.2	41.4	2.6	11.2	14.4	0.6	20.0	8.4	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	1177	1006	404	908	801	215	453	387	170	439	561
V/C Ratio(X)	0.90	0.56	0.04	0.05	0.93	0.10	0.14	0.69	0.04	0.38	0.44	0.40
Avail Cap(c_a), veh/h	312	1177	1006	404	908	801	239	502	429	198	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	8.9	5.8	14.3	22.4	12.6	35.3	32.9	27.6	42.0	30.6	23.3
Incr Delay (d2), s/veh	28.6	1.9	0.1	0.2	17.5	0.3	0.4	4.2	0.1	2.0	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.6	11.0	0.5	0.5	27.9	1.7	1.1	11.4	0.5	2.8	6.7	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	10.8	5.9	14.6	39.9	12.9	35.8	37.1	27.7	44.0	31.6	23.9
LnGrp LOS	D	B	A	B	D	B	D	D	C	D	C	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		22.9			37.1			36.6			29.7	
Approach LOS		C			D			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		67.5		27.5	15.0	52.5		27.5				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		20.7		22.0	10.6	43.4		16.4				
Green Ext Time (p_c), s		4.3		0.8	0.0	0.8		1.2				

Intersection Summary		
HCM 6th Ctrl Delay		30.7
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	274	1135	970	308	865	763	218	498	425	167	482	599
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1795	1796	1535	644	1826	1610	870	1885	1610	1021	1826	1598
Grp Volume(v), veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	644	1826	1610	870	1885	1610	1021	1826	1598
Q Serve(g_s), s	10.5	25.8	1.2	2.1	45.0	2.8	3.2	16.6	0.7	6.4	9.6	11.2
Cycle Q Clear(g_c), s	10.5	25.8	1.2	12.9	45.0	2.8	12.8	16.6	0.7	23.0	9.6	11.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	274	1135	970	308	865	763	218	498	425	167	482	599
V/C Ratio(X)	1.16	0.67	0.05	0.07	1.14	0.11	0.16	0.73	0.04	0.42	0.46	0.42
Avail Cap(c_a), veh/h	274	1135	970	308	865	763	220	502	429	169	486	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	11.2	6.7	20.1	25.0	13.9	34.6	31.8	26.0	42.3	29.2	22.1
Incr Delay (d2), s/veh	103.3	3.2	0.1	0.4	77.2	0.3	0.5	5.7	0.1	2.4	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.5	14.9	0.7	0.6	50.9	1.9	1.3	13.0	0.5	3.0	7.6	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.7	14.4	6.8	20.6	102.2	14.2	35.1	37.5	26.0	44.7	30.2	22.7
LnGrp LOS	F	B	A	C	F	B	D	D	C	D	C	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		47.5			93.7			36.8			28.6	
Approach LOS		D			F			D			C	

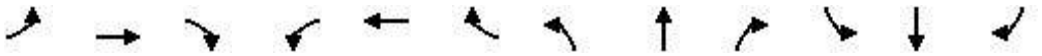
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.2		29.8	15.0	50.2		29.8				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	10.5	44.8		* 25				
Max Q Clear Time (g_c+I1), s		27.8		25.0	12.5	47.0		18.6				
Green Ext Time (p_c), s		5.3		0.1	0.0	0.0		1.2				

Intersection Summary		
HCM 6th Ctrl Delay	58.8	
HCM 6th LOS	E	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 7'



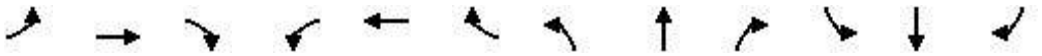
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	530	1131	61	423	2272	79	120	330	23	66	343	332
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	742	1648	88	695	3309	115	920	1577	111	114	1641	1585
Grp Volume(v), veh/h	84	0	650	32	320	334	21	0	137	298	0	224
Grp Sat Flow(s),veh/h/ln	742	0	1736	695	1678	1746	920	0	1687	1755	0	1585
Q Serve(g_s), s	4.7	0.0	17.8	2.3	7.0	7.0	2.1	0.0	6.6	8.0	0.0	12.4
Cycle Q Clear(g_c), s	11.7	0.0	17.8	20.1	7.0	7.0	17.4	0.0	6.6	15.3	0.0	12.4
Prop In Lane	1.00		0.05	1.00		0.07	1.00		0.07	0.10		1.00
Lane Grp Cap(c), veh/h	530	0	1192	423	1152	1199	120	0	353	409	0	332
V/C Ratio(X)	0.16	0.00	0.55	0.08	0.28	0.28	0.17	0.00	0.39	0.73	0.00	0.68
Avail Cap(c_a), veh/h	530	0	1192	423	1152	1199	221	0	538	598	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	0.0	7.5	12.5	5.8	5.8	44.0	0.0	32.3	35.7	0.0	34.6
Incr Delay (d2), s/veh	0.6	0.0	1.8	0.3	0.6	0.6	1.0	0.0	1.0	3.5	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	6.0	0.4	2.2	2.3	0.5	0.0	2.8	6.8	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	0.0	9.3	12.8	6.4	6.3	45.0	0.0	33.3	39.2	0.0	38.0
LnGrp LOS	A	A	A	B	A	A	D	A	C	D	A	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		9.2			6.7			34.9			38.7	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		70.4		24.6		70.4		24.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		19.8		17.3		22.1		19.4				
Green Ext Time (p_c), s		5.0		2.2		3.9		0.5				

Intersection Summary		
HCM 6th Ctrl Delay		17.6
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



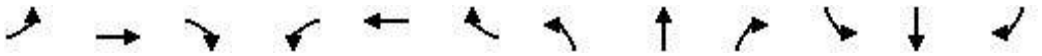
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	434	993	53	315	1935	118	117	466	30	126	362	465
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	715	1648	88	681	3213	197	839	1587	102	273	1232	1585
Grp Volume(v), veh/h	105	0	672	33	341	352	22	0	149	380	0	294
Grp Sat Flow(s),veh/h/ln	715	0	1736	681	1678	1731	839	0	1689	1505	0	1585
Q Serve(g_s), s	8.2	0.0	23.9	3.1	9.6	9.6	2.4	0.0	6.5	16.7	0.0	15.3
Cycle Q Clear(g_c), s	17.8	0.0	23.9	27.0	9.6	9.6	25.7	0.0	6.5	23.2	0.0	15.3
Prop In Lane	1.00		0.05	1.00		0.11	1.00		0.06	0.22		1.00
Lane Grp Cap(c), veh/h	434	0	1046	315	1011	1043	117	0	496	488	0	465
V/C Ratio(X)	0.24	0.00	0.64	0.10	0.34	0.34	0.19	0.00	0.30	0.78	0.00	0.63
Avail Cap(c_a), veh/h	434	0	1046	315	1011	1043	138	0	539	529	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	12.3	21.0	9.4	9.4	44.1	0.0	26.0	32.4	0.0	29.1
Incr Delay (d2), s/veh	1.3	0.0	3.0	0.7	0.9	0.9	1.1	0.0	0.5	7.4	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	9.0	0.5	3.4	3.5	0.5	0.0	2.7	9.0	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.2	0.0	15.3	21.7	10.3	10.3	45.2	0.0	26.5	39.8	0.0	31.9
LnGrp LOS	B	A	B	C	B	B	D	A	C	D	A	C
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		15.3			10.8			28.9			36.3	
Approach LOS		B			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		62.4		32.6		62.4		32.6				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		25.9		25.2		29.0		27.7				
Green Ext Time (p_c), s		5.4		1.7		4.0		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



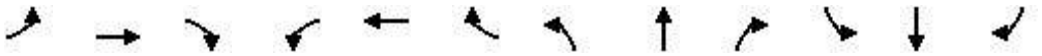
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	364	952	50	217	1863	105	100	501	37	127	387	506
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	646	1650	87	615	3229	183	777	1569	117	254	1213	1585
Grp Volume(v), veh/h	119	0	782	39	395	408	26	0	173	431	0	332
Grp Sat Flow(s),veh/h/ln	646	0	1736	615	1678	1734	777	0	1686	1467	0	1585
Q Serve(g_s), s	11.9	0.0	32.9	5.0	12.4	12.4	2.9	0.0	7.4	20.0	0.0	17.1
Cycle Q Clear(g_c), s	24.3	0.0	32.9	37.9	12.4	12.4	30.3	0.0	7.4	27.4	0.0	17.1
Prop In Lane	1.00		0.05	1.00		0.11	1.00		0.07	0.21		1.00
Lane Grp Cap(c), veh/h	364	0	1002	217	968	1000	100	0	538	514	0	506
V/C Ratio(X)	0.33	0.00	0.78	0.18	0.41	0.41	0.26	0.00	0.32	0.84	0.00	0.66
Avail Cap(c_a), veh/h	364	0	1002	217	968	1000	100	0	538	514	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	15.5	30.1	11.1	11.1	46.1	0.0	24.6	32.2	0.0	27.9
Incr Delay (d2), s/veh	2.4	0.0	6.0	1.8	1.3	1.2	1.9	0.0	0.5	12.2	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	13.1	0.8	4.5	4.6	0.7	0.0	3.0	10.9	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	0.0	21.5	31.9	12.4	12.4	48.1	0.0	25.0	44.4	0.0	31.4
LnGrp LOS	C	A	C	C	B	B	D	A	C	D	A	C
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		21.3			13.3			28.1			38.7	
Approach LOS		C			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.0		35.0		60.0		35.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30		54.8		* 30				
Max Q Clear Time (g_c+I1), s		34.9		29.4		39.9		32.3				
Green Ext Time (p_c), s		6.1		0.4		4.1		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



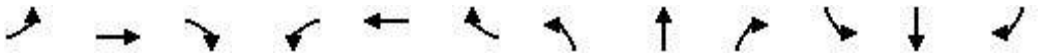
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	474	1112	76	416	1870	64	138	405	20	64	273	482
Arrive On Green	0.07	0.67	0.67	0.55	0.55	0.55	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1795	1663	113	733	3423	117	976	1781	88	89	1201	1598
Grp Volume(v), veh/h	211	0	676	18	416	432	29	0	297	201	0	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	733	1735	1805	976	0	1869	1290	0	1598
Q Serve(g_s), s	4.5	0.0	19.3	1.3	13.6	13.6	2.7	0.0	13.9	1.7	0.0	8.3
Cycle Q Clear(g_c), s	4.5	0.0	19.3	9.1	13.6	13.6	18.3	0.0	13.9	15.5	0.0	8.3
Prop In Lane	1.00		0.06	1.00		0.06	1.00		0.05	0.15		1.00
Lane Grp Cap(c), veh/h	474	0	1187	416	948	986	138	0	425	337	0	482
V/C Ratio(X)	0.45	0.00	0.57	0.04	0.44	0.44	0.21	0.00	0.70	0.60	0.00	0.37
Avail Cap(c_a), veh/h	633	0	1187	416	948	986	227	0	596	488	0	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.8	0.0	8.4	14.0	12.8	12.8	42.9	0.0	33.7	32.5	0.0	26.0
Incr Delay (d2), s/veh	0.9	0.0	2.0	0.2	1.5	1.4	1.1	0.0	3.0	2.4	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	6.8	0.2	5.2	5.4	0.7	0.0	6.6	4.1	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.7	0.0	10.4	14.2	14.3	14.3	44.0	0.0	36.7	34.9	0.0	26.7
LnGrp LOS	A	A	B	B	B	B	D	A	D	C	A	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		10.2			14.3			37.3			31.1	
Approach LOS		B			B			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		68.8		26.2	11.6	57.2		26.2				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		21.3		17.5	6.5	15.6		20.3				
Green Ext Time (p_c), s		4.2		1.5	0.6	4.5		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			18.5									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



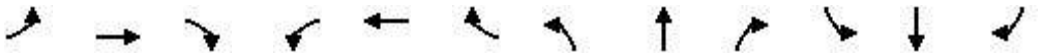
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	417	997	69	320	1423	138	130	530	24	104	275	644
Arrive On Green	0.11	0.60	0.60	0.45	0.45	0.45	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1795	1661	114	717	3196	309	918	1791	80	191	930	1598
Grp Volume(v), veh/h	282	0	699	20	460	470	30	0	328	256	0	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	717	1735	1770	918	0	1871	1121	0	1598
Q Serve(g_s), s	7.5	0.0	24.7	1.8	19.0	19.0	3.0	0.0	14.2	8.2	0.0	9.2
Cycle Q Clear(g_c), s	7.5	0.0	24.7	11.8	19.0	19.0	25.5	0.0	14.2	22.4	0.0	9.2
Prop In Lane	1.00		0.06	1.00		0.17	1.00		0.04	0.25		1.00
Lane Grp Cap(c), veh/h	417	0	1066	320	773	788	130	0	553	379	0	644
V/C Ratio(X)	0.68	0.00	0.66	0.06	0.60	0.60	0.23	0.00	0.59	0.68	0.00	0.35
Avail Cap(c_a), veh/h	517	0	1066	320	773	788	151	0	597	414	0	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	12.5	21.2	19.9	19.9	43.5	0.0	28.6	31.6	0.0	19.7
Incr Delay (d2), s/veh	3.3	0.0	3.2	0.4	3.4	3.3	1.3	0.0	1.8	4.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	9.5	0.3	7.9	8.1	0.7	0.0	6.6	5.9	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	0.0	15.7	21.6	23.3	23.2	44.8	0.0	30.3	36.1	0.0	20.1
LnGrp LOS	B	A	B	C	C	C	D	A	C	D	A	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		16.3			23.2			31.5			28.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		62.2		32.8	14.7	47.5		32.8				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		26.7		24.4	9.5	21.0		27.5				
Green Ext Time (p_c), s		4.3		1.3	0.7	4.4		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			22.8									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	374	959	65	217	1310	114	105	571	25	100	278	707
Arrive On Green	0.12	0.58	0.58	0.41	0.41	0.41	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1795	1662	113	644	3229	281	870	1792	79	168	870	1598
Grp Volume(v), veh/h	317	0	814	22	530	543	34	0	378	290	0	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	644	1735	1775	870	0	1871	1038	0	1598
Q Serve(g_s), s	9.2	0.0	34.0	2.6	24.9	24.9	3.2	0.0	16.4	10.7	0.0	10.0
Cycle Q Clear(g_c), s	9.2	0.0	34.0	20.4	24.9	24.9	30.3	0.0	16.4	27.1	0.0	10.0
Prop In Lane	1.00		0.06	1.00		0.16	1.00		0.04	0.24		1.00
Lane Grp Cap(c), veh/h	374	0	1024	217	704	720	105	0	597	378	0	707
V/C Ratio(X)	0.85	0.00	0.79	0.10	0.75	0.75	0.32	0.00	0.63	0.77	0.00	0.36
Avail Cap(c_a), veh/h	445	0	1024	217	704	720	105	0	597	378	0	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	15.7	30.0	24.2	24.2	46.1	0.0	27.6	32.0	0.0	17.5
Incr Delay (d2), s/veh	13.4	0.0	6.4	0.9	7.3	7.2	2.5	0.0	2.5	9.7	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	13.9	0.5	11.0	11.3	0.9	0.0	7.7	7.3	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	0.0	22.1	31.0	31.5	31.3	48.6	0.0	30.1	41.7	0.0	18.0
LnGrp LOS	C	A	C	C	C	C	D	A	C	D	A	B
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		24.9			31.4			31.7			30.7	
Approach LOS		C			C			C			C	

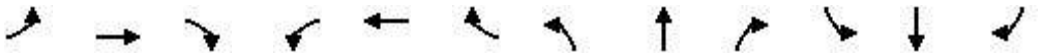
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		60.0		35.0	16.3	43.7		35.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		36.0		29.1	11.2	26.9		32.3				
Green Ext Time (p_c), s		4.9		0.4	0.6	3.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			29.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 8'



