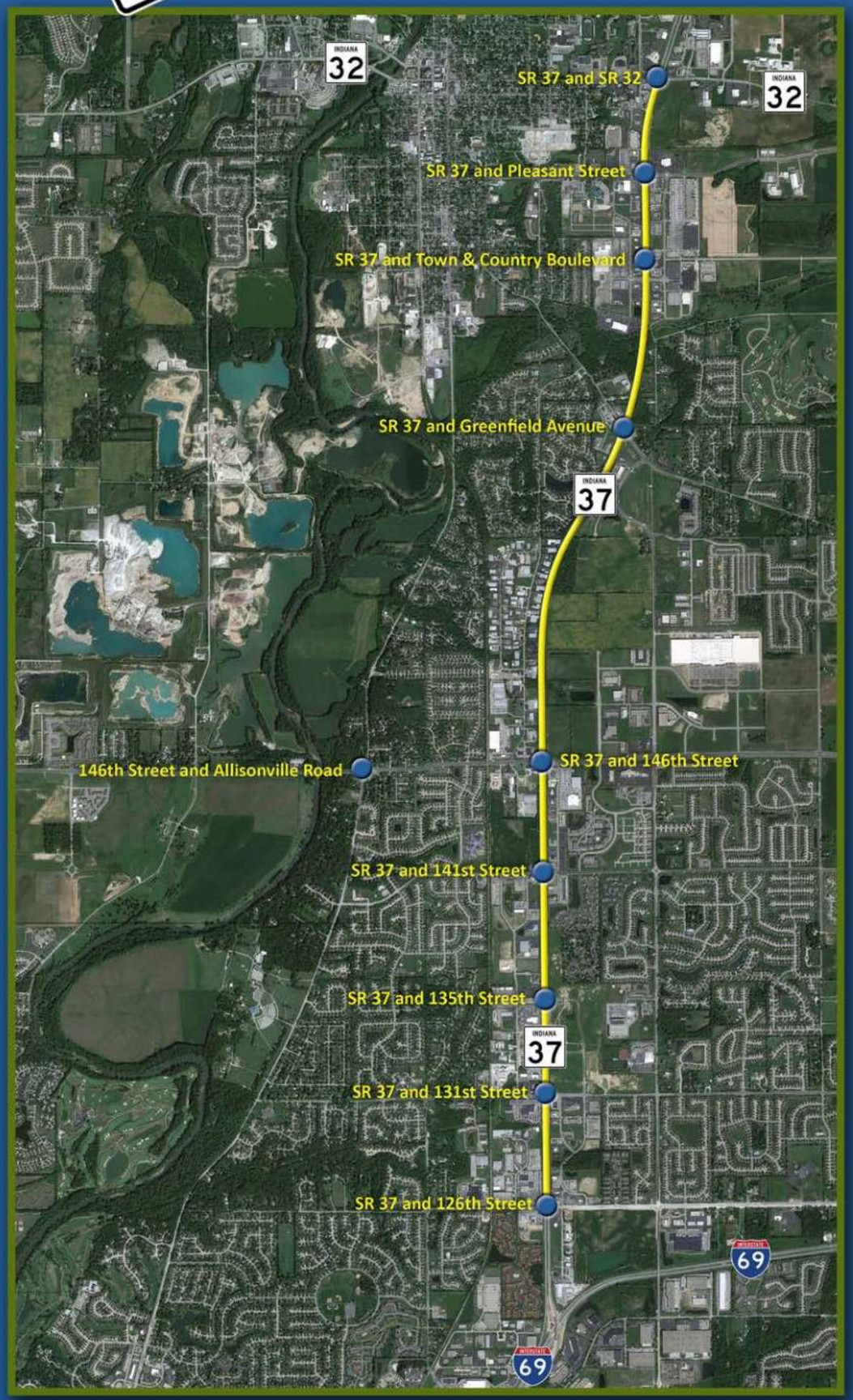
SR 37 Mobility Study



Traffic Operation Analysis

Presented to:

County of Hamilton, State of Indiana

MPO

Town of Fishers, Indiana

Indiana Department of Transportation (INDOT)

City of Noblesville, Incorporated May 6, 1887, Seal, Indiana

Presented by:

United Consulting

American Structurepoint Inc.

Traffic Operation Analysis

for

SR 37 from 126th Street to SR 32

Hamilton County, Indiana

Prepared for:

Hamilton County, Indiana

Prepared by:

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December 9, 2011

Traffic Operation Analysis

For

SR 37 from 126th Street to SR 32

Hamilton County, Indiana

I certify that this Traffic Operation Analysis has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering.

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Executive Summary

Study Purpose and Scope

The purpose of this Traffic Operations Analysis (TOA) is to evaluate traffic operations at various study intersections along the SR 37 corridor in Hamilton County. This TOA is part of the SR 37 Mobility Study that has been undertaken with the goal of proposing feasible alternatives to relieve the existing traffic congestion along the SR 37 corridor. The concepts that are being explored as a part of the Mobility Study involve upgrading the existing SR 37 between 126th Street and SR 32 by converting the at-grade signalized intersections to grade-separated interchanges. After such improvements, SR 37 will be a four-lane freeway without any at-grade intersections throughout the study area. The TOA focuses on performing capacity analysis and providing recommendations for the proposed intersection lane configurations.

There are three alternatives that were evaluated for the capacity analysis:

- No Build: At the existing intersections, the existing intersection lane configurations have been retained. At the planned signalized intersection at SR 37 and 135th Street, the intersection lane configurations have been assumed to be similar to those at the intersection of SR 37 and 141st Street.
- Alternative 1: All existing and planned signalized study intersections, except for the intersection of 146th Street and Cumberland Road and the intersection of SR 37 and Cherry Street, will be converted to teardrop roundabout interchanges. The proposed interchange lane configurations have been developed based on the capacity analysis. The intersection of 146th Street and Cumberland Road will remain an at-grade signalized intersection.
- Alternative 2: All existing and planned signalized study intersections, except for the intersection of 146th Street and Cumberland Road and the intersection of SR 37 and Cherry Street, will be converted to tight diamond interchanges with traffic signals (if warranted). The proposed interchange lane configurations are developed based on the capacity analysis. The intersection of 146th Street and Cumberland Road will remain an at-grade signalized intersection.

Capacity Analysis

A capacity analysis has been performed at the study intersections based on the methodology outlined in the *Highway Capacity Manual (HCM) 2010*. To facilitate the analysis, Synchro (Version 8) has been used to perform capacity analysis at signalized and stop-controlled intersections, and RODEL (Version 1) was used to perform the capacity analysis for roundabouts. The use of different programs for signalized/stop-controlled intersections and roundabouts represents each program's strength in analyzing the particular traffic control and its acceptance among transportation professionals.

The capacity analysis was performed at each of the study intersections for No Build (year 2010 and year 2036), Alternative 1 (year 2036), and Alternative 2 (year 2036). For Alternatives 1 and 2, the proposed intersection lane configurations were developed based on the following two criteria:

- Each intersection approach should be operating at LOS D or better during the analyzed periods.
- Individual turning movements should have a V/C ratio < 1.0 during the analyzed periods.

An abbreviated weaving analysis has been performed to identify and evaluate the weaving segments that may be created along SR 37 with Alternatives 1 and 2.

Findings and Recommendations

Based on the analysis performed in this study, it has been demonstrated that some study intersections are currently operating at an unacceptable LOS, and if no improvements are made, all of the study intersections along SR 37 will be operating at an unacceptable LOS in the year 2036. The SR 37 Mobility Study has proposed a plan to upgrade the existing SR 37 corridor with either teardrop roundabout interchanges (Alternative 1) or tight diamond interchanges (Alternative 2). Both alternatives will significantly improve traffic operations at the study intersections.

- For Alternative 1, based on the RODEL analysis, all study intersections will be operating at an acceptable LOS in year 2036, with the proposed intersection lane configurations.
    - There are a total of five triple-lane approaches at four proposed roundabouts based on the year 2036 traffic volumes. During the design stage of this project, it is recommended to further evaluate the possibility of operating these roundabouts with less travel lanes in the opening year with future expandability to maximize the roundabouts' safety benefits.
- For Alternative 2, all study intersections will be operating at an acceptable LOS in year 2036 with the proposed intersection lane configurations.
    - Due to the scope of the study, only the tight diamond interchange configuration was analyzed for Alternative 2. Previous research has indicated that the single point diamond interchange (SPUI) can provide comparable traffic operations with the same traffic volumes. One unique benefit of the SPUI is that there is only one signalized intersection at the interchange, which makes it easier to coordinate with adjacent signalized intersections along the cross street.
    - Although no formal signal warrant analysis has been performed, most of the proposed ramp intersections are expected to be signalized. During the design stage of this project, it is recommended to evaluate the need for traffic signals at the ramp intersections based on requirements documented in the Indiana MUTCD.
- The abbreviated weaving analysis indicates that at five locations along SR 37, collector-distributor lanes will be required to interconnect adjacent interchanges, thus eliminating any weaving operations that are expected to fail in year 2036.
- The construction of the new intersection at SR 37 and 135th Street will likely be driven by the development/redevelopment east and west of SR 37. Due to the nature of the development plans, the traffic impact study reports reviewed in this study may have become outdated. It is recommended to continue to coordinate with the developers for the latest site plans to assure no significant changes have occurred that would affect the design of this interchange.
- Both Alternatives 1 and 2 will be able to address the capacity needs at the study intersections. To select the preferred alternative, other factors such as right-of-way impact, overall project cost, intersection safety, and community preference need to be evaluated. It is possible the preferred alternative may be a combination of Alternatives 1 and 2, and may include additional interchange configurations such as the single point urban interchange.

Study Purpose and Scope

The purpose of this Traffic Operations Analysis (TOA) is to evaluate traffic operations at various study intersections along the SR 37 corridor in Hamilton County. This TOA is part of the SR 37 Mobility Study, which has been undertaken with the goal of proposing feasible alternatives to relieve the existing traffic congestion along the SR 37 corridor. The concepts that are being explored as a part of the Mobility Study involve upgrading the existing SR 37 between 126th Street and SR 32 by converting the at-grade signalized intersections to grade-separated interchanges. After such improvements, SR 37 will be a four-lane freeway without any at-grade intersections throughout the study area. The TOA focuses on performing capacity analysis and providing recommendations for the proposed intersection lane configurations.

The study area includes SR 37 from 126th Street to SR 32, and also 146th Street from Allisonville Road to Cumberland Road. The study intersections are listed below.

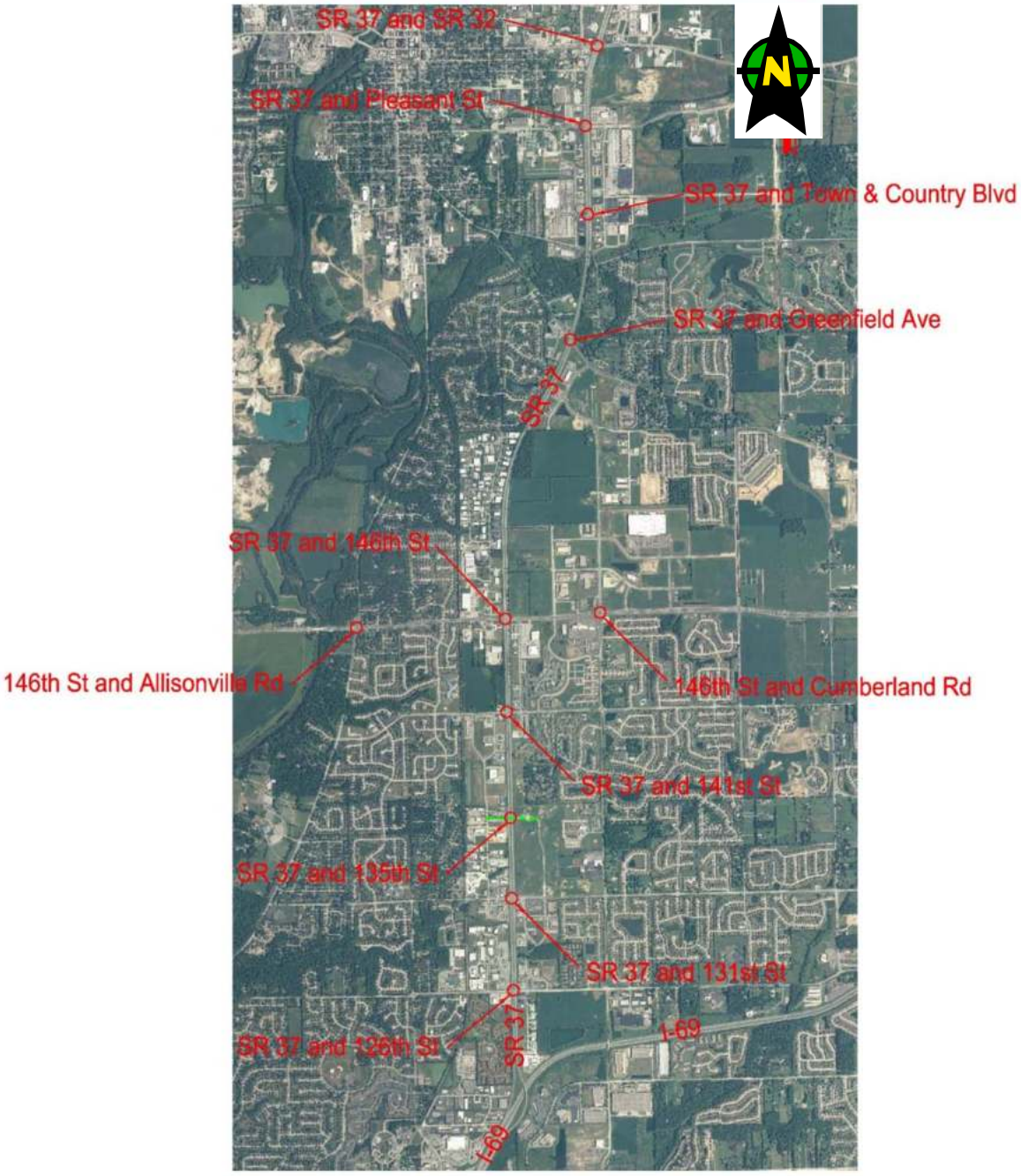
Figure 1 shows the locations of the study intersections. The existing intersection lane configurations for all study intersections are shown in Appendix A.

- SR 37 and 126th Street (existing signalized intersection)
- SR 37 and 131st Street (existing signalized intersection)
- SR 37 and 135th Street (planned signalized intersection)
- SR 37 and 141st Street (existing signalized intersection)
- SR 37 and 146th Street (existing signalized intersection)
- SR 37 and Greenfield Avenue (existing signalized intersection)
- SR 37 and Town & Country Blvd (existing signalized intersection)
- SR 37 and Pleasant Street (existing signalized intersection)
- SR 37 and Cherry Street (existing unsignalized intersection)
- SR 37 and SR 32 (existing signalized intersection)
- 146th Street and Allisonville Road (existing signalized intersection)
- 146th Street and Cumberland Road (existing signalized intersection)

There are three alternatives that were evaluated for the capacity analysis:

- No Build: At the existing intersections, the existing intersection lane configurations have been retained. At the planned signalized intersection at SR 37 and 135th Street, the intersection lane configurations have been assumed to be similar to those at the intersection of SR 37 and 141st Street.
- Alternative 1: All existing and planned signalized study intersections, except for the intersection of 146th Street and Cumberland Road and the intersection of SR 37 and Cherry Street, will be converted to teardrop roundabout interchanges. The proposed interchange lane configurations have been developed based on the capacity analysis. The intersection of 146th Street and Cumberland Road will remain an at-grade signalized intersection.

- Alternative 2: All existing and planned signalized study intersections, except for the intersection of 146th Street and Cumberland Road and the intersection of SR 37 and Cherry Street, will be converted to tight diamond interchanges with traffic signals (if warranted). The proposed interchange lane configurations have been developed based on the capacity analysis. The intersection of 146th Street and Cumberland Road will remain an at-grade signalized intersection.



○ Study Intersections ▪▪▪▪ 135th Street (Planned Street Connection)

Figure 1 - Study Area

Background Information

Existing Roadway System Within the Study Area

Table 1 provides information about the existing roadway system in the study area.

Table 1 - Existing Roadway Systems

Streets	Travel Lanes(1)	Functional Class(2)	Speed Limit(1) (MPH)
SR 37	4	Expressway	55
126th Street	2	Secondary Arterial	35
131st Street	2	Collector	35
135th Street	-	-	-
141st Street	2	Secondary Arterial	35
146th Street	4	Primary Arterial	45
Greenfield Avenue	2	Primary Arterial	35 (W of SR 37) 40 (E of SR 37)
Town and Country Blvd	2	Collector	35
Pleasant Street	2 (W of SR 37) 4 (E of SR 37)	Collector	35
SR 32	4	Primary Arterial	35 (W of SR 37) 45 (E of SR 37)
Allisonville Road	4	Primary Arterial	35
Cumberland Road	4	Secondary Arterial	40

Note (1): Based on the sections of the streets near the study intersections.
Note (2): Based on the 2007 Hamilton County Thoroughfare Plan Update

Previous Transportation Studies

Various transportation studies have been reviewed in the preparation of this study.

- Indianapolis Northeast Corridor Transportation Study (2003), a.k.a. the ConNECTions Study. This study addressed highway needs of the Northeast Corridor, which extends from downtown Indianapolis, Marion County to Noblesville in Hamilton County. It was found that SR 37 from I-69 to SR 32 will be operating over its capacity by year 2025. The study has indentified the preferred Alternative H5, which includes major freeway expansion predominantly in existing right-of-way. For SR 37, Alternative H5 recommended a 6-lane freeway from I-69 to Greenfield Avenue and a 6-lane expressway from Greenfield Avenue to SR 32.

- Corridor Traffic Study, 146th Street from Allisonville Road to Cumberland Road, Hamilton County (2009). This study evaluated improvements along 146th Street to facilitate use of 146th Street as an east-west county thoroughfare. Based on a 4 percent per year compounded growth rate, this study recommended widening 146th Street to be a 6-lane roadway from Allisonville Road to Cumberland Road and constructing single point urban interchanges (SPUI) at SR 37 and at Allisonville Road.
- Traffic Impact Analysis, Britton Park Redevelopment, 131st Street and SR 37, Fishers (2010). This study evaluated the traffic impact of the proposed redevelopment west of SR 37 between 131st Street and 141st Street. The recommendations included additional turn lanes at the intersection of SR 37 and 131st and the intersection of SR 37 and 141st Street, and a new traffic signal at the intersection of SR 37 and 135th Street.
- Traffic Operations Analysis for Proposed 131st Street Marketplace, Fishers (2007). This study evaluated the traffic impact associated with the development east of SR 37 between 131st Street and 141st Street. The recommendations included widening 131st Street, adding one additional northbound travel lane on SR 37, and a new traffic signal at the intersection of SR 37 and 135th Street.
- With its "Operation Indy Commute" initiative, INDOT is planning to add various auxiliary lanes at the interchange of I-69 and 116th Street/SR 37 in year 2012. Currently, this interchange is experiencing recurring traffic congestion during the peak hours, and is considered to be a bottleneck for traffic movements on both the I-69 corridor and the SR 37 corridor. These improvements are being constructed with the intention of alleviating traffic congestion and removing the bottleneck situation.

Traffic Forecast

The traffic data for the No Build alternative was obtained from the Traffic Forecast Report, SR 37 Mobility Study, Hamilton County (2011). Within the Traffic Forecast Report, a linear 1.7 percent per year growth rate was used to project traffic volumes from year 2010 to year 2036. The traffic data for Alternatives 1 and 2 were further developed in this TOA by adjusting the No Build traffic data to account for the proposed interchanges and the collector-distributor lanes between some interchanges. Appendix B shows the schematic diagrams of the proposed interchanges and the proposed collector-distributor lanes along the SR 37 corridor. **Figures 2 through 4** show the year 2010 and year 2036 traffic volumes for No Build, and the year 2036 traffic volumes for Alternatives 1 and 2.

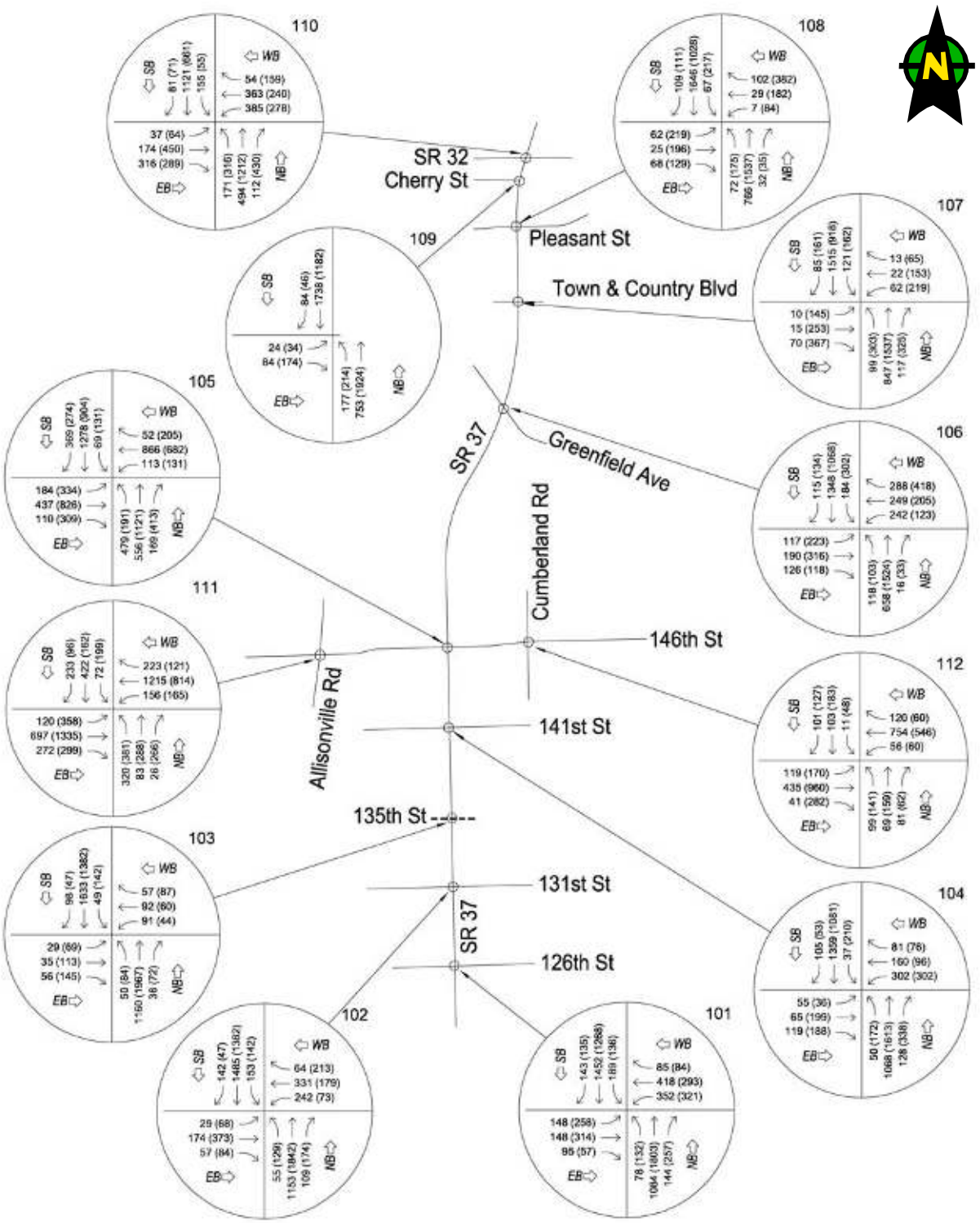


Figure 2 – Study Area Year 2010 Traffic Volumes: No Build

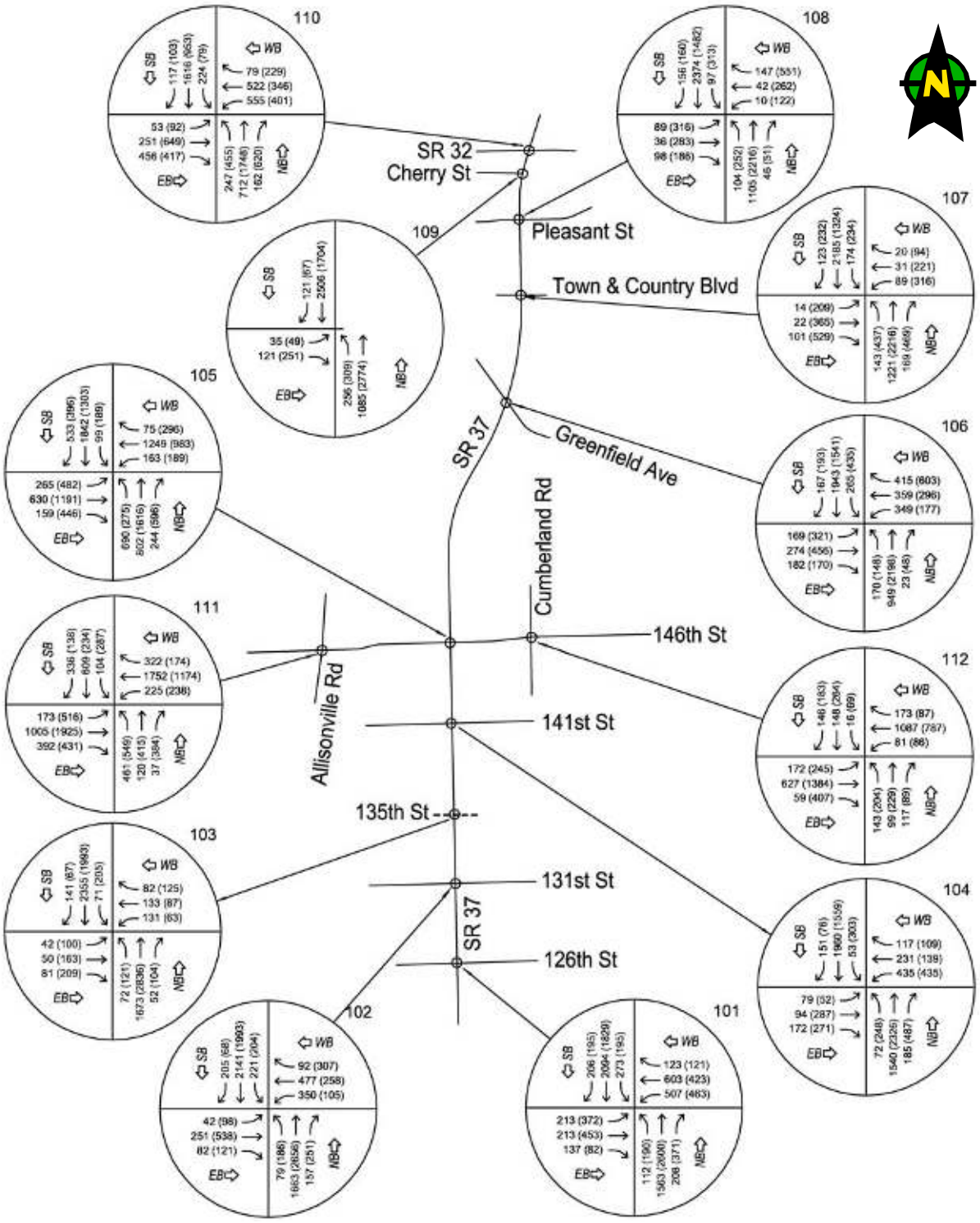


Figure 3 – Study Area Year 2036 Traffic Volumes: No Build

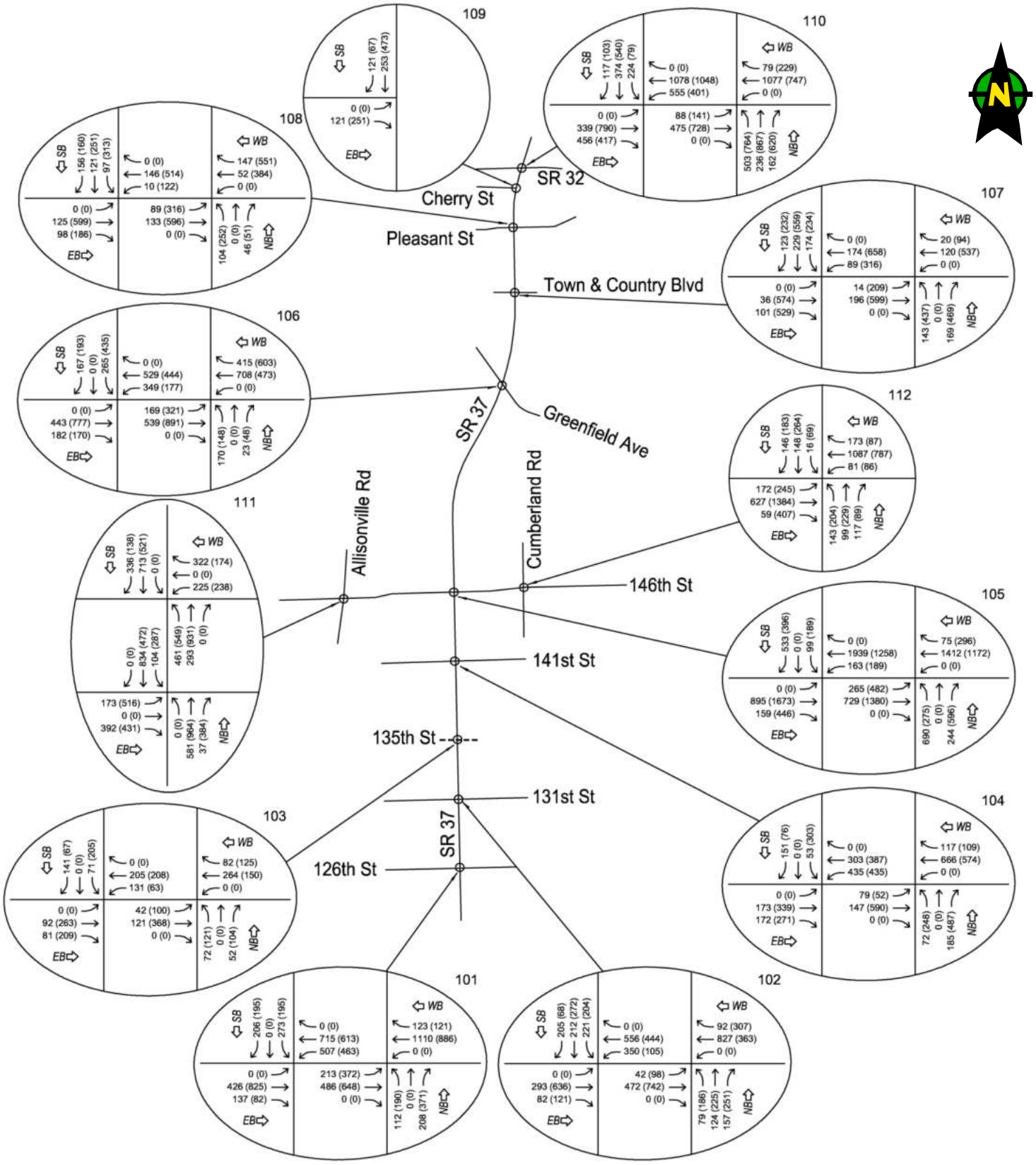


Figure 4 – Study Area Year 2036 Traffic Volumes: Alternatives 1 and 2

Note: The free-flow mainline traffic on grade-separated interchanges not shown in this figure

Capacity Analysis

Methodology of Intersection Capacity Analysis

A capacity analysis has been performed at the study intersections based on the methodology outlined in the *Highway Capacity Manual (HCM) 2010*. The standard parameter used to evaluate traffic operating conditions is referred to as the level of service (LOS). There are six LOS (A through F), that relate to driving conditions from best to worst, respectively. LOS for both signalized and unsignalized intersections are defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Table 2 provides the LOS criteria for signalized and unsignalized intersections defined in the HCM 2010.

Table 2 - Level of Service Criteria for Signalized and Unsignalized Intersections

LOS	Control Delay Per Vehicle (second)	
	Signalized Intersections	Unsignalized Intersections Including Roundabouts
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

To facilitate the analysis, Synchro (Version 8) has been used to perform capacity analysis at signalized and stop-controlled intersections, and RODEL (Version 1) were used to perform the capacity analysis for roundabouts. The use of different programs for signalized/stop-controlled intersections and roundabouts represents each program's strength in analyzing the particular traffic control and its acceptance among transportation professionals. The RODEL analysis uses the capacity models described in the first edition of the *FHWA Roundabout Guide* (2003). The capacity models in RODEL generally provide higher capacity estimation than those in HCM 2010, and are expected to be more appropriate for regions where drivers are familiar with roundabouts. The software output from Synchro and RODEL each include the average vehicle control delay, LOS, average queue length, and 95th percentile queue length.

The capacity analysis was performed at each of the study intersections for the No Build alternative (year 2010 and year 2036), Alternative 1 (year 2036), and Alternative 2 (year 2036). For Alternatives 1 and 2, the proposed intersection lane configurations were developed based on the following two criteria:

- Each intersection should be operating at an overall LOS D or better during the analyzed periods.
- Individual turning movements should have a V/C ratio < 1.0 during the analyzed periods.

The proposed intersection lane configurations for Alternatives 1 and 2 are provided in **Appendix C**, and the software output for the capacity analysis is provided in **Appendix D**.

Year 2010 No Build Capacity Analysis

Table 3 shows the summary of the year 2010 capacity analysis for the No Build alternative. There are multiple intersections that are currently operating at an overall LOS "E" in the year 2010 AM and PM peak hours. Because the heavy through traffic along SR 37 requires a significant amount of the overall green time per cycle, some side-street movements are operating at a LOS "E" or "F".

Table 3 – Year 2010 No Build Capacity Analysis

Intersection	Traffic Control	Peak	West Leg		East Leg		South Leg		North Leg		Overall	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 37 and 126th Street	Signal	AM	D	50.6	E	55.4	C	34.7	C	23.2	D	35.5
		PM	F	114.1	F	112.4	E	60.6	C	21.5	E	62.5
SR 37 and 131st Street	Signal	AM	D	44.1	D	54.4	B	12.5	B	16.4	C	22.9
		PM	E	70.2	D	36.5	E	55.7	C	24.0	D	44.9
SR 37 and 135th Street	--	AM	--	--	--	--	--	--	--	--	--	--
		PM	--	--	--	--	--	--	--	--	--	--
SR 37 and 141st Street	Signal	AM	D	48.1	D	44.0	A	5.4	A	8.5	B	15.5
		PM	F	138.7	F	115.5	D	49.2	D	50.1	E	65.3
SR 37 and 146th Street	Signal	AM	D	37.4	E	59.2	D	37.4	D	37.7	D	42.3
		PM	D	37.1	D	41.1	B	11.1	B	14.2	C	24.3
SR 37 and Greenfield Avenue	Signal	AM	D	43.3	D	35.1	C	29.5	B	15.6	C	26.0
		PM	F	85.0	E	57.9	D	44.5	C	28.8	D	47.3
SR 37 and Town & Country Blvd	Signal	AM	C	26.6	D	49.4	B	14.5	A	5.9	B	11.0
		PM	D	37.7	E	64.5	B	15.4	B	16.3	C	24.0
SR 37 and Pleasant Street	Signal	AM	C	31.6	C	26.6	A	7.2	B	10.1	B	11.1
		PM	F	160.4	F	92.1	D	52.5	D	43.4	E	69.2
SR 37 and Cherry Street	One-Way Stop	AM	C	19.1	--	--	--	--	--	--	--	--
		PM	C	19.2	--	--	--	--	--	--	--	--
SR 37 and SR 32	Signal	AM	D	39.1	D	39.9	D	43.7	D	39.5	D	40.5
		PM	D	43.1	D	42.0	C	22.6	D	43.7	C	33.5
146th Street and Allisonville Road	Signal	AM	C	26.7	B	18.4	D	47.1	D	48.6	C	29.7
		PM	C	28.8	C	23.4	D	38.7	D	44.1	C	31.1
146th Street and Cumberland Road	Signal	AM	B	19.4	C	21.3	C	35.3	D	39.2	C	24.4
		PM	B	16.0	C	26.6	D	39.0	D	40.3	C	24.6

Note: For unsignalized intersections, LOS on uncontrolled approaches not reported

Year 2036 No Build Capacity Analysis

Table 4 shows the summary of the year 2036 capacity analysis for the No Build alternative. Except for the intersection of 146th Street and Cumberland Road, all of the study intersections will be operating at an unacceptable LOS during the year 2036 AM and/or PM peak hours.

Table 4 – Year 2036 No Build Capacity Analysis

Intersection	Traffic Control	Peak	West Leg		East Leg		South Leg		North Leg		Overall	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 37 and 126th Street	Signal	AM	F	130.6	F	183.9	F	83.6	F	130.9	F	127.1
		PM	F	276.2	F	230.7	F	249.9	E	78.8	F	198.5
SR 37 and 131st Street	Signal	AM	E	76.1	F	105.8	D	42.2	F	94.9	E	78.0
		PM	F	209.2	E	67.4	F	219.7	F	86.1	F	158.8
SR 37 and 135th Street	Signal	AM	E	57.8	F	102.9	A	6.8	D	38.6	C	32.1
		PM	F	163	F	111.4	F	155.7	C	33.2	F	108.6
SR 37 and 141st Street	Signal	AM	F	136.2	F	106.6	B	14.9	E	60.5	E	56.6
		PM	F	314.8	F	242.7	F	234.5	F	100.3	F	201.8
SR 37 and 146th Street	Signal	AM	E	65.6	F	190.0	F	112.6	F	163.6	F	141.0
		PM	E	73.0	F	98.4	D	54.7	D	38.2	E	63.7
SR 37 and Greenfield Avenue	Signal	AM	F	100.0	F	92.5	E	58.0	E	75.0	E	78.1
		PM	F	187.1	F	189.3	F	220.8	E	58.4	F	157.3
SR 37 and Town & Country Blvd	Signal	AM	D	35.2	E	73.5	C	29.6	B	14.5	C	22.5
		PM	F	91.3	F	142.7	F	96.1	C	29.9	F	81.9
SR 37 and Pleasant Street	Signal	AM	E	64.5	D	37.2	B	16.0	E	72.9	D	54.2
		PM	F	284.6	F	250.8	F	263.2	F	91.0	F	209.7
SR 37 and Cherry Street	One-Way Stop	AM	F	>300	--	--	--	--	--	--	--	--
		PM	F	>300	--	--	--	--	--	--	--	--
SR 37 and SR 32	Signal	AM	F	134.3	F	111.3	E	57.9	F	122.9	F	107.3
		PM	F	119.4	F	95.7	F	128.7	F	128.9	F	121.7
146th Street and Allisonville Road	Signal	AM	D	54.6	E	77.2	F	127.7	F	125.7	F	85.6
		PM	E	63.1	C	32.3	F	102.0	F	94.1	E	66.8
146th Street and Cumberland Road	Signal	AM	C	24.2	C	31.9	D	46.8	D	50.9	C	33.5
		PM	C	21.5	D	44.1	E	63.0	E	61.8	D	37.4

Note: For unsignalized intersections, LOS on uncontrolled approaches not reported

Year 2036 Alternative 1 Capacity Analysis

Table 5 shows the summary of the capacity analysis for Alternative 1. With the proposed intersection lane configurations, all study intersections will be operating at an overall LOS D or better in year 2036 AM and PM peak hours. The following improvements have been identified:

- SR 37 and 126th Street: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37.
- SR 37 and 131st Street: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37.
- SR 37 and 135th Street: A teardrop roundabout interchange is proposed, with a 2-lane bridge crossing SR 37.
- SR 37 and 141st Street: A teardrop roundabout interchange is proposed, with a 2-lane bridge crossing SR 37.
- SR 37 and 146th Street: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37. There are two three-lane approaches due to the heavy turning movements.
- SR 37 and Greenfield Avenue: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37.
- SR 37 and Town & Country Blvd: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37.
- SR 37 and Pleasant Street: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37.
- SR 37 and Cherry Street: Cherry Street will only be provided access to the SR 37 southbound collector/distributor. A one-way stop-controlled "T" intersection is proposed.
- SR 37 and SR 32: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing SR 37. There are three triple-lane approaches due to heavy turning movements.
- 146th Street and Allisonville Road: A teardrop roundabout interchange is proposed, with a 4-lane bridge crossing 146th Street.
- 146th Street and Cumberland Road: No improvement is necessary. The existing at-grade signalized intersection will remain unchanged.

Table 5 – Year 2036 Alternative 1 Capacity Analysis

Intersection	Traffic Control	Peak	West Leg		East Leg		South Leg		North Leg		Overall	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 37 NB Ramps and 126th Street	Roundabout	AM	A	2.4	A	4.2	A	2.4	--	--	A	3.3
		PM	A	3.0	A	3.6	A	3.6	--	--	A	3.3
SR 37 SB Ramps and 126th Street	Roundabout	AM	A	3.0	A	3.0	--	--	A	3.6	A	3.3
		PM	A	3.6	A	3.0	--	--	A	3.0	A	3.2
SR 37 NB Ramps and 131st Street	Roundabout	AM	A	1.8	A	3.0	A	2.4	--	--	A	2.5
		PM	A	2.4	A	3.0	A	3.6	--	--	A	2.8
SR 37 SB Ramps and 131st Street	Roundabout	AM	A	2.4	A	2.4	--	--	A	3.0	A	2.7
		PM	A	3.0	A	1.8	--	--	A	2.4	A	2.6
SR 37 NB Ramps and 135th Street	Roundabout	AM	A	3.6	A	4.8	A	3.6	--	--	A	4.2
		PM	A	5.4	A	4.8	A	5.4	--	--	A	5
SR 37 SB Ramps and 135th Street	Roundabout	AM	A	4.2	A	4.2	--	--	A	4.8	A	4.3
		PM	A	6.6	A	4.2	--	--	A	4.8	A	5.4
SR 37 NB Ramps and 141st Street	Roundabout	AM	A	3.6	A	2.4	A	1.8	--	--	A	2.6
		PM	A	6.6	A	2.4	A	3.0	--	--	A	4.1
SR 37 SB Ramps and 141st Street	Roundabout	AM	A	2.4	A	8.4	--	--	A	2.4	A	5.7
		PM	A	3.0	B	10.2	--	--	A	3.0	A	6.3
SR 37 NB Ramps and 146th Street	Roundabout	AM	A	2.4	D	25.2	A	2.4	--	--	B	12.3
		PM	B	7.8	B	11.4	A	4.2	--	--	A	8.4
SR 37 SB Ramps and 146th Street	Roundabout	AM	A	1.8	C	16.8	--	--	C	21.0	B	13.1
		PM	A	3.6	A	4.2	--	--	A	4.8	A	4.0
SR 37 NB Ramps and Greenfield Avenue	Roundabout	AM	A	2.4	A	3.6	A	2.4	--	--	A	3.0
		PM	A	3.0	A	4.2	A	3.0	--	--	A	3.5
SR 37 SB Ramps and Greenfield Avenue	Roundabout	AM	A	3.0	A	2.4	--	--	A	3.0	A	2.7
		PM	A	3.6	A	1.8	--	--	A	3.0	A	3.0
SR 37 NB Ramps and Town & Country Blvd	Roundabout	AM	A	1.8	A	1.8	A	1.8	--	--	A	1.8
		PM	A	2.4	A	3.0	A	4.2	--	--	A	3.2
SR 37 SB Ramps and Town & Country Blvd	Roundabout	AM	A	1.8	A	1.8	--	--	A	2.4	A	2.0
		PM	A	8.4	A	2.4	--	--	A	6.0	A	5.8
SR 37 NB Ramps and Pleasant Street	Roundabout	AM	A	1.8	A	1.8	A	1.8	--	--	A	1.8
		PM	A	2.4	A	3.6	A	2.4	--	--	A	3.0
SR 37 SB Ramps and Pleasant Street	Roundabout	AM	A	1.8	A	1.8	--	--	A	1.8	A	1.9
		PM	A	3.6	A	2.4	--	--	A	3.0	A	2.9
SR 37 and Cherry Street	One-Way Stop	AM	B	11.2	--	--	--	--	--	--	--	--
		PM	C	17.8	--	--	--	--	--	--	--	--
SR 37 NB Ramps and SR 32	Roundabout	AM	A	1.8	A	2.4	A	1.8	--	--	A	2.1
		PM	A	2.4	A	4.2	A	9.0	--	--	A	6.6
SR 37 SB Ramps and SR 32	Roundabout	AM	A	2.4	A	5.4	--	--	A	8.4	A	5.1
		PM	A	3.0	A	4.2	--	--	A	6.6	A	4.1
146th Street EB Ramps and Allisonville Road	Roundabout	AM	A	3.0	--	--	A	2.4	A	2.4	A	2.7
		PM	A	4.2	--	--	A	9.0	A	2.4	A	5.9
146th Street WB Ramps and Allisonville Road	Roundabout	AM	--	--	A	3.0	A	2.4	A	4.8	A	3.4
		PM	--	--	A	4.2	A	4.2	A	3.0	A	4.0
146th Street and Cumberland Road	Signal	AM	C	32.3	C	32.8	C	33.3	C	28.5	C	32.2
		PM	C	34.5	C	34.4	D	50.5	D	54.8	D	39.1

Note: For unsignalized intersections, LOS on uncontrolled approaches not reported

Year 2036 Alternative 2 Capacity Analysis

Table 6 shows the summary of the capacity analysis for Alternative 2. With the proposed intersection lane configurations, all study intersections will be operating at an overall LOS D or better in the year 2036 AM and PM peak hours. The following improvements have been identified:

- SR 37 and 126th Street: A tight diamond interchange is proposed, with a 4-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and 131st Street: A tight diamond interchange is proposed, with a 4-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and 135th Street: A tight diamond interchange is proposed, with a 3-lane bridge crossing SR 37. Both ramp intersections will remain unsignalized by year 2036.
- SR 37 and 141st Street: A tight diamond interchange is proposed, with a 4-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and 146th Street: A tight diamond interchange is proposed, with a 6-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and Greenfield Avenue: A tight diamond interchange is proposed, with a 4-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and Town & Country Blvd: A tight diamond interchange is proposed, with a 4-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and Pleasant Street: A tight diamond interchange is proposed, with a 4-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- SR 37 and Cherry Street: Cherry Street will only be provided access to the SR 37 southbound collector/distributor. A one-way stop-controlled "T" intersection is proposed.
- SR 37 and SR 32: A tight diamond interchange is proposed, with a 6-lane bridge crossing SR 37. Both ramp intersections will be signalized by year 2036.
- 146th Street and Allisonville Road: A tight diamond interchange is proposed, with a 4-lane bridge crossing 146th Street. Both ramp intersections will be signalized by year 2036.
- 146th Street and Cumberland Road: No improvement is necessary. The existing at-grade signalized intersection will remain unchanged.

Table 6 – Year 2036 Alternative 2 Capacity Analysis

Intersection	Traffic Control	Year 2036	West Leg		East Leg		South Leg		North Leg		Overall	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 37 NB Ramps and 126th Street	Signal	AM	A	6.9	B	15.2	C	23.8	--	--	B	13.8
		PM	B	13.0	C	23.9	C	28.2	--	--	C	20.5
SR 37 SB Ramps and 126th Street	Signal	AM	C	28.9	A	7.3	--	--	C	30.8	B	17.6
		PM	C	25.1	B	14.8	--	--	C	32.9	C	21.7
SR 37 NB Ramps and 131st Street	Signal	AM	A	4.5	A	7.1	C	29.6	--	--	B	10.9
		PM	A	5.8	A	4.4	C	29.3	--	--	B	12.6
SR 37 SB Ramps and 131st Street	Signal	AM	B	15.5	A	5.7	--	--	C	29.8	B	15.7
		PM	B	15.9	A	5.3	--	--	D	38.8	B	19.5
SR 37 NB Ramps and 135th Street	One-Way Stop	AM	--	--	--	--	B	12.5	--	--	--	--
		PM	--	--	--	--	C	21.1	--	--	--	--
SR 37 SB Ramps and 135th Street	One-Way Stop	AM	--	--	--	--	--	--	B	12.8	--	--
		PM	--	--	--	--	--	--	D	31	--	--
SR 37 NB Ramps and 141st Street	Signal	AM	A	4.1	A	7.4	B	15.2	--	--	B	8.4
		PM	B	14.5	B	18.3	B	19.9	--	--	B	17.7
SR 37 SB Ramps and 141st Street	Signal	AM	A	6.1	A	1.9	--	--	C	21.2	A	6.1
		PM	B	15.2	B	15.6	--	--	D	40.4	C	20.7
SR 37 NB Ramps and 146th Street	Signal	AM	B	19.3	B	16.9	D	48.2	--	--	C	26.2
		PM	B	14.8	D	51.1	D	48.1	--	--	C	34.4
SR 37 SB Ramps and 146th Street	Signal	AM	B	13.6	A	6.2	--	--	D	49.8	B	15.5
		PM	B	15.3	A	7.1	--	--	D	38.0	B	15.7
SR 37 NB Ramps and Greenfield Avenue	Signal	AM	A	7.5	B	11.6	D	45.3	--	--	B	13.4
		PM	A	7.1	A	8.2	D	39.7	--	--	B	10.2
SR 37 SB Ramps and Greenfield Avenue	Signal	AM	B	17.8	A	9.7	--	--	C	26.6	B	16.1
		PM	C	32.0	C	22.9	--	--	D	53.2	D	35.5
SR 37 NB Ramps and Town & Country Blvd	Signal	AM	A	1.2	A	5.0	C	25.2	--	--	B	13.4
		PM	A	5.6	C	23.4	C	32.5	--	--	C	20.8
SR 37 SB Ramps and Town & Country Blvd	Signal	AM	A	5.9	A	3.1	--	--	C	33.5	C	20.8
		PM	D	35.7	C	28.8	--	--	D	53.1	D	39.3
SR 37 NB Ramps and Pleasant Street	Signal	AM	A	2.3	A	3.3	C	34.7	--	--	B	11.1
		PM	A	5.2	B	11.0	D	40.2	--	--	B	12.7
SR 37 SB Ramps and Pleasant Street	Signal	AM	A	3.9	A	1.3	--	--	C	26.6	B	14.7
		PM	C	20.6	A	6.4	--	--	D	40.8	C	23.2
SR 37 and Cherry Street	One-Way Stop	AM	B	11.2	--	--	--	--	--	--	--	--
		PM	C	17.8	--	--	--	--	--	--	--	--
SR 37 NB Ramps and SR 32	Signal	AM	A	4.4	C	21.3	C	27.5	--	--	B	19.8
		PM	B	14.6	D	38.7	C	33.4	--	--	C	30.6
SR 37 SB Ramps and SR 32	Signal	AM	C	22.7	A	8.2	--	--	D	49.0	C	21.1
		PM	C	25.3	B	13.2	--	--	D	45.0	C	24.3
146th Street EB Ramps and Allisonville Road	Signal	AM	D	36.8	--	--	B	12.2	A	9.8	B	17.7
		PM	C	34.1	--	--	C	25.7	C	25.5	C	28.3
146th Street WB Ramps and Allisonville Road	Signal	AM	--	--	C	25.5	B	17.5	C	22.0	C	21.4
		PM	--	--	C	34.3	B	12.3	C	24.8	B	19.1
146th Street and Cumberland Road	Signal	AM	C	32.3	C	32.8	C	33.3	C	28.5	C	32.2
		PM	C	34.5	C	34.4	D	50.5	D	54.8	D	39.1

Note: For unsignalized intersections, LOS on uncontrolled approaches not reported

Year 2036 Weaving Analysis

For Alternatives 1 and 2, because of the proximity between some adjacent interchanges along SR 37, weaving segments may be created along SR 37. An abbreviated weaving analysis has been performed using the following procedure:

1. The segment of SR 37 with the highest hourly traffic volume is between 131st and 135th in the northbound direction, which will be 2,836 vph in year 2036 PM peak hour. With two existing travel lanes in both directions of SR 37 and the basic capacity of 2,300 passenger cars per hour per lane for freeways with a Free-Flow Speed of 60 mph, it is concluded that all basic freeway segments along SR 37 will be operating at an acceptable LOS in year 2036.
2. All weaving segments between proposed interchanges along SR 37 were then identified assuming no collector-distributor lanes will be provided. On-ramps and off-ramps at the proposed interchanges have been preliminarily designed to determine the distance from the interchanges that the ramps could feasibly converge with mainline SR 37. The distance between the back of an entrance gore from one interchange to the back of an exit gore to the next interchange was then estimated and summarized in **Table 7**. According to The Indiana Design Manual Figure 48-3B, 1,600 ft is the recommended minimum ramp terminal spacing from back of gore to back of gore in weaving segments at "service to service" interchanges. For the weaving segments shorter than 1,600 ft, a capacity analysis based on the methodology in the Highway Capacity Manual has been performed to further evaluate the weaving operations. The weaving segments between 146th Street and Greenfield Avenue, and between Greenfield Avenue and Town & Country Boulevard exceed the minimum distance and were not analyzed.
3. In the capacity analysis, the weaving segments were analyzed as a type "A" weave using HCS 2000. Rather than using the back of gore to back of gore distances for the weaving segments as defined in the Indiana Design Manual, the nose of gore to nose of gore distances were used in the analysis. This approach provides a more conservative analysis that more closely reflects normal driver behavior. In **Table 7**, the resulting LOS were shown, and the highlighted weaving segments indicate an unacceptable LOS in year 2036. For these segments, the weaving movements will need to be removed from mainline SR 37 by interconnecting adjacent interchanges using collector-distributor lanes.

Table 7 – Summary of Weaving Analysis in Year 2036

SR 37 Weaving Segments	Back of Gore to Back of Gore Distance (ft)	Nose of Gore to Nose of Gore Distance (ft)	Travel Direction	LOS	Peak Hour	Notes
126th St. to 131st St.	1,120	417	NB	D	PM	
			SB	C	AM	With 135th to 131st (SB) NOT interconnected
			SB	C	AM	With 135th to 131st (SB) interconnected
131st St. to 135th St.	760	57	NB	F	PM	
			SB	E	AM	
135th St. to 141st St.	1,510	807	NB	C	PM	With 135th to 131st (NB) NOT interconnected
			NB	D	PM	With 135th to 131st (NB) interconnected
			SB	B	AM	
141st St. to 146th St.	1,140	437	NB	C	PM	
			SB	B	AM	
146th St. to Greenfield Ave.	6,820	6,117				Not analyzed
Greenfield Ave. to Town & Country Blvd.	2,110	1,407				Not analyzed
Town & Country Blvd. to Pleasant St.	990	287	NB	C	PM	
			SB	B	PM	With SR 32 & Pleasant St (SB) NOT interconnected
			SB	F	PM	With SR 32 & Pleasant St (SB) interconnected
Pleasant St. to SR 32	810	107	NB	F	PM	
			SB	F	AM	

Appendix B illustrates the resulting interconnection plan showing the proposed collector-distributor lanes between the proposed interchanges. All failing weaving conditions shown in **Table 7** have been eliminated. This configuration can be used with either Alternative 1 or Alternative 2, and has been incorporated into the traffic forecast shown previously in **Figure 4**. Additional weaving analysis calculations and information are provided in **Appendix D**.

Findings and Recommendations

Based on the analysis performed in this study, it has been demonstrated that some study intersections are currently operating at an unacceptable LOS, and if no improvements are made, all of the study intersections along SR 37 will be operating at an unacceptable LOS in the year 2036. The SR 37 Mobility Study has proposed a plan to upgrade the existing SR 37 corridor with either teardrop roundabout interchanges (Alternative 1) or tight diamond interchanges (Alternative 2). Both alternatives will significantly improve traffic operations at the study intersections.

Summary of Findings and Recommendations

- For Alternative 1, based on the RODEL analysis, all study intersections will be operating at an acceptable LOS in year 2036 with the proposed intersection lane configurations.
    - There are a total of five triple-lane approaches at four proposed roundabouts based on the year 2036 traffic volumes. During the design stage of this project, it is recommended to further evaluate the possibility of operating these roundabouts with less travel lanes in the opening year with future expandability to maximize the roundabouts' safety benefits.
- For Alternative 2, all study intersections will be operating at an acceptable LOS in year 2036 with the proposed intersection lane configurations.
    - Due to the scope of the study, only the tight-diamond interchange configuration was analyzed for Alternative 2. Previous research has indicated that the single-point urban interchange (SPUI) can provide comparable traffic operations with the same traffic volumes. One unique benefit of the SPUI is that there is only one signalized intersection at the interchange, which makes it easier to coordinate with adjacent signalized intersections along the cross street.
    - Although no formal signal warrant analysis has been performed, most of the proposed ramp intersections are expected to be signalized. During the design stage of this project, it is recommended to evaluate the need for traffic signals at the ramp intersections based on requirements documented in the Indiana MUTCD.
- The abbreviated weaving analysis indicates that at five locations along SR 37, collector-distributor lanes will be required to interconnect adjacent interchanges, thus eliminating any weaving operations that are expected to fail in year 2036.
- The construction of the new intersection at SR 37 and 135th Street will likely be driven by the development/redevelopment east and west of SR 37. Due to the nature of the development plans, the traffic impact study reports reviewed in this study may have become outdated. It is recommended to continue to coordinate with the developers for the latest site plans to assure no significant changes have occurred that would affect the design of this interchange.
- Both Alternatives 1 and 2 will be able to address the capacity needs at the study intersections. To select the preferred alternative, other factors such as right-of-way impact, overall project cost, intersection safety, and community preference need to be evaluated. It is possible the preferred alternative may be a combination of Alternatives 1 and 2, and may include additional interchange configurations such as the single point urban interchange.

Appendices

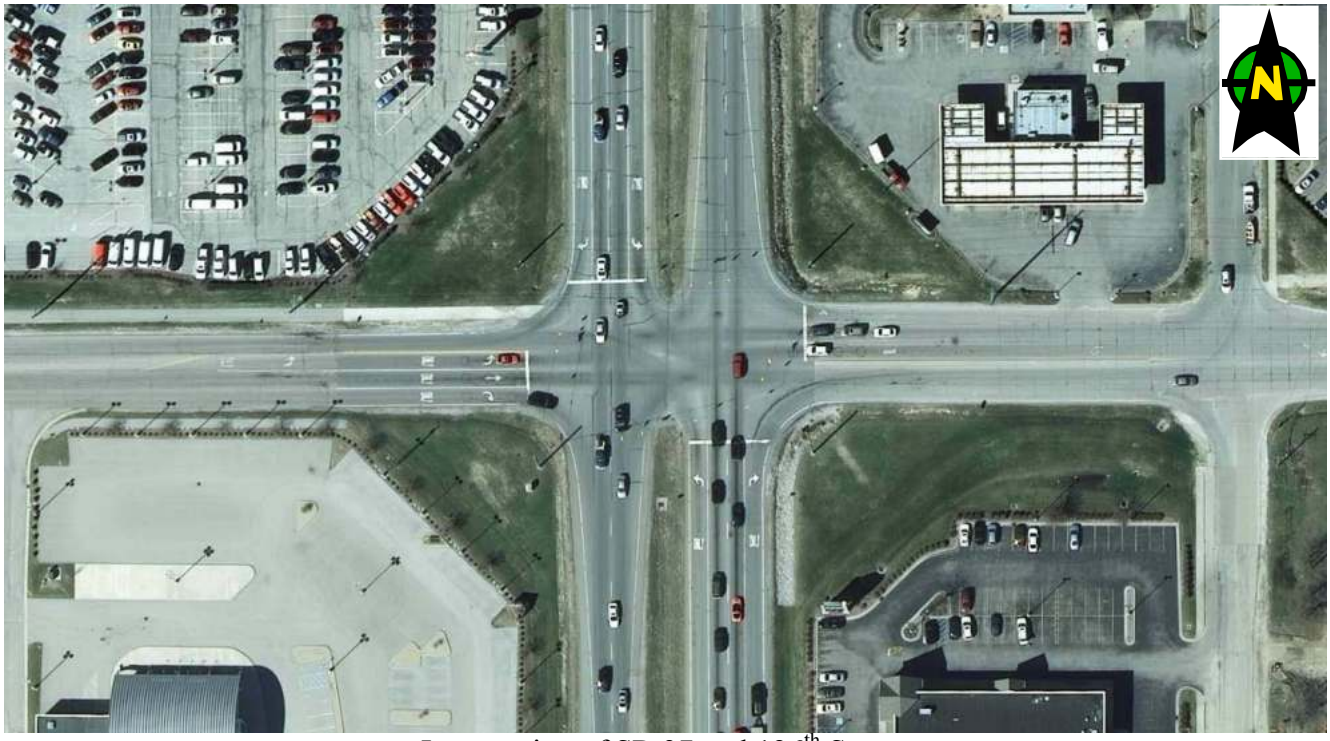
Appendix A – Existing Intersection Lane Configurations

Appendix B – Schematic Diagrams for the SR 37 Corridor

Appendix C – Proposed Intersection Lane Configurations for Alternatives 1 and 2

Appendix D – Capacity Analysis Output

Appendix A – Existing Intersection Lane Configurations for Study Intersections



Intersection of SR 37 and 126th Street

Intersection of SR 37 and 131st Street

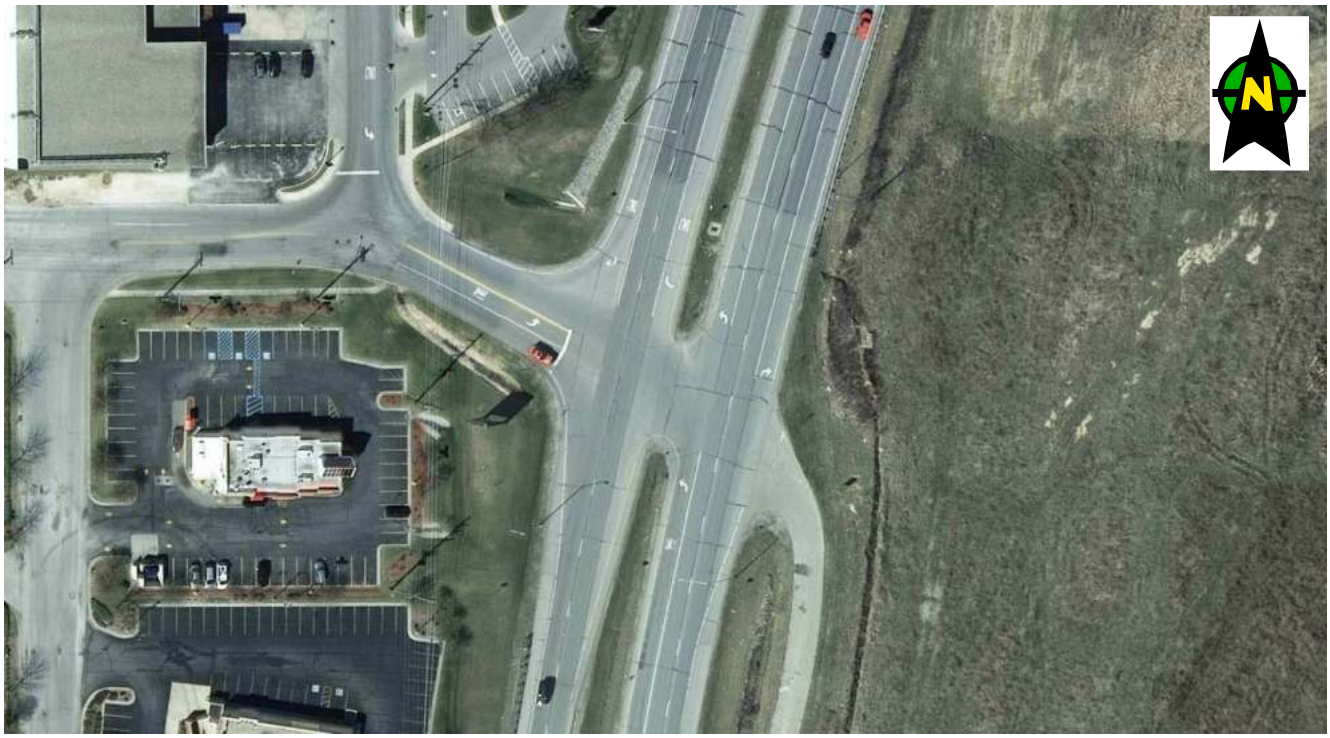
Intersection of SR 37 and 141st Street

Intersection of SR 37 and 146th Street

Intersection of SR 37 and Greenfield Avenue

Intersection of SR 37 and Town and Country Blvd

Intersection of SR 37 and Pleasant Street



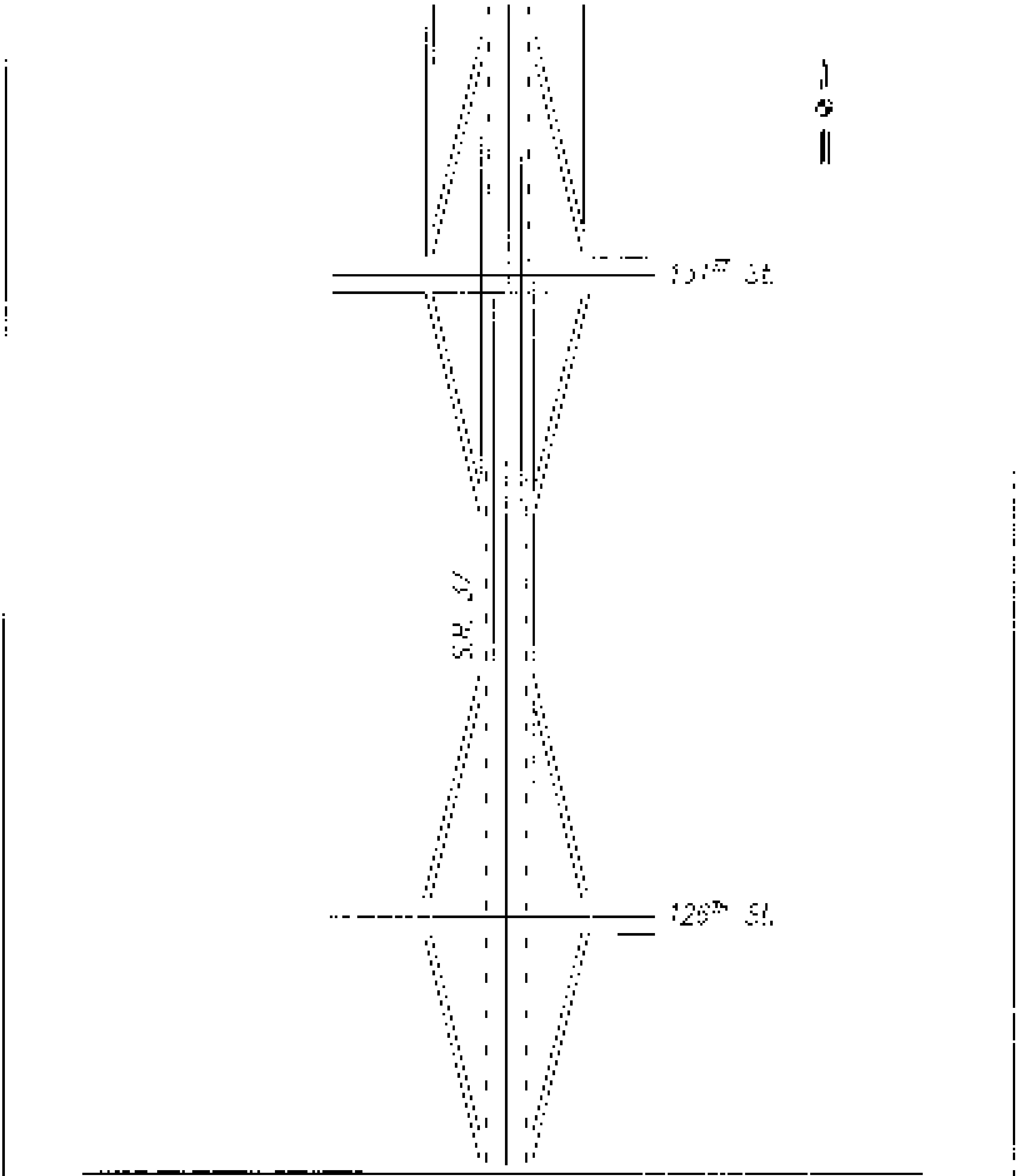
Intersection of SR 37 and Cherry Street

Intersection of SR 37 and SR 32

Intersection of 146th Street and Allisonville Road

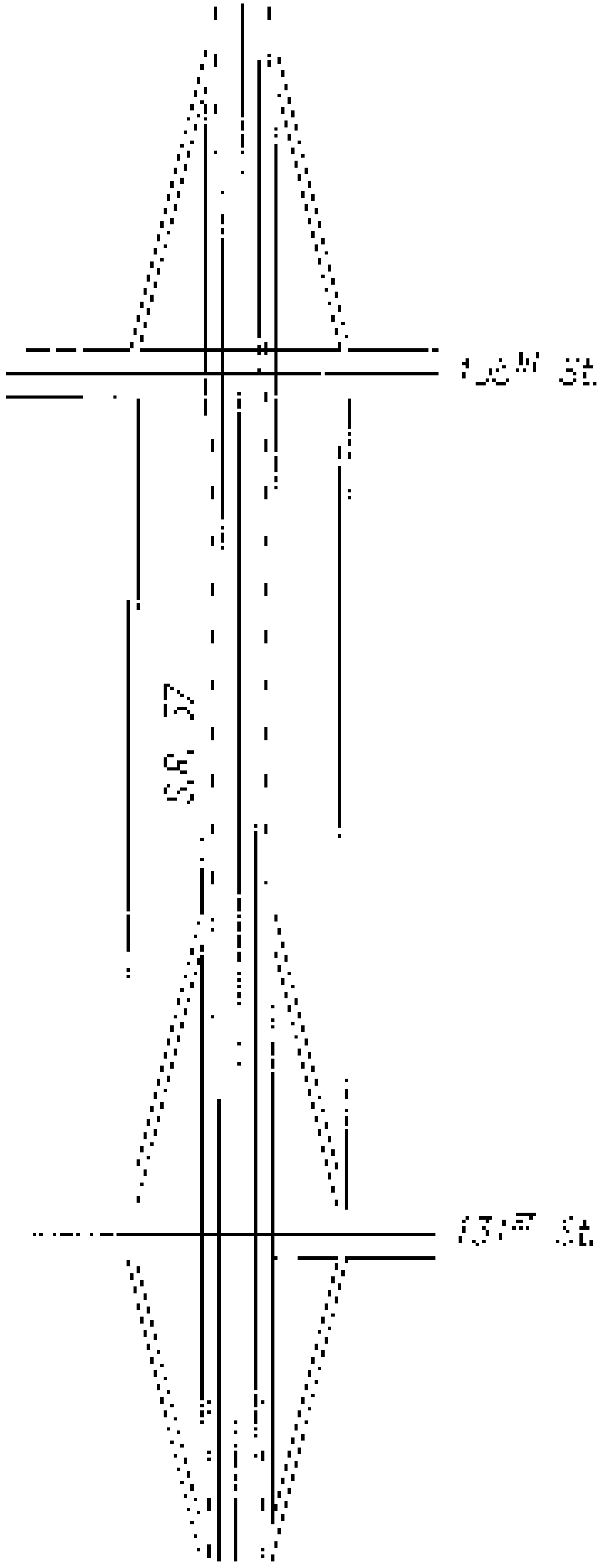
Intersection of 146th Street and Cumberland Road

Appendix B – Schematic Diagrams for the SR 37 Corridor



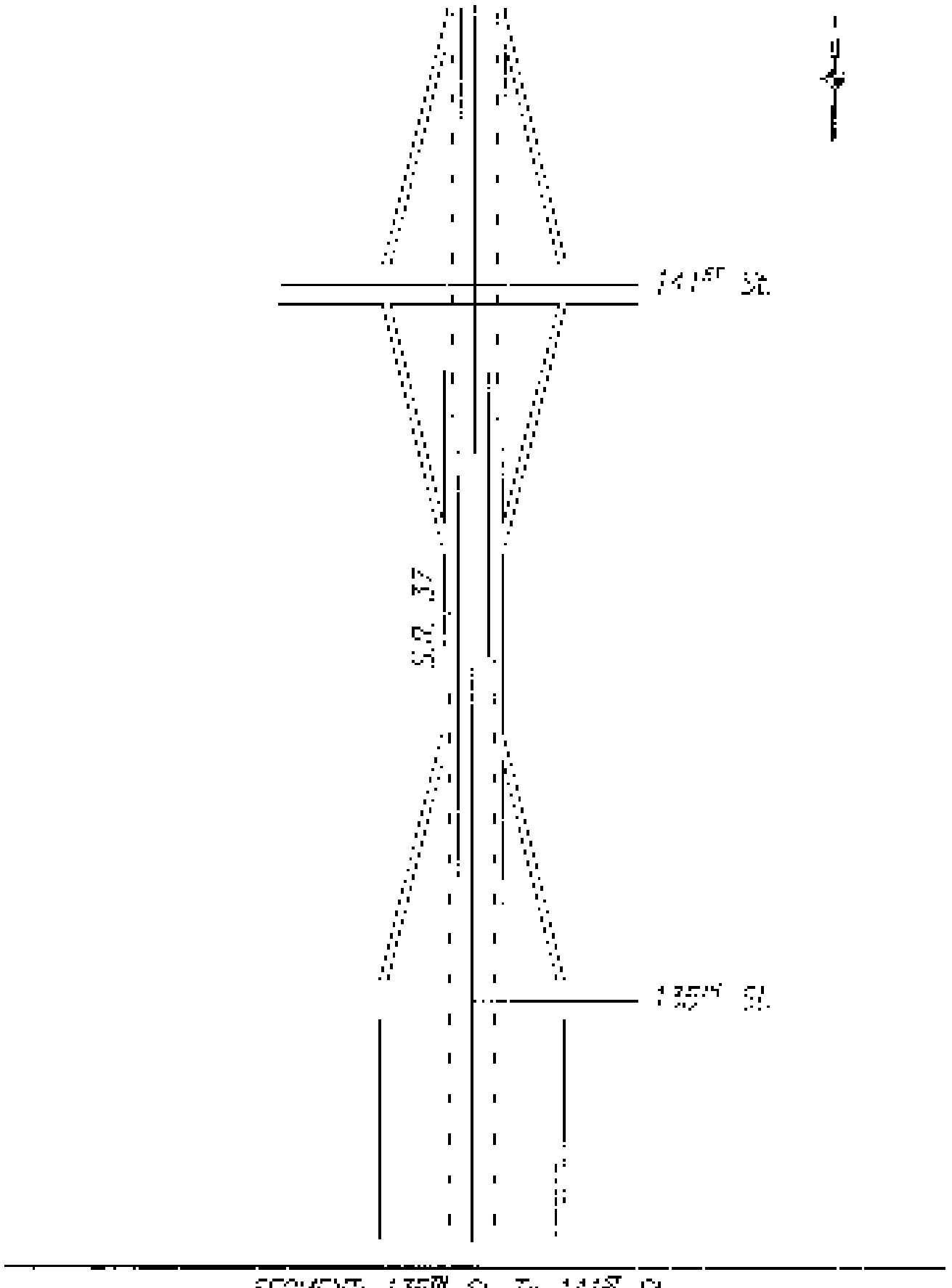
SEGMENT: 126th St. To 131st St.