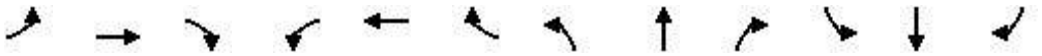
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	524	1163	1011	425	2198	76	138	334	24	73	350	336
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	742	1752	1522	695	3309	115	920	1577	111	109	1648	1585
Grp Volume(v), veh/h	84	617	33	32	320	334	21	0	137	298	0	224
Grp Sat Flow(s),veh/h/ln	742	1752	1522	695	1678	1746	920	0	1687	1757	0	1585
Q Serve(g_s), s	4.2	14.6	0.6	2.0	6.3	6.3	1.8	0.0	5.6	6.1	0.0	10.4
Cycle Q Clear(g_c), s	10.6	14.6	0.6	16.6	6.3	6.3	14.5	0.0	5.6	12.8	0.0	10.4
Prop In Lane	1.00		1.00	1.00		0.07	1.00		0.07	0.10		1.00
Lane Grp Cap(c), veh/h	524	1163	1011	425	1115	1159	138	0	358	422	0	336
V/C Ratio(X)	0.16	0.53	0.03	0.08	0.29	0.29	0.15	0.00	0.38	0.71	0.00	0.67
Avail Cap(c_a), veh/h	524	1163	1011	425	1115	1159	234	0	534	602	0	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.8	7.0	4.6	11.3	5.6	5.6	36.8	0.0	27.0	29.8	0.0	28.9
Incr Delay (d2), s/veh	0.7	1.7	0.1	0.3	0.7	0.6	0.7	0.0	1.0	3.1	0.0	3.2
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(95%),veh/ln	1.2	8.3	0.3	0.6	3.5	3.6	0.8	0.0	4.2	9.4	0.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	8.7	4.7	11.6	6.2	6.2	37.5	0.0	28.0	32.9	0.0	32.1
LnGrp LOS	A	A	A	B	A	A	D	A	C	C	A	C
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		8.5			6.5			29.2			32.5	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		58.3		21.7		58.3		21.7				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		16.6		14.8		18.6		16.5				
Green Ext Time (p_c), s		4.8		2.0		3.7		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



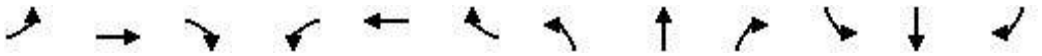
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	435	1029	894	329	1887	115	134	459	29	133	368	458
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	715	1752	1522	681	3213	197	839	1587	102	271	1275	1585
Grp Volume(v), veh/h	105	638	34	33	341	352	22	0	149	380	0	294
Grp Sat Flow(s),veh/h/ln	715	1752	1522	681	1678	1731	839	0	1689	1546	0	1585
Q Serve(g_s), s	7.1	18.9	0.8	2.6	8.4	8.4	2.0	0.0	5.5	13.3	0.0	13.0
Cycle Q Clear(g_c), s	15.6	18.9	0.8	21.6	8.4	8.4	20.9	0.0	5.5	18.8	0.0	13.0
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.06	0.22		1.00
Lane Grp Cap(c), veh/h	435	1029	894	329	986	1017	134	0	488	502	0	458
V/C Ratio(X)	0.24	0.62	0.04	0.10	0.35	0.35	0.16	0.00	0.31	0.76	0.00	0.64
Avail Cap(c_a), veh/h	435	1029	894	329	986	1017	157	0	534	546	0	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.6	10.7	7.0	17.7	8.6	8.6	36.8	0.0	22.2	27.2	0.0	24.8
Incr Delay (d2), s/veh	1.3	2.8	0.1	0.6	1.0	0.9	0.8	0.0	0.5	6.2	0.0	3.0
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(95%),veh/ln	2.1	11.2	0.4	0.8	5.1	5.3	0.8	0.0	4.0	11.7	0.0	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	13.5	7.0	18.3	9.5	9.5	37.6	0.0	22.7	33.3	0.0	27.8
LnGrp LOS	B	B	A	B	A	A	D	A	C	C	A	C
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		13.3			9.9			24.6			30.9	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.2		27.8		52.2		27.8				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		20.9		20.8		23.6		22.9				
Green Ext Time (p_c), s		5.0		1.5		3.8		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



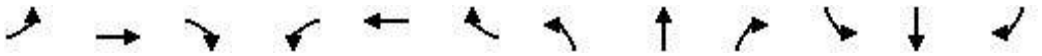
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	364	981	852	235	1808	102	121	496	37	134	398	501
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	646	1752	1522	615	3229	183	777	1569	117	253	1259	1585
Grp Volume(v), veh/h	119	743	39	39	395	408	26	0	173	431	0	332
Grp Sat Flow(s),veh/h/ln	646	1752	1522	615	1678	1734	777	0	1686	1513	0	1585
Q Serve(g_s), s	10.4	25.9	0.9	4.1	10.8	10.8	2.7	0.0	6.3	15.9	0.0	14.5
Cycle Q Clear(g_c), s	21.2	25.9	0.9	30.1	10.8	10.8	24.8	0.0	6.3	22.1	0.0	14.5
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.07	0.21		1.00
Lane Grp Cap(c), veh/h	364	981	852	235	940	971	121	0	533	533	0	501
V/C Ratio(X)	0.33	0.76	0.05	0.17	0.42	0.42	0.22	0.00	0.32	0.81	0.00	0.66
Avail Cap(c_a), veh/h	364	981	852	235	940	971	121	0	533	533	0	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.2	13.4	7.9	24.9	10.1	10.1	38.2	0.0	20.8	26.7	0.0	23.7
Incr Delay (d2), s/veh	2.4	5.5	0.1	1.5	1.4	1.3	1.3	0.0	0.5	9.5	0.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	15.3	0.5	1.2	6.8	7.0	1.0	0.0	4.5	13.6	0.0	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	18.9	8.0	26.5	11.5	11.5	39.4	0.0	21.3	36.2	0.0	27.3
LnGrp LOS	B	B	A	C	B	B	D	A	C	D	A	C
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		18.4			12.2			23.7			32.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		30.0		50.0		30.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		27.9		24.1		32.1		26.8				
Green Ext Time (p_c), s		5.5		0.5		3.8		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			20.8									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



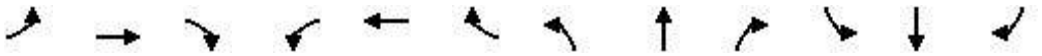
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	474	1201	1026	433	1870	64	138	405	20	64	273	482
Arrive On Green	0.07	0.67	0.67	0.55	0.55	0.55	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1795	1796	1535	733	3423	117	976	1781	88	89	1201	1598
Grp Volume(v), veh/h	211	633	43	18	416	432	29	0	297	201	0	177
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	733	1735	1805	976	0	1869	1290	0	1598
Q Serve(g_s), s	4.5	17.1	0.9	1.2	13.6	13.6	2.7	0.0	13.9	1.7	0.0	8.3
Cycle Q Clear(g_c), s	4.5	17.1	0.9	6.8	13.6	13.6	18.3	0.0	13.9	15.5	0.0	8.3
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.05	0.15		1.00
Lane Grp Cap(c), veh/h	474	1201	1026	433	948	986	138	0	425	337	0	482
V/C Ratio(X)	0.45	0.53	0.04	0.04	0.44	0.44	0.21	0.00	0.70	0.60	0.00	0.37
Avail Cap(c_a), veh/h	633	1201	1026	433	948	986	227	0	596	488	0	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.8	8.1	5.4	12.8	12.8	12.8	42.9	0.0	33.7	32.5	0.0	26.0
Incr Delay (d2), s/veh	0.9	1.7	0.1	0.2	1.5	1.4	1.1	0.0	3.0	2.4	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	10.1	0.5	0.4	9.0	9.2	1.3	0.0	10.8	7.4	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.7	9.7	5.4	13.0	14.3	14.3	44.0	0.0	36.7	34.9	0.0	26.7
LnGrp LOS	A	A	A	B	B	B	D	A	D	C	A	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		9.5			14.3			37.3			31.1	
Approach LOS		A			B			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		68.8		26.2	11.6	57.2		26.2				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		19.1		17.5	6.5	15.6		20.3				
Green Ext Time (p_c), s		4.1		1.5	0.6	4.5		1.2				

Intersection Summary		
HCM 6th Ctrl Delay		18.2
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



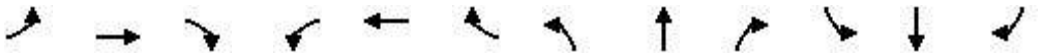
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	417	1078	921	342	1423	138	130	530	24	104	275	644
Arrive On Green	0.11	0.60	0.60	0.45	0.45	0.45	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1795	1796	1535	717	3196	309	918	1791	80	191	930	1598
Grp Volume(v), veh/h	282	654	45	20	460	470	30	0	328	256	0	223
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	717	1735	1770	918	0	1871	1121	0	1598
Q Serve(g_s), s	7.5	21.8	1.1	1.7	19.0	19.0	3.0	0.0	14.2	8.2	0.0	9.2
Cycle Q Clear(g_c), s	7.5	21.8	1.1	8.8	19.0	19.0	25.5	0.0	14.2	22.4	0.0	9.2
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.04	0.25		1.00
Lane Grp Cap(c), veh/h	417	1078	921	342	773	788	130	0	553	379	0	644
V/C Ratio(X)	0.68	0.61	0.05	0.06	0.60	0.60	0.23	0.00	0.59	0.68	0.00	0.35
Avail Cap(c_a), veh/h	517	1078	921	342	773	788	151	0	597	414	0	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.6	11.9	7.8	19.3	19.9	19.9	43.5	0.0	28.6	31.6	0.0	19.7
Incr Delay (d2), s/veh	3.3	2.5	0.1	0.3	3.4	3.3	1.3	0.0	1.8	4.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	13.2	0.7	0.6	12.6	12.7	1.3	0.0	10.8	9.9	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	14.5	7.9	19.6	23.3	23.2	44.8	0.0	30.3	36.1	0.0	20.1
LnGrp LOS	B	B	A	B	C	C	D	A	C	D	A	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		15.2			23.2			31.5			28.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		62.2		32.8	14.7	47.5		32.8				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		23.8		24.4	9.5	21.0		27.5				
Green Ext Time (p_c), s		4.2		1.3	0.7	4.4		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			22.4									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	374	1036	885	247	1310	114	105	571	25	100	278	707
Arrive On Green	0.12	0.58	0.58	0.41	0.41	0.41	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1795	1796	1535	644	3229	281	870	1792	79	168	870	1598
Grp Volume(v), veh/h	317	762	52	22	530	543	34	0	378	290	0	253
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	644	1735	1775	870	0	1871	1038	0	1598
Q Serve(g_s), s	9.2	29.6	1.4	2.5	24.9	24.9	3.2	0.0	16.4	10.7	0.0	10.0
Cycle Q Clear(g_c), s	9.2	29.6	1.4	15.8	24.9	24.9	30.3	0.0	16.4	27.1	0.0	10.0
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.04	0.24		1.00
Lane Grp Cap(c), veh/h	374	1036	885	247	704	720	105	0	597	378	0	707
V/C Ratio(X)	0.85	0.74	0.06	0.09	0.75	0.75	0.32	0.00	0.63	0.77	0.00	0.36
Avail Cap(c_a), veh/h	445	1036	885	247	704	720	105	0	597	378	0	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	14.8	8.8	26.6	24.2	24.2	46.1	0.0	27.6	32.0	0.0	17.5
Incr Delay (d2), s/veh	13.4	4.6	0.1	0.7	7.3	7.2	2.5	0.0	2.5	9.7	0.0	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.3	17.7	0.8	0.8	16.5	16.8	1.6	0.0	12.2	11.7	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	19.4	8.9	27.3	31.5	31.3	48.6	0.0	30.1	41.7	0.0	18.0
LnGrp LOS	C	B	A	C	C	C	D	A	C	D	A	B
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		22.5			31.3			31.7			30.7	
Approach LOS		C			C			C			C	

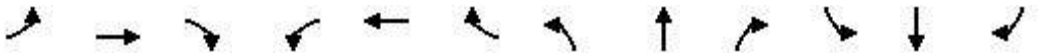
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		60.0		35.0	16.3	43.7		35.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		31.6		29.1	11.2	26.9		32.3				
Green Ext Time (p_c), s		5.0		0.4	0.6	3.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	28.1	
HCM 6th LOS	C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

'SCENARIO 9'



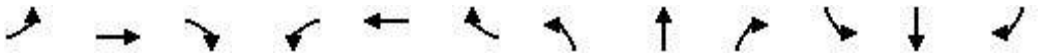
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	542	1197	1041	445	2262	79	139	304	21	235	349	305
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	742	1752	1522	695	3309	115	920	1577	111	1193	1811	1585
Grp Volume(v), veh/h	84	617	33	32	320	334	21	0	137	31	267	224
Grp Sat Flow(s),veh/h/ln	742	1752	1522	695	1678	1746	920	0	1687	1193	1811	1585
Q Serve(g_s), s	4.0	13.8	0.6	1.9	6.0	6.0	1.8	0.0	5.7	1.9	11.2	10.6
Cycle Q Clear(g_c), s	10.0	13.8	0.6	15.7	6.0	6.0	12.9	0.0	5.7	7.6	11.2	10.6
Prop In Lane	1.00		1.00	1.00		0.07	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	542	1197	1041	445	1147	1193	139	0	325	235	349	305
V/C Ratio(X)	0.16	0.52	0.03	0.07	0.28	0.28	0.15	0.00	0.42	0.13	0.77	0.73
Avail Cap(c_a), veh/h	542	1197	1041	445	1147	1193	253	0	534	382	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	6.2	4.1	10.0	5.0	5.0	36.7	0.0	28.4	31.7	30.6	30.4
Incr Delay (d2), s/veh	0.6	1.6	0.1	0.3	0.6	0.6	0.7	0.0	1.2	0.4	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	7.7	0.3	0.5	3.2	3.3	0.8	0.0	4.3	1.0	8.8	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	7.8	4.2	10.3	5.6	5.5	37.4	0.0	29.6	32.1	35.5	35.2
LnGrp LOS	A	A	A	B	A	A	D	A	C	C	D	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		7.6			5.8			30.6			35.2	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		59.9		20.1		59.9		20.1				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		15.8		13.2		17.7		14.9				
Green Ext Time (p_c), s		4.8		2.1		3.8		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			15.6									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



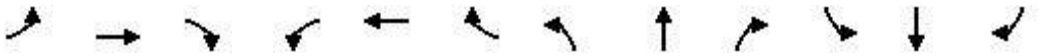
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	487	1130	982	391	2072	127	157	367	24	275	419	367
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	715	1752	1522	681	3213	197	839	1587	102	1180	1811	1585
Grp Volume(v), veh/h	105	638	34	33	341	352	22	0	149	83	297	294
Grp Sat Flow(s),veh/h/ln	715	1752	1522	681	1678	1731	839	0	1689	1180	1811	1585
Q Serve(g_s), s	6.1	16.3	0.6	2.3	7.2	7.3	2.0	0.0	6.0	5.1	12.1	14.0
Cycle Q Clear(g_c), s	13.4	16.3	0.6	18.5	7.2	7.3	14.0	0.0	6.0	11.1	12.1	14.0
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	487	1130	982	391	1082	1117	157	0	391	275	419	367
V/C Ratio(X)	0.22	0.56	0.03	0.08	0.31	0.32	0.14	0.00	0.38	0.30	0.71	0.80
Avail Cap(c_a), veh/h	487	1130	982	391	1082	1117	229	0	534	375	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.3	7.9	5.2	13.1	6.3	6.3	34.7	0.0	25.9	30.6	28.3	29.0
Incr Delay (d2), s/veh	1.0	2.0	0.1	0.4	0.8	0.7	0.6	0.0	0.9	0.9	3.4	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	9.3	0.3	0.7	4.1	4.2	0.8	0.0	4.4	2.6	9.1	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	10.0	5.2	13.5	7.1	7.1	35.3	0.0	26.8	31.5	31.7	36.8
LnGrp LOS	B	A	A	B	A	A	D	A	C	C	C	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		9.8			7.4			27.9			33.9	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		56.8		23.2		56.8		23.2				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		18.3		16.0		20.5		16.0				
Green Ext Time (p_c), s		5.2		2.5		4.0		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			17.3									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