[illegible]



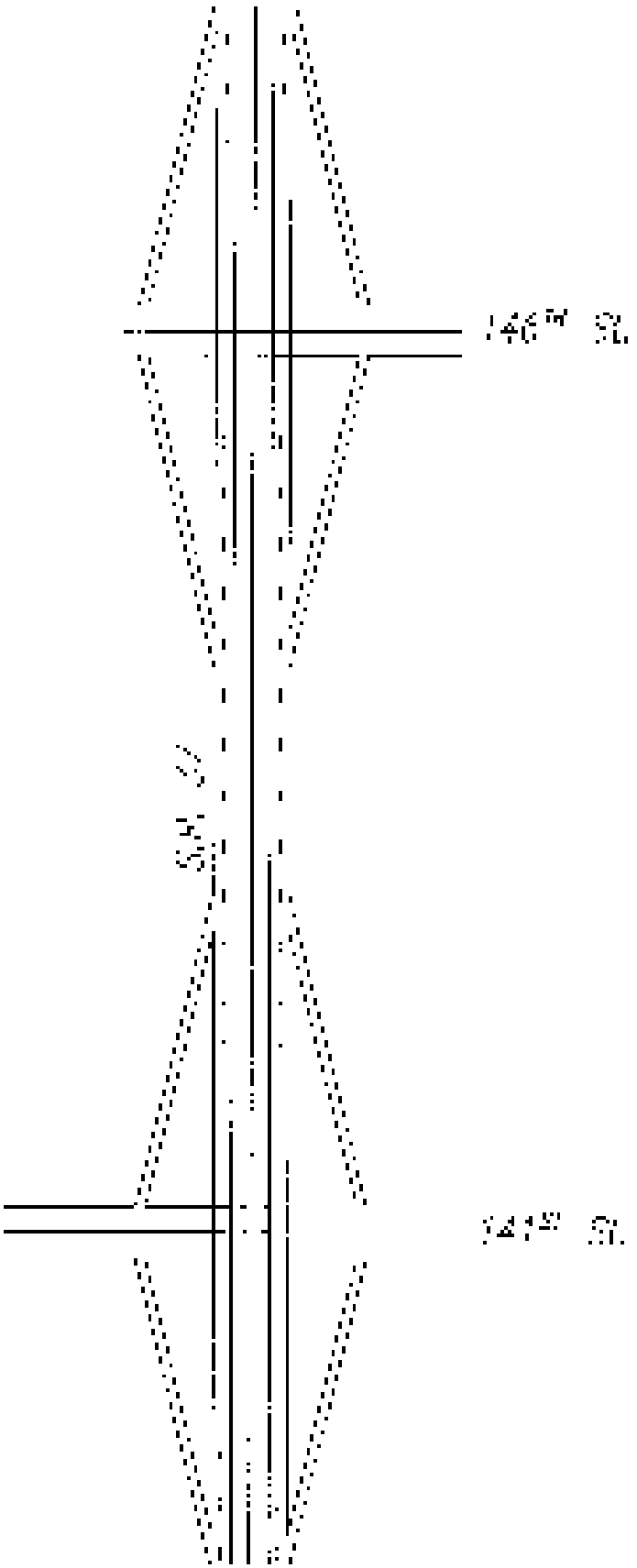
SEGMENT: 131ST St. To 136TH St.

NOTE: This Diagram Is to Illustrate Configuration of [illegible] Ramps and Collector Distributor Connections Only.



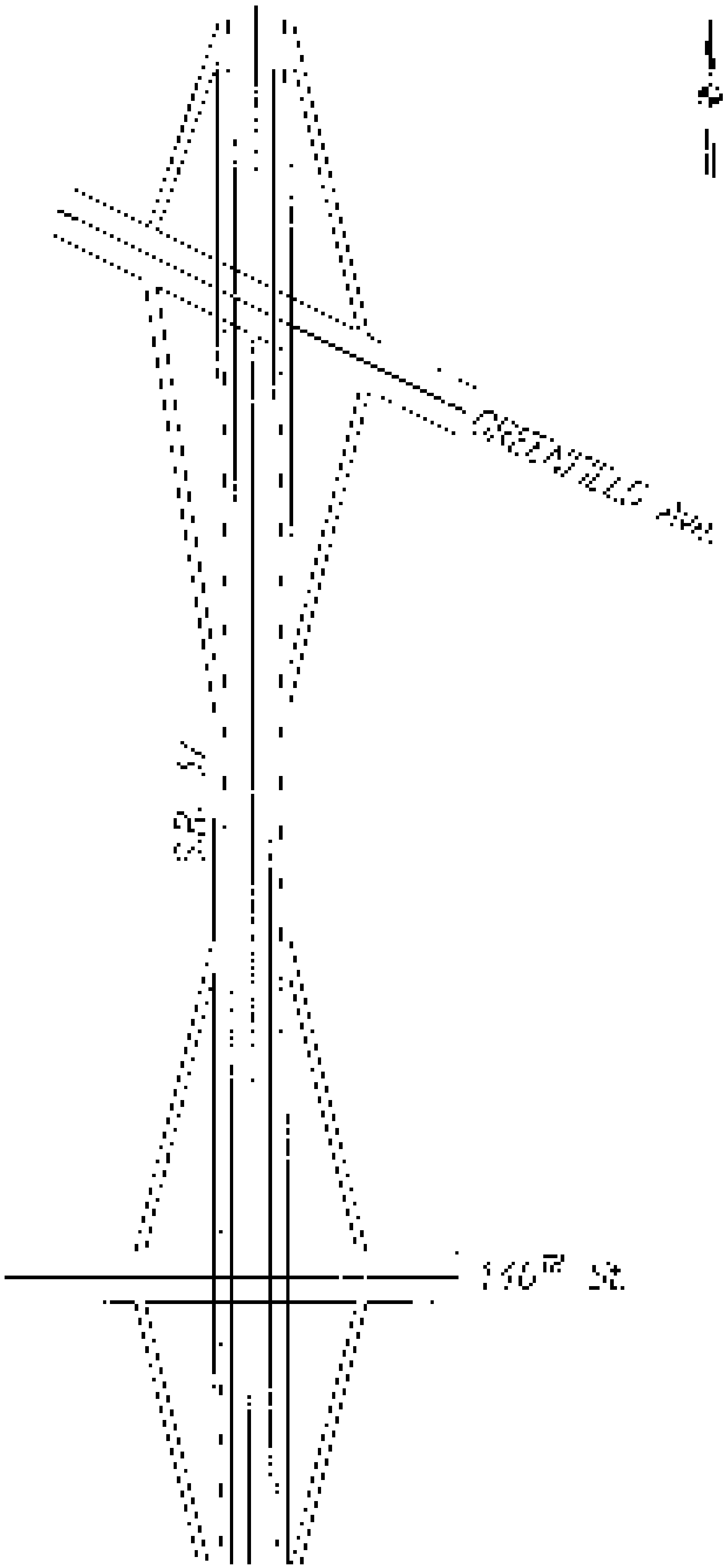
SCHEME: 135TH St. To 141ST St.

NOTE: This diagram is to illustrate configurations of Intersection Merge and Diverge-Weaving Connections only.



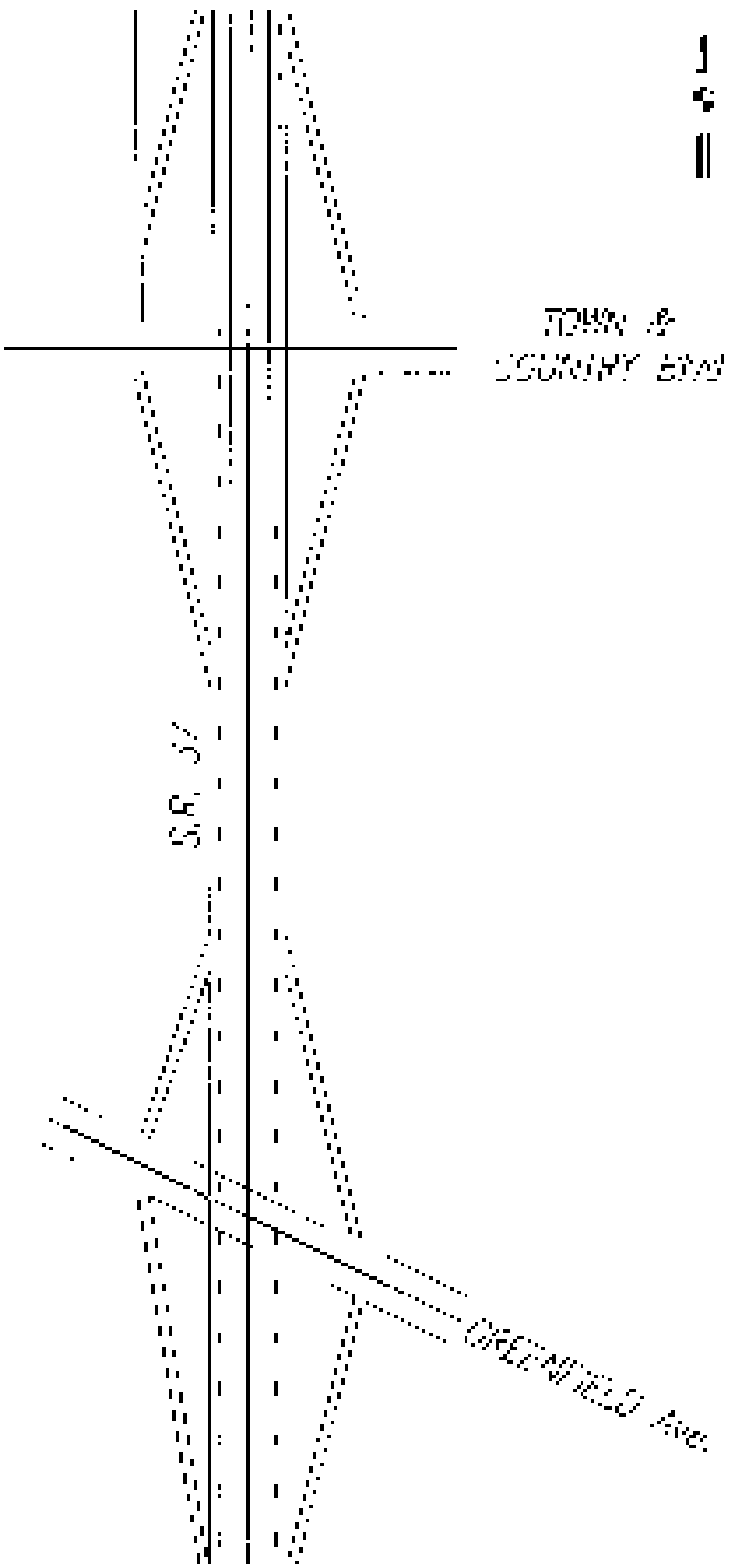
SEGMENT: 141ST St. to 146TH St.

Note: See Diagram A for Typical Configuration of Primary Exit Ramps and Collector-Distributor Connections Only



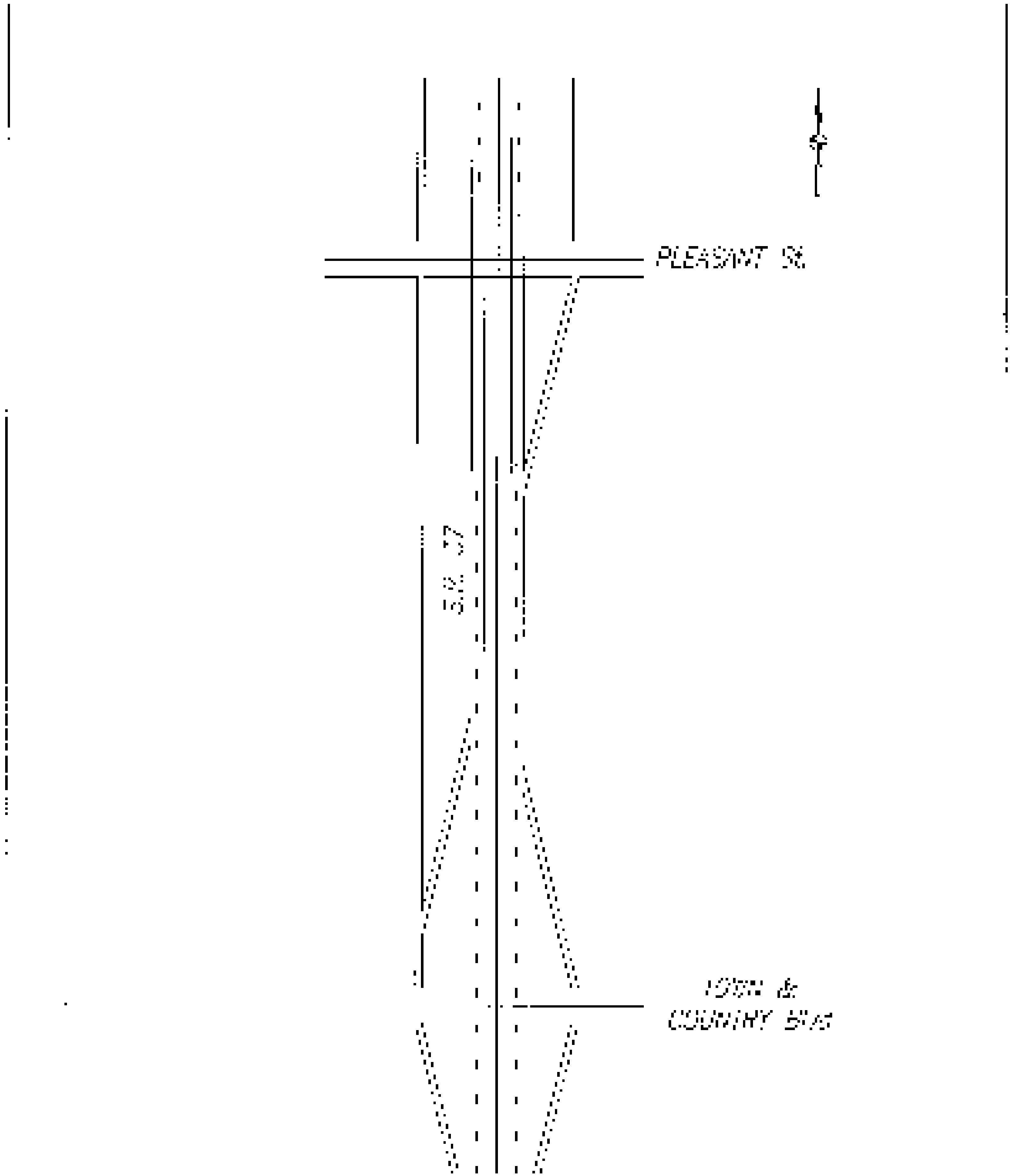
SEGMENT: 146th St. to GREENFIELD Ave.

NOTE: This Diagram is to Illustrate Configuration of Entrance/Exit Ramps and Collector Distributor Connections Only.



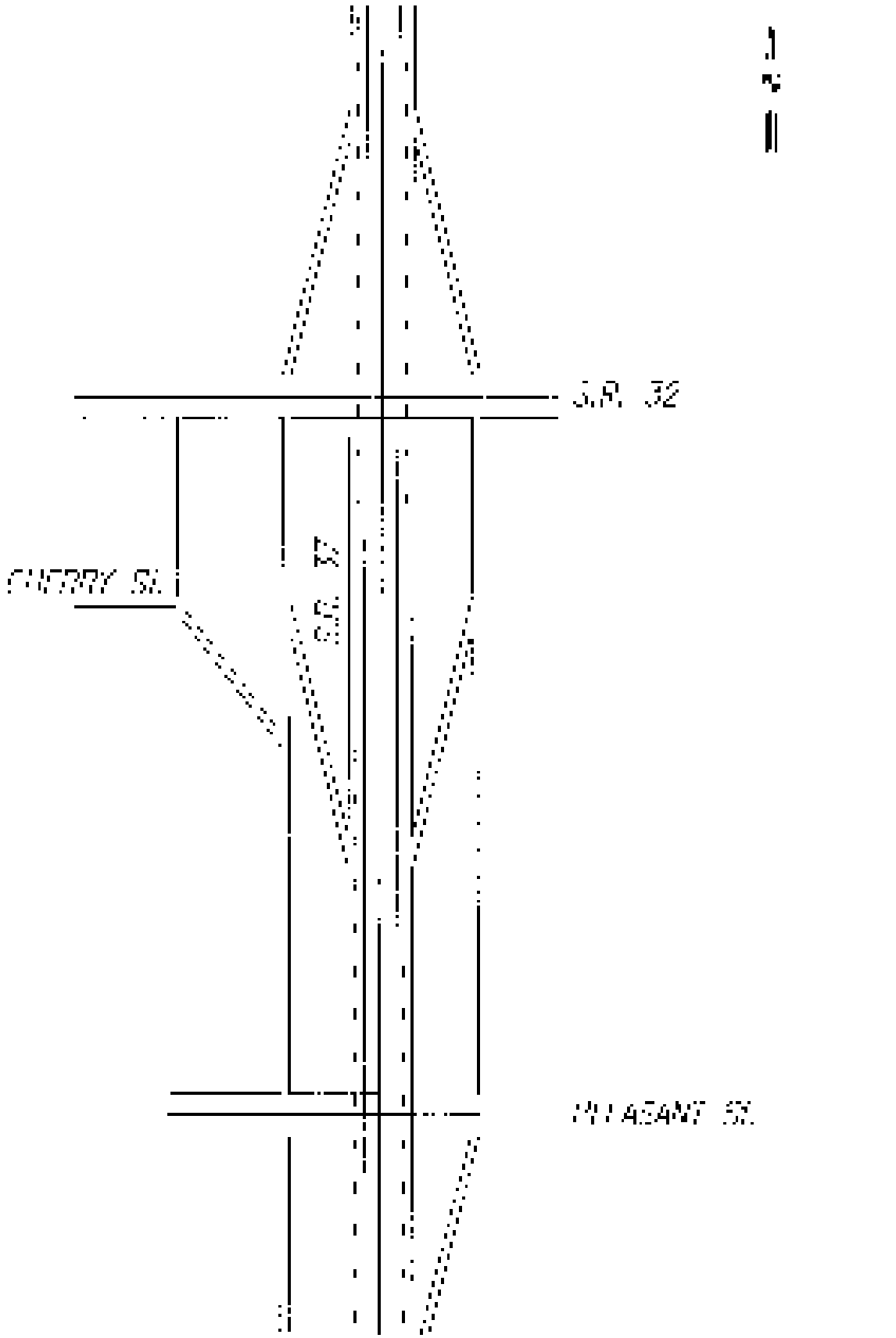
SEGMENT: GREENFIELD Ave. TO TOWN & COUNTRY Blvd.

NOTE: This Diagram is for Schematic Configurations of Entrance/Exit Ramps and Collector Distributor Conventions Only.



SEGMENT: TOWN & COUNTRY Blvd. To PLEASANT St.

NOTE: This Diagram is a Schematic Configuration of Entrance/Exit Ramps
and Collector Distributor Connections Only

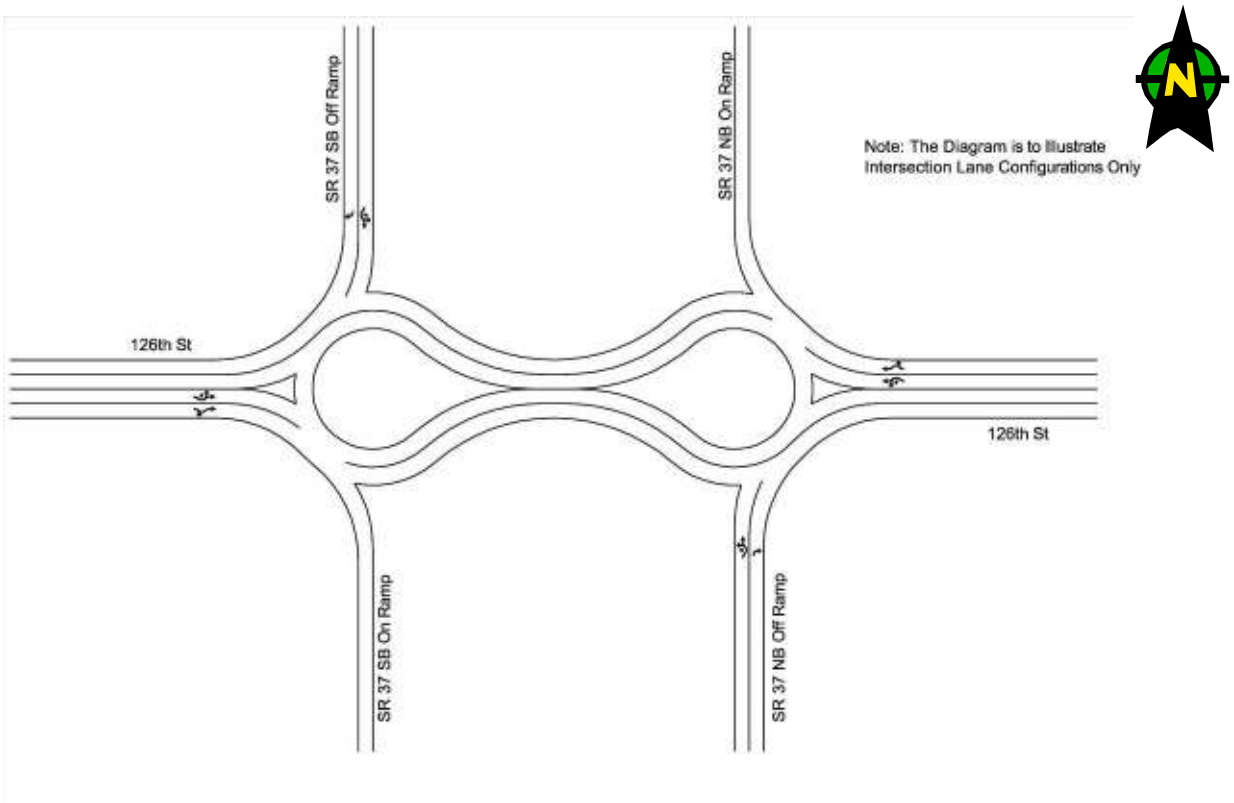


SEGMENT: PLEASANT ST. To S.R. 32

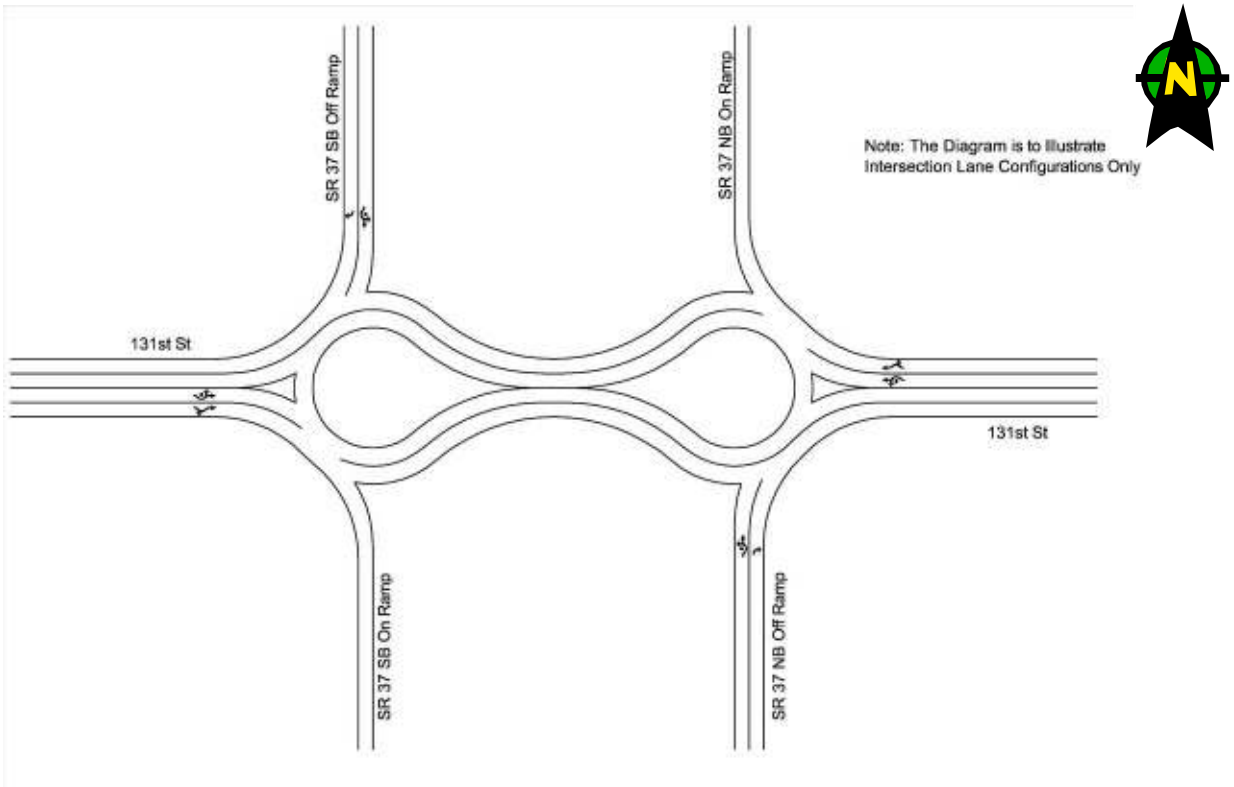
NOTE: This Diagram is to Illustrate Configuration of Entrance/Exit Ramps and Collector Distributor Connections Only.

Appendix C – Proposed Intersection Lane Configurations for Study Intersections

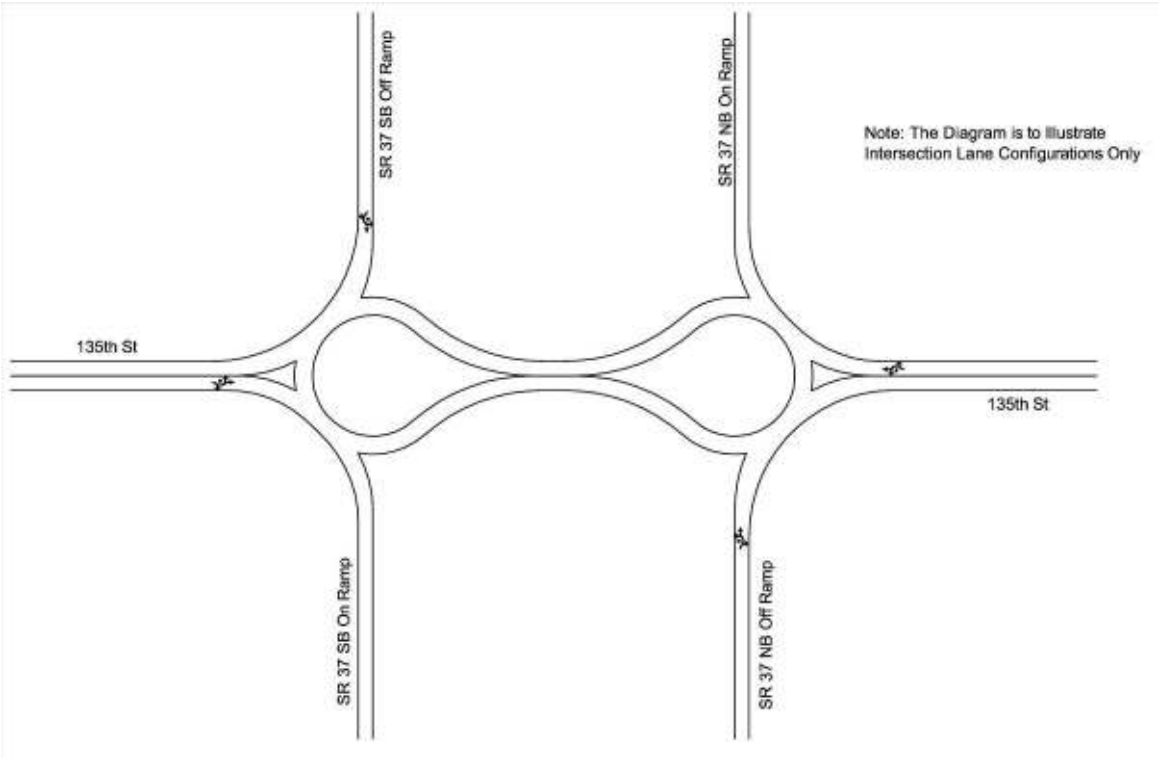
C-1 Alternative 1
C-2 Alternative 2



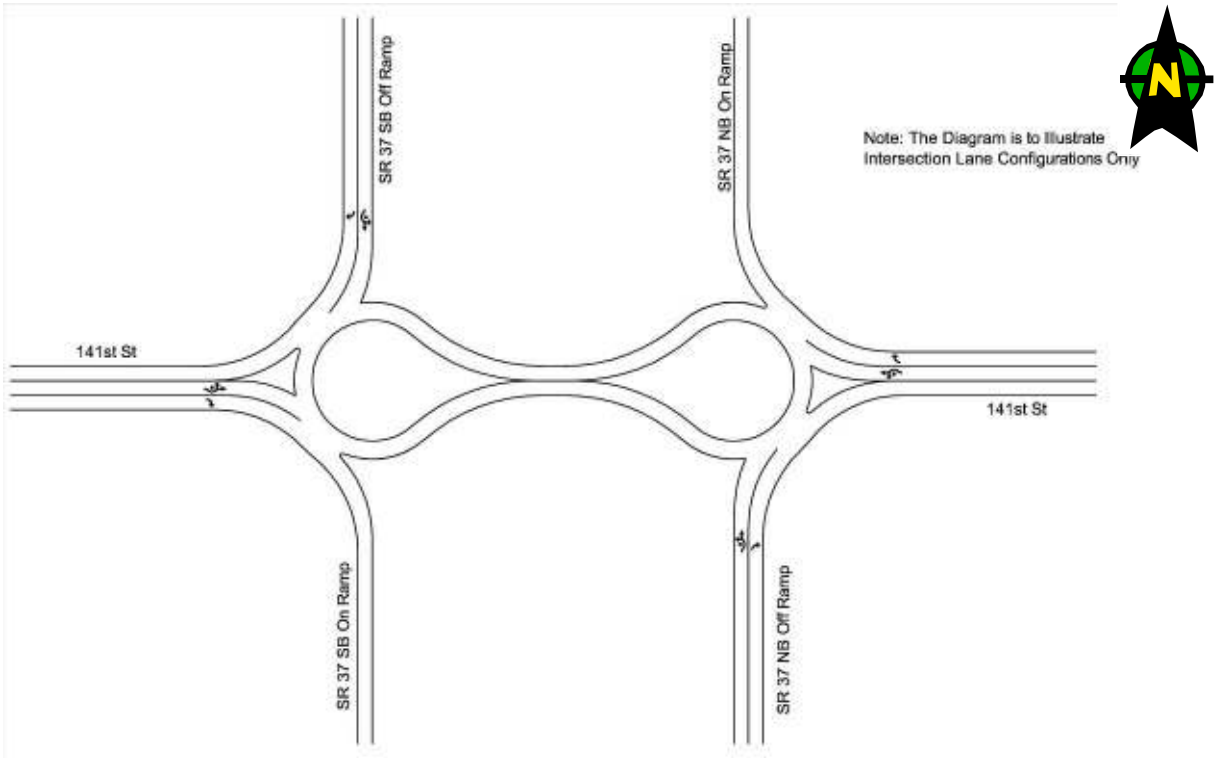
Interchange of SR 37 and 126th Street: Alternative 1