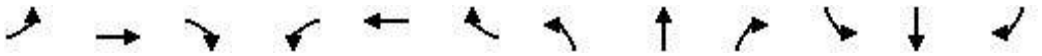
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	417	1090	947	301	2010	114	152	398	30	285	460	402
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	646	1752	1522	615	3229	183	777	1569	117	1154	1811	1585
Grp Volume(v), veh/h	119	743	39	39	395	408	26	0	173	89	342	332
Grp Sat Flow(s),veh/h/ln	646	1752	1522	615	1678	1734	777	0	1686	1154	1811	1585
Q Serve(g_s), s	8.9	22.3	0.8	3.6	9.3	9.3	2.5	0.0	6.8	5.6	13.9	15.8
Cycle Q Clear(g_c), s	18.2	22.3	0.8	25.8	9.3	9.3	16.4	0.0	6.8	12.4	13.9	15.8
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	417	1090	947	301	1044	1079	152	0	428	285	460	402
V/C Ratio(X)	0.29	0.68	0.04	0.13	0.38	0.38	0.17	0.00	0.40	0.31	0.74	0.82
Avail Cap(c_a), veh/h	417	1090	947	301	1044	1079	201	0	533	357	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	9.9	5.9	18.4	7.5	7.5	35.0	0.0	24.8	30.0	27.4	28.2
Incr Delay (d2), s/veh	1.7	3.5	0.1	0.9	1.0	1.0	0.7	0.0	0.9	0.9	4.8	10.0
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(95%),veh/ln	2.4	12.5	0.4	1.0	5.5	5.6	0.9	0.0	5.0	2.8	10.4	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	13.4	5.9	19.3	8.5	8.5	35.8	0.0	25.7	30.8	32.3	38.1
LnGrp LOS	B	B	A	B	A	A	D	A	C	C	C	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		13.1			9.0			27.0			34.6	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		25.0		55.0		25.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		24.3		17.8		27.8		18.4				
Green Ext Time (p_c), s		6.0		2.5		4.3		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			18.9									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



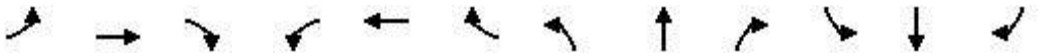
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	582	40	17	754	74	25	265	12	55	159	187
Future Volume (veh/h)	252	582	40	17	754	74	25	265	12	55	159	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	274	633	43	18	820	80	29	305	14	64	185	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	461	1174	1003	417	1630	159	221	433	20	169	442	540
Arrive On Green	0.10	0.65	0.65	0.51	0.51	0.51	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1795	1796	1535	733	3193	311	928	1788	82	1077	1826	1598
Grp Volume(v), veh/h	274	633	43	18	445	455	29	0	319	64	185	217
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	733	1735	1770	928	0	1870	1077	1826	1598
Q Serve(g_s), s	6.4	17.9	0.9	1.3	16.1	16.1	2.6	0.0	14.8	5.5	8.1	9.9
Cycle Q Clear(g_c), s	6.4	17.9	0.9	5.6	16.1	16.1	10.7	0.0	14.8	20.3	8.1	9.9
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	461	1174	1003	417	885	903	221	0	453	169	442	540
V/C Ratio(X)	0.59	0.54	0.04	0.04	0.50	0.50	0.13	0.00	0.70	0.38	0.42	0.40
Avail Cap(c_a), veh/h	582	1174	1003	417	885	903	244	0	498	195	486	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.9	8.8	5.9	13.9	15.3	15.3	34.9	0.0	32.9	42.1	30.3	24.1
Incr Delay (d2), s/veh	1.8	1.8	0.1	0.2	2.0	2.0	0.4	0.0	4.6	2.0	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.3	10.7	0.5	0.4	10.5	10.7	1.1	0.0	11.7	2.7	6.5	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	10.6	5.9	14.1	17.4	17.3	35.2	0.0	37.5	44.1	31.2	24.8
LnGrp LOS	B	B	A	B	B	B	D	A	D	D	C	C
Approach Vol, veh/h		950			918			348			466	
Approach Delay, s/veh		11.0			17.3			37.3			30.0	
Approach LOS		B			B			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		67.3		27.7	13.6	53.7		27.7				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	15.5	39.8		* 25				
Max Q Clear Time (g_c+I1), s		19.9		22.3	8.4	18.1		16.8				
Green Ext Time (p_c), s		4.1		0.7	0.7	5.0		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			19.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	449	1165	996	397	1606	155	222	442	20	169	451	553
Arrive On Green	0.10	0.65	0.65	0.50	0.50	0.50	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1795	1796	1535	717	3196	309	918	1791	80	1069	1826	1598
Grp Volume(v), veh/h	282	654	45	20	460	470	30	0	328	65	191	223
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	717	1735	1770	918	0	1871	1069	1826	1598
Q Serve(g_s), s	6.7	19.1	1.0	1.5	17.1	17.1	2.7	0.0	15.2	5.6	8.4	10.1
Cycle Q Clear(g_c), s	6.7	19.1	1.0	6.7	17.1	17.1	11.1	0.0	15.2	20.8	8.4	10.1
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	449	1165	996	397	872	890	222	0	462	169	451	553
V/C Ratio(X)	0.63	0.56	0.05	0.05	0.53	0.53	0.14	0.00	0.71	0.39	0.42	0.40
Avail Cap(c_a), veh/h	564	1165	996	397	872	890	240	0	498	189	486	584
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	9.2	6.0	14.9	16.0	16.0	34.7	0.0	32.7	42.2	30.1	23.6
Incr Delay (d2), s/veh	2.1	2.0	0.1	0.2	2.3	2.2	0.4	0.0	4.8	2.0	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	11.3	0.6	0.5	11.1	11.3	1.1	0.0	11.9	2.8	6.6	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	11.2	6.1	15.1	18.3	18.2	35.1	0.0	37.5	44.2	31.0	24.3
LnGrp LOS	B	B	A	B	B	B	D	A	D	D	C	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		11.7			18.2			37.3			29.7	
Approach LOS		B			B			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		66.8		28.2	13.9	52.9		28.2				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	15.5	39.8		* 25				
Max Q Clear Time (g_c+I1), s		21.1		22.8	8.7	19.1		17.2				
Green Ext Time (p_c), s		4.3		0.6	0.7	5.2		1.1				

Intersection Summary		
HCM 6th Ctrl Delay	20.3	
HCM 6th LOS	C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	404	1131	966	305	1512	132	220	477	21	158	486	607
Arrive On Green	0.11	0.63	0.63	0.47	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	1796	1535	644	3229	281	870	1792	79	1021	1826	1598
Grp Volume(v), veh/h	317	762	52	22	530	543	34	0	378	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	1796	1535	644	1735	1775	870	0	1871	1021	1826	1598
Q Serve(g_s), s	8.1	25.9	1.2	2.2	22.2	22.2	3.2	0.0	17.6	6.4	9.5	11.1
Cycle Q Clear(g_c), s	8.1	25.9	1.2	12.8	22.2	22.2	12.8	0.0	17.6	24.1	9.5	11.1
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	404	1131	966	305	813	832	220	0	498	158	486	607
V/C Ratio(X)	0.78	0.67	0.05	0.07	0.65	0.65	0.15	0.00	0.76	0.44	0.45	0.42
Avail Cap(c_a), veh/h	493	1131	966	305	813	832	220	0	498	158	486	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	11.3	6.7	20.4	19.3	19.3	34.4	0.0	32.0	43.1	29.1	21.7
Incr Delay (d2), s/veh	7.6	3.2	0.1	0.5	4.1	4.0	0.5	0.0	7.1	2.8	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	15.0	0.7	0.6	14.2	14.5	1.3	0.0	13.8	3.1	7.5	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	14.5	6.9	20.8	23.4	23.3	34.9	0.0	39.1	45.9	30.0	22.3
LnGrp LOS	C	B	A	C	C	C	C	A	D	D	C	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		16.8			23.3			38.8			28.5	
Approach LOS		B			C			D			C	

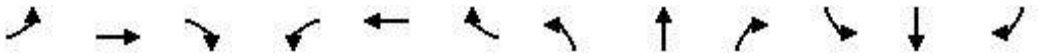
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		65.0		30.0	15.3	49.7		30.0				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		59.8		* 25	15.5	39.8		* 25				
Max Q Clear Time (g_c+I1), s		27.9		26.1	10.1	24.2		19.6				
Green Ext Time (p_c), s		5.3		0.0	0.7	5.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

SCENARIO 10'



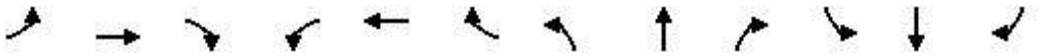
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Future Volume (veh/h)	79	580	31	28	556	19	18	109	8	28	240	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	84	617	33	32	632	22	21	128	9	31	267	224
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	542	1126	60	433	2262	79	139	304	21	235	349	305
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	742	1648	88	695	3309	115	920	1577	111	1193	1811	1585
Grp Volume(v), veh/h	84	0	650	32	320	334	21	0	137	31	267	224
Grp Sat Flow(s),veh/h/ln	742	0	1736	695	1678	1746	920	0	1687	1193	1811	1585
Q Serve(g_s), s	4.0	0.0	15.2	2.0	6.0	6.0	1.8	0.0	5.7	1.9	11.2	10.6
Cycle Q Clear(g_c), s	10.0	0.0	15.2	17.1	6.0	6.0	12.9	0.0	5.7	7.6	11.2	10.6
Prop In Lane	1.00		0.05	1.00		0.07	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	542	0	1187	433	1147	1193	139	0	325	235	349	305
V/C Ratio(X)	0.16	0.00	0.55	0.07	0.28	0.28	0.15	0.00	0.42	0.13	0.77	0.73
Avail Cap(c_a), veh/h	542	0	1187	433	1147	1193	253	0	534	382	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	0.0	6.4	10.7	5.0	5.0	36.7	0.0	28.4	31.7	30.6	30.4
Incr Delay (d2), s/veh	0.6	0.0	1.8	0.3	0.6	0.6	0.7	0.0	1.2	0.4	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	0.0	8.2	0.6	3.2	3.3	0.8	0.0	4.3	1.0	8.8	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	0.0	8.2	11.1	5.6	5.5	37.4	0.0	29.6	32.1	35.5	35.2
LnGrp LOS	A	A	A	B	A	A	D	A	C	C	D	D
Approach Vol, veh/h		734			686			158			522	
Approach Delay, s/veh		8.1			5.8			30.6			35.2	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		59.9		20.1		59.9		20.1				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		17.2		13.2		19.1		14.9				
Green Ext Time (p_c), s		4.9		2.1		3.7		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			15.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



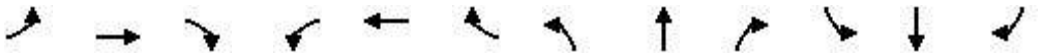
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Future Volume (veh/h)	99	600	32	29	575	35	19	119	8	75	267	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	105	638	34	33	653	40	22	140	9	83	297	294
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	487	1063	57	376	2072	127	157	367	24	275	419	367
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	715	1648	88	681	3213	197	839	1587	102	1180	1811	1585
Grp Volume(v), veh/h	105	0	672	33	341	352	22	0	149	83	297	294
Grp Sat Flow(s),veh/h/ln	715	0	1736	681	1678	1731	839	0	1689	1180	1811	1585
Q Serve(g_s), s	6.1	0.0	17.9	2.4	7.2	7.3	2.0	0.0	6.0	5.1	12.1	14.0
Cycle Q Clear(g_c), s	13.4	0.0	17.9	20.3	7.2	7.3	14.0	0.0	6.0	11.1	12.1	14.0
Prop In Lane	1.00		0.05	1.00		0.11	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	487	0	1120	376	1082	1117	157	0	391	275	419	367
V/C Ratio(X)	0.22	0.00	0.60	0.09	0.31	0.32	0.14	0.00	0.38	0.30	0.71	0.80
Avail Cap(c_a), veh/h	487	0	1120	376	1082	1117	229	0	534	375	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.3	0.0	8.2	14.1	6.3	6.3	34.7	0.0	25.9	30.6	28.3	29.0
Incr Delay (d2), s/veh	1.0	0.0	2.4	0.5	0.8	0.7	0.6	0.0	0.9	0.9	3.4	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	0.0	10.0	0.7	4.1	4.2	0.8	0.0	4.4	2.6	9.1	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.0	10.6	14.6	7.1	7.1	35.3	0.0	26.8	31.5	31.7	36.8
LnGrp LOS	B	A	B	B	A	A	D	A	C	C	C	D
Approach Vol, veh/h		777			726			171			674	
Approach Delay, s/veh		10.6			7.4			27.9			33.9	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		56.8		23.2		56.8		23.2				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		19.9		16.0		22.3		16.0				
Green Ext Time (p_c), s		5.2		2.5		3.9		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			17.6									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



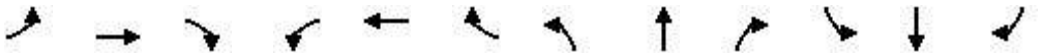
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Future Volume (veh/h)	112	698	37	34	669	38	22	137	10	80	308	299
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1752	1796	1663	1767	1811	1900	1707	1900	1781	1811	1870
Adj Flow Rate, veh/h	119	743	39	39	760	43	26	161	12	89	342	332
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	8	10	7	16	9	6	0	13	0	8	6	2
Cap, veh/h	417	1027	54	282	2010	114	152	398	30	285	460	402
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	646	1650	87	615	3229	183	777	1569	117	1154	1811	1585
Grp Volume(v), veh/h	119	0	782	39	395	408	26	0	173	89	342	332
Grp Sat Flow(s),veh/h/ln	646	0	1736	615	1678	1734	777	0	1686	1154	1811	1585
Q Serve(g_s), s	8.9	0.0	24.8	3.7	9.3	9.3	2.5	0.0	6.8	5.6	13.9	15.8
Cycle Q Clear(g_c), s	18.2	0.0	24.8	28.5	9.3	9.3	16.4	0.0	6.8	12.4	13.9	15.8
Prop In Lane	1.00		0.05	1.00		0.11	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	417	0	1080	282	1044	1079	152	0	428	285	460	402
V/C Ratio(X)	0.29	0.00	0.72	0.14	0.38	0.38	0.17	0.00	0.40	0.31	0.74	0.82
Avail Cap(c_a), veh/h	417	0	1080	282	1044	1079	201	0	533	357	573	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	10.4	20.2	7.5	7.5	35.0	0.0	24.8	30.0	27.4	28.2
Incr Delay (d2), s/veh	1.7	0.0	4.2	1.0	1.0	1.0	0.7	0.0	0.9	0.9	4.8	10.0
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(95%),veh/ln	2.4	0.0	13.7	1.1	5.5	5.6	0.9	0.0	5.0	2.8	10.4	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	0.0	14.6	21.2	8.5	8.5	35.8	0.0	25.7	30.8	32.3	38.1
LnGrp LOS	B	A	B	C	A	A	D	A	C	C	C	D
Approach Vol, veh/h		901			842			199			763	
Approach Delay, s/veh		14.5			9.1			27.0			34.6	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		25.0		55.0		25.0				
Change Period (Y+Rc), s		5.2		* 4.7		5.2		* 4.7				
Max Green Setting (Gmax), s		44.8		* 25		44.8		* 25				
Max Q Clear Time (g_c+I1), s		26.8		17.8		30.5		18.4				
Green Ext Time (p_c), s		5.8		2.5		4.0		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			19.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