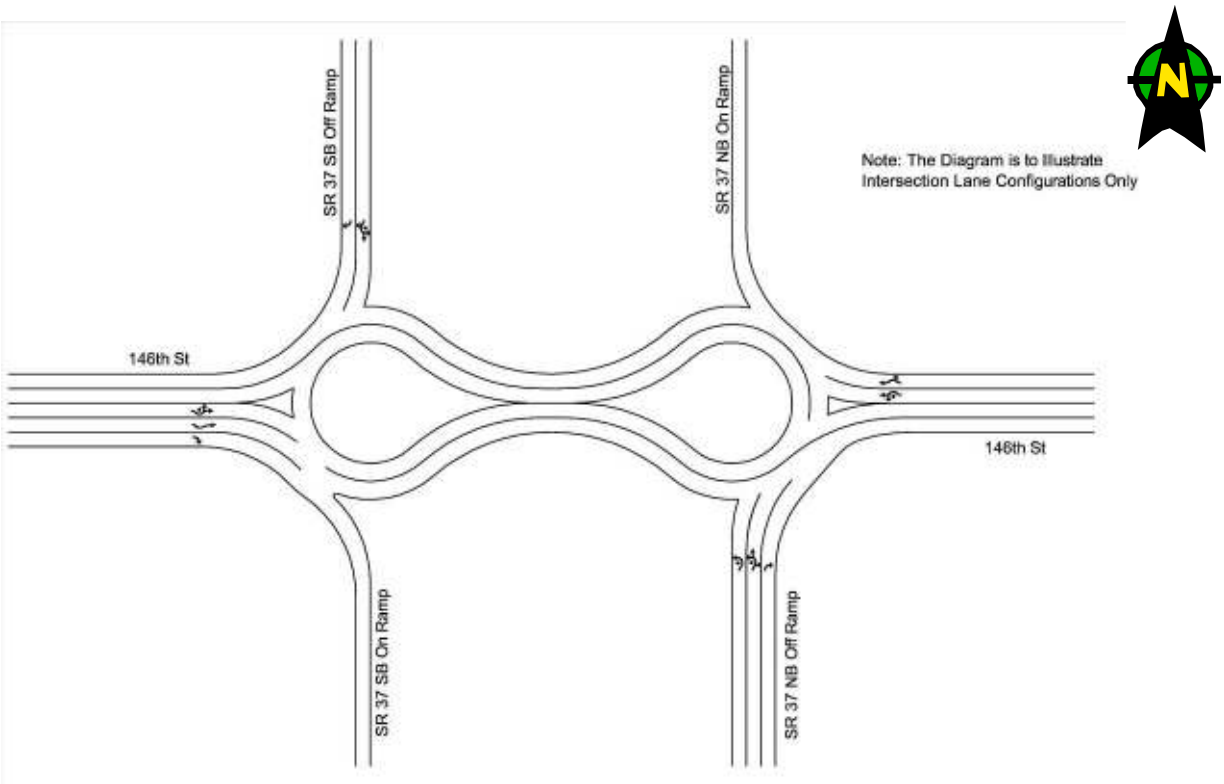
Interchange of SR 37 and 131st Street: Alternative 1



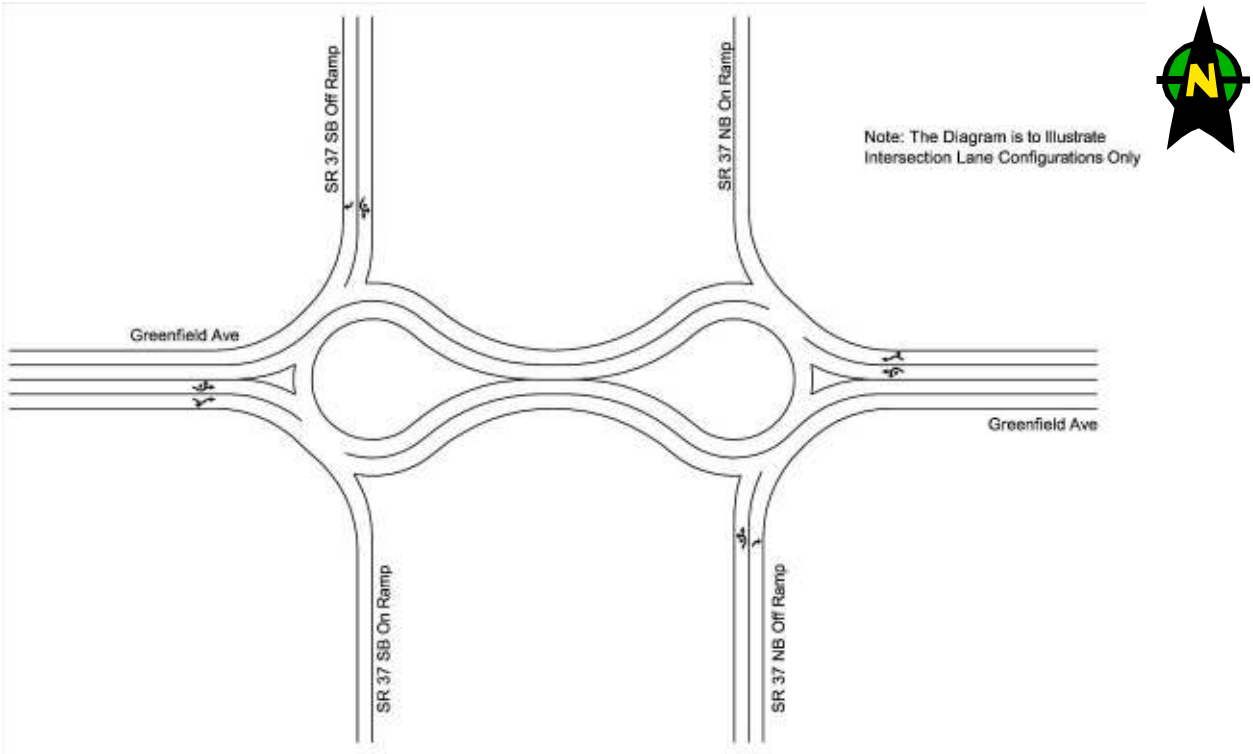
Interchange of SR 37 and 135th Street: Alternative 1



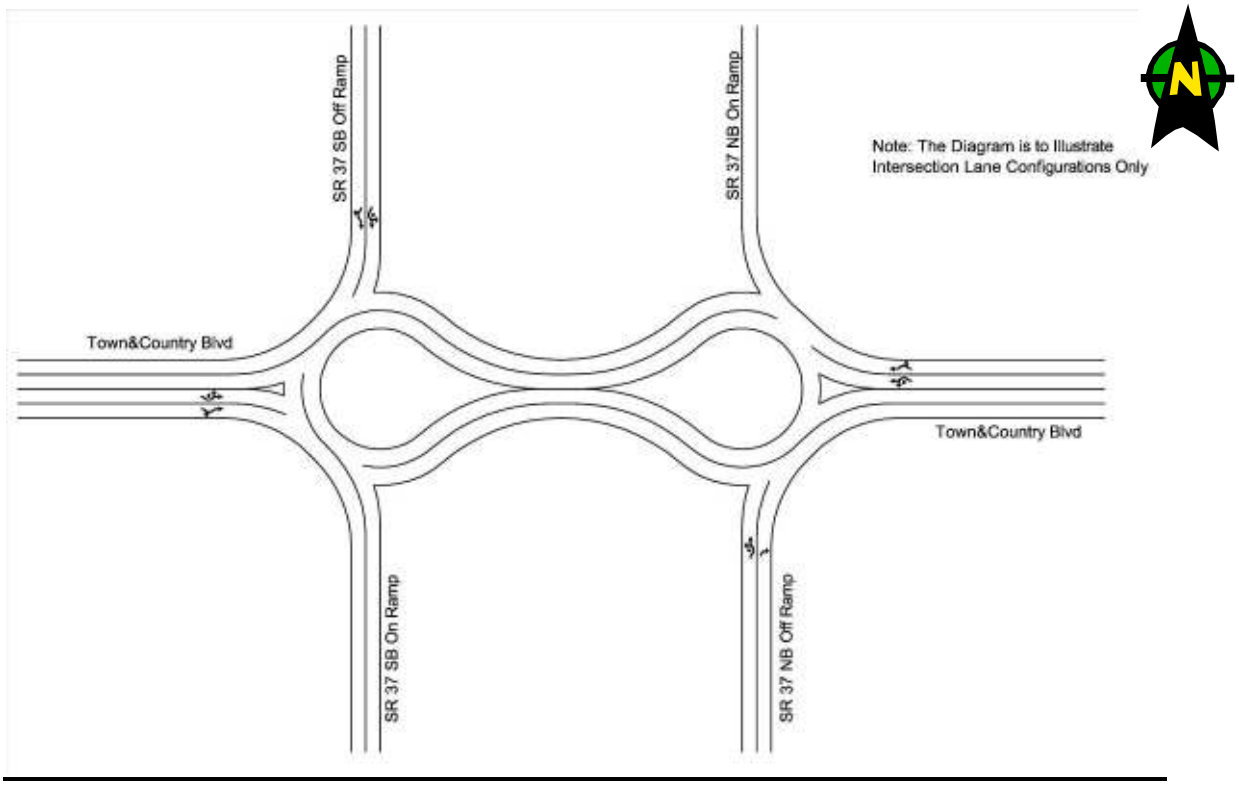
Interchange of SR 37 and 141st Street: Alternative 1



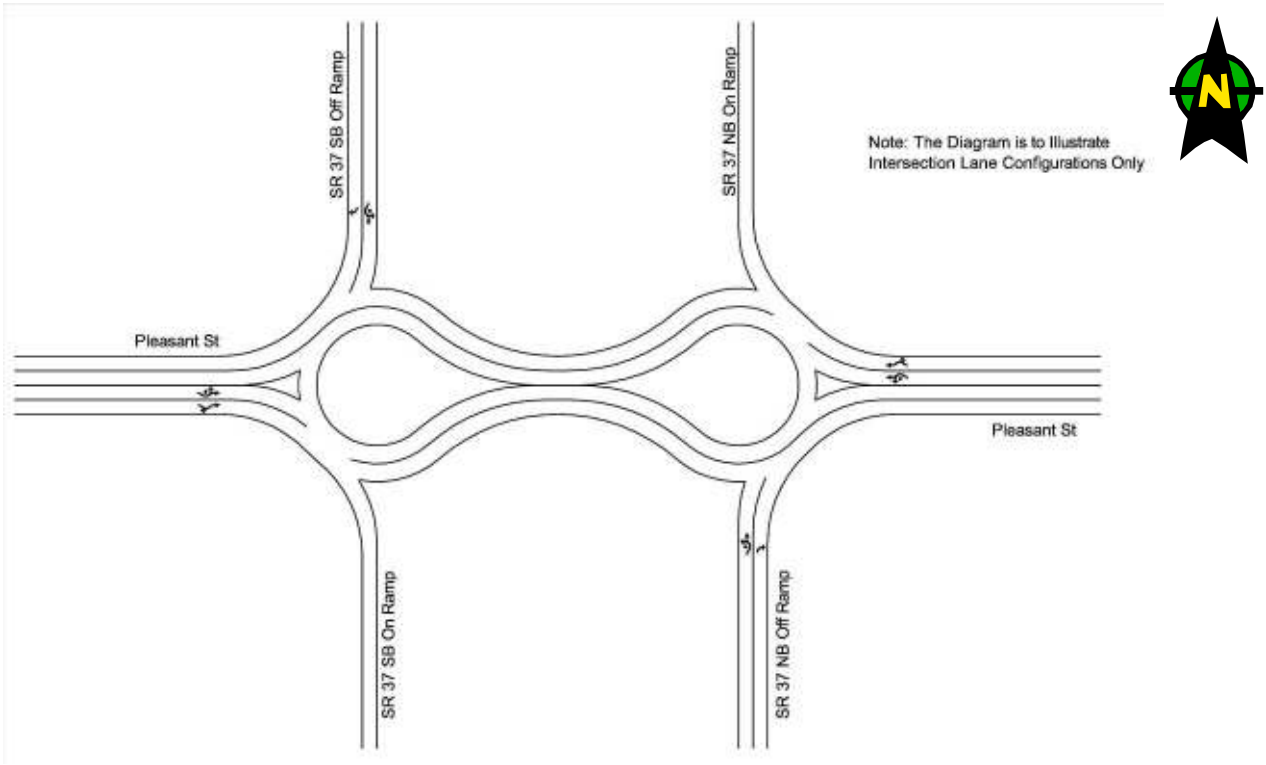
Interchange of SR 37 and 146th Street: Alternative 1



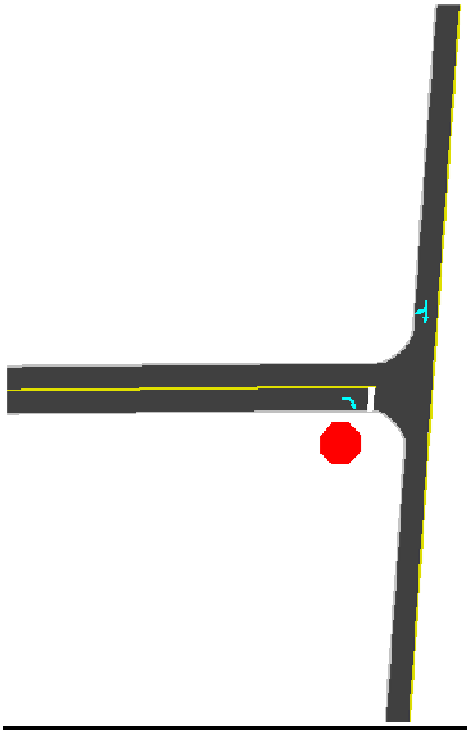
Interchange of SR 37 and Greenfield Avenue: Alternative 1



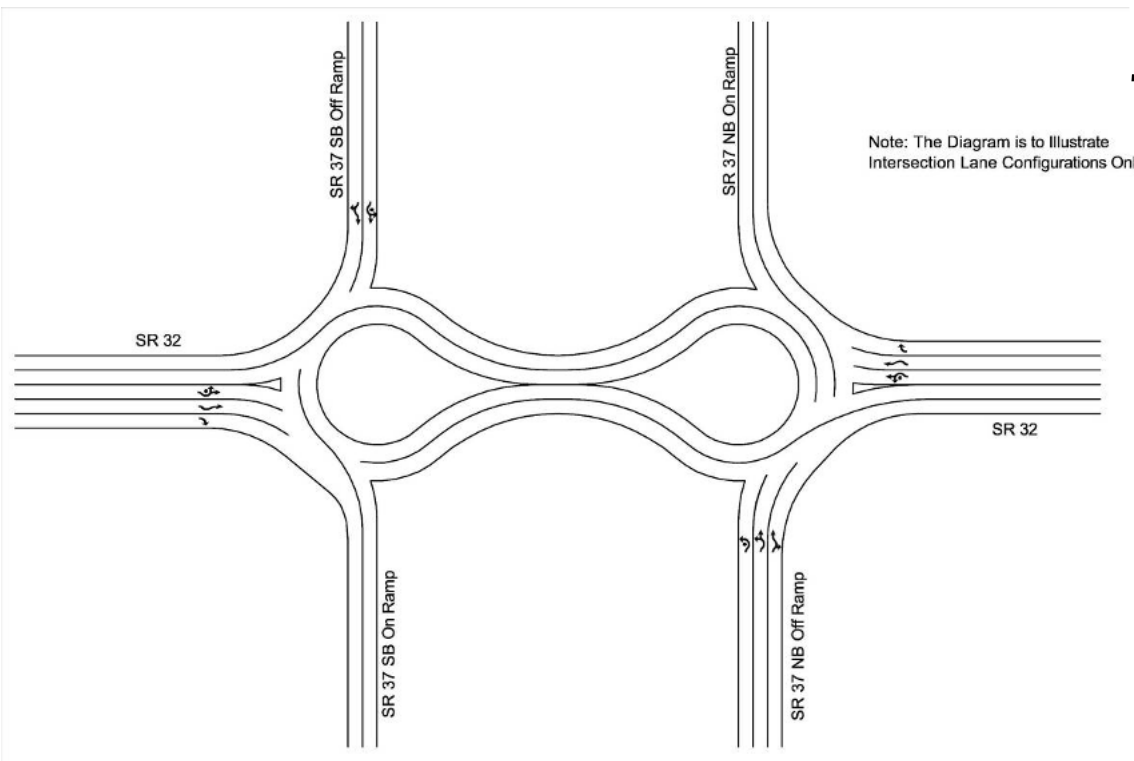
Interchange of SR 37 and Town and Country Blvd: Alternative 1



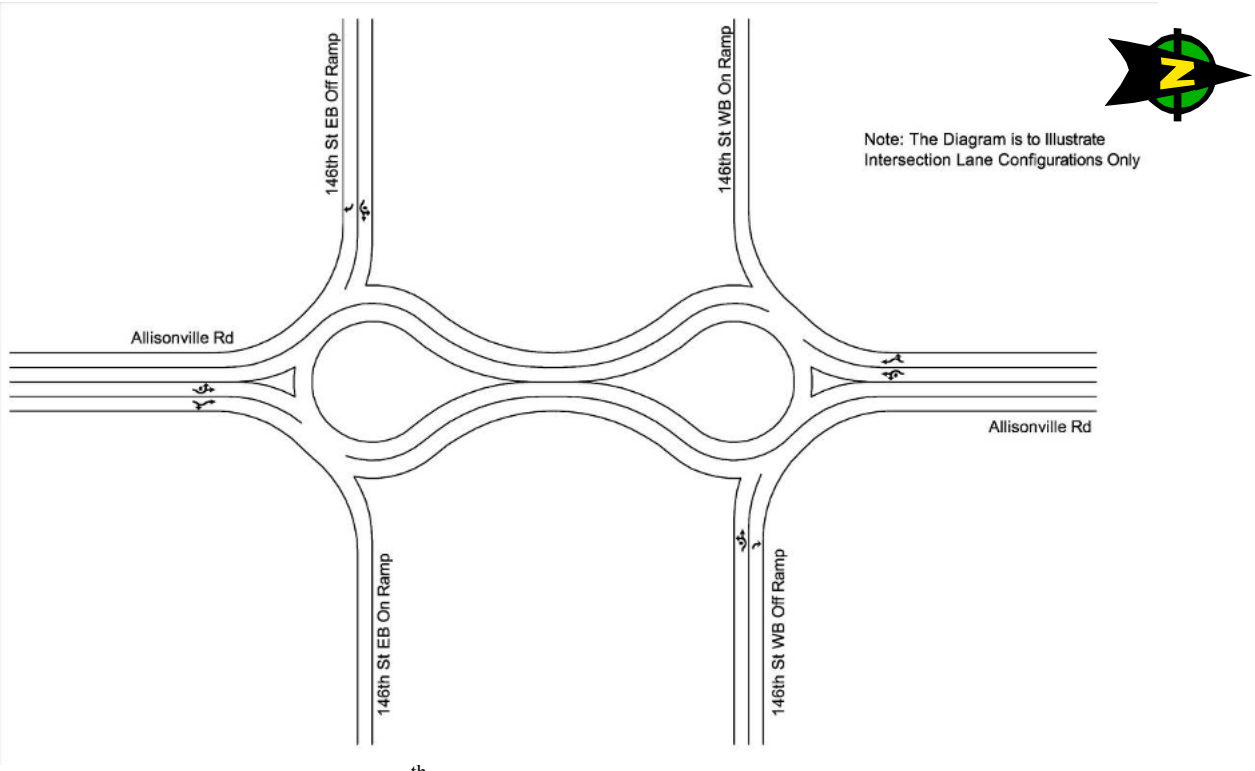
Interchange of SR 37 and Pleasant Street: Alternative 1



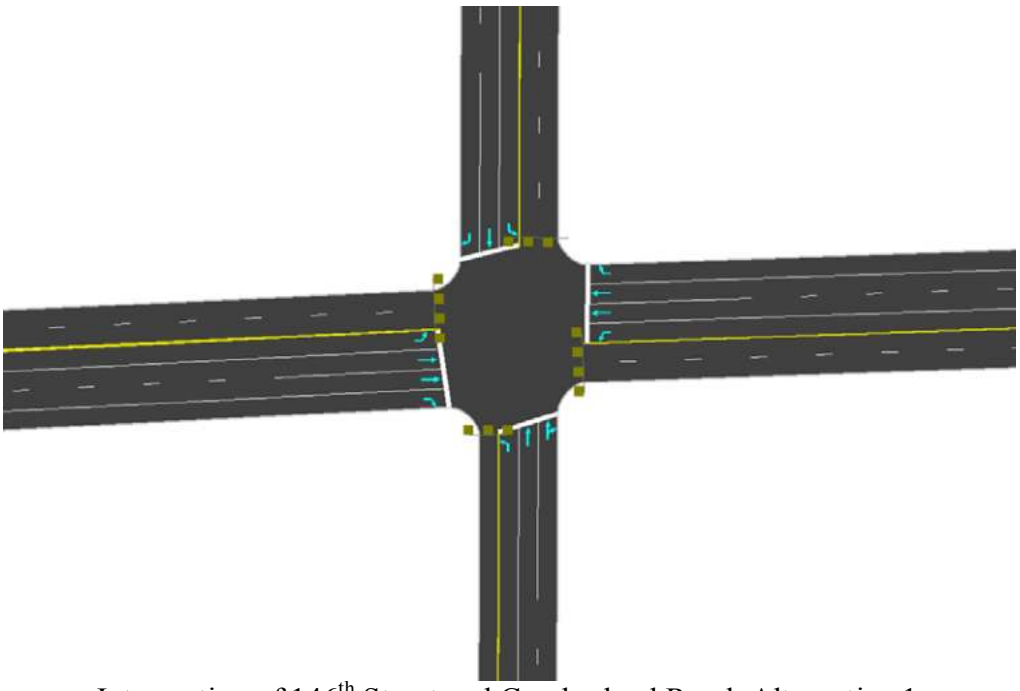
Intersection of SR 37 SB CD and Cherry Street : Alternative 1



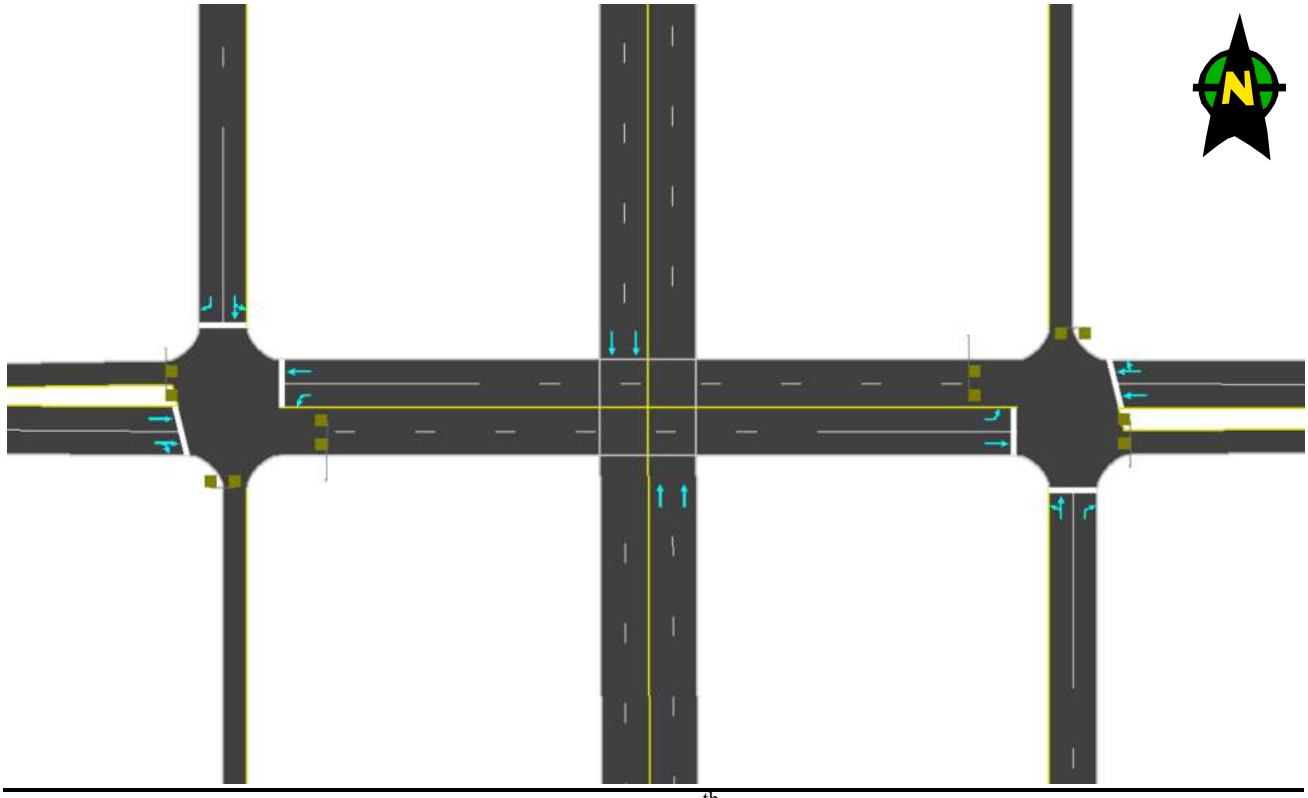
Interchange of SR 37 and SR 32: Alternative 1



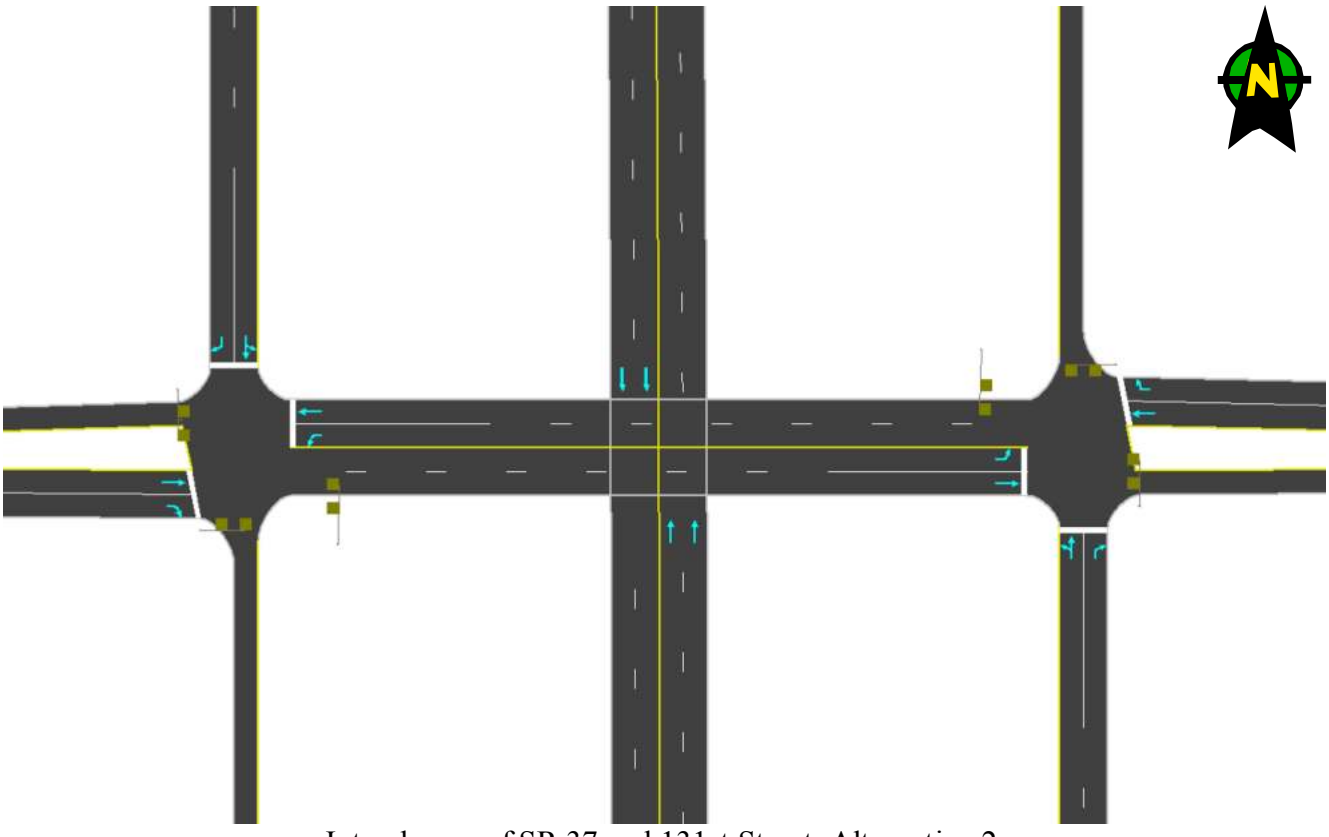
Interchange of 146th Street and Allisonville Road: Alternative 1



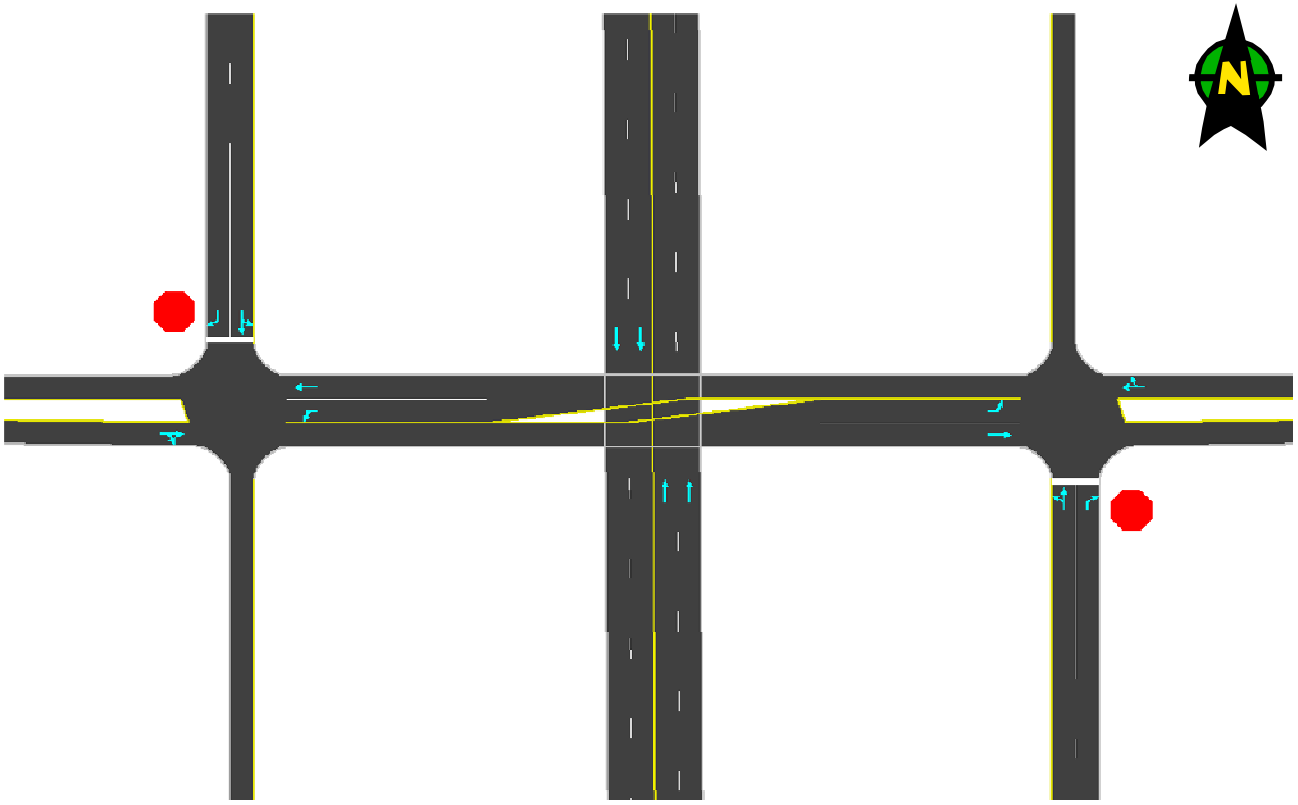
Intersection of 146th Street and Cumberland Road: Alternative 1



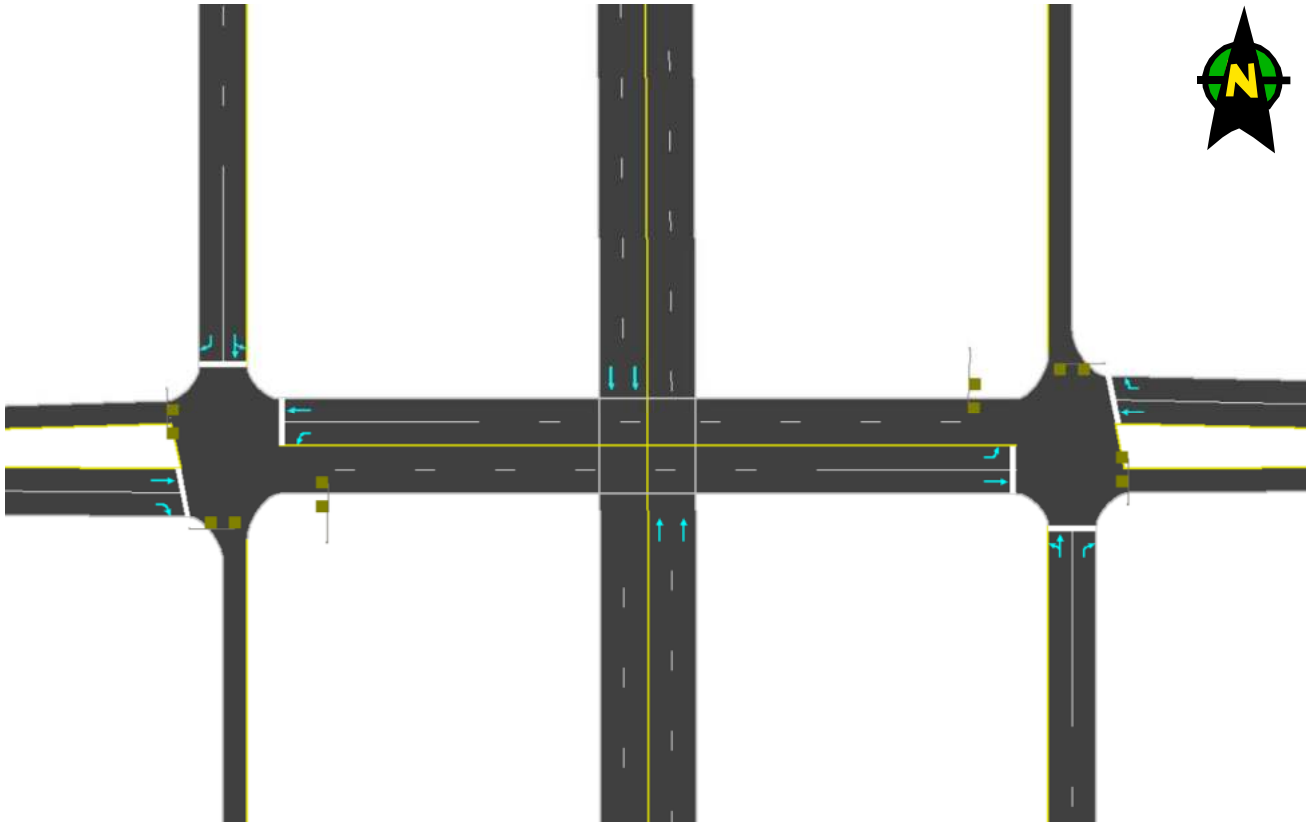
Interchange of SR 37 and 126th Street: Alternative 2



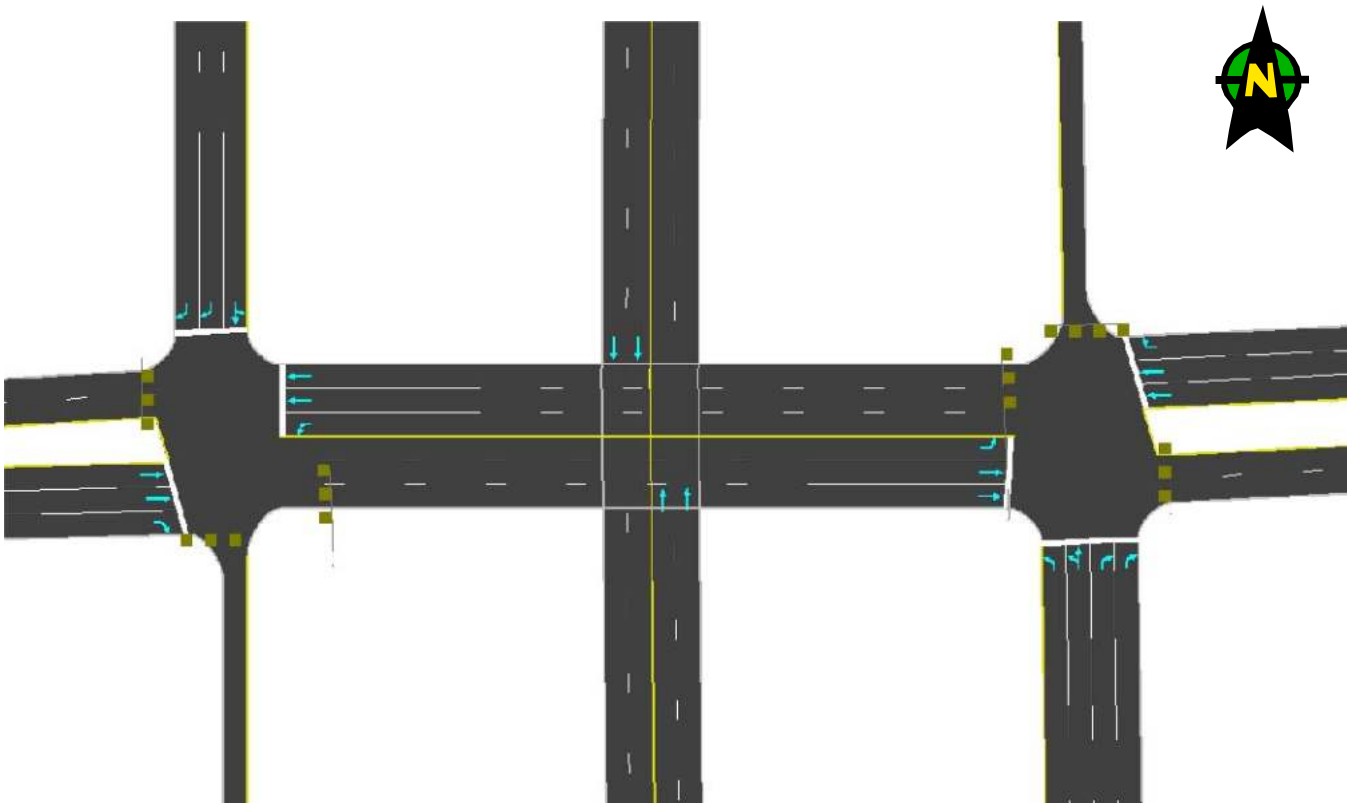
Interchange of SR 37 and 131st Street: Alternative 2



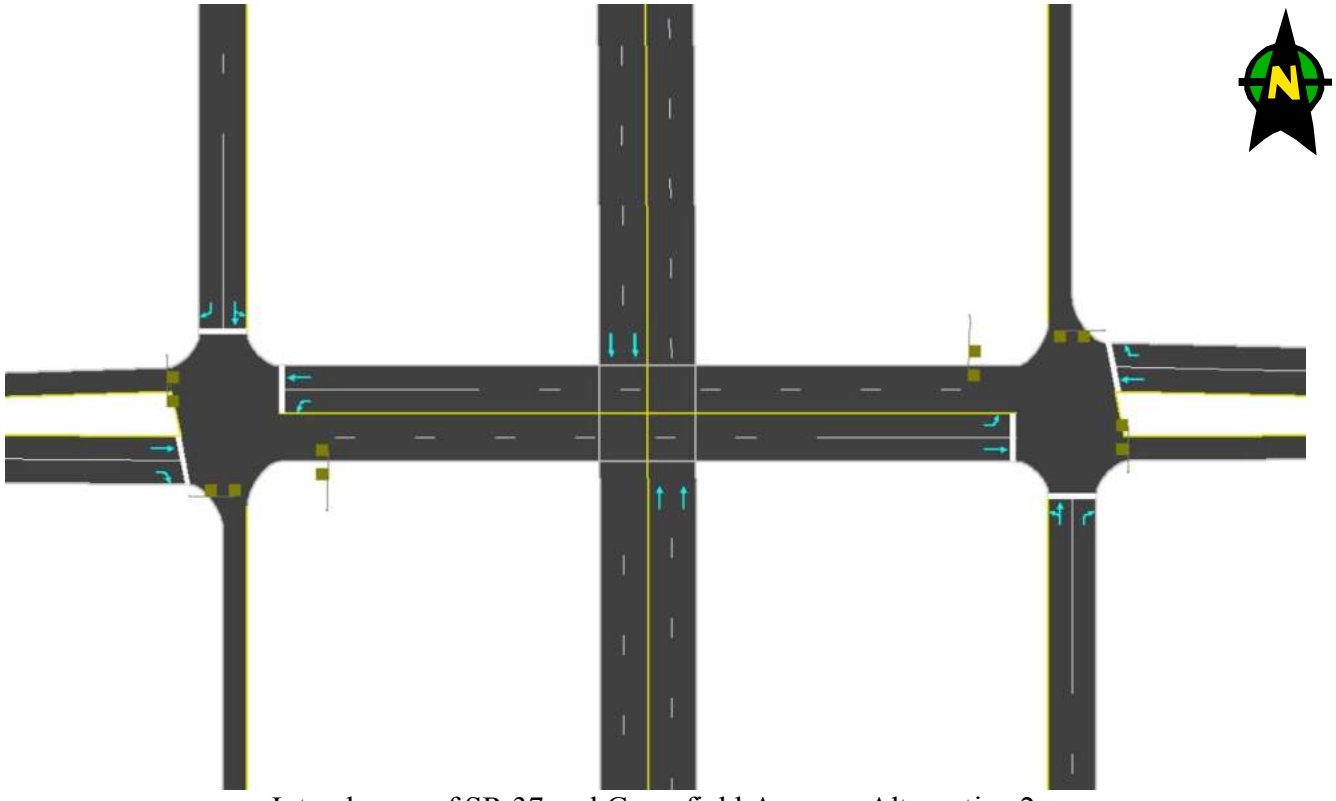
Interchange of SR 37 and 135th Street: Alternative 2



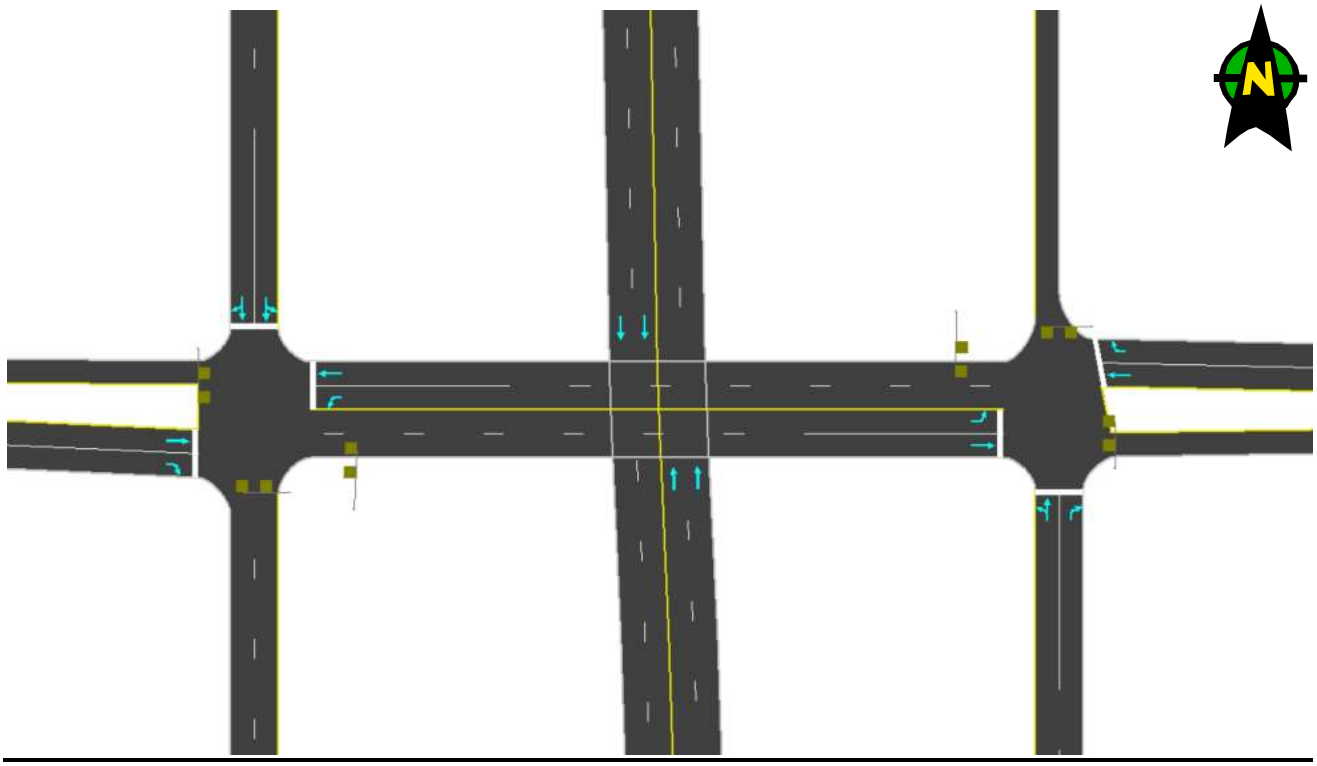
Interchange of SR 37 and 141st Street: Alternative 2



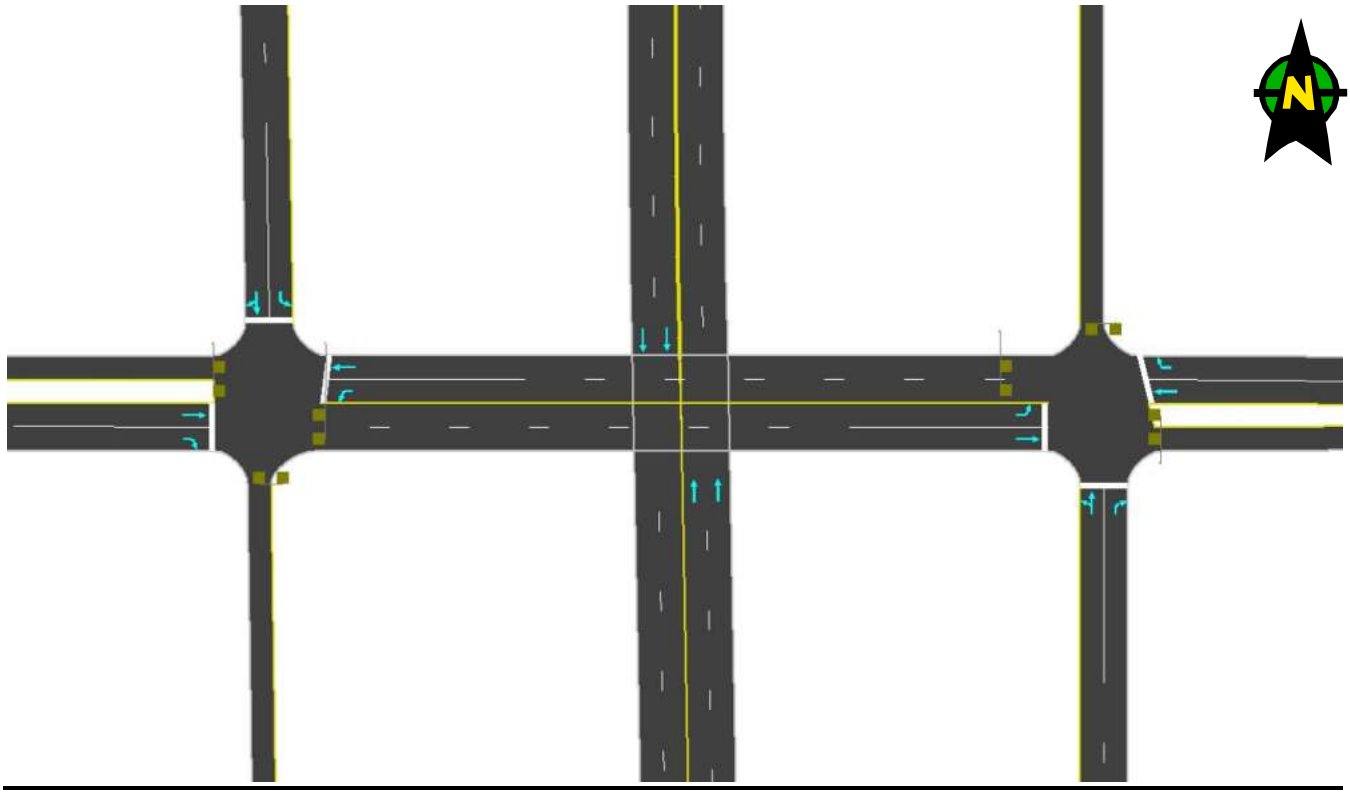
Interchange of SR 37 and 146th Street: Alternative 2



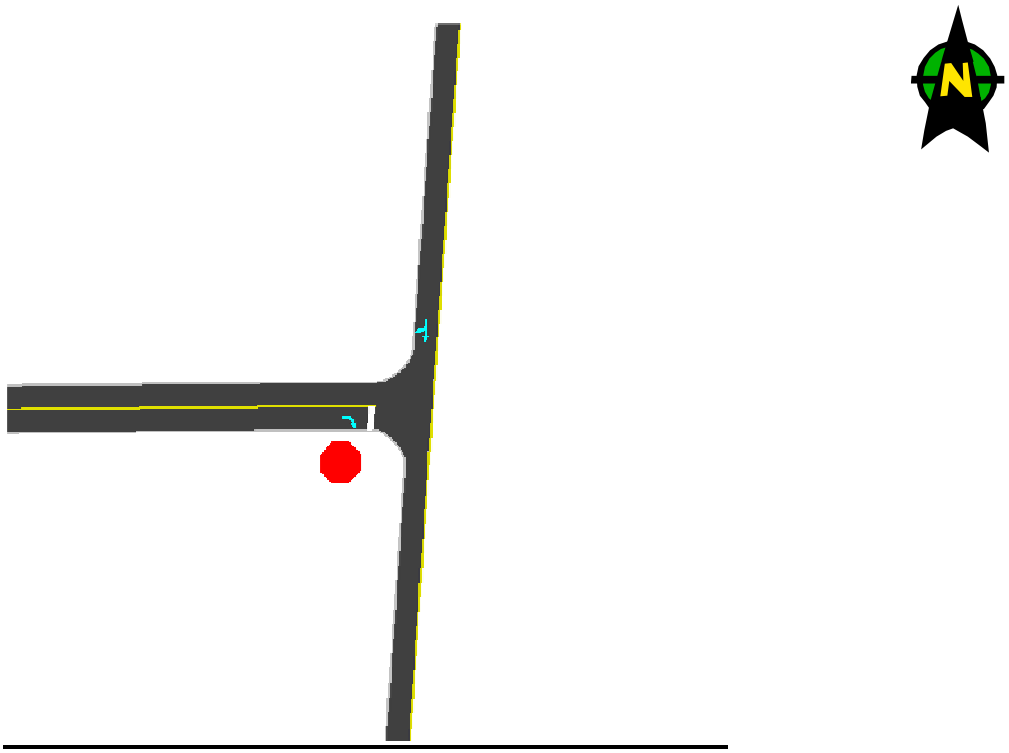
Interchange of SR 37 and Greenfield Avenue: Alternative 2



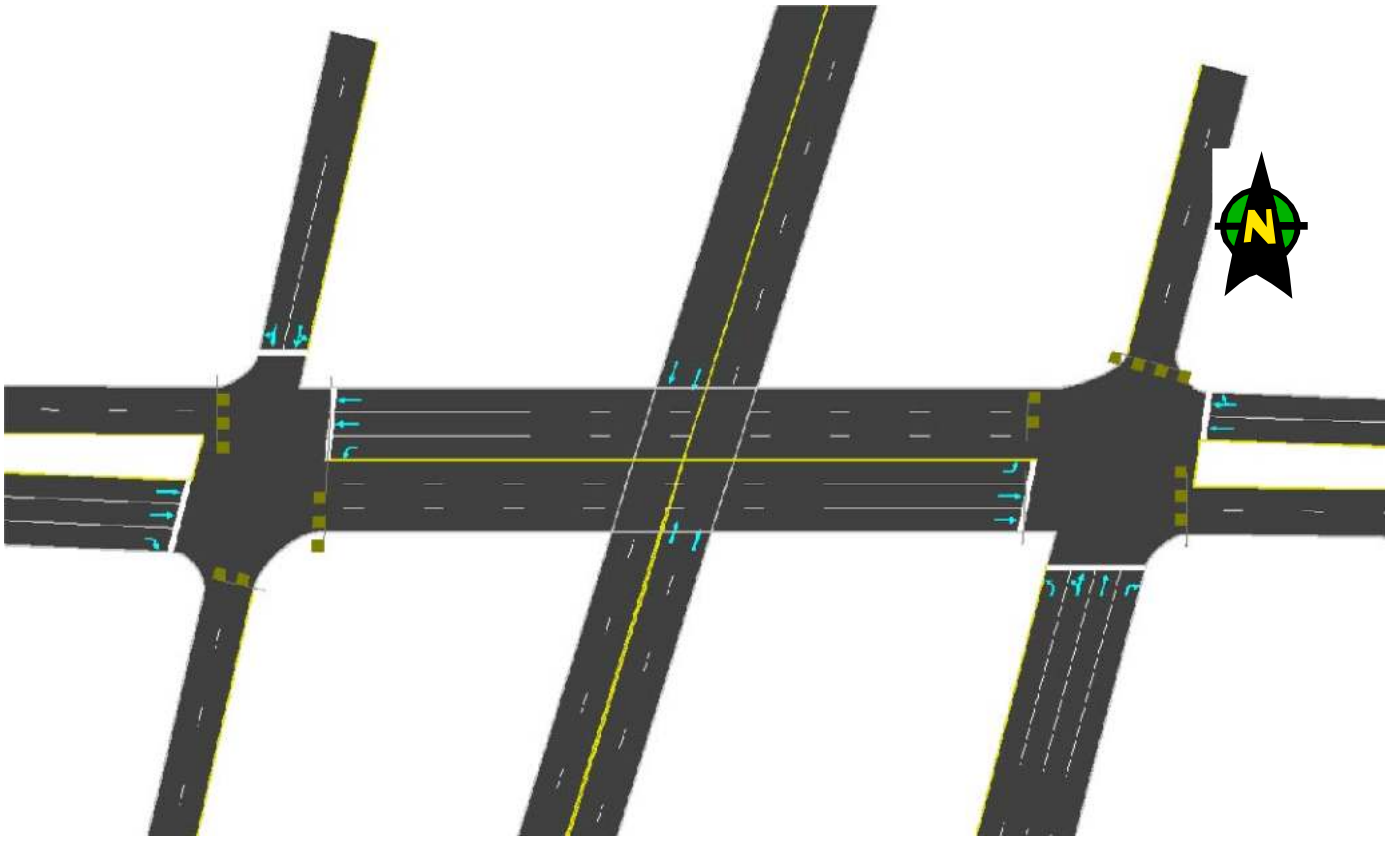
Interchange of SR 37 and Town and Country Blvd: Alternative 2



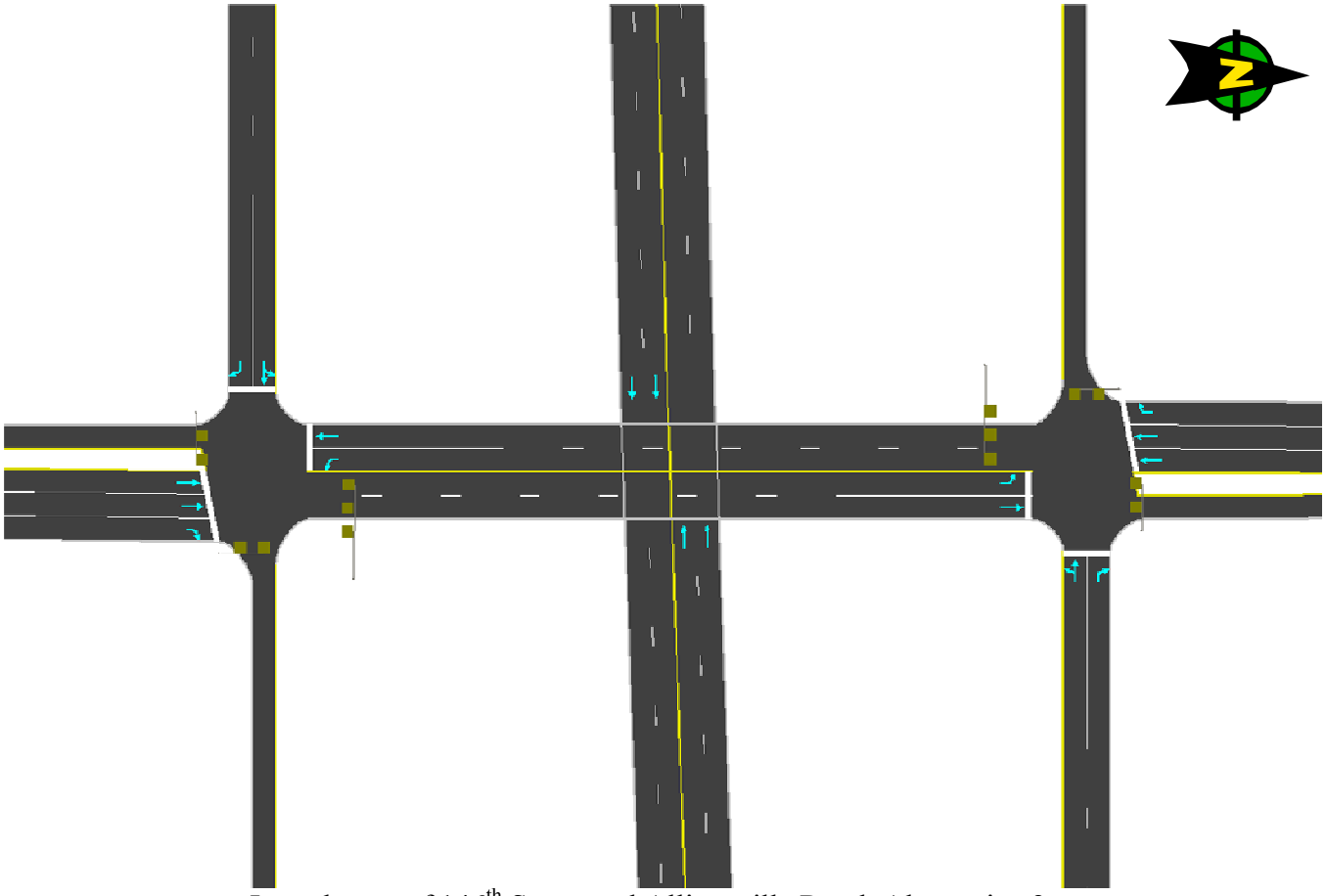
Interchange of SR 37 and Pleasant Street: Alternative 2



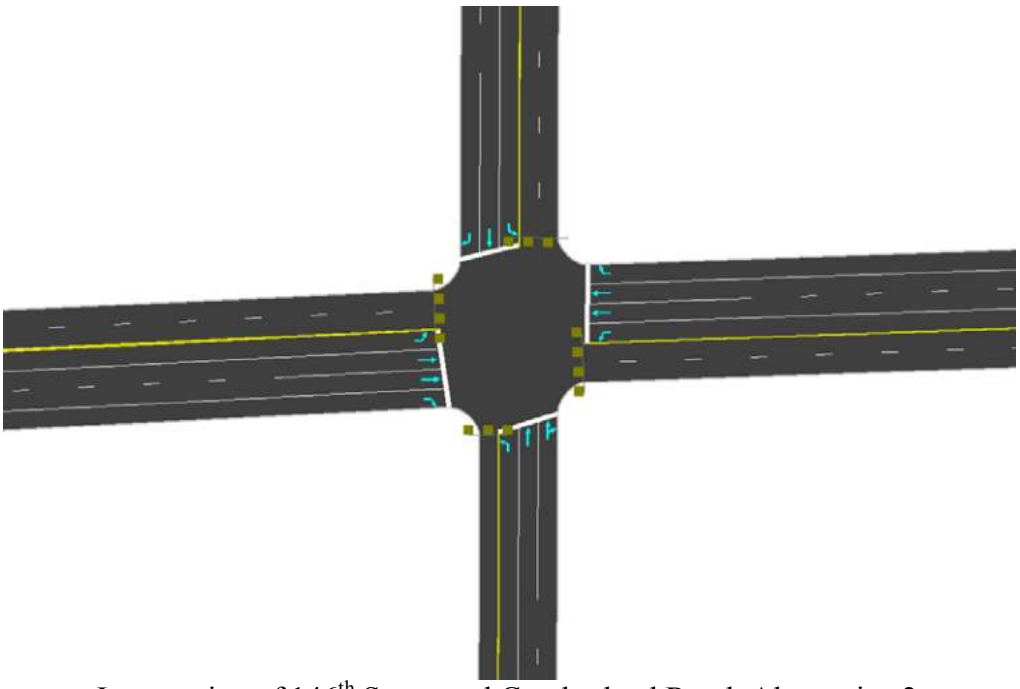
Intersection of SR 37 SB CD and Cherry Street : Alternative 2



Interchange of SR 37 and SR 32: Alternative 2



Interchange of 146th Street and Allisonville Road: Alternative 2



Intersection of 146th Street and Cumberland Road: Alternative 2

Appendix D –Capacity Analysis Output

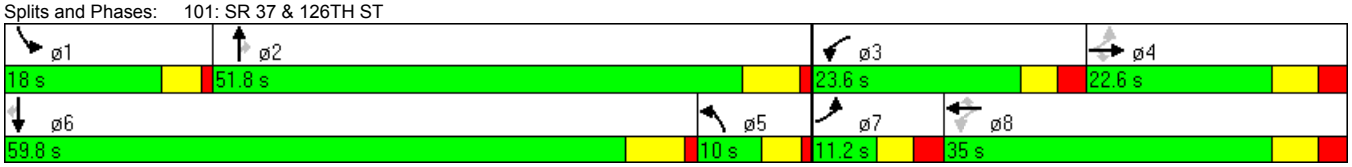
Section D-1 Year 2010 No Build Capacity Analysis Output
Section D-2 Year 2036 No Build Capacity Analysis Output
Section D-3 Year 2036 Alternative 1 Capacity Analysis Output
Section D-4 Year 2036 Alternative 2 Capacity Analysis Output
Section D-5 Year 2035 Weaving Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	148	95	352	418	85	78	1084	144	189	1452	143
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.227			0.397			0.950			0.950		
Satd. Flow (perm)	415	1827	1553	725	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			100			89			152			151
Lane Group Flow (vph)	156	156	100	371	440	89	82	1141	152	199	1528	151
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Total Split (s)	11.2	22.6	22.6	23.6	35.0	35.0	10.0	51.8	51.8	18.0	59.8	59.8
Total Lost Time (s)	3.7	4.6	4.6	3.7	4.6	4.6	2.5	4.2	4.2	2.5	4.2	4.2
Act Effct Green (s)	26.0	17.6	17.6	42.1	30.0	30.0	7.5	48.0	48.0	15.5	56.0	56.0
Actuated g/C Ratio	0.22	0.15	0.15	0.36	0.26	0.26	0.06	0.41	0.41	0.13	0.48	0.48
v/c Ratio	0.87	0.56	0.31	0.85	0.93	0.19	0.73	0.80	0.21	0.86	0.91	0.18
Control Delay	72.4	54.0	11.2	49.8	69.8	7.9	88.3	34.9	4.1	69.9	19.3	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.4	54.0	11.2	49.8	69.8	7.9	88.3	34.9	4.1	69.9	19.3	1.3
LOS	E	D	B	D	E	A	F	C	A	E	B	A
Approach Delay		50.6			55.4			34.7			23.2	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	80	109	0	221	320	0	61	387	0	133	532	9
Queue Length 95th (ft)	#183	179	49	#313	#513	40	#145	477	40	m#196	#662	m11
Internal Link Dist (ft)		700			1140			3702			2575	
Turn Bay Length (ft)	200		150	250		250	510		500	370		550
Base Capacity (vph)	179	284	325	437	479	473	112	1435	732	232	1675	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.55	0.31	0.85	0.92	0.19	0.73	0.80	0.21	0.86	0.91	0.18

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 102 (88%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 35.5 Intersection LOS: D
Intersection Capacity Utilization 88.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: SR 37 & 126TH ST

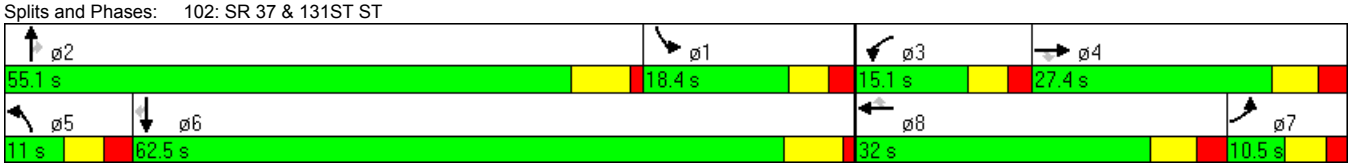


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	174	57	242	331	64	55	1153	109	153	1485	142
Satd. Flow (prot)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			60			67			115			149
Lane Group Flow (vph)	31	183	60	255	348	67	58	1214	115	161	1563	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	10.5	27.4	27.4	15.1	32.0	32.0	11.0	55.1	55.1	18.4	62.5	62.5
Total Lost Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.9	4.2	4.2	3.9	4.2	4.2
Act Effct Green (s)	7.4	19.5	19.5	11.6	28.3	28.3	7.8	54.2	54.2	14.5	63.2	63.2
Actuated g/C Ratio	0.06	0.17	0.17	0.10	0.24	0.24	0.07	0.47	0.47	0.12	0.54	0.54
v/c Ratio	0.28	0.60	0.19	0.76	0.78	0.16	0.50	0.75	0.15	0.74	0.83	0.16
Control Delay	58.9	52.3	11.4	65.9	54.7	9.3	74.5	10.6	0.5	49.4	14.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	52.3	11.4	65.9	54.7	9.3	74.5	10.6	0.5	49.4	14.5	0.3
LOS	E	D	B	E	D	A	E	B	A	D	B	A
Approach Delay		44.1			54.4			12.5			16.4	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	23	123	0	97	247	0	36	429	1	116	279	0
Queue Length 95th (ft)	55	197	37	#154	#391	36	m50	405	m1	m144	427	m0
Internal Link Dist (ft)		781			963			2575			5240	
Turn Bay Length (ft)	250		250	350		350	800		800	580		580
Base Capacity (vph)	111	359	353	337	446	429	117	1622	787	217	1892	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.51	0.17	0.76	0.78	0.16	0.50	0.75	0.15	0.74	0.83	0.16

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 43 (37%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 22.9 Intersection LOS: C
Intersection Capacity Utilization 80.8% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: SR 37 & 131ST ST

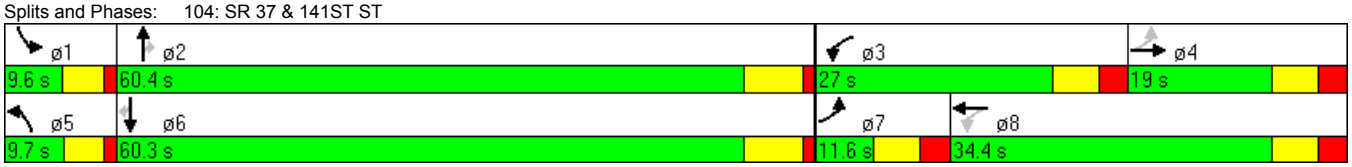


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	65	119	302	160	81	50	1068	128	37	1359	105
Satd. Flow (prot)	1736	1650	0	1736	1736	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.602			0.240			0.950			0.950		
Satd. Flow (perm)	1100	1650	0	438	1736	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		65			21				135			111
Lane Group Flow (vph)	58	193	0	318	253	0	53	1124	135	39	1431	111
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Total Split (s)	11.6	19.0	0.0	27.0	34.4	0.0	9.7	60.4	60.4	9.6	60.3	60.3
Total Lost Time (s)	4.6	4.6	3.0	4.6	4.6	2.0	2.6	4.2	4.2	2.6	4.2	4.2
Act Effct Green (s)	20.5	13.5		39.6	30.4		7.3	61.8	61.8	7.2	59.7	59.7
Actuated g/C Ratio	0.18	0.12		0.34	0.26		0.06	0.53	0.53	0.06	0.51	0.51
v/c Ratio	0.25	0.77		0.81	0.54		0.49	0.61	0.15	0.36	0.80	0.13
Control Delay	29.7	53.6		48.0	38.8		90.3	2.0	0.2	75.0	7.3	0.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	53.6		48.0	38.8		90.3	2.0	0.2	75.0	7.3	0.4
LOS	C	D		D	D		F	A	A	E	A	A
Approach Delay		48.1			44.0			5.4			8.5	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)	29	93		186	150		42	22	1	0	84	0
Queue Length 95th (ft)	59	#199		#299	236		m59	31	m0	m0	m86	m0
Internal Link Dist (ft)		666			1364			5240			2592	
Turn Bay Length (ft)	275			52			450		450	450		460
Base Capacity (vph)	233	262		400	472		109	1849	890	108	1785	852
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.74		0.80	0.54		0.49	0.61	0.15	0.36	0.80	0.13

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 106 (91%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 15.5 — Intersection LOS: B
Intersection Capacity Utilization 80.2% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: SR 37 & 141ST ST

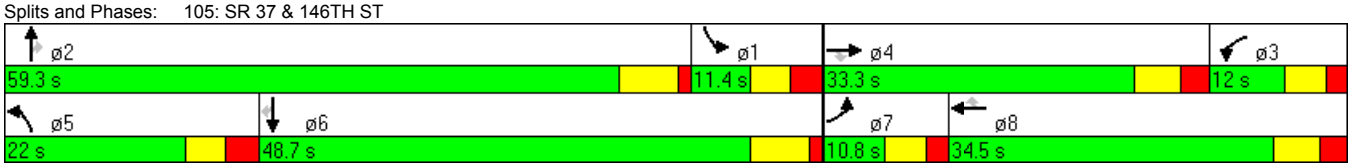


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	437	110	113	866	52	479	556	169	69	1278	369
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Satd. Flow (RTOR)			116			55			178			145
Lane Group Flow (vph)	194	460	116	119	912	55	504	585	178	73	1345	388
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	10.8	33.3	33.3	12.0	34.5	34.5	22.0	59.3	59.3	11.4	48.7	48.7
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.4	4.3	4.3	4.4	4.3	4.3
Act Effct Green (s)	7.3	22.9	22.9	14.4	30.0	30.0	17.6	57.3	57.3	7.0	44.4	44.4
Actuated g/C Ratio	0.06	0.20	0.20	0.12	0.26	0.26	0.15	0.49	0.49	0.06	0.38	0.38
v/c Ratio	0.92	0.67	0.29	0.28	1.02	0.12	0.99	0.34	0.21	0.36	1.01	0.57
Control Delay	81.2	27.3	4.1	36.5	65.6	3.2	65.3	21.9	9.2	43.2	45.4	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	27.3	4.1	36.5	65.6	3.2	65.3	21.9	9.2	43.2	45.4	9.9
LOS	F	C	A	D	E	A	E	C	A	D	D	A
Approach Delay		37.4			59.2			37.4			37.7	
Approach LOS		D			E			D			D	
Queue Length 50th (ft)	55	169	17	42	~373	2	198	210	59	25	~443	31
Queue Length 95th (ft)	#138	176	27	64	#485	5	#308	272	103	m31	#682	m86
Internal Link Dist (ft)		4178			2627			2592			3721	
Turn Bay Length (ft)	490		290	400		400	850		560	725		850
Base Capacity (vph)	212	862	473	419	898	442	511	1714	857	203	1329	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.53	0.25	0.28	1.02	0.12	0.99	0.34	0.21	0.36	1.01	0.57

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 59 (51%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 42.3 Intersection LOS: D
Intersection Capacity Utilization 92.5% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: SR 37 & 146TH ST