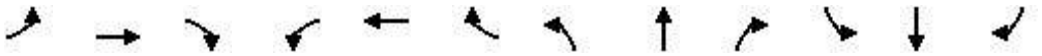
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Future Volume (veh/h)	194	582	40	17	754	26	25	246	12	26	147	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	211	633	43	18	820	28	29	283	14	30	171	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	487	1138	77	435	1928	66	203	377	19	145	386	455
Arrive On Green	0.07	0.68	0.68	0.56	0.56	0.56	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1795	1663	113	733	3423	117	976	1781	88	1099	1826	1598
Grp Volume(v), veh/h	211	0	676	18	416	432	29	0	297	30	171	177
Grp Sat Flow(s),veh/h/ln	1795	0	1776	733	1735	1805	976	0	1869	1099	1826	1598
Q Serve(g_s), s	4.3	0.0	18.4	1.2	13.1	13.1	2.5	0.0	14.1	2.5	7.7	8.5
Cycle Q Clear(g_c), s	4.3	0.0	18.4	8.2	13.1	13.1	10.3	0.0	14.1	16.6	7.7	8.5
Prop In Lane	1.00		0.06	1.00		0.06	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	487	0	1215	435	977	1017	203	0	396	145	386	455
V/C Ratio(X)	0.43	0.00	0.56	0.04	0.43	0.43	0.14	0.00	0.75	0.21	0.44	0.39
Avail Cap(c_a), veh/h	648	0	1215	435	977	1017	307	0	596	263	582	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.1	0.0	7.6	12.7	11.9	11.9	37.0	0.0	35.1	42.9	32.6	27.3
Incr Delay (d2), s/veh	0.9	0.0	1.8	0.2	1.4	1.3	0.5	0.0	4.1	1.0	1.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	0.0	10.5	0.4	8.6	8.9	1.1	0.0	11.1	1.3	6.2	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.9	0.0	9.5	12.8	13.3	13.2	37.5	0.0	39.2	43.9	33.7	28.1
LnGrp LOS	A	A	A	B	B	B	D	A	D	D	C	C
Approach Vol, veh/h		887			866			326			378	
Approach Delay, s/veh		9.4			13.2			39.0			31.9	
Approach LOS		A			B			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		70.2		24.8	11.5	58.7		24.8				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		20.4		18.6	6.3	15.1		16.1				
Green Ext Time (p_c), s		4.2		1.5	0.6	4.5		1.4				

Intersection Summary		
HCM 6th Ctrl Delay		18.1
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



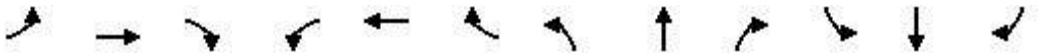
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Future Volume (veh/h)	259	602	41	18	780	75	26	273	12	56	164	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	282	654	45	20	848	82	30	314	14	65	191	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	444	1066	73	369	1578	153	229	455	20	178	464	566
Arrive On Green	0.10	0.64	0.64	0.49	0.49	0.49	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1795	1661	114	717	3196	309	918	1791	80	1069	1826	1598
Grp Volume(v), veh/h	282	0	699	20	460	470	30	0	328	65	191	223
Grp Sat Flow(s),veh/h/ln	1795	0	1776	717	1735	1770	918	0	1871	1069	1826	1598
Q Serve(g_s), s	6.8	0.0	22.1	1.6	17.4	17.4	2.7	0.0	15.1	5.6	8.3	9.9
Cycle Q Clear(g_c), s	6.8	0.0	22.1	9.7	17.4	17.4	10.9	0.0	15.1	20.6	8.3	9.9
Prop In Lane	1.00		0.06	1.00		0.17	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	444	0	1139	369	857	874	229	0	476	178	464	566
V/C Ratio(X)	0.63	0.00	0.61	0.05	0.54	0.54	0.13	0.00	0.69	0.36	0.41	0.39
Avail Cap(c_a), veh/h	557	0	1139	369	857	874	289	0	597	247	582	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	10.1	17.1	16.6	16.6	34.1	0.0	32.0	41.4	29.5	23.0
Incr Delay (d2), s/veh	2.2	0.0	2.5	0.3	2.4	2.4	0.4	0.0	3.1	1.8	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	0.0	12.8	0.5	11.3	11.5	1.1	0.0	11.6	2.7	6.6	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	0.0	12.5	17.4	19.0	18.9	34.4	0.0	35.1	43.1	30.3	23.6
LnGrp LOS	B	A	B	B	B	B	C	A	D	D	C	C
Approach Vol, veh/h		981			950			358			479	
Approach Delay, s/veh		13.0			18.9			35.1			29.0	
Approach LOS		B			B			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		66.1		28.9	14.0	52.1		28.9				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		24.1		22.6	8.8	19.4		17.1				
Green Ext Time (p_c), s		4.4		1.5	0.7	4.6		1.5				

Intersection Summary		
HCM 6th Ctrl Delay		20.7
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Future Volume (veh/h)	292	701	48	20	908	79	30	315	14	60	189	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1796	1811	1796	1826	1900	1767	1885	1900	1900	1826	1885
Adj Flow Rate, veh/h	317	762	52	22	987	86	34	362	16	70	220	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.86	0.86	0.86
Percent Heavy Veh, %	1	7	6	7	5	0	9	1	0	0	5	1
Cap, veh/h	395	1020	70	260	1451	126	236	506	22	178	515	638
Arrive On Green	0.12	0.61	0.61	0.45	0.45	0.45	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1795	1662	113	644	3229	281	870	1792	79	1021	1826	1598
Grp Volume(v), veh/h	317	0	814	22	530	543	34	0	378	70	220	253
Grp Sat Flow(s),veh/h/ln	1795	0	1776	644	1735	1775	870	0	1871	1021	1826	1598
Q Serve(g_s), s	8.4	0.0	31.1	2.4	23.0	23.0	3.2	0.0	17.3	6.3	9.3	10.7
Cycle Q Clear(g_c), s	8.4	0.0	31.1	17.9	23.0	23.0	12.5	0.0	17.3	23.6	9.3	10.7
Prop In Lane	1.00		0.06	1.00		0.16	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	395	0	1089	260	780	798	236	0	528	178	515	638
V/C Ratio(X)	0.80	0.00	0.75	0.08	0.68	0.68	0.14	0.00	0.72	0.39	0.43	0.40
Avail Cap(c_a), veh/h	478	0	1089	260	780	798	268	0	597	216	582	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	13.1	25.0	20.7	20.7	32.9	0.0	30.7	41.3	27.8	20.4
Incr Delay (d2), s/veh	9.0	0.0	4.7	0.6	4.8	4.7	0.4	0.0	4.1	2.0	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.2	0.0	17.8	0.7	14.9	15.2	1.2	0.0	13.0	3.0	7.3	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	0.0	17.8	25.7	25.5	25.4	33.3	0.0	34.8	43.2	28.6	21.0
LnGrp LOS	C	A	B	C	C	C	C	A	C	D	C	C
Approach Vol, veh/h		1131			1095			412			543	
Approach Delay, s/veh		20.1			25.4			34.6			26.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		63.5		31.5	15.6	47.9		31.5				
Change Period (Y+Rc), s		5.2		* 4.7	4.5	5.2		* 4.7				
Max Green Setting (Gmax), s		54.8		* 30	15.5	34.8		* 30				
Max Q Clear Time (g_c+I1), s		33.1		25.6	10.4	25.0		19.3				
Green Ext Time (p_c), s		5.1		1.3	0.7	4.3		1.6				

Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX E
STORAGE LENGTH CALCULATIONS

STORAGE LENGTH CALCULATIONS

DESIGN YEAR 2047 'BUILD' TRAFFIC VOLUMES - AM PEAK HOUR
Scenarios 2 - 6

Central Ave. (SR 37) / Lake St. (US 42)

ANTICIPATED CYCLE LENGTH: 95 SEC.

EB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	112		698		37
% OF APPROACH VOLUME:	13.2%		82.4%		4.4%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	112		698		37
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	3		19		1
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	150		650		50
TOTAL TURN LANE LENGTH:	***200***		***650***		***100***

WB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	34		669		38
% OF APPROACH VOLUME:	4.6%		90.3%		5.1%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	34		669		38
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	1		18		2
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		625		100
TOTAL TURN LANE LENGTH:	***100***		***625***		***150***

NB Lake St. (US 42)

DESIGN SPEED: 25 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	22		137		10
% OF APPROACH VOLUME:	13.0%		81.1%		5.9%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	22		137		10
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	1		4		1
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		175		50
TOTAL TURN LANE LENGTH:	***100***		***175***		***100***

SB Lake St. (US 42)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	80		308		299
% OF APPROACH VOLUME:	11.6%		44.8%		43.5%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	80		308		299
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	3		9		8
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	150		350		325
TOTAL TURN LANE LENGTH:	***200***		***350***		***375***

RECOMMENDED STORAGE LENGTHS INCLUDE 50' DIVERGING TAPER

STORAGE LENGTH CALCULATIONS

DESIGN YEAR 2047 'BUILD' TRAFFIC VOLUMES - PM PEAK HOUR
Scenarios 2 - 6

Central Ave. (SR 37) / Lake St. (US 42)

ANTICIPATED CYCLE LENGTH: 95 SEC.

EB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	292		701		48
% OF APPROACH VOLUME:	28.0%		67.3%		4.6%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	292		701		48
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	8		19		2
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	325		650		100
TOTAL TURN LANE LENGTH:	***375***		***650***		***150***

WB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	20		908		79
% OF APPROACH VOLUME:	2.0%		90.2%		7.8%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	20		908		79
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	1		24		3
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		800		150
TOTAL TURN LANE LENGTH:	***100***		***800***		***200***

NB Lake St. (US 42)

DESIGN SPEED: 25 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	30		315		14
% OF APPROACH VOLUME:	8.4%		87.7%		3.9%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	30		315		14
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	1		9		1
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		350		50
TOTAL TURN LANE LENGTH:	***100***		***350***		***100***

SB Lake St. (US 42)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	60		189		218
% OF APPROACH VOLUME:	8.7%		27.5%		31.7%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	60		189		218
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	2		5		6
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	100		200		250
TOTAL TURN LANE LENGTH:	***150***		***200***		***300***

RECOMMENDED STORAGE LENGTHS INCLUDE 50' DIVERGING TAPER

STORAGE LENGTH CALCULATIONS

DESIGN YEAR 2047 'BUILD' TRAFFIC VOLUMES - AM PEAK HOUR
Scenarios 7 - 10A

Central Ave. (SR 37) / Lake St. (US 42)

ANTICIPATED CYCLE LENGTH: 95 SEC.

EB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	112		698		37
% OF APPROACH VOLUME:	13.2%		82.4%		4.4%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	112		698		37
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	3		19		1
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	150		650		50
TOTAL TURN LANE LENGTH:	***200***		***650***		***100***

WB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	34		669		38
% OF APPROACH VOLUME:	4.6%		90.3%		5.1%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	34		669		38
NUMBER OF LANES:	1		2		1
VEHICLES PER CYCLE:	1		9		2
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		350		100
TOTAL TURN LANE LENGTH:	***100***		***350***		***150***

NB Lake St. (US 42)

DESIGN SPEED: 25 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	22		137		10
% OF APPROACH VOLUME:	13.0%		81.1%		5.9%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	22		137		10
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	1		4		1
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		175		50
TOTAL TURN LANE LENGTH:	***100***		***175***		***100***

SB Lake St. (US 42)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	80		308		299
% OF APPROACH VOLUME:	11.6%		44.8%		43.5%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	80		308		299
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	3		9		8
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	150		350		325
TOTAL TURN LANE LENGTH:	***200***		***350***		***375***

RECOMMENDED STORAGE LENGTHS INCLUDE 50' DIVERGING TAPER

STORAGE LENGTH CALCULATIONS

DESIGN YEAR 2047 'BUILD' TRAFFIC VOLUMES - PM PEAK HOUR
Scenarios 7 - 10A

Central Ave. (SR 37) / Lake St. (US 42)

ANTICIPATED CYCLE LENGTH: 95 SEC.

EB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	292		701		48
% OF APPROACH VOLUME:	28.0%		67.3%		4.6%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	292		701		48
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	8		19		2
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	325		650		100
TOTAL TURN LANE LENGTH:	***375***		***650***		***150***

WB Central Ave. (SR 37)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	20		908		79
% OF APPROACH VOLUME:	2.0%		90.2%		7.8%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	20		908		79
NUMBER OF LANES:	1		2		1
VEHICLES PER CYCLE:	1		12		3
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		450		150
TOTAL TURN LANE LENGTH:	***100***		***450***		***200***

NB Lake St. (US 42)

DESIGN SPEED: 25 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	30		315		14
% OF APPROACH VOLUME:	8.4%		87.7%		3.9%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	30		315		14
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	1		9		1
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	50		350		50
TOTAL TURN LANE LENGTH:	***100***		***350***		***100***

SB Lake St. (US 42)

DESIGN SPEED: 35 MPH

MOVEMENT:	LEFT		THRU		RIGHT
VOLUME:	60		189		218
% OF APPROACH VOLUME:	8.7%		27.5%		31.7%
LANE GROUP:	LEFT		THRU		RIGHT
LANE GROUP VOLUME:	60		189		218
NUMBER OF LANES:	1		1		1
VEHICLES PER CYCLE:	2		5		6
CONTROLLING LANE GROUP:	X				X
TAPER LENGTH:	50				50
STORAGE LENGTH:	100		200		250
TOTAL TURN LANE LENGTH:	***150***		***200***		***300***

RECOMMENDED STORAGE LENGTHS INCLUDE 50' DIVERGING TAPER

APPENDIX F
QUEUE ANALYSIS

'NO-BUILD' CONDITIONS

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	99	483	110	360	239	482	145
Average Queue (ft)	30	158	16	181	103	218	116
95th Queue (ft)	68	319	63	306	194	390	183
Link Distance (ft)		1534		3444	900	2367	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		3	0	29		29	1
Queuing Penalty (veh)		2	0	8		59	2

Network Summary

Network wide Queuing Penalty: 71

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	309	385	109	429	435	2024	145
Average Queue (ft)	52	138	15	261	159	1121	140
95th Queue (ft)	144	255	61	419	334	2241	161
Link Distance (ft)		1534		3444	900	2367	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)	0	1	0	36		56	8
Queuing Penalty (veh)	0	1	0	10		150	26

Network Summary

Network wide Queuing Penalty: 188

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	310	617	109	657	412	2419	145
Average Queue (ft)	77	209	29	346	154	2351	139
95th Queue (ft)	192	424	83	580	342	2587	183
Link Distance (ft)		1534		3444	900	2367	
Upstream Blk Time (%)						82	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		7	0	38		70	9
Queuing Penalty (veh)		8	2	13		211	34

Network Summary

Network wide Queuing Penalty: 267

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	148	402	108	830	584	909	145
Average Queue (ft)	82	118	13	369	314	405	110
95th Queue (ft)	144	241	61	713	515	794	198
Link Distance (ft)		1534		3444	900	2367	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		1	0	36		54	6
Queuing Penalty (veh)		2	0	6		84	10

Network Summary

Network wide Queuing Penalty: 102

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	310	1204	110	1939	716	2419	145
Average Queue (ft)	219	332	13	1122	385	1572	93
95th Queue (ft)	364	847	48	2103	658	3056	206
Link Distance (ft)		1534		3444	900	2367	
Upstream Blk Time (%)						50	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)	26	4		47		86	5
Queuing Penalty (veh)	174	9		8		166	11