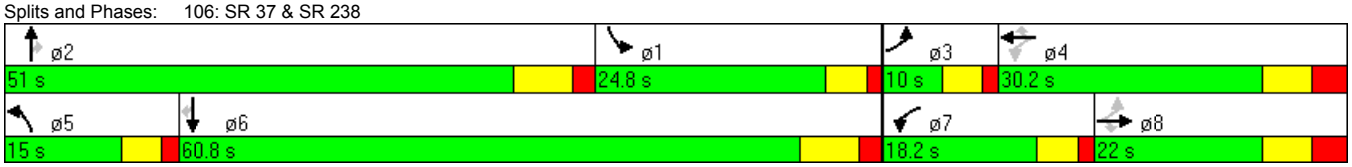


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	117	190	126	242	249	288	118	658	16	184	1348	115
Satd. Flow (prot)	1736	1900	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.525			0.301			0.950			0.950		
Satd. Flow (perm)	959	1900	1553	550	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			133			303			17			121
Lane Group Flow (vph)	123	200	133	255	262	303	124	693	17	194	1419	121
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			6
Total Split (s)	10.0	22.0	22.0	18.2	30.2	30.2	15.0	51.0	51.0	24.8	60.8	60.8
Total Lost Time (s)	2.9	5.5	6.5	2.9	5.5	5.5	2.9	5.1	5.1	2.9	5.1	5.1
Act Effct Green (s)	25.7	16.0	15.0	36.8	24.2	24.2	11.8	46.4	46.4	21.9	56.5	56.5
Actuated g/C Ratio	0.22	0.14	0.13	0.32	0.21	0.21	0.10	0.40	0.40	0.19	0.49	0.49
v/c Ratio	0.47	0.77	0.42	0.77	0.69	0.54	0.70	0.50	0.03	0.59	0.84	0.15
Control Delay	37.3	67.8	12.0	48.9	52.7	8.2	61.1	24.2	11.4	33.9	14.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	67.8	12.0	48.9	52.7	8.2	61.1	24.2	11.4	33.9	14.4	0.9
LOS	D	E	B	D	D	A	E	C	B	C	B	A
Approach Delay		43.3			35.1			29.5			15.6	
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	67	145	0	151	181	0	98	216	0	131	340	4
Queue Length 95th (ft)	116	#252	57	#256	274	75	m#152	m257	m15	m199	446	m6
Internal Link Dist (ft)		2170			1592			4518			3581	
Turn Bay Length (ft)	120		470	475		325	580		580	710		565
Base Capacity (vph)	260	270	323	330	389	569	181	1389	632	328	1691	819
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.74	0.41	0.77	0.67	0.53	0.69	0.50	0.03	0.59	0.84	0.15

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 79 (68%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 26.0 Intersection LOS: C
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: SR 37 & SR 238



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	15	70	62	22	13	99	847	117	121	1515	85
Satd. Flow (prot)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			74			14			123			89
Lane Group Flow (vph)	11	16	74	65	23	14	104	892	123	127	1595	89
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	9.7	14.6	14.6	9.8	14.7	14.7	16.4	72.6	72.6	19.0	75.2	75.2
Total Lost Time (s)	2.7	4.8	4.8	2.7	4.8	4.8	2.7	4.3	4.3	2.7	4.3	4.3
Act Effct Green (s)	7.0	9.2	9.2	7.1	15.1	15.1	12.8	73.6	73.6	16.3	77.1	77.1
Actuated g/C Ratio	0.06	0.08	0.08	0.06	0.13	0.13	0.11	0.63	0.63	0.14	0.66	0.66
v/c Ratio	0.10	0.06	0.39	0.32	0.10	0.07	0.54	0.41	0.12	0.52	0.69	0.08
Control Delay	54.0	49.7	17.5	56.5	46.0	22.0	46.2	12.4	2.7	38.8	3.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	49.7	17.5	56.5	46.0	22.0	46.2	12.4	2.7	38.8	3.6	0.3
LOS	D	D	B	E	D	C	D	B	A	D	A	A
Approach Delay		26.6			49.4			14.5			5.9	
Approach LOS		C			D			B			A	
Queue Length 50th (ft)	8	5	0	24	15	0	69	243	17	95	153	1
Queue Length 95th (ft)	27	17	47	47	43	21	127	323	34	m113	185	m1
Internal Link Dist (ft)		755			780			3581			2436	
Turn Bay Length (ft)	285					50	590		490	390		580
Base Capacity (vph)	105	293	199	206	241	217	208	2202	1030	244	2307	1063
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.05	0.37	0.32	0.10	0.06	0.50	0.41	0.12	0.52	0.69	0.08

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 22 (19%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 11.0 — Intersection LOS: B
Intersection Capacity Utilization 66.7% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: SR 37 & TOWN & COUNTRY BLVD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	25	68	7	29	102	72	766	32	67	1646	109
Satd. Flow (prot)	1736	1626	0	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.593			0.685			0.950			0.950		
Satd. Flow (perm)	1083	1626	0	1251	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		82				123			39			132
Lane Group Flow (vph)	75	112	0	8	35	123	87	927	39	81	1993	132
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			6
Total Split (s)	11.0	13.0	0.0	11.0	13.0	13.0	13.0	76.7	76.7	15.3	79.0	79.0
Total Lost Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	3.3	4.0	4.0	3.3	4.1	4.1
Act Effct Green (s)	17.0	15.6		14.6	9.0	9.0	9.5	78.2	78.2	11.1	79.7	79.7
Actuated g/C Ratio	0.15	0.13		0.13	0.08	0.08	0.08	0.67	0.67	0.10	0.69	0.69
v/c Ratio	0.38	0.39		0.04	0.25	0.53	0.61	0.40	0.04	0.49	0.84	0.12
Control Delay	48.2	20.6		40.8	55.0	17.5	46.2	3.8	0.3	62.5	8.6	0.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	20.6		40.8	55.0	17.5	46.2	3.8	0.3	62.5	8.6	0.4
LOS	D	C		D	D	B	D	A	A	E	A	A
Approach Delay		31.6			26.6			7.2			10.1	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)	49	19		5	25	0	59	74	0	60	279	1
Queue Length 95th (ft)	94	80		20	59	59	#126	64	0	m79	283	m2
Internal Link Dist (ft)		3024			1250			2436			1468	
Turn Bay Length (ft)	425			100		100	690		690	510		510
Base Capacity (vph)	198	290		187	142	234	145	2338	1059	180	2385	1109
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.39		0.04	0.25	0.53	0.60	0.40	0.04	0.45	0.84	0.12

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 115 (99%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 77.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: SR 37 & PLEASANT ST

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	84	177	753	1738	84
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	88	186	793	1829	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					756	
pX, platoon unblocked	0.68	0.68	0.68			
vC, conflicting volume	2598	915	1918			
vC1, stage 1 conf vol	1829					
vC2, stage 2 conf vol	769					
vCu, unblocked vol	2411	0	1412			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	88	42			
cM capacity (veh/h)	107	735	319			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	88	186	396	396	915	915	88
Volume Left	25	0	186	0	0	0	0	0
Volume Right	0	88	0	0	0	0	0	88
cSH	107	735	319	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.12	0.58	0.23	0.23	0.54	0.54	0.05
Queue Length 95th (ft)	21	10	87	0	0	0	0	0
Control Delay (s)	49.0	10.6	30.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	D					
Approach Delay (s)	19.1		5.9			0.0		
Approach LOS	C							

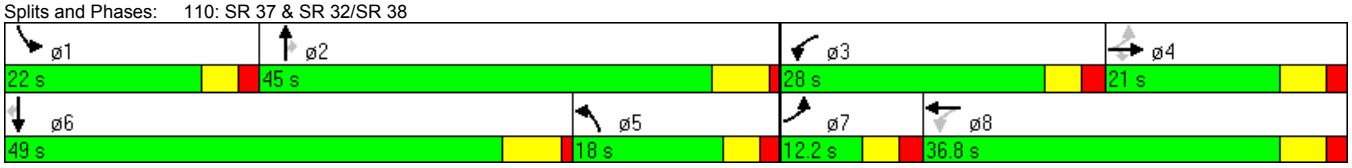
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	71.2%	ICU Level of Service		C
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	174	316	385	363	54	171	494	112	155	1121	81
Satd. Flow (prot)	1736	1827	1553	1736	3405	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.497			0.333			0.950			0.950		
Satd. Flow (perm)	908	1827	1553	608	3405	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			245		14				118			85
Lane Group Flow (vph)	39	183	333	405	439	0	180	520	118	163	1180	85
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Total Split (s)	12.2	21.0	21.0	28.0	36.8	0.0	18.0	45.0	45.0	22.0	49.0	49.0
Total Lost Time (s)	3.2	3.9	3.9	3.2	3.9	2.0	3.0	4.0	4.0	3.0	4.0	4.0
Act Effct Green (s)	25.9	16.2	16.2	44.5	36.5		15.0	44.5	44.5	16.8	46.3	46.3
Actuated g/C Ratio	0.22	0.14	0.14	0.38	0.31		0.13	0.38	0.38	0.14	0.40	0.40
v/c Ratio	0.15	0.72	0.78	0.86	0.41		0.80	0.39	0.18	0.65	0.85	0.13
Control Delay	24.9	64.1	27.1	48.0	32.4		83.6	36.1	16.6	58.9	39.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	64.1	27.1	48.0	32.4		83.6	36.1	16.6	58.9	39.3	5.3
LOS	C	E	C	D	C		F	D	B	E	D	A
Approach Delay		39.1			39.9			43.7			39.5	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	18	131	60	236	137		141	172	25	115	424	0
Queue Length 95th (ft)	40	#220	#192	#362	186		#257	233	80	186	522	32
Internal Link Dist (ft)		370			2806			676			7320	
Turn Bay Length (ft)				400						765		860
Base Capacity (vph)	267	269	438	474	1080		224	1332	669	284	1386	671
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.68	0.76	0.85	0.41		0.80	0.39	0.18	0.57	0.85	0.13

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 40.5 — Intersection LOS: D
Intersection Capacity Utilization 84.3% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 110: SR 37 & SR 32/SR 38

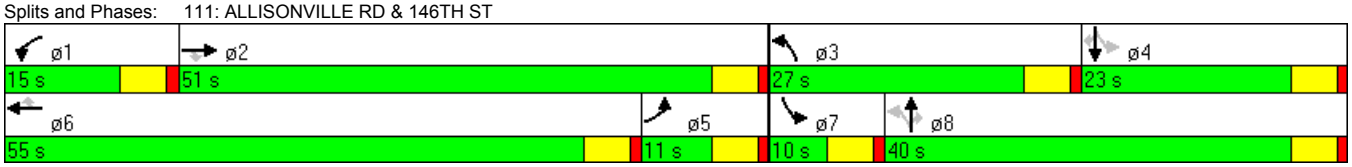


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	697	272	156	1215	223	320	83	26	72	422	233
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.190			0.698		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	347	3471	1553	1275	3471	1553
Satd. Flow (RTOR)			286			133			27			148
Lane Group Flow (vph)	126	734	286	164	1279	235	337	87	27	76	444	245
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Total Split (s)	11.0	51.0	51.0	15.0	55.0	55.0	27.0	40.0	40.0	10.0	23.0	23.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	6.3	47.9	47.9	9.5	51.1	51.1	43.6	35.6	35.6	22.9	17.7	17.7
Actuated g/C Ratio	0.05	0.41	0.41	0.08	0.44	0.44	0.38	0.31	0.31	0.20	0.15	0.15
v/c Ratio	0.69	0.51	0.35	0.59	0.84	0.31	0.88	0.08	0.05	0.28	0.84	0.68
Control Delay	74.2	27.5	3.9	67.0	15.4	1.0	54.6	29.3	10.5	29.0	62.9	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	27.5	3.9	67.0	15.4	1.0	54.6	29.3	10.5	29.0	62.9	28.7
LOS	E	C	A	E	B	A	D	C	B	C	E	C
Approach Delay		26.7			18.4			47.1			48.6	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	48	217	0	54	232	0	189	24	0	36	171	66
Queue Length 95th (ft)	#95	277	53	m61	m280	m2	#345	44	22	69	#248	158
Internal Link Dist (ft)		944			4178			856			1261	
Turn Bay Length (ft)	200		300	220		150	240		120	150		125
Base Capacity (vph)	182	1432	809	290	1530	759	394	1066	495	272	544	368
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.51	0.35	0.57	0.84	0.31	0.86	0.08	0.05	0.28	0.82	0.67

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 7 (6%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 83.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: ALLISONVILLE RD & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	435	41	56	754	120	99	69	81	11	103	101
Satd. Flow (prot)	1736	3471	1553	1736	3471	1553	1736	3190	0	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	1736	3471	1553	1736	3190	0	1736	1827	1553
Satd. Flow (RTOR)			43			126		85				106
Lane Group Flow (vph)	125	458	43	59	794	126	104	158	0	12	108	106
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	24.0	60.0	60.0	16.0	52.0	52.0	20.0	30.0	0.0	10.0	20.0	20.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	13.6	65.6	65.6	8.9	58.7	58.7	11.8	26.6		5.0	11.8	11.8
Actuated g/C Ratio	0.12	0.57	0.57	0.08	0.51	0.51	0.10	0.23		0.04	0.10	0.10
v/c Ratio	0.61	0.23	0.05	0.44	0.45	0.15	0.59	0.20		0.16	0.58	0.42
Control Delay	85.1	3.3	0.7	61.0	21.1	4.1	62.7	17.3		58.5	61.8	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	85.1	3.3	0.7	61.0	21.1	4.1	62.7	17.3		58.5	61.8	14.1
LOS	F	A	A	E	C	A	E	B		E	E	B
Approach Delay		19.4			21.3			35.3			39.2	
Approach LOS		B			C			D			D	
Queue Length 50th (ft)	91	6	0	43	195	0	75	22		9	78	0
Queue Length 95th (ft)	139	48	m0	86	299	37	130	52		30	134	51
Internal Link Dist (ft)		2627			788			1078			997	
Turn Bay Length (ft)	370		500	400		650	270			200		
Base Capacity (vph)	284	1962	897	165	1757	849	224	824		75	236	293
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.44	0.23	0.05	0.36	0.45	0.15	0.46	0.19		0.16	0.46	0.36

Intersection Summary	
Cycle Length: 116	
Actuated Cycle Length: 116	
Offset: 74 (64%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 52.1%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

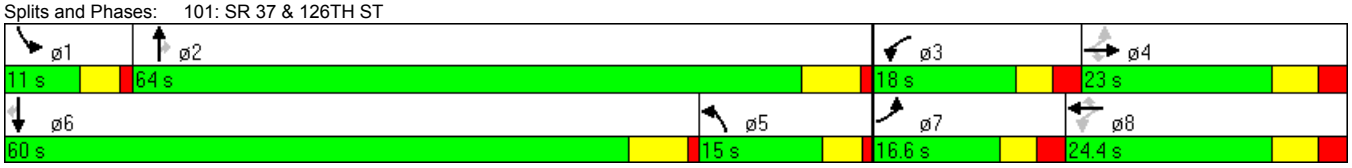
Splits and Phases: 112: CUMBERLAND RD & 146TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	258	314	57	321	293	84	132	1803	257	136	1268	135
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.217			0.202			0.950			0.950		
Satd. Flow (perm)	396	1827	1553	369	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			60			88			271			142
Lane Group Flow (vph)	272	331	60	338	308	88	139	1898	271	143	1335	142
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Total Split (s)	16.6	23.0	23.0	18.0	24.4	24.4	15.0	64.0	64.0	11.0	60.0	60.0
Total Lost Time (s)	3.7	4.6	4.6	3.7	4.6	4.6	2.5	4.2	4.2	2.5	4.2	4.2
Act Effct Green (s)	32.2	18.4	18.4	35.0	19.8	19.8	12.5	59.8	59.8	8.5	55.8	55.8
Actuated g/C Ratio	0.28	0.16	0.16	0.30	0.17	0.17	0.11	0.52	0.52	0.07	0.48	0.48
v/c Ratio	1.05	1.14	0.20	1.21	0.99	0.26	0.74	1.06	0.29	1.13	0.80	0.17
Control Delay	104.0	140.8	12.5	153.5	96.5	10.7	74.2	67.9	2.6	154.5	9.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.0	140.8	12.5	153.5	96.5	10.7	74.2	67.9	2.6	154.5	9.5	0.6
LOS	F	F	B	F	F	B	E	E	A	F	A	A
Approach Delay		114.1			112.4			60.6			21.5	
Approach LOS		F			F			E			C	
Queue Length 50th (ft)	~169	~290	0	~255	232	0	102	~821	0	~120	214	2
Queue Length 95th (ft)	#337	#472	38	#442	#414	45	#200	#960	41	m#167	290	m2
Internal Link Dist (ft)		700			1140			3702			2575	
Turn Bay Length (ft)	200		150	250		250	510		500	370		550
Base Capacity (vph)	259	290	297	280	312	338	187	1789	932	127	1670	821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.14	0.20	1.21	0.99	0.26	0.74	1.06	0.29	1.13	0.80	0.17

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 58 (50%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 62.5 Intersection LOS: E
Intersection Capacity Utilization 105.7% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: SR 37 & 126TH ST

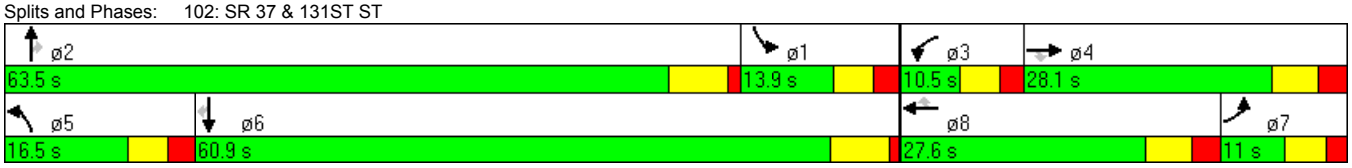


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	68	373	84	73	179	213	129	1842	174	142	1382	47
Satd. Flow (prot)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			88			155			183			49
Lane Group Flow (vph)	72	393	88	77	188	224	136	1939	183	149	1455	49
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	11.0	28.1	28.1	10.5	27.6	27.6	16.5	63.5	63.5	13.9	60.9	60.9
Total Lost Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.9	4.2	4.2	3.9	4.2	4.2
Act Effct Green (s)	10.0	25.6	25.6	7.0	22.9	22.9	12.4	59.3	59.3	10.0	56.9	56.9
Actuated g/C Ratio	0.09	0.22	0.22	0.06	0.20	0.20	0.11	0.51	0.51	0.09	0.49	0.49
v/c Ratio	0.48	0.98	0.21	0.38	0.52	0.52	0.74	1.09	0.21	0.99	0.85	0.06
Control Delay	62.5	85.2	9.4	58.1	48.6	18.9	55.9	60.9	0.9	89.6	18.0	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	85.2	9.4	58.1	48.6	18.9	55.9	60.9	0.9	89.6	18.0	2.7
LOS	E	F	A	E	D	B	E	E	A	F	B	A
Approach Delay		70.2			36.5			55.7			24.0	
Approach LOS		E			D			E			C	
Queue Length 50th (ft)	51	~324	0	28	132	46	92	~868	8	118	193	1
Queue Length 95th (ft)	#123	#518	43	54	202	122	m90	m#786	m8	m#148	m197	m1
Internal Link Dist (ft)		781			963			2575			5240	
Turn Bay Length (ft)	250		250	350		350	800		800	580		580
Base Capacity (vph)	150	403	411	203	397	459	189	1774	883	150	1704	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.98	0.21	0.38	0.47	0.49	0.72	1.09	0.21	0.99	0.85	0.06

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 1 (1%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 44.9 Intersection LOS: D
Intersection Capacity Utilization 96.6% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: SR 37 & 131ST ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	199	188	302	96	76	172	1613	338	210	1081	53
Satd. Flow (prot)	1736	1694	0	1736	1706	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.643			0.140			0.950			0.950		
Satd. Flow (perm)	1175	1694	0	256	1706	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		36			32				315			56
Lane Group Flow (vph)	38	407	0	318	181	0	181	1698	356	221	1138	56
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Total Split (s)	11.6	26.0	0.0	18.0	32.4	0.0	19.0	56.0	56.0	16.0	53.0	53.0
Total Lost Time (s)	4.6	4.6	2.0	4.6	4.6	2.0	2.6	4.2	4.2	2.6	4.2	4.2
Act Effct Green (s)	28.4	21.4		39.4	32.4		15.8	51.8	51.8	13.4	49.4	49.4
Actuated g/C Ratio	0.24	0.18		0.34	0.28		0.14	0.45	0.45	0.12	0.43	0.43
v/c Ratio	0.12	1.19		1.23	0.36		0.77	1.10	0.41	1.10	0.77	0.08
Control Delay	27.5	149.0		163.4	31.4		66.7	57.5	0.5	121.9	38.2	9.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	149.0		163.4	31.4		66.7	57.5	0.5	121.9	38.2	9.1
LOS	C	F		F	C		E	E	A	F	D	A
Approach Delay		138.7			115.5			49.2			50.1	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	19	~346		~250	94		127	~744	6	~183	446	14
Queue Length 95th (ft)	44	#545		#432	163		m126	m#660	m5	m#335	528	m28
Internal Link Dist (ft)		666			1364			5240			2592	
Turn Bay Length (ft)	275			52			450		450	450		460
Base Capacity (vph)	322	342		258	500		245	1550	868	201	1477	693
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.12	1.19		1.23	0.36		0.74	1.10	0.41	1.10	0.77	0.08

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 75 (65%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 65.3 Intersection LOS: E
Intersection Capacity Utilization 109.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

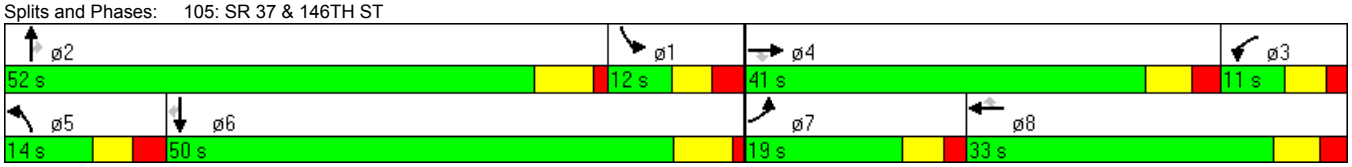
Splits and Phases: 104: SR 37 & 141ST ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	826	309	131	682	205	191	1121	413	131	904	274
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Satd. Flow (RTOR)			205			127			154			288
Lane Group Flow (vph)	352	869	325	138	718	216	201	1180	435	138	952	288
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	19.0	41.0	41.0	11.0	33.0	33.0	14.0	52.0	52.0	12.0	50.0	50.0
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.4	4.3	4.3	4.4	4.3	4.3
Act Effct Green (s)	15.4	35.1	35.1	8.3	28.0	28.0	9.9	48.3	48.3	7.6	46.0	46.0
Actuated g/C Ratio	0.13	0.30	0.30	0.07	0.24	0.24	0.09	0.42	0.42	0.07	0.40	0.40
v/c Ratio	0.79	0.83	0.53	0.57	0.86	0.46	0.70	0.82	0.59	0.62	0.69	0.37
Control Delay	64.8	35.5	11.4	55.4	46.9	12.9	67.9	5.3	0.7	44.6	13.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.8	35.5	11.4	55.4	46.9	12.9	67.9	5.3	0.7	44.6	13.8	1.1
LOS	E	D	B	E	D	B	E	A	A	D	B	A
Approach Delay		37.1			41.1			11.1			14.2	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)	117	210	26	53	275	61	68	46	1	48	71	1
Queue Length 95th (ft)	m162	340	m78	#91	#364	87	m64	m40	m1	m82	177	m1
Internal Link Dist (ft)		4178			2627			2592			3721	
Turn Bay Length (ft)	490		290	400		400	850		560	725		850
Base Capacity (vph)	450	1092	629	241	853	477	287	1444	736	221	1376	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.80	0.52	0.57	0.84	0.45	0.70	0.82	0.59	0.62	0.69	0.37

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 112 (97%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 24.3 Intersection LOS: C
Intersection Capacity Utilization 77.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: SR 37 & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	223	316	118	123	205	418	103	1524	33	302	1068	134
Satd. Flow (prot)	1736	1900	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.288			0.235			0.950			0.950		
Satd. Flow (perm)	526	1900	1553	429	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			124			274			35			141
Lane Group Flow (vph)	235	333	124	129	216	440	108	1604	35	318	1124	141
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			6
Total Split (s)	12.4	25.0	25.0	9.9	22.5	22.5	16.7	58.1	58.1	23.0	64.4	64.4
Total Lost Time (s)	2.9	5.5	5.5	2.9	5.5	5.5	2.9	5.1	5.1	2.9	5.1	5.1
Act Effct Green (s)	31.6	19.5	19.5	26.6	17.0	17.0	12.7	53.0	53.0	20.1	60.4	60.4
Actuated g/C Ratio	0.27	0.17	0.17	0.23	0.15	0.15	0.11	0.46	0.46	0.17	0.52	0.52
v/c Ratio	0.97	1.04	0.34	0.73	0.81	0.95	0.57	1.01	0.05	1.06	0.62	0.16
Control Delay	89.9	109.4	10.2	58.9	70.9	51.2	49.0	45.1	3.0	100.7	11.9	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.9	109.4	10.2	58.9	70.9	51.2	49.0	45.1	3.0	100.7	11.9	1.8
LOS	F	F	B	E	E	D	D	D	A	F	B	A
Approach Delay		85.0			57.9			44.5			28.8	
Approach LOS		F			E			D			C	
Queue Length 50th (ft)	147	~270	0	75	158	134	72	~558	4	~269	288	6
Queue Length 95th (ft)	#257	#452	52	#131	#283	#341	m93	#792	m5	m#443	351	m24
Internal Link Dist (ft)		2170			1592			4518			3581	
Turn Bay Length (ft)	120		470	475		325	580		580	710		565
Base Capacity (vph)	242	319	364	177	268	461	207	1586	729	301	1806	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	1.04	0.34	0.73	0.81	0.95	0.52	1.01	0.05	1.06	0.62	0.16

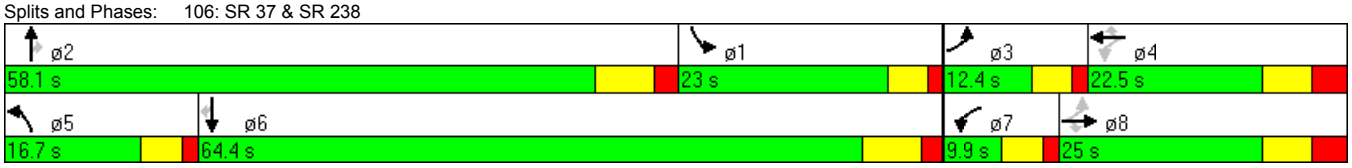
Intersection Summary	
Cycle Length: 116	
Actuated Cycle Length: 116	
Offset: 6 (5%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 47.3	Intersection LOS: D
Intersection Capacity Utilization 97.8%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: SR 37 & SR 238



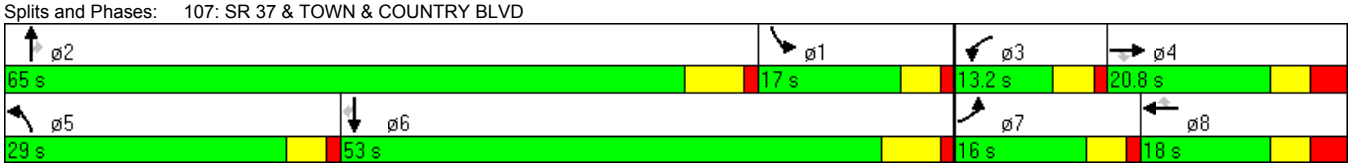
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	253	367	219	153	65	303	1537	325	162	918	161
Satd. Flow (prot)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			386			44			342			169
Lane Group Flow (vph)	153	266	386	231	161	68	319	1618	342	171	966	169
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	16.0	20.8	20.8	13.2	18.0	18.0	29.0	65.0	65.0	17.0	53.0	53.0
Total Lost Time (s)	2.7	4.8	4.8	2.7	4.8	4.8	2.7	4.3	4.3	2.7	4.3	4.3
Act Effct Green (s)	13.1	15.7	15.7	10.5	13.1	13.1	25.1	61.0	61.0	14.3	50.2	50.2
Actuated g/C Ratio	0.11	0.14	0.14	0.09	0.11	0.11	0.22	0.53	0.53	0.12	0.43	0.43
v/c Ratio	0.78	0.57	0.71	0.76	0.78	0.32	0.85	0.89	0.35	0.80	0.64	0.22
Control Delay	76.4	52.1	12.5	68.0	75.8	25.5	50.5	11.7	0.3	48.8	13.1	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	52.1	12.5	68.0	75.8	25.5	50.5	11.7	0.3	48.8	13.1	1.3
LOS	E	D	B	E	E	C	D	B	A	D	B	A
Approach Delay		37.7			64.5			15.4			16.3	
Approach LOS		D			E			B			B	
Queue Length 50th (ft)	113	98	0	88	119	16	198	313	0	118	114	1
Queue Length 95th (ft)	#217	144	96	#144	#226	61	m201	m326	m0	m#163	m173	m10
Internal Link Dist (ft)		755			780			3581			2436	
Turn Bay Length (ft)	285					50	590		490	390		580
Base Capacity (vph)	199	479	547	305	208	216	394	1826	979	214	1503	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.56	0.71	0.76	0.77	0.31	0.81	0.89	0.35	0.80	0.64	0.22

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 48 (41%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 24.0 — Intersection LOS: C
Intersection Capacity Utilization 81.8% — ICU Level of Service D
Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: SR 37 & TOWN & COUNTRY BLVD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	196	129	84	182	382	175	1537	35	217	1028	111
Satd. Flow (prot)	1736	1717	0	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.200			0.250			0.950			0.950		
Satd. Flow (perm)	365	1717	0	457	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		25				228			42			134
Lane Group Flow (vph)	265	393	0	102	220	462	212	1861	42	263	1244	134
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			6
Total Split (s)	15.0	24.0	0.0	11.0	20.0	20.0	21.7	62.0	62.0	19.0	59.3	59.3
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	4.0	3.3	4.0	4.0	3.3	4.1	4.1
Act Effct Green (s)	31.0	20.0		23.0	16.0	16.0	18.4	58.0	58.0	15.7	55.2	55.2
Actuated g/C Ratio	0.27	0.17		0.20	0.14	0.14	0.16	0.50	0.50	0.14	0.48	0.48
v/c Ratio	1.16	1.24		0.61	0.87	1.12	0.77	1.07	0.05	1.12	0.75	0.17
Control Delay	145.9	170.2		50.4	81.4	106.4	43.4	54.7	0.7	131.8	28.8	5.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	145.9	170.2		50.4	81.4	106.4	43.4	54.7	0.7	131.8	28.8	5.4
LOS	F	F		D	F	F	D	D	A	F	C	A
Approach Delay		160.4			92.1			52.5			43.4	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	~185	~351		60	163	~242	144	~803	0	~232	395	24
Queue Length 95th (ft)	#357	#549		#114	#302	#450	m177	#938	m0	m#366	m446	m43
Internal Link Dist (ft)		3024			1250			2436			1468	
Turn Bay Length (ft)	425			100		100	690		690	510		510
Base Capacity (vph)	228	317		168	252	411	275	1736	798	235	1652	809
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	1.24		0.61	0.87	1.12	0.77	1.07	0.05	1.12	0.75	0.17

Intersection Summary

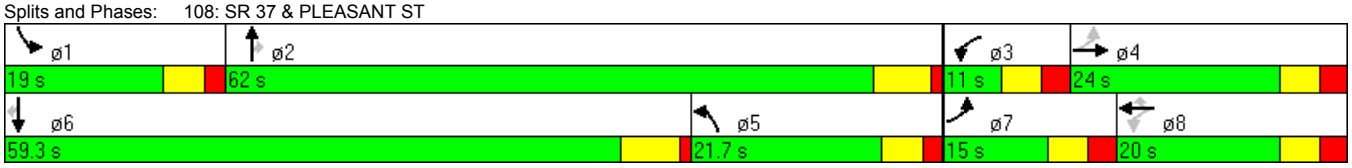
Cycle Length: 116
Actuated Cycle Length: 116
Offset: 57 (49%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 69.2 — Intersection LOS: E
Intersection Capacity Utilization 102.3% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: SR 37 & PLEASANT ST



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	174	214	1924	1182	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	36	183	225	2025	1244	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					756	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	2707	622	1293			
vC1, stage 1 conf vol	1244					
vC2, stage 2 conf vol	1463					
vCu, unblocked vol	2642	90	911			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	76	62			
cM capacity (veh/h)	99	771	598			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	36	183	225	1013	1013	622	622	48
Volume Left	36	0	225	0	0	0	0	0
Volume Right	0	183	0	0	0	0	0	48
cSH	99	771	598	1700	1700	1700	1700	1700
Volume to Capacity	0.36	0.24	0.38	0.60	0.60	0.37	0.37	0.03
Queue Length 95th (ft)	36	23	44	0	0	0	0	0
Control Delay (s)	60.5	11.1	14.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	B					
Approach Delay (s)	19.2		1.5			0.0		
Approach LOS	C							

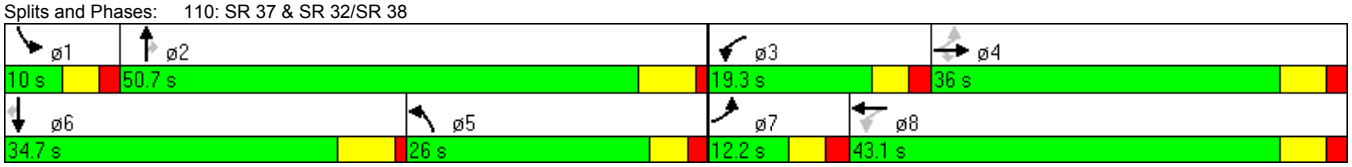
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	63.2%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	450	289	278	240	159	316	1212	430	55	661	71
Satd. Flow (prot)	1736	1827	1553	1736	3263	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.506			0.111			0.950			0.950		
Satd. Flow (perm)	924	1827	1553	203	3263	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			303		145				334			75
Lane Group Flow (vph)	67	474	304	293	420	0	333	1276	453	58	696	75
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Total Split (s)	12.2	36.0	36.0	19.3	43.1	0.0	26.0	50.7	50.7	10.0	34.7	34.7
Total Lost Time (s)	3.2	3.9	3.9	3.2	3.9	2.0	3.0	4.0	4.0	3.0	4.0	4.0
Act Effct Green (s)	41.6	31.9	31.9	51.9	41.4		23.0	48.9	48.9	7.2	30.9	30.9
Actuated g/C Ratio	0.36	0.28	0.28	0.45	0.36		0.20	0.42	0.42	0.06	0.27	0.27
v/c Ratio	0.17	0.94	0.47	0.96	0.33		0.97	0.87	0.53	0.54	0.75	0.16
Control Delay	20.0	70.0	6.3	75.2	18.8		47.1	23.2	2.9	71.9	45.1	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	70.0	6.3	75.2	18.8		47.1	23.2	2.9	71.9	45.1	8.3
LOS	C	E	A	E	B		D	C	A	E	D	A
Approach Delay		43.1			42.0			22.6			43.7	
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	28	346	1	169	77		253	478	50	43	252	0
Queue Length 95th (ft)	56	#551	68	#346	121		m234	m400	m41	#97	323	37
Internal Link Dist (ft)		370			2806			676			7320	
Turn Bay Length (ft)				400						765		860
Base Capacity (vph)	394	506	649	304	1259		344	1463	848	107	925	469
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.94	0.47	0.96	0.33		0.97	0.87	0.53	0.54	0.75	0.16

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 33.5 Intersection LOS: C
Intersection Capacity Utilization 90.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

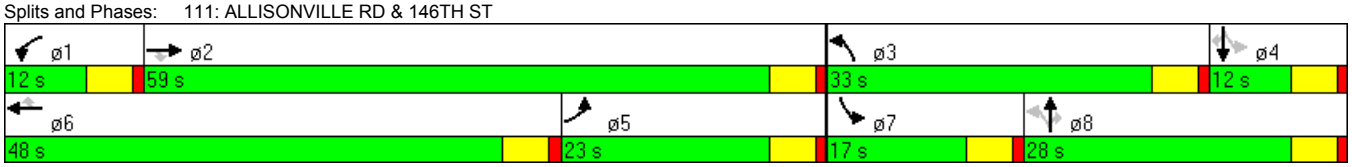
Splits and Phases: 110: SR 37 & SR 32/SR 38



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	358	1335	299	165	814	121	381	288	266	199	162	96
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.363			0.567		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	663	3471	1553	1036	3471	1553
Satd. Flow (RTOR)			315			100			165			101
Lane Group Flow (vph)	377	1405	315	174	857	127	401	303	280	209	171	101
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Total Split (s)	23.0	59.0	59.0	12.0	48.0	48.0	33.0	28.0	28.0	17.0	12.0	12.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Act Effct Green (s)	24.7	57.2	57.2	9.4	41.9	41.9	40.4	23.6	23.6	23.6	9.8	9.8
Actuated g/C Ratio	0.21	0.49	0.49	0.08	0.36	0.36	0.35	0.20	0.20	0.20	0.08	0.08
v/c Ratio	0.53	0.82	0.34	0.64	0.68	0.20	0.82	0.43	0.63	0.71	0.59	0.45
Control Delay	44.3	30.4	2.9	56.8	19.8	1.7	46.9	42.0	23.4	44.1	60.1	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	30.4	2.9	56.8	19.8	1.7	46.9	42.0	23.4	44.1	60.1	16.8
LOS	D	C	A	E	B	A	D	D	C	D	E	B
Approach Delay		28.8			23.4			38.7			44.1	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	127	466	0	53	296	11	246	103	75	112	66	0
Queue Length 95th (ft)	189	567	47	m76	343	m13	#368	147	168	#188	104	54
Internal Link Dist (ft)		944			4178			856			1261	
Turn Bay Length (ft)	200		300	220		150	240		120	150		125
Base Capacity (vph)	716	1711	926	273	1354	667	509	748	464	297	292	223
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.82	0.34	0.64	0.63	0.19	0.79	0.41	0.60	0.70	0.59	0.45

Intersection Summary	
Cycle Length: 116	
Actuated Cycle Length: 116	
Offset: 70 (60%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 111: ALLISONVILLE RD & 146TH ST

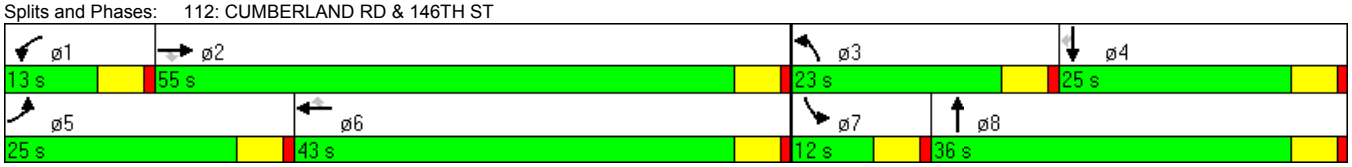


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	960	282	60	546	60	141	159	62	48	183	127
Satd. Flow (prot)	1736	3471	1553	1736	3471	1553	1736	3325	0	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	1736	3471	1553	1736	3325	0	1736	1827	1553
Satd. Flow (RTOR)			297			63		49				134
Lane Group Flow (vph)	179	1011	297	63	575	63	148	232	0	51	193	134
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	25.0	55.0	55.0	13.0	43.0	43.0	23.0	36.0	0.0	12.0	25.0	25.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0
Act Effct Green (s)	18.5	60.9	60.9	10.0	50.3	50.3	16.5	28.6		8.7	18.7	18.7
Actuated g/C Ratio	0.16	0.52	0.52	0.09	0.43	0.43	0.14	0.25		0.08	0.16	0.16
v/c Ratio	0.65	0.55	0.31	0.42	0.38	0.09	0.60	0.27		0.39	0.65	0.37
Control Delay	66.4	11.5	0.7	58.9	25.3	6.7	56.4	27.8		60.1	56.1	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	66.4	11.5	0.7	58.9	25.3	6.7	56.4	27.8		60.1	56.1	9.9
LOS	E	B	A	E	C	A	E	C		E	E	A
Approach Delay		16.0			26.6			39.0			40.3	
Approach LOS		B			C			D			D	
Queue Length 50th (ft)	126	166	1	45	155	0	104	58		37	136	0
Queue Length 95th (ft)	m175	215	m1	91	230	30	168	88		78	209	53
Internal Link Dist (ft)		2627			788			1078			997	
Turn Bay Length (ft)	370		500	400		650	270			200		
Base Capacity (vph)	329	1822	956	157	1505	709	299	981		135	347	403
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.54	0.55	0.31	0.40	0.38	0.09	0.49	0.24		0.38	0.56	0.33

Intersection Summary

Cycle Length: 116
Actuated Cycle Length: 116
Offset: 113 (97%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 24.6 — Intersection LOS: C
Intersection Capacity Utilization 61.5% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 112: CUMBERLAND RD & 146TH ST

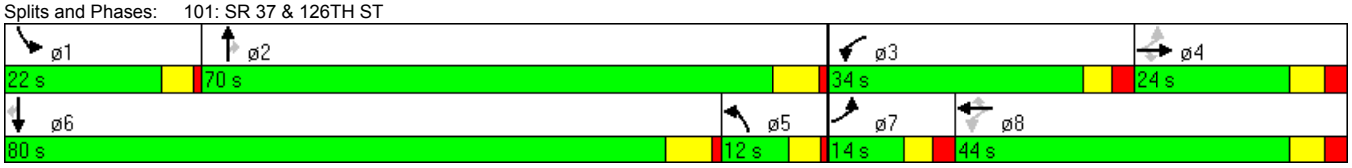


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	213	213	137	507	603	123	112	1563	208	273	2094	206
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.206			0.173			0.950			0.950		
Satd. Flow (perm)	376	1827	1553	316	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			78			73			219			209
Lane Group Flow (vph)	224	224	144	534	635	129	118	1645	219	287	2204	217
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Total Split (s)	14.0	24.0	24.0	34.0	44.0	44.0	12.0	70.0	70.0	22.0	80.0	80.0
Total Lost Time (s)	3.7	4.6	4.6	3.7	4.6	4.6	2.5	4.2	4.2	2.5	4.2	4.2
Act Effct Green (s)	30.6	19.4	19.4	54.3	39.4	39.4	9.5	65.8	65.8	19.5	75.8	75.8
Actuated g/C Ratio	0.20	0.13	0.13	0.36	0.26	0.26	0.06	0.44	0.44	0.13	0.51	0.51
v/c Ratio	1.32	0.95	0.54	1.33	1.32	0.28	1.07	1.08	0.27	1.27	1.26	0.24
Control Delay	211.2	110.6	36.2	201.7	202.0	21.4	170.0	88.1	3.8	174.4	137.9	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	211.2	110.6	36.2	201.7	202.0	21.4	170.0	88.1	3.8	174.4	137.9	2.0
LOS	F	F	D	F	F	C	F	F	A	F	F	A
Approach Delay		130.6			183.9			83.6			130.9	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	~228	221	60	~627	~801	42	~128	~943	0	~351	~1425	21
Queue Length 95th (ft)	#402	#391	136	#862	#1043	101	#264	#1082	49	m#296	m#1173	m15
Internal Link Dist (ft)		700			1140			3702			2575	
Turn Bay Length (ft)	200		150	250		250	510		500	370		550
Base Capacity (vph)	170	236	269	401	480	462	110	1523	804	226	1754	888
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.95	0.54	1.33	1.32	0.28	1.07	1.08	0.27	1.27	1.26	0.24

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 109 (73%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 127.1 Intersection LOS: F
Intersection Capacity Utilization 121.6% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: SR 37 & 126TH ST

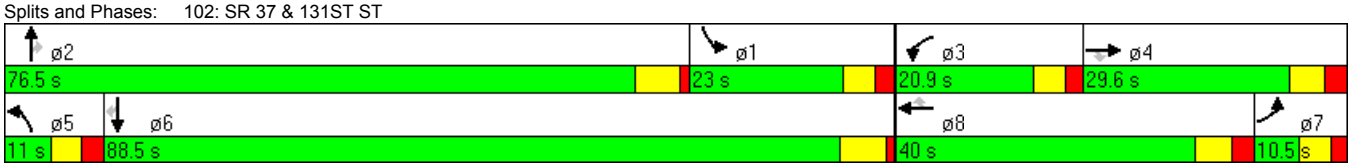


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	251	82	350	477	92	79	1663	157	221	2141	205
Satd. Flow (prot)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			63			67			165			178
Lane Group Flow (vph)	44	264	86	368	502	97	83	1751	165	233	2254	216
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	10.5	29.6	29.6	20.9	40.0	40.0	11.0	76.5	76.5	23.0	88.5	88.5
Total Lost Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.9	4.2	4.2	3.9	4.2	4.2
Act Effct Green (s)	7.0	24.4	24.4	17.4	36.9	36.9	7.7	72.9	72.9	19.1	84.3	84.3
Actuated g/C Ratio	0.05	0.16	0.16	0.12	0.25	0.25	0.05	0.49	0.49	0.13	0.56	0.56
v/c Ratio	0.54	0.89	0.28	0.94	1.12	0.22	0.93	1.04	0.20	1.05	1.16	0.23
Control Delay	94.0	90.9	21.4	98.0	128.5	18.4	91.2	43.7	1.7	96.6	103.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.0	90.9	21.4	98.0	128.5	18.4	91.2	43.7	1.7	96.6	103.1	7.8
LOS	F	F	C	F	F	B	F	D	A	F	F	A
Approach Delay		76.1			105.8			42.2			94.9	
Approach LOS		E			F			D			F	
Queue Length 50th (ft)	43	255	19	187	~581	23	~80	~1000	18	~246	~1358	43
Queue Length 95th (ft)	#94	#413	72	#288	#810	73	m75	m852	m15	m#246	m#1322	m41
Internal Link Dist (ft)		781			963			2575			2220	
Turn Bay Length (ft)	250		250	350		350	800		800	580		580
Base Capacity (vph)	81	305	311	391	450	433	89	1686	839	221	1951	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.87	0.28	0.94	1.12	0.22	0.93	1.04	0.20	1.05	1.16	0.23

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 35 (23%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 78.0 Intersection LOS: E
Intersection Capacity Utilization 106.8% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: SR 37 & 131ST ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	50	81	131	133	82	72	1673	52	71	2355	141
Satd. Flow (prot)	1736	1659	0	1736	1723	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.247			0.494			0.950			0.950		
Satd. Flow (perm)	451	1659	0	902	1723	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		45			17				50			99
Lane Group Flow (vph)	44	138	0	138	226	0	76	1761	55	75	2479	148
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Total Split (s)	27.4	27.4	0.0	27.4	27.4	0.0	13.6	106.9	106.9	15.7	109.0	109.0
Total Lost Time (s)	4.6	4.6	2.0	4.6	4.6	2.0	2.6	4.2	4.2	2.6	4.2	4.2
Act Effct Green (s)	22.8	22.8		22.8	22.8		10.7	103.7	103.7	12.1	105.1	105.1
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.07	0.69	0.69	0.08	0.70	0.70
v/c Ratio	0.64	0.48		1.01	0.82		0.62	0.73	0.05	0.54	1.02	0.13
Control Delay	98.7	44.8		140.5	80.0		101.0	2.9	0.0	53.7	40.1	6.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.7	44.8		140.5	80.0		101.0	2.9	0.0	53.7	40.1	6.0
LOS	F	D		F	E		F	A	A	D	D	A
Approach Delay		57.8			102.9			6.8			38.6	
Approach LOS		E			F			A			D	
Queue Length 50th (ft)	41	83		~138	202		79	36	0	68	~1335	34
Queue Length 95th (ft)	#107	157		#287	#339		m81	m41	m0	m61	m851	m26
Internal Link Dist (ft)		1195			1211			2220			2940	
Turn Bay Length (ft)												
Base Capacity (vph)	69	290		137	276		127	2400	1089	152	2433	1118
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.48		1.01	0.82		0.60	0.73	0.05	0.49	1.02	0.13

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 56 (37%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 32.1	Intersection LOS: C
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: SR 37 & 135TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	94	172	435	231	117	72	1540	185	53	1960	151
Satd. Flow (prot)	1736	1650	0	1736	1736	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.508			0.182			0.950			0.950		
Satd. Flow (perm)	928	1650	0	332	1736	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		50			17				195			146
Lane Group Flow (vph)	83	280	0	458	366	0	76	1621	195	56	2063	159
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Total Split (s)	11.6	22.0	0.0	34.0	44.4	0.0	9.6	84.0	84.0	10.0	84.4	84.4
Total Lost Time (s)	4.6	4.6	2.0	4.6	4.6	2.0	2.6	4.2	4.2	2.6	4.2	4.2
Act Effct Green (s)	24.4	17.4		51.4	39.8		7.0	81.8	81.8	7.4	80.2	80.2
Actuated g/C Ratio	0.16	0.12		0.34	0.27		0.05	0.55	0.55	0.05	0.53	0.53
v/c Ratio	0.44	1.19		1.18	0.77		0.94	0.86	0.21	0.65	1.11	0.18
Control Delay	45.8	163.0		143.2	60.8		154.7	10.1	0.6	99.6	64.1	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	163.0		143.2	60.8		154.7	10.1	0.6	99.6	64.1	0.3
LOS	D	F		F	E		F	B	A	F	E	A
Approach Delay		136.2			106.6			14.9			60.5	
Approach LOS		F			F			B			E	
Queue Length 50th (ft)	56	~284		~486	319		79	64	0	58	~1232	1
Queue Length 95th (ft)	98	#477		#710	446		m#129	427	m7	m52	m88	m0
Internal Link Dist (ft)		666			1364			2940			2592	
Turn Bay Length (ft)	275			52			450		450	450		460
Base Capacity (vph)	189	236		389	473		81	1893	935	86	1856	898
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.19		1.18	0.77		0.94	0.86	0.21	0.65	1.11	0.18

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 93 (62%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 56.6 Intersection LOS: E
Intersection Capacity Utilization 110.6% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

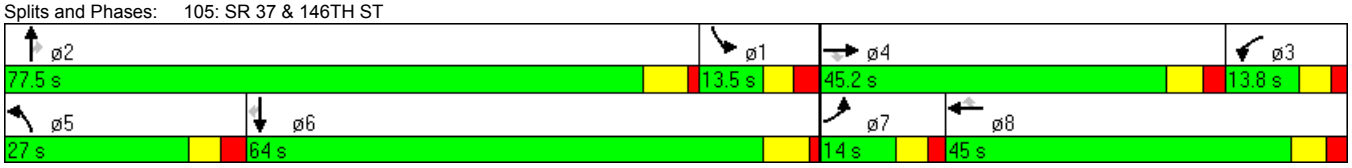
Splits and Phases: 104: SR 37 & 141ST ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	265	630	159	163	1249	75	690	802	244	99	1842	533
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Satd. Flow (RTOR)			167			64			212			153
Lane Group Flow (vph)	279	663	167	172	1315	79	726	844	257	104	1939	561
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	14.0	45.2	45.2	13.8	45.0	45.0	27.0	77.5	77.5	13.5	64.0	64.0
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.4	4.3	4.3	4.4	4.3	4.3
Act Effct Green (s)	10.5	36.0	36.0	15.0	40.5	40.5	22.6	73.2	73.2	9.1	59.7	59.7
Actuated g/C Ratio	0.07	0.24	0.24	0.10	0.27	0.27	0.15	0.49	0.49	0.06	0.40	0.40
v/c Ratio	1.18	0.79	0.33	0.51	1.40	0.17	1.43	0.50	0.30	0.51	1.40	0.79
Control Delay	147.1	43.5	17.0	53.1	219.1	4.6	234.3	37.4	15.3	57.3	211.1	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.1	43.5	17.0	53.1	219.1	4.6	234.3	37.4	15.3	57.3	211.1	19.2
LOS	F	D	B	D	F	A	F	D	B	E	F	B
Approach Delay		65.6			190.0			112.6			163.6	
Approach LOS		E			F			F			F	
Queue Length 50th (ft)	~169	345	88	85	~910	20	~504	426	107	52	~1343	430
Queue Length 95th (ft)	#269	424	m147	#141	#1042	m16	m#636	486	m159	m48	m#1102	m319
Internal Link Dist (ft)		4178			2627			2592			3721	
Turn Bay Length (ft)	490		290	400		400	850		560	725		850
Base Capacity (vph)	236	942	543	336	937	466	507	1694	866	204	1381	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.70	0.31	0.51	1.40	0.17	1.43	0.50	0.30	0.51	1.40	0.79

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 39 (26%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.43
Intersection Signal Delay: 141.0 Intersection LOS: F
Intersection Capacity Utilization 127.0% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: SR 37 & 146TH ST

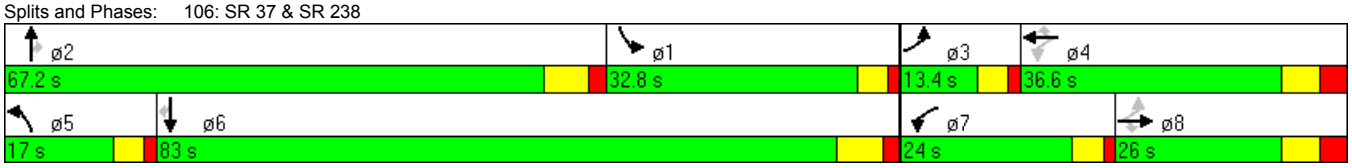


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	274	182	349	359	415	170	949	23	265	1943	167
Satd. Flow (prot)	1736	1900	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.195			0.171			0.950			0.950		
Satd. Flow (perm)	356	1900	1553	312	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			151			350			24			176
Lane Group Flow (vph)	178	288	192	367	378	437	179	999	24	279	2045	176
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			6
Total Split (s)	13.4	26.0	26.0	24.0	36.6	36.6	17.0	67.2	67.2	32.8	83.0	83.0
Total Lost Time (s)	2.9	5.5	5.5	2.9	5.5	5.5	2.9	5.1	5.1	2.9	5.1	5.1
Act Effct Green (s)	33.6	20.5	20.5	47.1	31.1	31.1	14.1	62.1	62.1	29.9	77.9	77.9
Actuated g/C Ratio	0.22	0.14	0.14	0.31	0.21	0.21	0.09	0.41	0.41	0.20	0.52	0.52
v/c Ratio	1.01	1.11	0.56	1.23	1.00	0.73	1.10	0.70	0.04	0.81	1.13	0.20
Control Delay	114.3	145.1	22.2	167.5	104.1	19.6	148.5	42.8	18.3	50.6	84.6	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.3	145.1	22.2	167.5	104.1	19.6	148.5	42.8	18.3	50.6	84.6	1.4
LOS	F	F	C	F	F	B	F	D	B	D	F	A
Approach Delay		100.9			92.5			58.0			75.0	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	~135	~321	36	~388	374	75	~203	398	9	262	~1218	11
Queue Length 95th (ft)	#284	#514	120	#597	#594	213	m#314	m431	m20	m284	m#1325	m12
Internal Link Dist (ft)		2170			1592			4518			3581	
Turn Bay Length (ft)	120		470	475		325	580		580	710		565
Base Capacity (vph)	176	260	343	298	379	599	163	1437	657	346	1803	891
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.11	0.56	1.23	1.00	0.73	1.10	0.70	0.04	0.81	1.13	0.20

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 51 (34%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 78.1 Intersection LOS: E
Intersection Capacity Utilization 112.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: SR 37 & SR 238



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	22	101	89	31	20	143	1221	169	174	2185	123
Satd. Flow (prot)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			106			21			178			129
Lane Group Flow (vph)	15	23	106	94	33	21	151	1285	178	183	2300	129
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	9.7	13.8	13.8	9.7	13.8	13.8	18.0	97.7	97.7	28.8	108.5	108.5
Total Lost Time (s)	2.7	4.8	4.8	2.7	4.8	4.8	2.7	4.3	4.3	2.7	4.3	4.3
Act Effct Green (s)	7.0	9.0	9.0	7.0	14.8	14.8	15.3	93.4	93.4	26.1	104.2	104.2
Actuated g/C Ratio	0.05	0.06	0.06	0.05	0.10	0.10	0.10	0.62	0.62	0.17	0.69	0.69
v/c Ratio	0.19	0.11	0.55	0.60	0.18	0.12	0.85	0.59	0.17	0.61	0.95	0.12
Control Delay	74.3	68.0	22.6	86.2	67.6	25.8	68.1	28.4	5.7	47.2	12.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.3	68.0	22.6	86.2	67.6	25.8	68.1	28.4	5.7	47.2	12.7	1.2
LOS	E	E	C	F	E	C	E	C	A	D	B	A
Approach Delay		35.2			73.5			29.6			14.5	
Approach LOS		D			E			C			B	
Queue Length 50th (ft)	14	11	0	47	29	0	142	560	52	158	282	5
Queue Length 95th (ft)	40	27	63	79	69	30	m#233	m632	m67	m140	m249	m3
Internal Link Dist (ft)		755			780			3581			2436	
Turn Bay Length (ft)	285					50	590		490	390		580
Base Capacity (vph)	81	208	193	157	181	172	177	2161	1034	302	2411	1118
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.11	0.55	0.60	0.18	0.12	0.85	0.59	0.17	0.61	0.95	0.12

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 128 (85%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 22.5 Intersection LOS: C
Intersection Capacity Utilization 88.4% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: SR 37 & TOWN & COUNTRY BLVD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	36	98	10	42	147	104	1105	46	97	2374	156
Satd. Flow (prot)	1736	1626	0	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.584			0.323			0.950			0.950		
Satd. Flow (perm)	1067	1626	0	590	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		69				178			56			189
Lane Group Flow (vph)	108	163	0	12	51	178	126	1338	56	117	2874	189
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			6
Total Split (s)	11.0	13.0	0.0	11.0	13.0	13.0	13.0	104.3	104.3	21.7	113.0	113.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	4.0	3.3	4.0	4.0	3.3	4.1	4.1
Act Effct Green (s)	18.4	15.6		16.0	9.0	9.0	9.7	102.5	102.5	16.2	108.9	108.9
Actuated g/C Ratio	0.12	0.10		0.11	0.06	0.06	0.06	0.68	0.68	0.11	0.73	0.73
v/c Ratio	0.67	0.71		0.10	0.46	0.68	1.12	0.56	0.05	0.63	1.14	0.16
Control Delay	81.2	53.4		58.9	82.3	22.8	170.3	2.1	0.1	69.9	77.8	0.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	53.4		58.9	82.3	22.8	170.3	2.1	0.1	69.9	77.8	0.1
LOS	F	D		E	F	C	F	A	A	E	E	A
Approach Delay		64.5			37.2			16.0			72.9	
Approach LOS		E			D			B			E	
Queue Length 50th (ft)	99	87		10	49	0	~145	34	0	112	~1725	0
Queue Length 95th (ft)	#196	#255		32	97	80	#283	43	m0	m105	m428	m0
Internal Link Dist (ft)		3024			1250			2436			1468	
Turn Bay Length (ft)	425			100		100	690		690	510		510
Base Capacity (vph)	162	231		116	110	261	112	2373	1079	213	2520	1179
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.71		0.10	0.46	0.68	1.13	0.56	0.05	0.55	1.14	0.16

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 132 (88%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 54.2 Intersection LOS: D
Intersection Capacity Utilization 104.5% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: SR 37 & PLEASANT ST

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	35	121	256	1085	2506	121
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	127	269	1142	2638	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					756	
pX, platoon unblocked	0.61	0.61	0.61			
vC, conflicting volume	3748	1319	2765			
vC1, stage 1 conf vol	2638					
vC2, stage 2 conf vol	1110					
vCu, unblocked vol	4234	226	2613			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	73	0			
cM capacity (veh/h)	0	467	95			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	37	127	269	571	571	1319	1319	127
Volume Left	37	0	269	0	0	0	0	0
Volume Right	0	127	0	0	0	0	0	127
cSH	0	467	95	1700	1700	1700	1700	1700
Volume to Capacity	Err	0.27	2.84	0.34	0.34	0.78	0.78	0.07
Queue Length 95th (ft)	Err	27	644	0	0	0	0	0
Control Delay (s)	Err	15.6	925.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	F					
Approach Delay (s)	Err		176.7			0.0		
Approach LOS	F							

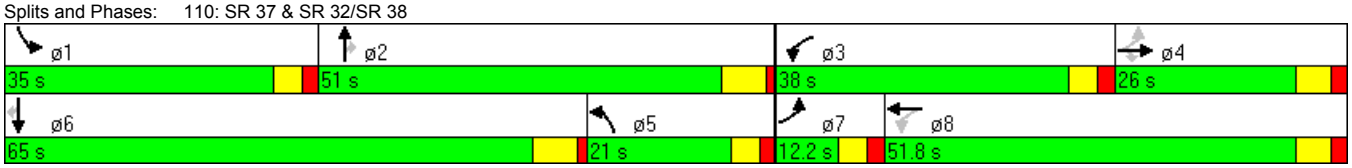
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	96.8%	ICU Level of Service		F
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	251	456	555	522	79	247	712	162	224	1616	117
Satd. Flow (prot)	1736	1827	1553	1736	3402	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.412			0.152			0.950			0.950		
Satd. Flow (perm)	753	1827	1553	278	3402	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			187		12				167			123
Lane Group Flow (vph)	56	264	480	584	632	0	260	749	171	236	1701	123
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Total Split (s)	12.2	26.0	26.0	38.0	51.8	0.0	21.0	51.0	51.0	35.0	65.0	65.0
Total Lost Time (s)	3.2	3.9	3.9	3.2	3.9	2.0	3.0	4.0	4.0	3.0	4.0	4.0
Act Effct Green (s)	31.8	22.1	22.1	60.8	50.3		18.0	52.2	52.2	26.8	61.0	61.0
Actuated g/C Ratio	0.21	0.15	0.15	0.41	0.34		0.12	0.35	0.35	0.18	0.41	0.41
v/c Ratio	0.26	0.98	1.24	1.29	0.55		1.25	0.62	0.26	0.76	1.20	0.17
Control Delay	33.6	113.0	157.8	185.6	42.6		180.8	27.8	2.6	74.1	138.2	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	113.0	157.8	185.6	42.6		180.8	27.8	2.6	74.1	138.2	5.0
LOS	C	F	F	F	D		F	C	A	E	F	A
Approach Delay		134.3			111.3			57.9			122.9	
Approach LOS		F			F			E			F	
Queue Length 50th (ft)	33	261	~416	~681	267		~312	157	1	221	~1062	0
Queue Length 95th (ft)	64	#449	#645	#921	333		#496	322	11	310	#1200	41
Internal Link Dist (ft)		370			2806			676			7320	
Turn Bay Length (ft)				400						765		860
Base Capacity (vph)	219	269	388	451	1150		208	1207	649	370	1412	705
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.98	1.24	1.29	0.55		1.25	0.62	0.26	0.64	1.20	0.17

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 107.3 Intersection LOS: F
Intersection Capacity Utilization 115.6% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 110: SR 37 & SR 32/SR 38

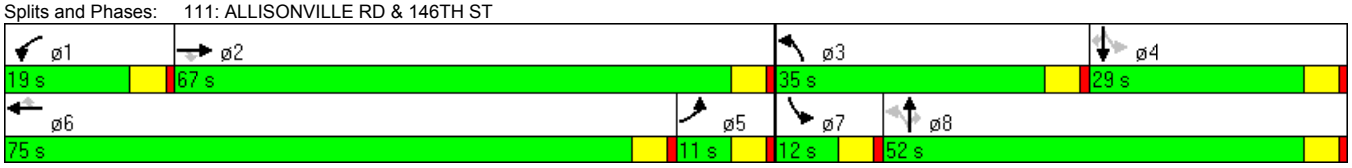


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	1005	392	225	1752	322	461	120	37	104	609	336
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.138			0.672		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	252	3471	1553	1228	3471	1553
Satd. Flow (RTOR)			394			110			39			88
Lane Group Flow (vph)	182	1058	413	237	1844	339	485	126	39	109	641	354
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Total Split (s)	11.0	67.0	67.0	19.0	75.0	75.0	35.0	52.0	52.0	12.0	29.0	29.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	6.0	62.4	62.4	13.6	70.0	70.0	59.0	47.0	47.0	31.0	24.0	24.0
Actuated g/C Ratio	0.04	0.42	0.42	0.09	0.47	0.47	0.39	0.31	0.31	0.21	0.16	0.16
v/c Ratio	1.35	0.73	0.47	0.78	1.14	0.43	1.22	0.12	0.08	0.39	1.15	1.10
Control Delay	248.3	40.6	5.1	61.3	92.1	7.6	160.6	37.1	10.5	39.4	142.6	121.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	248.3	40.6	5.1	61.3	92.1	7.6	160.6	37.1	10.5	39.4	142.6	121.7
LOS	F	D	A	E	F	A	F	D	B	D	F	F
Approach Delay		54.6			77.2			127.7			125.7	
Approach LOS		D			E			F			F	
Queue Length 50th (ft)	~120	456	11	109	~1118	121	~534	46	0	69	~387	~315
Queue Length 95th (ft)	#203	541	82	m88	m752	m85	#762	72	28	114	#515	#523
Internal Link Dist (ft)		944			4178			856			1261	
Turn Bay Length (ft)	200		300	220		150	240		120	150		125
Base Capacity (vph)	135	1445	876	314	1620	783	396	1088	513	277	555	322
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	0.73	0.47	0.75	1.14	0.43	1.22	0.12	0.08	0.39	1.15	1.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 117 (78%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 85.6 Intersection LOS: F
Intersection Capacity Utilization 112.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: ALLISONVILLE RD & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	627	59	81	1087	173	143	99	117	16	148	146
Satd. Flow (prot)	1736	3471	1553	1736	3471	1553	1736	3190	0	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	1736	3471	1553	1736	3190	0	1736	1827	1553
Satd. Flow (RTOR)			62			182		123				154
Lane Group Flow (vph)	181	660	62	85	1144	182	151	227	0	17	156	154
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	30.0	78.0	78.0	20.0	68.0	68.0	26.0	42.0	0.0	10.0	26.0	26.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	20.2	83.0	83.0	12.1	74.9	74.9	17.5	35.9		5.0	17.4	17.4
Actuated g/C Ratio	0.13	0.55	0.55	0.08	0.50	0.50	0.12	0.24		0.03	0.12	0.12
v/c Ratio	0.77	0.34	0.07	0.60	0.66	0.21	0.74	0.26		0.29	0.74	0.49
Control Delay	91.4	7.8	2.3	84.0	32.5	4.0	85.4	21.1		83.8	84.1	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	91.4	7.8	2.3	84.0	32.5	4.0	85.4	21.1		83.8	84.1	13.6
LOS	F	A	A	F	C	A	F	C		F	F	B
Approach Delay		24.2			31.9			46.8			50.9	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	148	133	0	81	443	0	144	40		17	149	0
Queue Length 95th (ft)	m191	326	m17	140	596	47	221	79		45	226	68
Internal Link Dist (ft)		2627			788			1078			997	
Turn Bay Length (ft)	370		500	400		650	270			200		
Base Capacity (vph)	289	1920	887	174	1733	866	243	897		58	256	350
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.63	0.34	0.07	0.49	0.66	0.21	0.62	0.25		0.29	0.61	0.44

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 55 (37%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 33.5	Intersection LOS: C
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 112: CUMBERLAND RD & 146TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	372	453	82	463	423	121	190	2600	371	195	1829	195
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.157			0.137			0.950			0.950		
Satd. Flow (perm)	287	1827	1553	250	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			57			94			276			205
Lane Group Flow (vph)	392	477	86	487	445	127	200	2737	391	205	1925	205
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Total Split (s)	21.0	30.0	30.0	25.0	34.0	34.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Lost Time (s)	3.7	4.6	4.6	3.7	4.6	4.6	2.5	4.2	4.2	2.5	4.2	4.2
Act Effct Green (s)	43.6	25.4	25.4	51.3	29.4	29.4	12.5	75.8	75.8	12.5	75.8	75.8
Actuated g/C Ratio	0.29	0.17	0.17	0.34	0.20	0.20	0.08	0.51	0.51	0.08	0.51	0.51
v/c Ratio	1.56	1.54	0.28	1.64	1.24	0.33	1.38	1.56	0.42	1.41	1.10	0.23
Control Delay	302.5	300.0	24.1	333.1	179.1	18.7	255.5	284.1	7.8	236.5	70.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	302.5	300.0	24.1	333.1	179.1	18.7	255.5	284.1	7.8	236.5	70.1	2.5
LOS	F	F	C	F	F	B	F	F	A	F	E	A
Approach Delay		276.2			230.7			249.9			78.8	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	~493	~654	24	~640	~539	27	~259	~1985	59	~268	~1148	25
Queue Length 95th (ft)	#708	#879	77	#871	#761	88	#427	#2098	135	m#251	m#977	m22
Internal Link Dist (ft)		700			1140			3702			2575	
Turn Bay Length (ft)	200		150	250		250	510		500	370		550
Base Capacity (vph)	251	309	310	297	358	380	145	1754	921	145	1754	886
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.56	1.54	0.28	1.64	1.24	0.33	1.38	1.56	0.42	1.41	1.10	0.23

Intersection Summary

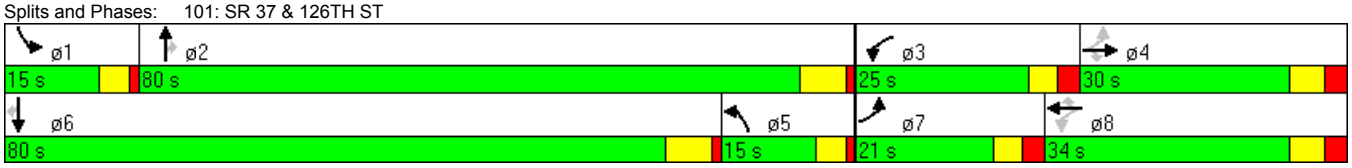
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 74 (49%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.64
Intersection Signal Delay: 198.5 — Intersection LOS: F
Intersection Capacity Utilization 146.2% — ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: SR 37 & 126TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	538	121	105	258	307	186	2656	251	204	1993	68
Satd. Flow (prot)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1827	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			75			151			169			72
Lane Group Flow (vph)	103	566	127	111	272	323	196	2796	264	215	2098	72
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	13.4	36.0	36.0	10.5	33.1	33.1	17.0	85.5	85.5	18.0	86.5	86.5
Total Lost Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.9	4.2	4.2	3.9	4.2	4.2
Act Effct Green (s)	11.7	31.4	31.4	7.0	26.7	26.7	13.1	81.3	81.3	14.1	82.3	82.3
Actuated g/C Ratio	0.08	0.21	0.21	0.05	0.18	0.18	0.09	0.54	0.54	0.09	0.55	0.55
v/c Ratio	0.76	1.48	0.33	0.71	0.83	0.81	1.29	1.49	0.29	1.32	1.10	0.08
Control Delay	100.1	270.5	24.2	93.8	81.0	46.8	188.3	242.4	2.3	203.7	76.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.1	270.5	24.2	93.8	81.0	46.8	188.3	242.4	2.3	203.7	76.8	5.8
LOS	F	F	C	F	F	D	F	F	A	F	E	A
Approach Delay		209.2			67.4			219.7			86.1	
Approach LOS		F			E			F			F	
Queue Length 50th (ft)	102	~760	42	56	256	166	~242	~2021	38	~269	~1212	5
Queue Length 95th (ft)	#223	#996	105	#102	#388	#294	m124	m975	m16	m#298	m#1280	m8
Internal Link Dist (ft)		781			963			2575			2220	
Turn Bay Length (ft)	250		250	350		350	800		800	580		580
Base Capacity (vph)	135	382	384	157	347	417	152	1881	919	163	1904	885
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.48	0.33	0.71	0.78	0.77	1.29	1.49	0.29	1.32	1.10	0.08