Network Summary

Network wide Queuing Penalty: 369

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	310	1586	23	3507	934	2419	145
Average Queue (ft)	268	1082	8	2255	738	2024	111
95th Queue (ft)	390	2103	24	4184	1178	2771	202
Link Distance (ft)		1534		3444	900	2367	
Upstream Blk Time (%)		32		38	65	51	
Queuing Penalty (veh)		0		0	0	0	
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)	51	11		50		85	1
Queuing Penalty (veh)	383	31		10		185	3

Network Summary

Network wide Queuing Penalty: 613

'SCENARIO 1'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	102	397	109	243	218	328	145
Average Queue (ft)	37	141	18	137	114	171	114
95th Queue (ft)	73	295	64	251	193	294	182
Link Distance (ft)		312		3427	900	2383	
Upstream Blk Time (%)		1					
Queuing Penalty (veh)		0					
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		2	1	19		20	2
Queuing Penalty (veh)		1	7	5		39	6

Network Summary

Network wide Queuing Penalty: 59

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	182	303	109	368	408	1058	145
Average Queue (ft)	52	159	20	202	127	387	136
95th Queue (ft)	125	283	68	335	249	835	170
Link Distance (ft)		312		3427	900	2383	
Upstream Blk Time (%)		0					
Queuing Penalty (veh)		0					
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		1	1	27		36	12
Queuing Penalty (veh)		1	4	8		96	41

Network Summary

Network wide Queuing Penalty: 149

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	310	357	110	636	343	1131	145
Average Queue (ft)	112	204	24	298	146	733	139
95th Queue (ft)	250	326	73	514	258	1121	173
Link Distance (ft)		312		3427	900	2383	
Upstream Blk Time (%)	0	1					
Queuing Penalty (veh)	0	0					
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		3	1	35		49	20
Queuing Penalty (veh)		3	6	12		148	76

Network Summary

Network wide Queuing Penalty: 245

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	126	273	110	996	368	912	145
Average Queue (ft)	79	119	9	565	184	236	92
95th Queue (ft)	125	220	45	946	297	610	184
Link Distance (ft)		312		3427	900	2383	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	250		60				125
Storage Blk Time (%)		0	0	48		29	1
Queuing Penalty (veh)		1	0	8		47	2

Network Summary

Network wide Queuing Penalty: 58

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	B32	WB	WB	NB	SB	SB
Directions Served	L	TR	T	L	TR	LTR	LT	R
Maximum Queue (ft)	309	384	166	109	3461	564	2446	145
Average Queue (ft)	160	173	6	4	2322	300	1586	99
95th Queue (ft)	272	335	57	21	3886	524	3041	207
Link Distance (ft)		312	576		3427	900	2383	
Upstream Blk Time (%)	0	1			4		40	
Queuing Penalty (veh)	0	0			0		0	
Storage Bay Dist (ft)	250			60				125
Storage Blk Time (%)	1	3		0	55		81	4
Queuing Penalty (veh)	4	7		0	10		157	9

Network Summary

Network wide Queuing Penalty: 186

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	B32	WB	WB	NB	SB	SB
Directions Served	L	TR	T	L	TR	LTR	LT	R
Maximum Queue (ft)	310	408	628	109	3479	915	2422	145
Average Queue (ft)	194	236	61	19	2888	653	1681	118
95th Queue (ft)	313	401	291	72	4364	1032	3160	206
Link Distance (ft)		312	576		3427	900	2383	
Upstream Blk Time (%)	0	4	1		59	1	54	
Queuing Penalty (veh)	0	0	0		0	0	0	
Storage Bay Dist (ft)	250			60				125
Storage Blk Time (%)	7	6		2	55		84	1
Queuing Penalty (veh)	49	16		21	11		183	3

Network Summary

Network wide Queuing Penalty: 283

'SCENARIO 2'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	116	385	109	312	72	139	351	145
Average Queue (ft)	46	167	26	153	19	77	182	119
95th Queue (ft)	94	308	82	267	49	131	290	185
Link Distance (ft)		1561		3408		898	2380	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		60		100			125
Storage Blk Time (%)		3	1	21		5	16	2
Queuing Penalty (veh)		3	5	6		1	33	4

Network Summary

Network wide Queuing Penalty: 51

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	204	449	110	397	91	134	951	145
Average Queue (ft)	84	184	18	195	19	69	417	133
95th Queue (ft)	165	299	65	330	56	129	812	178
Link Distance (ft)		1561		3408		898	2380	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		60		100			125
Storage Blk Time (%)		3	0	26	0	5	36	8
Queuing Penalty (veh)		3	0	8	0	1	97	28

Network Summary

Network wide Queuing Penalty: 137

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	309	444	108	484	48	155	2414	145
Average Queue (ft)	103	233	26	244	18	79	1365	140
95th Queue (ft)	221	368	72	429	45	148	2688	172
Link Distance (ft)		1561		3408		898	2380	
Upstream Blk Time (%)							4	
Queuing Penalty (veh)							0	
Storage Bay Dist (ft)	250		60		100			125
Storage Blk Time (%)		5	3	31		5	49	18
Queuing Penalty (veh)		6	20	10		1	146	70

Network Summary

Network wide Queuing Penalty: 254

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	180	272	110	898	70	367	420	145
Average Queue (ft)	98	145	13	414	18	164	165	102
95th Queue (ft)	159	226	51	776	54	291	335	178
Link Distance (ft)		1561		3408		898	2380	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		60		100			125
Storage Blk Time (%)		0	1	40		26	18	1
Queuing Penalty (veh)		1	8	7		7	30	1

Network Summary

Network wide Queuing Penalty: 54

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	308	323	110	2937	149	332	2108	145
Average Queue (ft)	131	142	17	1859	36	186	981	115
95th Queue (ft)	221	208	63	3503	113	304	1813	206
Link Distance (ft)		1561		3408		898	2380	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		60		100			125
Storage Blk Time (%)	0	1	0	53		33	75	3
Queuing Penalty (veh)	1	2	0	9		9	142	7

Network Summary

Network wide Queuing Penalty: 170

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	R
Maximum Queue (ft)	310	482	109	3471	149	354	2432	145
Average Queue (ft)	183	237	20	2568	30	203	1809	109
95th Queue (ft)	313	410	75	4249	101	326	2867	206
Link Distance (ft)		1561		3408		898	2380	
Upstream Blk Time (%)				54			45	
Queuing Penalty (veh)				0			0	
Storage Bay Dist (ft)	250		60		100			125
Storage Blk Time (%)	5	6	0	54		40	84	4
Queuing Penalty (veh)	44	17	0	11		12	183	9

Network Summary

Network wide Queuing Penalty: 276

'SCENARIO 3'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	109	284	109	355	87	159	72	240	158
Average Queue (ft)	43	140	22	135	20	80	29	145	78
95th Queue (ft)	90	255	72	267	56	143	62	210	132
Link Distance (ft)		1548		3445		898		2379	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		60		100		150		215
Storage Blk Time (%)		1	0	16	0	7		6	
Queuing Penalty (veh)		1	2	5	0	1		14	

Network Summary

Network wide Queuing Penalty: 23

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	178	381	48	370	88	189	200	291	264
Average Queue (ft)	69	148	14	173	20	79	62	151	126
95th Queue (ft)	139	248	41	311	56	151	143	249	242
Link Distance (ft)		1548		3445		898		2379	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		60		100		150		215
Storage Blk Time (%)		1	0	21	0	6		9	0
Queuing Penalty (veh)		1	0	6	0	1		29	0

Network Summary

Network wide Queuing Penalty: 38

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	302	384	109	442	68	161	200	562	265
Average Queue (ft)	75	177	30	194	22	82	101	238	163
95th Queue (ft)	166	289	80	353	54	154	211	435	301
Link Distance (ft)		1548		3445		898		2379	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		60		100		150		215
Storage Blk Time (%)		2	1	23		6	0	23	4
Queuing Penalty (veh)		3	9	8		1	0	86	16

Network Summary

Network wide Queuing Penalty: 123

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	156	237	109	819	149	326	50	221	136
Average Queue (ft)	93	137	13	407	20	167	29	95	66
95th Queue (ft)	154	218	52	724	73	287	50	174	123
Link Distance (ft)		1548		3445		898		2379	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		60		100		150		215
Storage Blk Time (%)		0	1	40		26		3	
Queuing Penalty (veh)		0	8	7		7		5	

Network Summary

Network wide Queuing Penalty: 27

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	256	275	109	2949	149	350	172	176	159
Average Queue (ft)	133	134	19	1805	38	190	67	99	80
95th Queue (ft)	223	198	73	3431	115	312	137	166	146
Link Distance (ft)		1548		3445		898		2379	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		60		100		150		215
Storage Blk Time (%)	0	0		52		35	2	2	
Queuing Penalty (veh)	1	1		9		9	8	5	

Network Summary

Network wide Queuing Penalty: 34

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	309	481	110	3508	149	354	184	220	240
Average Queue (ft)	190	234	19	2582	40	209	96	115	88
95th Queue (ft)	312	410	67	4296	117	336	180	212	169
Link Distance (ft)		1548		3445		898		2379	
Upstream Blk Time (%)				53					
Queuing Penalty (veh)				0					
Storage Bay Dist (ft)	250		60		100		150		215
Storage Blk Time (%)	7	6	0	54		44	13	6	1
Queuing Penalty (veh)	53	17	0	11		13	51	16	1

Network Summary

Network wide Queuing Penalty: 162

'SCENARIO 4'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	112	280	109	353	83	136	100	75	288	265
Average Queue (ft)	44	136	21	131	18	71	13	30	146	77
95th Queue (ft)	93	247	71	260	53	127	57	66	212	130
Link Distance (ft)		1560		3439		895			2381	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		60		100		50	150		215
Storage Blk Time (%)		1	1	16	0	22			7	
Queuing Penalty (veh)		0	4	5	0	6			15	

Network Summary

Network wide Queuing Penalty: 29

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	177	380	47	366	84	135	94	199	291	264
Average Queue (ft)	70	146	13	168	18	68	11	61	150	128
95th Queue (ft)	143	249	38	307	52	126	53	142	242	243
Link Distance (ft)		1560		3439		895			2381	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		60		100		50	150		215
Storage Blk Time (%)		1	0	20	0	24	0		8	0
Queuing Penalty (veh)		1	0	6	0	7	0		28	1

Network Summary

Network wide Queuing Penalty: 43

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	302	409	108	440	63	157	50	200	518	265
Average Queue (ft)	76	184	26	191	19	76	8	91	218	161
95th Queue (ft)	165	297	69	361	49	145	31	194	379	299
Link Distance (ft)		1560		3439		895			2381	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		60		100		50	150		215
Storage Blk Time (%)		3	1	21		22	0	0	20	3
Queuing Penalty (veh)		3	8	7		7	0	0	75	14

Network Summary

Network wide Queuing Penalty: 115

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	197	257	108	797	149	373	100	49	222	137
Average Queue (ft)	98	141	13	379	18	166	18	28	94	65
95th Queue (ft)	171	227	51	676	69	299	74	47	173	122
Link Distance (ft)		1560		3439		895			2381	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		60		100		50	150		215
Storage Blk Time (%)		0	1	38		46	0		3	
Queuing Penalty (veh)		0	9	7		17	0		5	

Network Summary

Network wide Queuing Penalty: 38

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	300	387	109	3502	150	351	100	135	161	188
Average Queue (ft)	164	189	13	2022	29	180	23	78	100	86
95th Queue (ft)	290	338	49	4123	94	306	89	138	158	157
Link Distance (ft)		1560		3439		895			2381	
Upstream Blk Time (%)				30						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	250		60		100		50	150		215
Storage Blk Time (%)	4	1	0	52	0	57	0	0	1	
Queuing Penalty (veh)	28	3	0	10	0	23	2	0	3	

Network Summary

Network wide Queuing Penalty: 68

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	309	882	110	3502	149	377	100	134	220	238
Average Queue (ft)	191	256	19	2579	26	203	20	70	109	90
95th Queue (ft)	305	531	66	4304	78	336	80	115	198	166
Link Distance (ft)		1560		3439		895			2381	
Upstream Blk Time (%)				54						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	250		60		100		50	150		215
Storage Blk Time (%)	2	8	0	54	0	62	1	0	5	1
Queuing Penalty (veh)	17	24	0	11	0	27	2	0	14	2

Network Summary

Network wide Queuing Penalty: 96

'SCENARIO 5'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	114	263	150	66	369	194	102	160	66	237	255
Average Queue (ft)	43	128	9	16	135	15	26	82	25	138	66
95th Queue (ft)	93	226	55	47	263	97	68	145	56	204	117
Link Distance (ft)		1548			3425			899		2361	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		100	150		150	100		150		215
Storage Blk Time (%)		9			4		2	7		6	
Queuing Penalty (veh)		10			2		2	1		13	

Network Summary

Network wide Queuing Penalty: 29

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	179	331	150	50	373	200	94	162	198	235	258
Average Queue (ft)	66	137	16	14	160	18	25	80	53	140	103
95th Queue (ft)	137	230	79	42	299	102	65	146	123	224	205
Link Distance (ft)		1548			3425			899		2361	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		100	150		150	100		150		215
Storage Blk Time (%)		11			6		0	7		8	0
Queuing Penalty (veh)		14			4		1	1		26	0

Network Summary

Network wide Queuing Penalty: 46

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	264	332	150	199	448	199	54	162	199	502	265
Average Queue (ft)	69	171	16	30	181	10	23	83	80	200	143
95th Queue (ft)	145	281	80	94	340	71	50	152	182	349	283
Link Distance (ft)		1548			3425			899		2361	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		100	150		150	100		150		215
Storage Blk Time (%)		16		0	10			7	0	19	4
Queuing Penalty (veh)		23		0	7			2	0	71	15

Network Summary

Network wide Queuing Penalty: 118

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	178	238	143	69	546	200	149	327	46	214	126
Average Queue (ft)	92	132	16	10	296	39	26	168	24	86	58
95th Queue (ft)	155	210	78	36	475	162	90	293	42	164	115
Link Distance (ft)		1548			3425			899		2361	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		100	150		150	100		150		215
Storage Blk Time (%)		13			27			28		3	
Queuing Penalty (veh)		31			12			7		5	

Network Summary

Network wide Queuing Penalty: 55

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	264	285	149	44	1461	200	149	348	170	181	168
Average Queue (ft)	128	132	11	14	696	77	35	188	66	90	73
95th Queue (ft)	201	197	59	36	1442	218	106	311	140	157	142
Link Distance (ft)		1548			3425			899		2361	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215		100	150		150	100		150		215
Storage Blk Time (%)	0	11			38			36	2	2	
Queuing Penalty (veh)	2	32			35			9	9	4	

Network Summary

Network wide Queuing Penalty: 93

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	242	311	150	200	3477	200	150	372	199	283	257
Average Queue (ft)	140	182	19	44	2435	88	41	200	89	116	80
95th Queue (ft)	220	290	80	160	4172	239	118	331	172	205	160
Link Distance (ft)		1548			3425			899		2361	
Upstream Blk Time (%)					37						
Queuing Penalty (veh)					0						
Storage Bay Dist (ft)	215		100	150		150	100		150		215
Storage Blk Time (%)	1	17			53			43	8	2	1
Queuing Penalty (veh)	4	56			52			13	33	6	2

Network Summary

Network wide Queuing Penalty: 167

'SCENARIO 6'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	126	243	150	62	323	36	91	195	31	199	271	265
Average Queue (ft)	50	128	28	14	121	3	21	71	7	32	111	57
95th Queue (ft)	102	225	111	41	239	16	61	130	27	94	203	134
Link Distance (ft)		1561			3433			896			2372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		100	140		150	100		50	150		215
Storage Blk Time (%)		9			4		1	20	0		4	
Queuing Penalty (veh)		10			2		2	5	0		10	

Network Summary

Network wide Queuing Penalty: 28

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	265	303	147	63	222	36	143	150	88	134	213	176
Average Queue (ft)	82	128	16	12	131	5	24	76	8	43	104	67
95th Queue (ft)	184	236	77	38	214	18	73	131	41	97	174	132
Link Distance (ft)		1561			3433			896			2372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		100	140		150	100		50	150		215
Storage Blk Time (%)	0	10			6			24	0	0	2	
Queuing Penalty (veh)	1	13			4			7	1	0	7	

Network Summary

Network wide Queuing Penalty: 32

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	264	330	150	190	443	200	52	162	31	200	499	265
Average Queue (ft)	70	169	17	26	184	16	20	79	7	88	206	144
95th Queue (ft)	147	280	80	89	353	99	46	150	27	193	372	283
Link Distance (ft)		1561			3433			896			2372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		100	140		150	100		50	150		215
Storage Blk Time (%)		15		0	10			24	0	0	20	4
Queuing Penalty (veh)		23		0	8			8	0	0	77	17

Network Summary

Network wide Queuing Penalty: 133

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	177	238	150	67	504	200	149	326	100	45	214	126
Average Queue (ft)	92	132	12	9	294	32	27	163	22	23	86	57
95th Queue (ft)	152	211	61	34	468	144	91	291	83	40	164	115
Link Distance (ft)		1561			3433			896			2372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		100	140		150	100		50	150		215
Storage Blk Time (%)		13			27			44	0		3	
Queuing Penalty (veh)		31			12			16	0		5	

Network Summary

Network wide Queuing Penalty: 64

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	240	266	149	189	1587	200	149	332	100	130	168	168
Average Queue (ft)	134	135	11	37	754	87	38	175	21	52	86	74
95th Queue (ft)	223	199	58	141	1559	234	117	288	82	104	149	144
Link Distance (ft)		1561			3433			896			2372	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	215		100	140		150	100		50	150		215
Storage Blk Time (%)	2	12			40			55	0		2	
Queuing Penalty (veh)	13	36			37			21	0		4	

Network Summary

Network wide Queuing Penalty: 111

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	265	904	150	44	3496	200	149	355	100	197	777	264
Average Queue (ft)	178	306	30	11	2048	45	42	196	23	92	179	91
95th Queue (ft)	290	660	112	33	4244	166	121	312	89	184	487	205
Link Distance (ft)		1561			3433			896			2372	
Upstream Blk Time (%)					34							
Queuing Penalty (veh)					0							
Storage Bay Dist (ft)	215		100	140		150	100		50	150		215
Storage Blk Time (%)	11	21			52		0	61	0	20	7	1
Queuing Penalty (veh)	90	71			51		0	27	0	80	18	3

Network Summary

Network wide Queuing Penalty: 340

'SCENARIO 7'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	54	241	101	156	178	64	150	271	260
Average Queue (ft)	29	154	22	51	61	14	73	169	62
95th Queue (ft)	60	255	60	112	130	42	119	245	136
Link Distance (ft)		1566		676	676		898	2355	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	268		170			100			215
Storage Blk Time (%)				0			4	2	
Queuing Penalty (veh)				0			1	4	

Network Summary

Network wide Queuing Penalty: 5

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	98	379	61	116	173	149	195	350	265
Average Queue (ft)	50	165	16	71	76	25	99	189	97
95th Queue (ft)	89	310	46	111	145	84	162	307	219
Link Distance (ft)		1566		676	676		898	2355	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	268		170			100			215
Storage Blk Time (%)		1					6	8	
Queuing Penalty (veh)		2					1	22	

Network Summary

Network wide Queuing Penalty: 25

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	318	566	103	188	184	88	221	608	265
Average Queue (ft)	56	265	33	81	91	19	107	334	177
95th Queue (ft)	149	451	73	139	157	54	192	623	347
Link Distance (ft)		1566		676	676		898	2355	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	268		170			100			215
Storage Blk Time (%)		9		0		0	8	31	
Queuing Penalty (veh)		10		0		0	2	92	

Network Summary

Network wide Queuing Penalty: 105

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	131	340	46	206	231	150	390	308	265
Average Queue (ft)	66	153	9	102	124	22	156	123	54
95th Queue (ft)	107	270	29	164	200	85	278	239	152
Link Distance (ft)		1566		676	676		898	2355	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	268		170			100			215
Storage Blk Time (%)		1		1			25	5	
Queuing Penalty (veh)		2		0			6	10	

Network Summary

Network wide Queuing Penalty: 18

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	318	419	45	296	301	149	310	1418	265
Average Queue (ft)	113	189	13	157	181	19	146	481	139
95th Queue (ft)	222	334	37	245	272	68	260	1208	319
Link Distance (ft)		1566		676	676		898	2355	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	268		170			100			215
Storage Blk Time (%)		2		6			22	38	0
Queuing Penalty (veh)		4		1			6	76	1

Network Summary

Network wide Queuing Penalty: 88

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	317	439	61	373	404	149	297	1918	265
Average Queue (ft)	155	239	20	195	219	32	171	943	215
95th Queue (ft)	295	376	48	318	315	108	261	1862	364
Link Distance (ft)		1566		676	676		898	2355	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	268		170			100			215
Storage Blk Time (%)		5		12		0	33	68	
Queuing Penalty (veh)		14		2		0	10	146	

Network Summary

Network wide Queuing Penalty: 172

'SCENARIO 8'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	94	266	150	64	102	139	53	160	328	265
Average Queue (ft)	38	139	26	17	51	62	12	80	136	62
95th Queue (ft)	80	239	100	51	92	115	39	146	229	132
Link Distance (ft)		1576			669	669		899	2371	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		100	170			100			215
Storage Blk Time (%)		10						5	2	
Queuing Penalty (veh)		11						1	4	

Network Summary

Network wide Queuing Penalty: 16

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	155	329	139	65	153	182	72	199	412	265
Average Queue (ft)	45	149	13	13	62	75	15	97	182	112
95th Queue (ft)	99	253	41	39	124	136	44	175	314	261
Link Distance (ft)		1576			669	669		899	2371	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		100	170			100			215
Storage Blk Time (%)		12			0			8	9	0
Queuing Penalty (veh)		16			0			1	23	0

Network Summary

Network wide Queuing Penalty: 41

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	317	632	150	90	142	168	75	160	647	265
Average Queue (ft)	77	242	25	21	76	94	27	88	268	162
95th Queue (ft)	218	447	100	53	125	150	62	151	470	316
Link Distance (ft)		1576			669	669		899	2371	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		100	170			100			215
Storage Blk Time (%)	0	26						8	17	1
Queuing Penalty (veh)	0	39						2	51	3

Network Summary

Network wide Queuing Penalty: 95

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	137	314	150	24	224	226	143	243	229	72
Average Queue (ft)	67	148	15	8	113	133	18	142	115	39
95th Queue (ft)	109	271	65	25	193	212	68	229	186	71
Link Distance (ft)		1576			669	669		899	2371	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		100	170			100			215
Storage Blk Time (%)		12			2			25	0	
Queuing Penalty (veh)		29			0			6	1	

Network Summary

Network wide Queuing Penalty: 36

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	317	557	150	45	345	333	149	294	597	265
Average Queue (ft)	96	161	18	11	160	174	24	142	185	94
95th Queue (ft)	169	326	68	36	270	268	76	248	392	234
Link Distance (ft)		1576			669	669		899	2371	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		100	170			100			215
Storage Blk Time (%)		14			6			22	13	
Queuing Penalty (veh)		42			1			6	30	

Network Summary

Network wide Queuing Penalty: 79

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	317	431	150	218	344	388	149	475	691	265
Average Queue (ft)	154	237	36	28	190	221	38	175	298	152
95th Queue (ft)	310	398	126	96	294	327	104	312	562	317
Link Distance (ft)		1576			669	669		899	2371	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		100	170			100			215
Storage Blk Time (%)		23	0		11		2	29	28	
Queuing Penalty (veh)		78	1		2		7	9	60	

Network Summary

Network wide Queuing Penalty: 157

'SCENARIO 9'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	92	264	150	63	148	143	49	216	73	244	94
Average Queue (ft)	30	124	24	16	56	70	18	72	29	119	52
95th Queue (ft)	62	218	98	46	116	128	47	137	63	188	82
Link Distance (ft)		1570			670	670		899		2363	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	268		100	170			100		150		215
Storage Blk Time (%)		10						5		2	
Queuing Penalty (veh)		11						1		6	

Network Summary

Network wide Queuing Penalty: 18

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	189	346	150	62	185	200	72	180	117	269	264
Average Queue (ft)	37	130	16	19	75	86	15	78	49	133	68
95th Queue (ft)	93	241	64	46	140	159	48	136	89	210	144
Link Distance (ft)		1570			670	670		899		2363	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	268		100	170			100		150		215
Storage Blk Time (%)		10			0			7		4	
Queuing Penalty (veh)		14			0			1		16	

Network Summary

Network wide Queuing Penalty: 31

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	318	454	150	93	204	216	70	223	199	361	265
Average Queue (ft)	57	202	6	26	85	92	21	94	62	145	98
95th Queue (ft)	181	359	22	60	153	161	55	167	128	253	202
Link Distance (ft)		1570			670	670		899		2363	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	268		100	170			100		150		215
Storage Blk Time (%)		18			0			11		9	0
Queuing Penalty (veh)		26			0			2		33	0

Network Summary

Network wide Queuing Penalty: 62

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	153	255	47	219	255	306	149	323	141	185	115
Average Queue (ft)	77	139	6	16	122	134	27	178	74	83	49
95th Queue (ft)	127	241	30	85	207	232	79	288	138	153	94
Link Distance (ft)		1570			670	670		899		2363	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	268		100	170			100		150		215
Storage Blk Time (%)		11			2		0	31	0	1	
Queuing Penalty (veh)		31			0		0	8	2	3	

Network Summary

Network wide Queuing Penalty: 44

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	156	240	142	47	255	275	149	288	95	160	133
Average Queue (ft)	74	128	12	13	119	139	33	167	55	77	52
95th Queue (ft)	127	226	58	39	207	230	105	259	90	140	108
Link Distance (ft)		1570			670	670		899		2363	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	268		100	170			100		150		215
Storage Blk Time (%)		9			2		0	31		0	
Queuing Penalty (veh)		27			0		0	8		1	

Network Summary

Network wide Queuing Penalty: 37

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	201	362	150	91	291	318	149	292	200	596	265
Average Queue (ft)	106	169	26	17	167	194	44	179	104	175	97
95th Queue (ft)	188	298	99	49	259	282	112	281	209	437	233
Link Distance (ft)		1570			670	670		899		2363	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	268		100	170			100		150		215
Storage Blk Time (%)		17			8			38	26	6	
Queuing Penalty (veh)		57			2			12	110	19	

Network Summary

Network wide Queuing Penalty: 199

SCENARIO 10'

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	85	232	84	141	124	46	173	199	223	94
Average Queue (ft)	31	129	21	51	53	13	93	27	117	54
95th Queue (ft)	63	222	58	112	111	37	164	89	183	86
Link Distance (ft)		1570		670	670		898		2363	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		170			100		150		215
Storage Blk Time (%)							6		3	
Queuing Penalty (veh)							1		8	

Network Summary

Network wide Queuing Penalty: 9

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	210	268	66	125	144	149	158	136	193	130
Average Queue (ft)	47	129	15	60	73	11	78	46	122	64
95th Queue (ft)	112	203	44	107	125	31	137	88	183	101
Link Distance (ft)		1570		670	670		898		2363	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		170			100		150		215
Storage Blk Time (%)		0					5	0	3	
Queuing Penalty (veh)		0					1	0	10	

Network Summary

Network wide Queuing Penalty: 11

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	317	579	71	204	210	47	185	111	260	259
Average Queue (ft)	54	233	25	79	88	19	98	52	136	91
95th Queue (ft)	149	427	60	145	163	44	164	106	223	180
Link Distance (ft)		1570		670	670		898		2363	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		170			100		150		215
Storage Blk Time (%)		6		0			10		6	0
Queuing Penalty (veh)		7		0			2		22	0

Network Summary

Network wide Queuing Penalty: 32

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	317	419	26	219	230	149	264	71	163	74
Average Queue (ft)	70	146	6	113	135	32	154	32	73	41
95th Queue (ft)	128	272	23	172	203	104	241	65	134	69
Link Distance (ft)		1570		670	670		898		2363	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		170			100		150		215
Storage Blk Time (%)		1		1			29		1	
Queuing Penalty (veh)		2		0			7		1	

Network Summary

Network wide Queuing Penalty: 11

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	317	339	46	255	276	149	302	95	208	167
Average Queue (ft)	94	149	12	125	157	33	149	44	75	52
95th Queue (ft)	176	255	36	194	236	96	240	74	152	106
Link Distance (ft)		1570		670	670		898		2363	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		170			100		150		215
Storage Blk Time (%)		1		2			24		1	
Queuing Penalty (veh)		3		0			6		3	

Network Summary

Network wide Queuing Penalty: 12

Intersection: 9: Lake St (US 42) & Central Ave (SR 37)

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	317	411	220	324	363	149	332	174	160	173
Average Queue (ft)	139	210	29	181	206	30	166	73	91	62
95th Queue (ft)	260	370	100	286	331	85	268	143	143	121
Link Distance (ft)		1570		670	670		898		2363	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	268		170			100		150		215
Storage Blk Time (%)		4		9		0	27	2	1	
Queuing Penalty (veh)		12		2		0	8	8	3	

Network Summary

Network wide Queuing Penalty: 34

APPENDIX G
COST ESTIMATES

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 1

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	1	EACH	$500	$500
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC. RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,500**
	RIGHT OF WAY				
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	1	EACH	$25,000	$25,000
	RIGHT OF WAY SUBTOTAL:				**$25,000**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$325,500**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$48,825**
	DESIGN CONTINGENCY COSTS:	(20% OF CONSTR. & R/W COST)			**$65,100**
	PROJECT SUBTOTAL:				**$439,425**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$87,885**
	TOTAL:				**$527,310**

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Central Avenue/Lake Street - Intersection Alternatives Study November 2023
SCENARIO 2

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$5,000	$5,000
202	PAVEMENT REMOVED	100	SY	$15	$1,500
202	PAVEMENT PLANING	2,000	SY	$4	$8,000
202	CURB REMOVED	150	FT	$7	$1,050
202	WALK REMOVED	1,600	SF	$5	$8,000
203	EXCAVATION & EMBANKMENT	60	CY	$35	$2,100
608	4" CONCRETE SIDEWALK	1,600	SF	$10	$16,000
608	ADA RAMP	6	EACH	$1,250	$7,500
609	CURB, TYPE 6	150	FT	$30	$4,500
659	SEEDING & MULCHING	150	SY	$10	$1,500
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$1,000	$1,000
832	EROSION CONTROL	1	LS	$3,500	$3,500
	ROADWAY SUBTOTAL:				**$59,650**
	DRAINAGE				
202	CATCH BASIN REMOVED	1	EACH	$750	$750
202	PIPE REMOVED 24" AND UNDER	10	FT	$25	$250
605	UNDERDRAINS	150	FT	$20	$3,000
611	CATCH BASIN NO. 3A	1	EA	$3,000	$3,000
611	STORM CONDUIT	20	FT	$100	$2,000
611	MANHOLE ADJUSTED TO GRADE	4	EACH	$850	$3,400
	DRAINAGE SUBTOTAL:				**$12,400**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	1	EACH	$5,000	$5,000
	WATER WORK SUBTOTAL:				**$5,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	30	CY	$85	$2,550
407	TACK COAT	300	GAL	$5	$1,500
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	10	CY	$215	$2,150
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	50	CY	$240	$12,000
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	70	SY	$100	$7,000
	PAVEMENT SUBTOTAL:				**$25,200**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$5,000	$5,000
	TRAFFIC CONTROL SUBTOTAL:				**$5,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue/Lake Street - Intersection Alternatives Study November 2023
SCENARIO 2

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$75,000	$75,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$75,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$15,000	$15,000
619	FIELD OFFICE	3	MON	$2,000	$6,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$4,000	$4,000
624	MOBILIZATION	1	LS	$10,000	$10,000
SPEC	PERFORMANCE BOND	1	LS	$4,000	$4,000
	PRE-CONSTRUCTION VIDEO	1	LS	$1,500	$1,500
	MISCELLANEOUS SUBTOTAL:				**$40,500**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	5	EACH	$5,000	$25,000
	TEMPORARY R/W TAKE - RESIDENTIAL	0	EACH	$2,000	$0
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	5	EACH	$25,000	$125,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	0	EACH	$10,000	$0
	ACQUISITION SERVICES	10	EACH	$6,500	$65,000
	APPRAISAL REVIEW SERVICES	10	EACH	$650	$6,500
	RIGHT OF WAY SUBTOTAL:				**$221,500**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$744,250**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$111,638**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$7,443**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$7,443**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$22,328**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$148,850**
	PROJECT SUBTOTAL:				**$1,041,952**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$208,391**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$1,250,343**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$125,035**
	TOTAL:				**$1,375,378**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 3

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$10,000	$10,000
202	PAVEMENT REMOVED	275	SY	$15	$4,125
202	PAVEMENT PLANING	5,000	SY	$4	$20,000
202	CURB REMOVED	500	FT	$7	$3,500
202	WALK REMOVED	3,700	SF	$5	$18,500
203	EXCAVATION & EMBANKMENT	150	CY	$35	$5,250
608	4" CONCRETE SIDEWALK	4,800	SF	$10	$48,000
608	ADA RAMP	8	EACH	$1,250	$10,000
609	CURB, TYPE 6	500	FT	$30	$15,000
659	SEEDING & MULCHING	300	SY	$10	$3,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$1,500	$1,500
832	EROSION CONTROL	1	LS	$5,000	$5,000
	ROADWAY SUBTOTAL:				**$143,875**
	DRAINAGE				
202	CATCH BASIN REMOVED	2	EACH	$750	$1,500
202	PIPE REMOVED 24" AND UNDER	20	FT	$25	$500
605	UNDERDRAINS	500	FT	$20	$10,000
611	CATCH BASIN NO. 3A	2	EACH	$3,000	$6,000
611	STORM CONDUIT	40	FT	$100	$4,000
611	MANHOLE ADJUSTED TO GRADE	5	EACH	$850	$4,250
611	CATCH BASIN ADJUSTED TO GRADE	3	EACH	$750	$2,250
	DRAINAGE SUBTOTAL:				**$28,500**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	1	EACH	$5,000	$5,000
	DRAINAGE SUBTOTAL:				**$5,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	145	CY	$85	$12,325
407	TACK COAT	930	GAL	$5	$4,650
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	40	CY	$215	$8,600
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	170	CY	$240	$40,800
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	120	SY	$100	$12,000
	PAVEMENT SUBTOTAL:				**$78,375**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$11,000	$11,000
	TRAFFIC CONTROL SUBTOTAL:				**$11,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 3

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$75,000	$75,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$75,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$15,000	$15,000
619	FIELD OFFICE	6	MON	$2,000	$12,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$8,000	$8,000
624	MOBILIZATION	1	LS	$20,000	$20,000
SPEC	PERFORMANCE BOND	1	LS	$8,000	$8,000
	PRECONSTRUCTION VIDEO	1	LS	$2,000	$2,000
	MISCELLANEOUS SUBTOTAL:				**$65,000**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	4	EACH	$5,000	$20,000
	TEMPORARY R/W TAKE - RESIDENTIAL	1	EACH	$2,000	$2,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	4	EACH	$25,000	$100,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	1	EACH	$10,000	$10,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	ACQUISITION SERVICES	11	EACH	$6,500	$71,500
	APPRAISAL REVIEW SERVICES	11	EACH	$650	$7,150
	RIGHT OF WAY SUBTOTAL:				**$310,650**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$1,017,400**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$152,610**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$10,174**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$10,174**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$30,522**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$203,480**
	PROJECT SUBTOTAL:				**$1,424,360**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$284,872**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$1,709,232**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$170,924**
				TOTAL:	**$1,880,156**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 4

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$12,500	$12,500
202	PAVEMENT REMOVED	150	SY	$15	$2,250
202	PAVEMENT PLANING	4,000	SY	$4	$16,000
202	CURB REMOVED	500	FT	$7	$3,500
202	WALK REMOVED	4,500	SF	$5	$22,500
203	EXCAVATION & EMBANKMENT	200	CY	$35	$7,000
608	4" CONCRETE SIDEWALK	5,800	SF	$10	$58,000
608	ADA RAMP	8	EACH	$1,250	$10,000
609	CURB, TYPE 6	500	FT	$30	$15,000
659	SEEDING & MULCHING	300	SY	$10	$3,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$1,500	$1,500
832	EROSION CONTROL	1	LS	$5,000	$5,000
	ROADWAY SUBTOTAL:				**$156,250**
	DRAINAGE				
202	CATCH BASIN REMOVED	2	EACH	$750	$1,500
202	PIPE REMOVED 24" AND UNDER	20	FT	$25	$500
605	UNDERDRAINS	500	FT	$20	$10,000
611	CATCH BASIN NO. 3A	2	EACH	$3,000	$6,000
611	STORM CONDUIT	40	FT	$100	$4,000
611	MANHOLE ADJUSTED TO GRADE	5	EACH	$850	$4,250
611	CATCH BASIN ADJUSTED TO GRADE	3	EACH	$750	$2,250
	DRAINAGE SUBTOTAL:				**$28,500**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	1	EACH	$5,000	$5,000
	WATER WORK SUBTOTAL:				**$5,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	170	CY	$85	$14,450
407	TACK COAT	960	GAL	$5	$4,800
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	40	CY	$215	$8,600
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	170	CY	$240	$40,800
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	120	SY	$100	$12,000
	PAVEMENT SUBTOTAL:				**$80,650**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$12,000	$12,000
	TRAFFIC CONTROL SUBTOTAL:				**$12,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 4

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$75,000	$75,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$75,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$15,000	$15,000
619	FIELD OFFICE	6	MON	$2,000	$12,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$8,000	$8,000
624	MOBILIZATION	1	LS	$20,000	$20,000
SPEC	PERFORMANCE BOND	1	LS	$8,000	$8,000
	PRECONSTRUCTION VIDEO	1	LS	$2,500	$2,500
	MISCELLANEOUS SUBTOTAL:				**$65,500**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	4	EACH	$5,000	$20,000
	TEMPORARY R/W TAKE - RESIDENTIAL	1	EACH	$2,000	$2,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	4	EACH	$25,000	$100,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	1	EACH	$10,000	$10,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	ACQUISITION SERVICES	11	EACH	$6,500	$71,500
	APPRAISAL REVIEW SERVICES	11	EACH	$650	$7,150
	RIGHT OF WAY SUBTOTAL:				**$310,650**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$1,033,550**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$155,033**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$10,336**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$10,336**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$31,007**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$206,710**
	PROJECT SUBTOTAL:				**$1,446,972**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$289,395**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$1,736,367**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$173,637**
	TOTAL:				**$1,910,004**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 5

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$20,000	$20,000
202	PAVEMENT REMOVED	2,000	SY	$15	$30,000
202	PAVEMENT PLANING	7,000	SY	$4	$28,000
202	CURB REMOVED	3,000	FT	$7	$21,000
202	WALK REMOVED	5,800	SF	$5	$29,000
203	EXCAVATION & EMBANKMENT	260	CY	$35	$9,100
608	4" CONCRETE SIDEWALK	7,900	SF	$10	$79,000
608	ADA RAMP	16	EACH	$1,250	$20,000
609	CURB, TYPE 6	3,000	FT	$30	$90,000
659	SEEDING & MULCHING	500	SY	$10	$5,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$2,500	$2,500
832	EROSION CONTROL	1	LS	$7,500	$7,500
	ROADWAY SUBTOTAL:				**$341,100**
	DRAINAGE				
202	CATCH BASIN REMOVED	6	EACH	$750	$4,500
202	PIPE REMOVED 24" AND UNDER	60	FT	$25	$1,500
605	UNDERDRAINS	3,000	FT	$20	$60,000
611	CATCH BASIN NO. 3A	6	EACH	$3,000	$18,000
611	STORM CONDUIT	120	FT	$100	$12,000
611	MANHOLE ADJUSTED TO GRADE	12	EACH	$850	$10,200
611	CATCH BASIN ADJUSTED TO GRADE	1	EACH	$750	$750
	DRAINAGE SUBTOTAL:				**$106,950**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	1	EACH	$5,000	$5,000
	WATER WORK SUBTOTAL:				**$5,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	540	CY	$85	$45,900
407	TACK COAT	2,200	GAL	$5	$11,000
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	150	CY	$215	$32,250
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	400	CY	$240	$96,000
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC-1	150	SY	$100	$15,000
	PAVEMENT SUBTOTAL:				**$200,150**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$25,000	$25,000
	TRAFFIC CONTROL SUBTOTAL:				**$25,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 5

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$100,000	$100,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$100,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$20,000	$20,000
619	FIELD OFFICE	8	MON	$2,000	$16,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$12,000	$12,000
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$12,000	$12,000
	PRECONSTRUCTION VIDEO	1	LS	$3,000	$3,000
	MISCELLANEOUS SUBTOTAL:				**$103,000**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	5	EACH	$5,000	$25,000
	TEMPORARY R/W TAKE - RESIDENTIAL	2	EACH	$2,000	$4,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	5	EACH	$25,000	$125,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	2	EACH	$10,000	$20,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	16	EACH	$6,500	$104,000
	APPRAISAL REVIEW SERVICES	16	EACH	$650	$10,400
	RIGHT OF WAY SUBTOTAL:				**$688,400**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$1,869,600**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$280,440**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$18,696**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$18,696**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$56,088**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$373,920**
	PROJECT SUBTOTAL:				**$2,617,440**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$523,488**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$3,140,928**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$314,093**
	TOTAL:				**$3,455,021**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 6

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$20,000	$20,000
202	PAVEMENT REMOVED	2,000	SY	$15	$30,000
202	PAVEMENT PLANING	7,000	SY	$4	$28,000
202	CURB REMOVED	3,000	FT	$7	$21,000
202	WALK REMOVED	5,800	SF	$5	$29,000
203	EXCAVATION & EMBANKMENT	260	CY	$35	$9,100
608	4" CONCRETE SIDEWALK	9,100	SF	$10	$91,000
608	ADA RAMP	16	EACH	$1,250	$20,000
609	CURB, TYPE 6	3,000	FT	$30	$90,000
659	SEEDING & MULCHING	500	SY	$10	$5,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$2,500	$2,500
832	EROSION CONTROL	1	LS	$7,500	$7,500
	ROADWAY SUBTOTAL:				**$353,100**
	DRAINAGE				
202	CATCH BASIN REMOVED	6	EACH	$750	$4,500
202	PIPE REMOVED 24" AND UNDER	60	FT	$25	$1,500
605	UNDERDRAINS	3,000	FT	$20	$60,000
611	CATCH BASIN NO. 3A	6	EACH	$3,000	$18,000
611	STORM CONDUIT	120	FT	$100	$12,000
611	MANHOLE ADJUSTED TO GRADE	12	EACH	$850	$10,200
611	CATCH BASIN ADJUSTED TO GRADE	1	EACH	$750	$750
	DRAINAGE SUBTOTAL:				**$106,950**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	1	EACH	$5,000	$5,000
	WATER WORK SUBTOTAL:				**$5,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	580	CY	$85	$49,300
407	TACK COAT	2,250	GAL	$5	$11,250
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	160	CY	$215	$34,400
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	410	CY	$240	$98,400
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	150	SY	$100	$15,000
	PAVEMENT SUBTOTAL:				**$208,350**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$26,000	$26,000
	TRAFFIC CONTROL SUBTOTAL:				**$26,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 6

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$125,000	$125,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$125,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$20,000	$20,000
619	FIELD OFFICE	8	MON	$2,000	$16,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$10,000	$10,000
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$10,000	$10,000
	PRECONSTRUCTION VIDEO	1	LS	$3,000	$3,000
	MISCELLANEOUS SUBTOTAL:				**$99,000**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	5	EACH	$5,000	$25,000
	TEMPORARY R/W TAKE - RESIDENTIAL	2	EACH	$2,000	$4,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	5	EACH	$25,000	$125,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	2	EACH	$10,000	$20,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	16	EACH	$6,500	$104,000
	APPRAISAL REVIEW SERVICES	16	EACH	$650	$10,400
	RIGHT OF WAY SUBTOTAL:				**$688,400**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$1,906,800**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$286,020**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$19,068**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$19,068**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$57,204**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$381,360**
	PROJECT SUBTOTAL:				**$2,669,520**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$533,904**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$3,203,424**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$320,343**
				TOTAL:	**$3,523,767**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 7

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$40,000	$40,000
202	PAVEMENT REMOVED	4,000	SY	$15	$60,000
202	PAVEMENT PLANING	11,200	SY	$4	$44,800
202	CURB REMOVED	6,300	FT	$7	$44,100
202	WALK REMOVED	7,200	SF	$5	$36,000
203	EXCAVATION & EMBANKMENT	500	CY	$35	$17,500
608	4" CONCRETE SIDEWALK	11,150	SF	$10	$111,500
608	ADA RAMP	22	EACH	$1,250	$27,500
609	CURB, TYPE 6	6,300	FT	$30	$189,000
659	SEEDING & MULCHING	800	SY	$10	$8,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$5,000	$5,000
832	EROSION CONTROL	1	LS	$15,000	$15,000
	ROADWAY SUBTOTAL:				**$598,400**
	DRAINAGE				
202	CATCH BASIN REMOVED	8	EACH	$750	$6,000
202	MANHOLE REMOVED	6	EACH	$1,000	$6,000
202	PIPE REMOVED 24" AND UNDER	140	FT	$25	$3,500
605	UNDERDRAINS	6,300	FT	$20	$126,000
611	CATCH BASIN NO. 3A	8	EACH	$3,000	$24,000
611	MANHOLE NO. 3	6	EACH	$4,000	$24,000
611	STORM CONDUIT	280	FT	$100	$28,000
611	MANHOLE ADJUSTED TO GRADE	22	EACH	$850	$18,700
611	CATCH BASIN ADJUSTED TO GRADE	6	EACH	$750	$4,500
	DRAINAGE SUBTOTAL:				**$240,700**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	3	EACH	$5,000	$15,000
	WATER WORK SUBTOTAL:				**$15,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	800	CY	$85	$68,000
407	TACK COAT	3,500	GAL	$5	$17,500
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	210	CY	$215	$45,150
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	540	CY	$240	$129,600
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	200	SY	$100	$20,000
	PAVEMENT SUBTOTAL:				**$280,250**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$45,000	$45,000
	TRAFFIC CONTROL SUBTOTAL:				**$45,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 7

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$75,000	$75,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$75,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$30,000	$30,000
619	FIELD OFFICE	9	MON	$2,000	$18,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$15,000	$15,000
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$15,000	$15,000
	PRECONSTRUCTION VIDEO	1	LS	$3,500	$3,500
	MISCELLANEOUS SUBTOTAL:				**$121,500**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	6	EACH	$5,000	$30,000
	TEMPORARY R/W TAKE - RESIDENTIAL	12	EACH	$2,000	$24,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	6	EACH	$25,000	$150,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	12	EACH	$10,000	$120,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	38	EACH	$6,500	$247,000
	APPRAISAL REVIEW SERVICES	38	EACH	$650	$24,700
	RIGHT OF WAY SUBTOTAL:				**$1,195,700**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$2,871,550**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$430,733**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$28,716**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$28,716**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$86,147**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$574,310**
	PROJECT SUBTOTAL:				**$4,020,172**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$804,035**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$4,824,207**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$482,421**
				TOTAL:	**$5,306,628**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 8

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$40,000	$40,000
202	PAVEMENT REMOVED	4,000	SY	$15	$60,000
202	PAVEMENT PLANING	11,200	SY	$4	$44,800
202	CURB REMOVED	6,300	FT	$7	$44,100
202	WALK REMOVED	7,200	SF	$5	$36,000
203	EXCAVATION & EMBANKMENT	550	CY	$35	$19,250
608	4" CONCRETE SIDEWALK	11,400	SF	$10	$114,000
608	ADA RAMP	22	EACH	$1,250	$27,500
609	CURB, TYPE 6	6,300	FT	$30	$189,000
659	SEEDING & MULCHING	800	SY	$10	$8,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$5,000	$5,000
832	EROSION CONTROL	1	LS	$15,000	$15,000
	ROADWAY SUBTOTAL:				**$602,650**
	DRAINAGE				
202	CATCH BASIN REMOVED	9	EACH	$750	$6,750
202	MANHOLE REMOVED	6	EACH	$1,000	$6,000
202	PIPE REMOVED 24" AND UNDER	150	FT	$25	$3,750
605	UNDERDRAINS	6,300	FT	$20	$126,000
611	CATCH BASIN NO. 3A	9	EACH	$3,000	$27,000
611	MANHOLE NO. 3	6	EACH	$4,000	$24,000
611	STORM CONDUIT	300	FT	$100	$30,000
611	MANHOLE ADJUSTED TO GRADE	22	EACH	$850	$18,700
611	CATCH BASIN ADJUSTED TO GRADE	6	EACH	$750	$4,500
	DRAINAGE SUBTOTAL:				**$246,700**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	3	EACH	$5,000	$15,000
	WATER WORK SUBTOTAL:				**$15,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	830	CY	$85	$70,550
407	TACK COAT	3,550	GAL	$5	$17,750
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	230	CY	$215	$49,450
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	550	CY	$240	$132,000
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	230	SY	$100	$23,000
	PAVEMENT SUBTOTAL:				**$292,750**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$46,000	$46,000
	TRAFFIC CONTROL SUBTOTAL:				**$46,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 8

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$150,000	$150,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$150,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$30,000	$30,000
619	FIELD OFFICE	9	MON	$2,000	$18,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$15,000	$15,000
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$15,000	$15,000
	PRECONSTRUCTION VIDEO	1	LS	$3,500	$3,500
	MISCELLANEOUS SUBTOTAL:				**$121,500**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	6	EACH	$5,000	$30,000
	TEMPORARY R/W TAKE - RESIDENTIAL	12	EACH	$2,000	$24,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	6	EACH	$25,000	$150,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	12	EACH	$10,000	$120,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	38	EACH	$6,500	$247,000
	APPRAISAL REVIEW SERVICES	38	EACH	$650	$24,700
	RIGHT OF WAY SUBTOTAL:				**$1,195,700**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$2,970,300**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$445,545**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$29,703**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$29,703**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$89,109**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$594,060**
	PROJECT SUBTOTAL:				**$4,158,420**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$831,684**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$4,990,104**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$499,011**
				TOTAL:	**$5,489,115**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 9

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$45,000	$45,000
202	PAVEMENT REMOVED	4,000	SY	$15	$60,000
202	PAVEMENT PLANING	11,200	SY	$4	$44,800
202	CURB REMOVED	7,000	FT	$7	$49,000
202	WALK REMOVED	8,850	SF	$5	$44,250
203	EXCAVATION & EMBANKMENT	600	CY	$35	$21,000
608	4" CONCRETE SIDEWALK	13,800	SF	$10	$138,000
608	ADA RAMP	22	EACH	$1,250	$27,500
609	CURB, TYPE 6	7,000	FT	$30	$210,000
659	SEEDING & MULCHING	900	SY	$10	$9,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$6,000	$6,000
832	EROSION CONTROL	1	LS	$18,000	$18,000
	ROADWAY SUBTOTAL:				**$672,550**
	DRAINAGE				
202	CATCH BASIN REMOVED	10	EACH	$750	$7,500
202	MANHOLE REMOVED	6	EACH	$1,000	$6,000
202	PIPE REMOVED 24" AND UNDER	160	FT	$25	$4,000
605	UNDERDRAINS	7,000	FT	$20	$140,000
611	CATCH BASIN NO. 3A	10	EACH	$3,000	$30,000
611	MANHOLE NO. 3	6	EACH	$4,000	$24,000
611	STORM CONDUIT	320	FT	$100	$32,000
611	MANHOLE ADJUSTED TO GRADE	22	EACH	$850	$18,700
611	CATCH BASIN ADJUSTED TO GRADE	6	EACH	$750	$4,500
	DRAINAGE SUBTOTAL:				**$266,700**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	3	EACH	$5,000	$15,000
	WATER WORK SUBTOTAL:				**$15,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	930	CY	$85	$79,050
407	TACK COAT	3,650	GAL	$5	$18,250
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	250	CY	$215	$53,750
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	600	CY	$240	$144,000
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	260	SY	$100	$26,000
	PAVEMENT SUBTOTAL:				**$321,050**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$47,500	$47,500
	TRAFFIC CONTROL SUBTOTAL:				**$47,500**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 9

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$175,000	$175,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$175,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$32,000	$32,000
619	FIELD OFFICE	10	MON	$2,000	$20,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$16,500	$16,500
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$16,500	$16,500
	PRECONSTRUCTION VIDEO	1	LS	$4,000	$4,000
	MISCELLANEOUS SUBTOTAL:				**$129,000**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	5	EACH	$5,000	$25,000
	TEMPORARY R/W TAKE - RESIDENTIAL	12	EACH	$2,000	$24,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	5	EACH	$25,000	$125,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	12	EACH	$10,000	$120,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	37	EACH	$6,500	$240,500
	APPRAISAL REVIEW SERVICES	37	EACH	$650	$24,050
	RIGHT OF WAY SUBTOTAL:				**$1,258,550**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$3,185,350**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$477,803**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$31,854**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$31,854**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$95,561**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$637,070**
	PROJECT SUBTOTAL:				**$4,459,492**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$891,899**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$5,351,391**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$535,140**
				TOTAL:	**$5,886,531**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 10

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$42,500	$42,500
202	PAVEMENT REMOVED	4,000	SY	$15	$60,000
202	PAVEMENT PLANING	11,200	SY	$4	$44,800
202	CURB REMOVED	6,300	FT	$7	$44,100
202	WALK REMOVED	8,850	SF	$5	$44,250
203	EXCAVATION & EMBANKMENT	570	CY	$35	$19,950
608	4" CONCRETE SIDEWALK	13,350	SF	$10	$133,500
608	ADA RAMP	22	EACH	$1,250	$27,500
609	CURB, TYPE 6	6,300	FT	$30	$189,000
659	SEEDING & MULCHING	800	SY	$10	$8,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$5,500	$5,500
832	EROSION CONTROL PLAN	1	LS	$16,500	$16,500
	ROADWAY SUBTOTAL:				**$635,600**
	DRAINAGE				
202	CATCH BASIN REMOVED	9	EACH	$750	$6,750
202	MANHOLE REMOVED	6	EACH	$1,000	$6,000
202	PIPE REMOVED 24" AND UNDER	150	FT	$25	$3,750
605	UNDERDRAINS	6,300	FT	$20	$126,000
611	CATCH BASIN NO. 3A	9	EACH	$3,000	$27,000
611	MANHOLE NO. 3	6	EACH	$4,000	$24,000
611	STORM CONDUIT	300	FT	$100	$30,000
611	MANHOLE ADJUSTED TO GRADE	22	EACH	$850	$18,700
611	CATCH BASIN ADJUSTED TO GRADE	6	EACH	$750	$4,500
	DRAINAGE SUBTOTAL:				**$246,700**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	3	EACH	$5,000	$15,000
	WATER WORK SUBTOTAL:				**$15,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	910	CY	$85	$77,350
407	TACK COAT	3,610	GAL	$5	$18,050
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	240	CY	$215	$51,600
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	560	CY	$240	$134,400
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	230	SY	$100	$23,000
	PAVEMENT SUBTOTAL:				**$304,400**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$46,000	$46,000
	TRAFFIC CONTROL SUBTOTAL:				**$46,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 10

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$175,000	$175,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$175,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$30,000	$30,000
619	FIELD OFFICE	10	MON	$2,000	$20,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$16,500	$16,500
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$16,500	$16,500
	PRECONSTRUCTION VIDEO	1	LS	$4,000	$4,000
	MISCELLANEOUS SUBTOTAL:				**$127,000**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	5	EACH	$5,000	$25,000
	TEMPORARY R/W TAKE - RESIDENTIAL	12	EACH	$2,000	$24,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	5	EACH	$25,000	$125,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	12	EACH	$10,000	$120,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	37	EACH	$6,500	$240,500
	APPRAISAL REVIEW SERVICES	37	EACH	$650	$24,050
	RIGHT OF WAY SUBTOTAL:				**$1,258,550**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$3,108,250**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$466,238**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$31,083**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$31,083**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$93,248**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$621,650**
	PROJECT SUBTOTAL:				**$4,351,552**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$870,311**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$5,221,863**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$522,187**
				TOTAL:	**$5,744,050**

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Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 10A

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	ROADWAY				
201	CLEARING AND GRUBBING	1	LS	$42,500	$42,500
202	PAVEMENT REMOVED	4,000	SY	$15	$60,000
202	PAVEMENT PLANING	11,200	SY	$4	$44,800
202	CURB REMOVED	6,300	FT	$7	$44,100
202	WALK REMOVED	8,850	SF	$5	$44,250
203	EXCAVATION & EMBANKMENT	570	CY	$35	$19,950
608	4" CONCRETE SIDEWALK	13,350	SF	$10	$133,500
608	6" CONCRETE TRAFFIC ISLAND	10	SY	$175	$1,750
608	ADA RAMP	22	EACH	$1,250	$27,500
609	CURB, TYPE 6	6,300	FT	$30	$189,000
659	SEEDING & MULCHING	800	SY	$10	$8,000
832	STORM WATER POLLUTION PREVENTION PLAN	1	LS	$5,500	$5,500
832	EROSION CONTROL PLAN	1	LS	$16,500	$16,500
	ROADWAY SUBTOTAL:				**$637,350**
	DRAINAGE				
202	CATCH BASIN REMOVED	9	EACH	$750	$6,750
202	MANHOLE REMOVED	6	EACH	$1,000	$6,000
202	PIPE REMOVED 24" AND UNDER	150	FT	$25	$3,750
605	UNDERDRAINS	6,300	FT	$20	$126,000
611	CATCH BASIN NO. 3A	9	EACH	$3,000	$27,000
611	MANHOLE NO. 3	6	EACH	$4,000	$24,000
611	STORM CONDUIT	300	FT	$100	$30,000
611	MANHOLE ADJUSTED TO GRADE	22	EACH	$850	$18,700
611	CATCH BASIN ADJUSTED TO GRADE	6	EACH	$750	$4,500
	DRAINAGE SUBTOTAL:				**$246,700**
	WATER WORK				
638	FIRE HYDRANT RELOCATED	3	EACH	$5,000	$15,000
	WATER WORK SUBTOTAL:				**$15,000**
	PAVEMENT				
304	AGGREGATE BASE (6" @ PAVEMENT, 2" @ SIDEWALKS)	900	CY	$85	$76,500
407	TACK COAT	3,600	GAL	$5	$18,000
442	1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	235	CY	$215	$50,525
442	1-1/4" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	550	CY	$240	$132,000
452	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	230	SY	$100	$23,000
	PAVEMENT SUBTOTAL:				**$300,025**
	TRAFFIC CONTROL				
	SIGNING & STRIPING	1	LS	$46,000	$46,000
	TRAFFIC CONTROL SUBTOTAL:				**$46,000**
	SIGNALIZATION				
632	TRAFFIC SIGNAL MODIFICATION	0	EACH	$70,000	$0
632	TRAFFIC SIGNAL RECONSTRUCTION	1	EACH	$250,000	$250,000
632	SIGNAL, MISC., RAILROAD INTERCONNECT	1	LS	$50,000	$50,000
	SIGNALIZATION SUBTOTAL:				**$300,000**

Central Avenue (SR 37) / Lake Street (US 42)
Intersection Alternatives Study
SCENARIO 10A

Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	TOTAL QUANTITY	UNIT	ESTIMATED PRICE	TOTAL COST
	MAINTENANCE OF TRAFFIC				
	MAINTENANCE OF TRAFFIC	1	LS	$175,000	$175,000
	MAINTENANCE OF TRAFFIC SUBTOTAL:				**$175,000**
	MISCELLANEOUS				
614	MAINTAINING TRAFFIC	1	LS	$30,000	$30,000
619	FIELD OFFICE	10	MON	$2,000	$20,000
623	CONSTRUCTION LAYOUT STAKES	1	LS	$16,500	$16,500
624	MOBILIZATION	1	LS	$40,000	$40,000
SPEC	PERFORMANCE BOND	1	LS	$16,500	$16,500
	PRECONSTRUCTION VIDEO	1	LS	$4,000	$4,000
	MISCELLANEOUS SUBTOTAL:				**$127,000**
	RIGHT OF WAY				
	TEMPORARY R/W TAKE - COMMERCIAL	5	EACH	$5,000	$25,000
	TEMPORARY R/W TAKE - RESIDENTIAL	12	EACH	$2,000	$24,000
	PERMANENT R/W TAKE - MINOR - COMMERCIAL	5	EACH	$25,000	$125,000
	PERMANENT R/W TAKE - MINOR - RESIDENTIAL	12	EACH	$10,000	$120,000
	PERMANENT R/W TAKE - TOTAL - COMMERCIAL	1	EACH	$100,000	$100,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	PERMANENT R/W TAKE - TOTAL - RESIDENTIAL	1	EACH	$300,000	$300,000
	ACQUISITION SERVICES	37	EACH	$6,500	$240,500
	APPRAISAL REVIEW SERVICES	37	EACH	$650	$24,050
	RIGHT OF WAY SUBTOTAL:				**$1,258,550**
	TOTAL CONSTRUCTION AND RIGHT OF WAY COST:				**$3,105,625**
	DESIGN ENGINEERING COST:	(15% OF CONSTR. & R/W COST)			**$465,844**
	GEOTECHNICAL ENGINEERING COST:	(1% OF CONSTR. & R/W COST)			**$31,057**
	ENVIRONMENTAL COST:	(1% OF CONSTR. & R/W COST)			**$31,057**
	SUBSURFACE UTILITY ENGINEERING (SUE):	(3% OF CONSTR. & R/W COST)			**$93,169**
	DESIGN CONTINGENCY COSTS	(20% OF CONSTR. & R/W COST)			**$621,125**
	PROJECT SUBTOTAL:				**$4,347,877**
	5% INFLATION CONTINGENCY OVER 4 YEARS (20%):				**$869,576**
	PROJECT TOTAL WITHOUT CONSTRUCTION INSPECTION				**$5,217,453**
	CONSTRUCTION INSPECTION COST:	(10% OF PROJECT TOTAL)			**$521,746**
				TOTAL:	**$5,739,199**

In providing estimates of probable construction cost, the Client understands that the Consultant has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that the Consultant's estimates of probable construction cost are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, express or implied, that the bids or the negotiated cost of the Work will not vary from the Consultant's estimate of probable construction cost. Please note that the pricing, contingencies and opinion contained or referenced herein anticipates a standard economic environment, and does not account for any uncertainty related to COVID-19 or the current extreme market conditions. As such, Client and Consultant recognize the current market volatility due to such factors including but not limited to COVID-19 restrictions, material and equipment shortages, and rapid price fluctuations. The existence and contents of this document shall not be construed to create responsibility or liability of Client or Consultant for changes related to this estimate of probable cost.