Intersection Summary

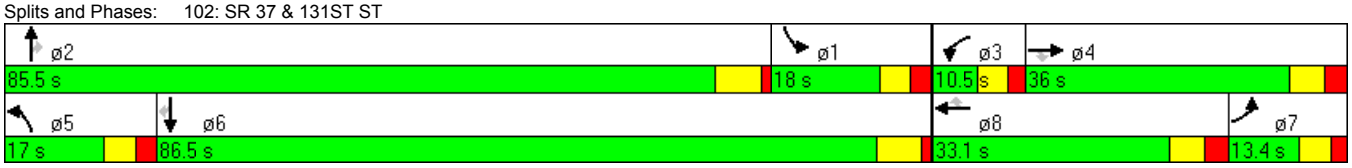
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 144 (96%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.49
Intersection Signal Delay: 158.8 — Intersection LOS: F
Intersection Capacity Utilization 131.2% — ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: SR 37 & 131ST ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	163	209	63	87	125	121	2836	104	205	1993	67
Satd. Flow (prot)	1736	1673	0	1736	1666	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.315			0.152			0.950			0.950		
Satd. Flow (perm)	575	1673	0	278	1666	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		37			42				52			51
Lane Group Flow (vph)	105	392	0	66	224	0	127	2985	109	216	2098	71
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Total Split (s)	31.0	31.0	0.0	31.0	31.0	0.0	14.8	101.0	101.0	18.0	104.2	104.2
Total Lost Time (s)	4.6	4.6	2.0	4.6	4.6	2.0	2.6	4.2	4.2	2.6	4.2	4.2
Act Effct Green (s)	26.4	26.4		26.4	26.4		12.2	96.8	96.8	15.4	100.0	100.0
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.08	0.65	0.65	0.10	0.67	0.67
v/c Ratio	1.04	1.21		1.35	0.68		0.90	1.33	0.11	1.21	0.91	0.07
Control Delay	158.8	164.1		291.5	58.4		87.9	164.3	0.1	158.9	21.3	2.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.8	164.1		291.5	58.4		87.9	164.3	0.1	158.9	21.3	2.3
LOS	F	F		F	E		F	F	A	F	C	A
Approach Delay		163.0			111.4			155.7			33.2	
Approach LOS		F			F			F			C	
Queue Length 50th (ft)	~110	~436		~84	170		131	~2043	0	~255	1004	9
Queue Length 95th (ft)	#240	#652		#190	268		m96	m109	m0	m#197	m737	m6
Internal Link Dist (ft)		1195			1211			2220			2940	
Turn Bay Length (ft)												
Base Capacity (vph)	101	325		49	328		141	2240	1021	178	2314	1052
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.21		1.35	0.68		0.90	1.33	0.11	1.21	0.91	0.07

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 8 (5%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 108.6 Intersection LOS: F
Intersection Capacity Utilization 131.5% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: SR 37 & 135TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	287	271	435	139	109	248	2326	487	303	1559	76
Satd. Flow (prot)	1736	1694	0	1736	1706	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.598			0.113			0.950			0.950		
Satd. Flow (perm)	1092	1694	0	206	1706	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		28			26				311			80
Lane Group Flow (vph)	55	587	0	458	261	0	261	2448	513	319	1641	80
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Total Split (s)	11.6	34.0	0.0	24.0	46.4	0.0	18.0	72.0	72.0	20.0	74.0	74.0
Total Lost Time (s)	4.6	4.6	2.0	4.6	4.6	2.0	2.6	4.2	4.2	2.6	4.2	4.2
Act Effct Green (s)	36.4	29.4		53.4	44.1		15.4	67.8	67.8	17.4	69.8	69.8
Actuated g/C Ratio	0.24	0.20		0.36	0.29		0.10	0.45	0.45	0.12	0.47	0.47
v/c Ratio	0.19	1.65		1.69	0.50		1.47	1.56	0.59	1.59	1.02	0.10
Control Delay	34.9	341.1		355.9	44.1		258.5	278.9	10.2	305.5	64.7	11.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	341.1		355.9	44.1		258.5	278.9	10.2	305.5	64.7	11.6
LOS	C	F		F	D		F	F	B	F	E	B
Approach Delay		314.8			242.7			234.5			100.3	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	36	~814		~610	196		~348	~1806	205	~445	~895	24
Queue Length 95th (ft)	70	#1055		#835	290		m#230	m#1194	m96	m#500	m#965	m28
Internal Link Dist (ft)		666			1364			2940			2592	
Turn Bay Length (ft)	275			52			450		450	450		460
Base Capacity (vph)	295	355		271	520		178	1569	872	201	1615	765
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.19	1.65		1.69	0.50		1.47	1.56	0.59	1.59	1.02	0.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 93 (62%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.69
Intersection Signal Delay: 201.8 Intersection LOS: F
Intersection Capacity Utilization 151.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: SR 37 & 141ST ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	482	1191	446	189	983	296	275	1616	596	189	1303	396
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Satd. Flow (RTOR)			184			93			124			324
Lane Group Flow (vph)	507	1254	469	199	1035	312	289	1701	627	199	1372	417
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	23.0	54.5	54.5	12.5	44.0	44.0	17.6	70.0	70.0	13.0	65.4	65.4
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.4	4.3	4.3	4.4	4.3	4.3
Act Effct Green (s)	19.5	50.0	50.0	9.0	39.5	39.5	13.2	65.7	65.7	8.6	61.1	61.1
Actuated g/C Ratio	0.13	0.33	0.33	0.06	0.26	0.26	0.09	0.44	0.44	0.06	0.41	0.41
v/c Ratio	1.16	1.08	0.73	0.99	1.13	0.65	0.98	1.12	0.84	1.03	0.97	0.51
Control Delay	121.8	74.7	15.8	117.3	114.9	31.7	96.3	66.6	3.3	105.1	38.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.8	74.7	15.8	117.3	114.9	31.7	96.3	66.6	3.3	105.1	38.0	6.8
LOS	F	E	B	F	F	C	F	E	A	F	D	A
Approach Delay		73.0			98.4			54.7			38.2	
Approach LOS		E			F			D			D	
Queue Length 50th (ft)	~299	~716	237	105	~629	207	138	~991	5	~107	702	134
Queue Length 95th (ft)	m#262	m#594	m202	m#186	#761	m313	m89	m41	m1	m#135	m#810	m122
Internal Link Dist (ft)		4178			2627			2592			3721	
Turn Bay Length (ft)	490		290	400		400	850		560	725		850
Base Capacity (vph)	438	1157	640	202	914	477	296	1520	750	193	1414	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	1.08	0.73	0.99	1.13	0.65	0.98	1.12	0.84	1.03	0.97	0.51

Intersection Summary

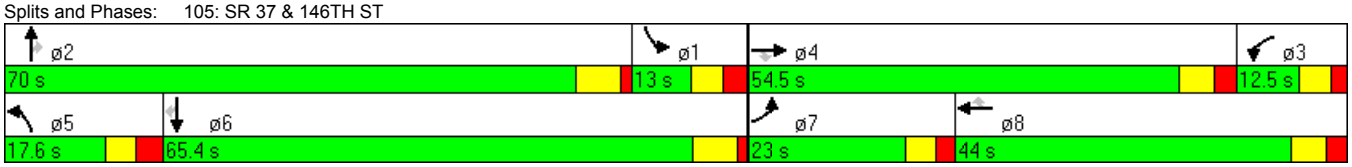
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 131 (87%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 63.7 — Intersection LOS: E
Intersection Capacity Utilization 105.3% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: SR 37 & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	321	456	170	177	296	603	148	2198	48	435	1541	193
Satd. Flow (prot)	1736	1900	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.157			0.178			0.950			0.950		
Satd. Flow (perm)	287	1900	1553	325	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			179			272			45			203
Lane Group Flow (vph)	338	480	179	186	312	635	156	2314	51	458	1622	203
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			6
Total Split (s)	18.0	35.0	35.0	11.0	28.0	28.0	19.2	74.0	74.0	30.0	84.8	84.8
Total Lost Time (s)	2.9	5.5	5.5	2.9	5.5	5.5	2.9	5.1	5.1	2.9	5.1	5.1
Act Effct Green (s)	43.1	29.5	29.5	33.2	22.5	22.5	16.1	68.9	68.9	27.1	79.9	79.9
Actuated g/C Ratio	0.29	0.20	0.20	0.22	0.15	0.15	0.11	0.46	0.46	0.18	0.53	0.53
v/c Ratio	1.48	1.28	0.40	1.26	1.14	1.37	0.83	1.45	0.07	1.46	0.88	0.22
Control Delay	272.5	193.3	9.4	197.7	152.1	205.1	61.3	236.2	9.8	243.9	13.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	272.5	193.3	9.4	197.7	152.1	205.1	61.3	236.2	9.8	243.9	13.3	0.2
LOS	F	F	A	F	F	F	E	F	A	F	B	A
Approach Delay		187.1			189.3			220.8			58.4	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	~401	~595	0	~170	~355	~581	162	~1642	13	~617	454	0
Queue Length 95th (ft)	#605	#820	66	#331	#552	#826	m154	m#1413	m12	m#634	m412	m0
Internal Link Dist (ft)		2170			1592			4518			3581	
Turn Bay Length (ft)	120		470	475		325	580		580	710		565
Base Capacity (vph)	228	374	449	148	274	464	189	1594	738	314	1849	922
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.48	1.28	0.40	1.26	1.14	1.37	0.83	1.45	0.07	1.46	0.88	0.22

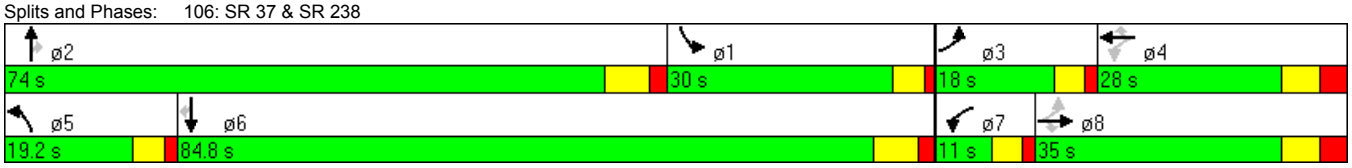
Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 143 (95%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.48	
Intersection Signal Delay: 157.3	Intersection LOS: F
Intersection Capacity Utilization 134.2%	ICU Level of Service H
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: SR 37 & SR 238

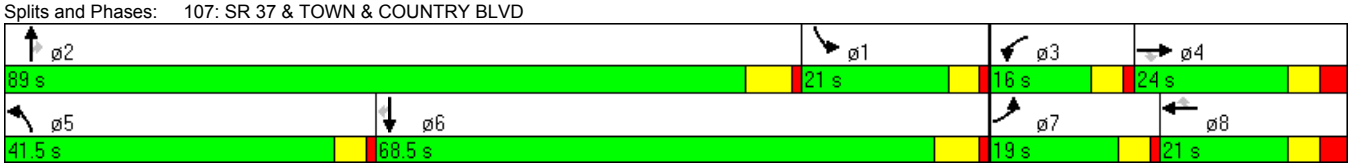


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	209	365	529	316	221	94	437	2216	469	234	1324	232
Satd. Flow (prot)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3367	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			393			34			340			244
Lane Group Flow (vph)	220	384	557	333	233	99	460	2333	494	246	1394	244
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Total Split (s)	19.0	24.0	24.0	16.0	21.0	21.0	41.5	89.0	89.0	21.0	68.5	68.5
Total Lost Time (s)	2.7	4.8	4.8	2.7	4.8	4.8	2.7	4.3	4.3	2.7	4.3	4.3
Act Effct Green (s)	16.3	19.2	19.2	13.3	16.2	16.2	38.8	84.7	84.7	18.3	64.2	64.2
Actuated g/C Ratio	0.11	0.13	0.13	0.09	0.11	0.11	0.26	0.56	0.56	0.12	0.43	0.43
v/c Ratio	1.16	0.86	1.03	1.11	1.18	0.50	1.02	1.19	0.48	1.16	0.94	0.30
Control Delay	172.5	83.6	64.5	146.1	177.1	50.5	54.8	122.9	7.9	116.3	19.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	172.5	83.6	64.5	146.1	177.1	50.5	54.8	122.9	7.9	116.3	19.8	0.4
LOS	F	F	E	F	F	D	D	F	A	F	B	A
Approach Delay		91.3			142.7			96.1			29.9	
Approach LOS		F			F			F			C	
Queue Length 50th (ft)	~255	196	~224	~192	~273	60	~489	~1454	168	~280	535	5
Queue Length 95th (ft)	#429	#283	#461	#295	#449	124	m265	m800	m53	m#262	m483	m4
Internal Link Dist (ft)		755			780			3581			2436	
Turn Bay Length (ft)	285					50	590		490	390		580
Base Capacity (vph)	189	444	541	299	197	198	449	1960	1025	212	1486	804
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.86	1.03	1.11	1.18	0.50	1.02	1.19	0.48	1.16	0.94	0.30

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 73 (49%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 81.9 Intersection LOS: F
Intersection Capacity Utilization 111.7% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: SR 37 & TOWN & COUNTRY BLVD

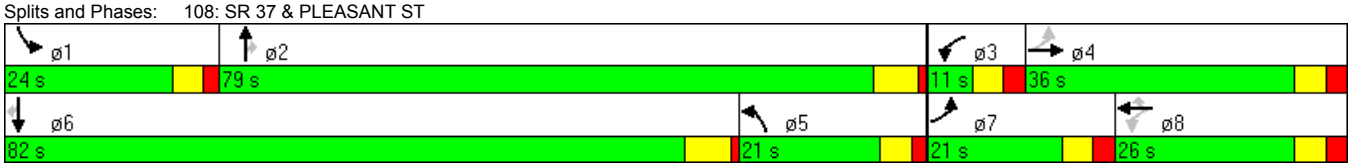


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	316	283	186	122	262	551	252	2216	51	313	1482	160
Satd. Flow (prot)	1736	1719	0	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.154			0.182			0.950			0.950		
Satd. Flow (perm)	281	1719	0	332	1827	1553	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)		20				219			60			194
Lane Group Flow (vph)	383	568	0	148	317	667	305	2683	62	379	1794	194
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			6
Total Split (s)	21.0	36.0	0.0	11.0	26.0	26.0	21.0	79.0	79.0	24.0	82.0	82.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	4.0	3.3	4.0	4.0	3.3	4.1	4.1
Act Effct Green (s)	43.0	32.0		29.0	22.0	22.0	17.7	75.0	75.0	20.7	77.9	77.9
Actuated g/C Ratio	0.29	0.21		0.19	0.15	0.15	0.12	0.50	0.50	0.14	0.52	0.52
v/c Ratio	1.56	1.49		1.14	1.18	1.61	1.49	1.55	0.08	1.58	1.00	0.22
Control Delay	304.6	271.1		163.4	166.9	310.1	258.9	269.7	2.3	310.3	53.7	7.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	304.6	271.1		163.4	166.9	310.1	258.9	269.7	2.3	310.3	53.7	7.3
LOS	F	F		F	F	F	F	F	A	F	D	A
Approach Delay		284.6			250.8			263.2			91.0	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	~481	~753		~118	~371	~745	~409	~1931	3	~537	905	47
Queue Length 95th (ft)	#695	#991		#265	#568	#993	m#360	m#1568	m3	m#549	m820	m55
Internal Link Dist (ft)		3024			1250			2436			1468	
Turn Bay Length (ft)	425			100		100	690		690	510		510
Base Capacity (vph)	245	382		130	268	415	205	1736	807	240	1803	900
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.56	1.49		1.14	1.18	1.61	1.49	1.55	0.08	1.58	1.00	0.22

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 73 (49%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.61
Intersection Signal Delay: 209.7 Intersection LOS: F
Intersection Capacity Utilization 141.7% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: SR 37 & PLEASANT ST



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	49	251	309	2774	1704	67
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	52	264	325	2920	1794	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					756	
pX, platoon unblocked	0.76	0.76	0.76			
vC, conflicting volume	3904	897	1864			
vC1, stage 1 conf vol	1794					
vC2, stage 2 conf vol	2111					
vCu, unblocked vol	4191	230	1504			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	55	1			
cM capacity (veh/h)	1	582	328			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	52	264	325	1460	1460	897	897	71
Volume Left	52	0	325	0	0	0	0	0
Volume Right	0	264	0	0	0	0	0	71
cSH	1	582	328	1700	1700	1700	1700	1700
Volume to Capacity	92.63	0.45	0.99	0.86	0.86	0.53	0.53	0.04
Queue Length 95th (ft)	Err	59	272	0	0	0	0	0
Control Delay (s)	Err	16.2	84.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	F					
Approach Delay (s)	1646.8		8.5			0.0		
Approach LOS	F							

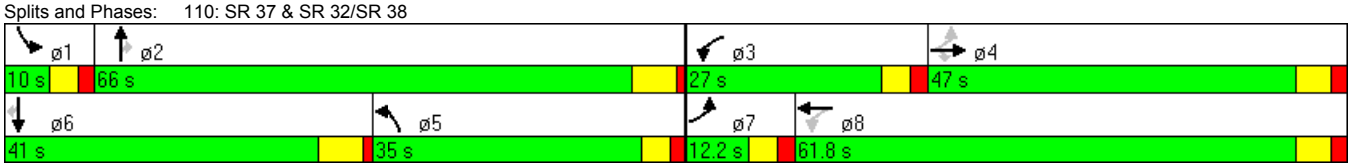
Intersection Summary				
Average Delay	100.9			
Intersection Capacity Utilization	86.7%	ICU Level of Service		E
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	649	417	401	346	229	455	1748	620	79	953	103
Satd. Flow (prot)	1736	1827	1553	1736	3263	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.412			0.086			0.950			0.950		
Satd. Flow (perm)	753	1827	1553	157	3263	0	1736	3471	1553	1736	3471	1553
Satd. Flow (RTOR)			238		122				304			108
Lane Group Flow (vph)	97	683	439	422	605	0	479	1840	653	83	1003	108
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Total Split (s)	12.2	47.0	47.0	27.0	61.8	0.0	35.0	66.0	66.0	10.0	41.0	41.0
Total Lost Time (s)	3.2	3.9	3.9	3.2	3.9	2.0	3.0	4.0	4.0	3.0	4.0	4.0
Act Effct Green (s)	52.8	43.1	43.1	70.8	57.9		32.0	62.0	62.0	7.0	37.0	37.0
Actuated g/C Ratio	0.35	0.29	0.29	0.47	0.39		0.21	0.41	0.41	0.05	0.25	0.25
v/c Ratio	0.30	1.30	0.71	1.30	0.45		1.29	1.28	0.80	1.02	1.17	0.23
Control Delay	26.0	191.1	28.4	192.8	28.1		174.4	158.2	12.3	174.1	138.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	191.1	28.4	192.8	28.1		174.4	158.2	12.3	174.1	138.2	8.7
LOS	C	F	C	F	C		F	F	B	F	F	A
Approach Delay		119.4			95.7			128.7			128.9	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	52	~853	183	~478	183		~603	~1209	342	~86	~613	0
Queue Length 95th (ft)	88	#1101	319	#698	239		m303	m591	m94	#202	#751	50
Internal Link Dist (ft)		370			2806			676			7320	
Turn Bay Length (ft)				400						765		860
Base Capacity (vph)	324	525	616	325	1334		370	1435	820	81	856	464
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.30	0.71	1.30	0.45		1.29	1.28	0.80	1.02	1.17	0.23

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green, Master Intersection
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 121.7 Intersection LOS: F
Intersection Capacity Utilization 122.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: SR 37 & SR 32/SR 38

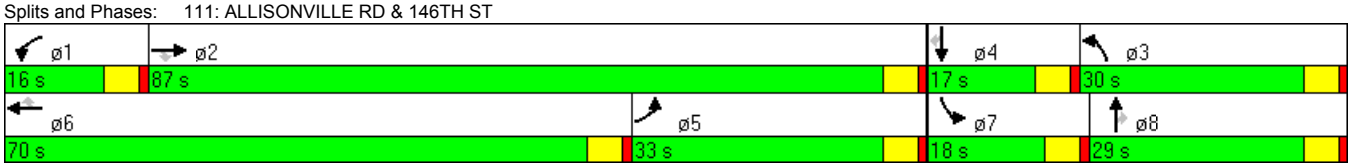


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	1925	431	238	1174	174	549	415	384	287	234	138
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	3367	3471	1553	3367	3471	1553
Satd. Flow (RTOR)			293			83			126			145
Lane Group Flow (vph)	543	2026	454	251	1236	183	578	437	404	302	246	145
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Total Split (s)	33.0	87.0	87.0	16.0	70.0	70.0	30.0	29.0	29.0	18.0	17.0	17.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	31.0	82.0	82.0	11.0	62.0	62.0	25.0	24.0	24.0	13.0	12.0	12.0
Actuated g/C Ratio	0.21	0.55	0.55	0.07	0.41	0.41	0.17	0.16	0.16	0.09	0.08	0.08
v/c Ratio	0.78	1.07	0.46	1.02	0.86	0.26	1.03	0.79	1.14	1.03	0.88	0.56
Control Delay	65.6	74.8	8.2	101.1	22.6	3.3	105.8	71.6	129.2	126.7	98.8	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	74.8	8.2	101.1	22.6	3.3	105.8	71.6	129.2	126.7	98.8	18.4
LOS	E	E	A	F	C	A	F	E	F	F	F	B
Approach Delay		63.1			32.3			102.0			94.1	
Approach LOS		E			C			F			F	
Queue Length 50th (ft)	267	~1150	81	~123	596	37	~310	219	~351	~163	127	0
Queue Length 95th (ft)	#359	#1282	163	m#135	m584	m39	#433	283	#567	#263	#209	71
Internal Link Dist (ft)		944			4178			856			1261	
Turn Bay Length (ft)	200		300	220		150	240		120	150		125
Base Capacity (vph)	696	1897	982	247	1504	720	561	555	354	292	278	258
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.07	0.46	1.02	0.82	0.25	1.03	0.79	1.14	1.03	0.88	0.56

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 52 (35%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 66.8 Intersection LOS: E
Intersection Capacity Utilization 98.8% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: ALLISONVILLE RD & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	1384	407	86	787	87	204	229	89	69	264	183
Satd. Flow (prot)	1736	3471	1553	1736	3471	1553	1736	3325	0	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	1736	3471	1553	1736	3325	0	1736	1827	1553
Satd. Flow (RTOR)			428			92		37				193
Lane Group Flow (vph)	258	1457	428	91	828	92	215	335	0	73	278	193
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	35.0	74.0	74.0	16.0	55.0	55.0	28.0	43.0	0.0	17.0	32.0	32.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	26.2	72.4	72.4	10.6	56.9	56.9	21.4	36.4		10.5	25.5	25.5
Actuated g/C Ratio	0.17	0.48	0.48	0.07	0.38	0.38	0.14	0.24		0.07	0.17	0.17
v/c Ratio	0.85	0.87	0.44	0.74	0.63	0.14	0.87	0.40		0.60	0.90	0.46
Control Delay	82.4	16.9	0.4	100.5	42.1	6.8	93.6	43.3		87.7	90.8	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	82.4	16.9	0.4	100.5	42.1	6.8	93.6	43.3		87.7	90.8	10.3
LOS	F	B	A	F	D	A	F	D		F	F	B
Approach Delay		21.5			44.1			63.0			61.8	
Approach LOS		C			D			E			E	
Queue Length 50th (ft)	246	365	0	89	364	0	206	126		70	266	0
Queue Length 95th (ft)	m244	m323	m0	#177	452	41	#339	176		127	#419	71
Internal Link Dist (ft)		2627			788			1078			997	
Turn Bay Length (ft)	370		500	400		650	270			200		
Base Capacity (vph)	347	1676	972	128	1317	646	266	872		139	329	438
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.74	0.87	0.44	0.71	0.63	0.14	0.81	0.38		0.53	0.84	0.44

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 108 (72%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 37.4 Intersection LOS: D
Intersection Capacity Utilization 84.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 112: CUMBERLAND RD & 146TH ST

126th St & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1011 126th St SR 37 NB 2036                      7   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  486  213  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  208  000  112  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  123 1110  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    699    320   1233            *                  *
* CAPACITY    veh     557   2317   1818   2085            * AVDEL s     3.3  *
* AVE DELAY  mins    0.00   0.04   0.04   0.07            * L  O  S       A  *
* MAX DELAY  mins    0.00   0.04   0.04   0.08            * VEH HRS     2.1  *
* AVE QUEUE   veh       0      0      0      1            * COST  $    30.9  *
* MAX QUEUE   veh       0      0      0      2            *                  *
*                                                          *                  *
*******************************************************************************
```

126th St & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1011 126th St SR 37 NB 2036                      8   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  648  372  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  371  000  190  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  121  886  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0   1020    561   1007         *                     *
* CAPACITY    veh     629   2317   1589   1916         * AVDEL s      3.3    *
* AVE DELAY  mins    0.00   0.05   0.06   0.06         * L  O  S        A    *
* MAX DELAY  mins    0.00   0.05   0.07   0.08         * VEH HRS      2.4    *
* AVE QUEUE   veh       0      1      1      1         * COST  $     36.0    *
* MAX QUEUE   veh       0      1      1      1         *                     *
*                                                       *                     *
*******************************************************************************
```

126th St & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1012 126th St SR 37 SB 2036                      9  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  206  000  273  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  137  426  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  715  507  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     479    563      0   1222          *                     *
* CAPACITY    veh    1445   1760    816   2317          * AVDEL s      3.3    *
* AVE DELAY  mins    0.06   0.05   0.00   0.05          * L  O  S        A    *
* MAX DELAY  mins    0.07   0.06   0.00   0.06          * VEH HRS      2.1    *
* AVE QUEUE   veh       0      0      0      1          * COST  $     30.8    *
* MAX QUEUE   veh       1      1      0      1          *                     *
*                                                       *                     *
*******************************************************************************
```

126th St & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1012 126th St SR 37 SB 2036                      10  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  195  000  195  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  082  825  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  613  463  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     390    907      0   1076          *                     *
* CAPACITY    veh    1549   1847    657   2317          * AVDEL s      3.2    *
* AVE DELAY  mins    0.05   0.06   0.00   0.05          * L  O  S        A    *
* MAX DELAY  mins    0.06   0.07   0.00   0.05          * VEH HRS      2.1    *
* AVE QUEUE   veh       0      1      0      1          * COST  $     32.0    *
* MAX QUEUE   veh       0      1      0      1          *                     *
*                                                       *                     *
*******************************************************************************
```

131st St & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1021 131st St SR 37 NB 2036                    10   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  472  042  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  157  124  079  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  092  827  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0    514    360    919         *                     *
* CAPACITY    veh     713   2317   1950   2142         * AVDEL s     2.5      *
* AVE DELAY  mins    0.00   0.03   0.04   0.05         * L  O  S       A      *
* MAX DELAY  mins    0.00   0.04   0.04   0.06         * VEH HRS     1.2      *
* AVE QUEUE   veh       0      0      0      1         * COST  $    18.7      *
* MAX QUEUE   veh       0      0      0      1         *                     *
*                                                       *                     *
*******************************************************************************
```

131st St & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1021 131st St SR 37 NB 2036                    11   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  742  098  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  251  225  186  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  307  363  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0    840    662    670         *                     *
* CAPACITY    veh     890   2317   1718   1954         * AVDEL s      2.8    *
* AVE DELAY  mins    0.00   0.04   0.06   0.05         * L  O  S        A    *
* MAX DELAY  mins    0.00   0.05   0.07   0.05         * VEH HRS      1.7    *
* AVE QUEUE   veh       0      1      1      1         * COST  $     25.4    *
* MAX QUEUE   veh       0      1      1      1         *                     *
*                                                       *                     *
*******************************************************************************
```

131 St & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1022 131st St SR 37 SB 2036                    12   *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    8.00   8.00   4.00   8.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  205  212  221  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  082  293  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  556  250  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     638    375      0    806           *                    *
* CAPACITY    veh    1742   1830    907   2317           * AVDEL s      2.7   *
* AVE DELAY  mins    0.05   0.04   0.00   0.04           * L  O  S        A   *
* MAX DELAY  mins    0.06   0.05   0.00   0.04           * VEH HRS      1.4   *
* AVE QUEUE   veh       1      0      0      1           * COST  $     20.3   *
* MAX QUEUE   veh       1      0      0      1           *                    *
*                                                        *                    *
*******************************************************************************
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131 St & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1022 131st St SR 37 SB 2036                    13   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  068  272  204  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  121  636  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  444  105  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     544    757      0    549          *                     *
* CAPACITY    veh    1925   1902    746   2317          * AVDEL s      2.6    *
* AVE DELAY  mins    0.04   0.05   0.00   0.03          * L  O  S        A    *
* MAX DELAY  mins    0.05   0.06   0.00   0.04          * VEH HRS      1.3    *
* AVE QUEUE   veh       0      1      0      0          * COST  $     20.2    *
* MAX QUEUE   veh       0      1      0      0          *                     *
*                                                       *                     *
*******************************************************************************
```

135th St & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1031 135th St SR 37 NB 2036                    13   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   4.00   4.00   4.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   3.60   3.60   3.60           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  121  042  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  052  000  072  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  082  264  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    163    124    346            *                  *
* CAPACITY    veh     979   1162   1073   1100            * AVDEL s     4.2  *
* AVE DELAY  mins    0.00   0.06   0.06   0.08            * L  O  S       A  *
* MAX DELAY  mins    0.00   0.07   0.07   0.09            * VEH HRS     0.7  *
* AVE QUEUE   veh       0      0      0      0            * COST  $    11.1  *
* MAX QUEUE   veh       0      0      0      0            *                  *
*                                                          *                  *
*******************************************************************************
```

135th St & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1031 135th St SR 37 NB 2036                      14  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   4.00   4.00   4.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   3.60   3.60   3.60           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  368  100  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  104  000  121  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  125  150  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    468    225    275            *                  *
* CAPACITY    veh    1014   1162    907   1042            * AVDEL s     5.0  *
* AVE DELAY  mins    0.00   0.09   0.09   0.08            * L  O  S       A  *
* MAX DELAY  mins    0.00   0.10   0.10   0.09            * VEH HRS     1.3  *
* AVE QUEUE   veh       0      1      0      0            * COST  $    20.1  *
* MAX QUEUE   veh       0      1      0      0            *                  *
*                                                          *                  *
*******************************************************************************
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135th & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

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*******************************************************************************
*                                                                             *
*  28:11:11              1032 135th St SR 37 SB 2036                    15   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   4.00   4.00   4.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   3.60   3.60   3.60           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  141  000  071  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  081  092  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  205  131  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     212    173      0    336             *                  *
* CAPACITY    veh     979   1052   1073   1162             * AVDEL s     4.3  *
* AVE DELAY  mins    0.08   0.07   0.00   0.07             * L  O  S       A  *
* MAX DELAY  mins    0.09   0.08   0.00   0.08             * VEH HRS     0.9  *
* AVE QUEUE   veh       0      0      0      0             * COST  $    13.0  *
* MAX QUEUE   veh       0      0      0      0             *                  *
*                                                          *                  *
*******************************************************************************
```

135th & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1032 135th St SR 37 SB 2036                    16   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   4.00   4.00   4.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   3.60   3.60   3.60           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  067  000  205  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  209  263  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  208  063  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     272    472      0    271          *                     *
* CAPACITY    veh    1014   1016    907   1162          * AVDEL s      5.4    *
* AVE DELAY  mins    0.08   0.11   0.00   0.07          * L  O  S        A    *
* MAX DELAY  mins    0.09   0.13   0.00   0.07          * VEH HRS      1.5    *
* AVE QUEUE   veh       0      1      0      0          * COST  $     22.7    *
* MAX QUEUE   veh       0      1      0      0          *                     *
*                                                       *                     *
*******************************************************************************
```

141st St & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1041 141st St SR 37 NB 2036                      12  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   4.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   3.60   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  147  079  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  185  000  072  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  117  666  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    226    257    783            *                  *
* CAPACITY    veh     761   1162   2140   2198            * AVDEL s      2.6 *
* AVE DELAY  mins    0.00   0.06   0.03   0.04            * L  O  S        A *
* MAX DELAY  mins    0.00   0.07   0.04   0.05            * VEH HRS      0.9 *
* AVE QUEUE   veh       0      0      0      1            * COST  $     13.8 *
* MAX QUEUE   veh       0      0      0      1            *                  *
*                                                          *                  *
*******************************************************************************
```

141st St & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1041 141st St SR 37 NB 2036                    13   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   4.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   3.60   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  590  052  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  487  000  248  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  109  574  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0    642    735    683         *                     *
* CAPACITY    veh     715   1162   1814   2082         * AVDEL s      4.1    *
* AVE DELAY  mins    0.00   0.11   0.05   0.04         * L  O  S        A    *
* MAX DELAY  mins    0.00   0.13   0.06   0.05         * VEH HRS      2.4    *
* AVE QUEUE   veh       0      1      1      0         * COST  $     35.4    *
* MAX QUEUE   veh       0      1      1      1         *                     *
*                                                       *                     *
*******************************************************************************
```

141st St & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1042 141st St SR 37 SB 2036                    20   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   4.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   3.60           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  151  000  053  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  172  173  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  303  435  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     204    345      0    738             *                  *
* CAPACITY    veh    1739   1934   1039   1162             * AVDEL s     5.7  *
* AVE DELAY  mins    0.04   0.04   0.00   0.14             * L  O  S       A  *
* MAX DELAY  mins    0.04   0.04   0.00   0.16             * VEH HRS     2.0  *
* AVE QUEUE   veh       0      0      0      2             * COST  $    30.7  *
* MAX QUEUE   veh       0      0      0      2             *                  *
*                                                          *                  *
*******************************************************************************
```

141st St & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1042 141st St SR 37 SB 2036                    21   *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    8.00   8.00   4.00   4.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   3.60          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  076  000  303  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  271  339  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  387  435  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     379    610      0    822             *                  *
* CAPACITY    veh    1673   1739    813   1162             * AVDEL s     6.3  *
* AVE DELAY  mins    0.05   0.05   0.00   0.17             * L  O  S       A  *
* MAX DELAY  mins    0.05   0.06   0.00   0.21             * VEH HRS     3.2  *
* AVE QUEUE   veh       0      1      0      2             * COST  $    47.5  *
* MAX QUEUE   veh       0      1      0      3             *                  *
*                                                          *                  *
*******************************************************************************
```

146th St & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1051 146th St SR 37 NB 2036                      12  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.00   8.00  12.00   8.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    3.60   7.20  10.80   7.20          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  729  265  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  244  000  690  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  075 1412  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    994    934   1487            *                  *
* CAPACITY    veh     123   2317   2541   1636            * AVDEL s    12.3  *
* AVE DELAY  mins    0.00   0.04   0.04   0.42            * L  O  S       B  *
* MAX DELAY  mins    0.00   0.05   0.04   0.71            * VEH HRS    11.7  *
* AVE QUEUE   veh       0      1      1     11            * COST  $   175.6  *
* MAX QUEUE   veh       0      1      1     17            *                  *
*                                                          *                  *
*******************************************************************************
```

146th St & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1051 146th St SR 37 NB 2036                    13   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00  12.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20  10.80   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000 1380  482  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  596  000  275  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  296  1172 000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0   1862    871   1468            *                  *
* CAPACITY    veh     446   2317   1734   1777            * AVDEL s     8.4   *
* AVE DELAY  mins    0.00   0.13   0.07   0.19            * L  O  S       A   *
* MAX DELAY  mins    0.00   0.17   0.09   0.27            * VEH HRS     9.8   *
* AVE QUEUE   veh       0      4      1      5            * COST  $   146.7   *
* MAX QUEUE   veh       0      5      1      6            *                  *
*                                                          *                  *
*******************************************************************************
```

146th St & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1052 146th St SR 37 SB 2036                      14  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00  12.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20  10.80   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  533  000  099  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  159  895  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000 1939  163  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     632   1054      0   2102            *                  *
* CAPACITY    veh     820   3222    670   2317            * AVDEL s    13.1  *
* AVE DELAY  mins    0.35   0.03   0.00   0.28            * L  O  S       B  *
* MAX DELAY  mins    0.56   0.03   0.00   0.42            * VEH HRS    13.8  *
* AVE QUEUE   veh       4      0      0     10            * COST  $   206.6  *
* MAX QUEUE   veh       6      1      0     14            *                  *
*                                                          *                  *
*******************************************************************************
```

146th St & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1052 146th St SR 37 SB 2036                      15  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00  12.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20  10.80   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  396  000  189  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  446 1673  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000 1258  189  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     585   2119      0   1447            *                  *
* CAPACITY    veh    1285   3114    240   2317            * AVDEL s     4.0  *
* AVE DELAY  mins    0.08   0.06   0.00   0.07            * L  O  S       A  *
* MAX DELAY  mins    0.10   0.07   0.00   0.08            * VEH HRS     4.6  *
* AVE QUEUE   veh       1      2      0      2            * COST  $    68.4  *
* MAX QUEUE   veh       1      2      0      2            *                  *
*                                                          *                  *
*******************************************************************************
```

Greenfield Ave & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1061 Greenfie SR 37 NB 2036                     14   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  539  169  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  023  000  170  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  415  708  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0    708    193   1123         *                     *
* CAPACITY    veh     727   2317   1812   2075         * AVDEL s      3.0    *
* AVE DELAY  mins    0.00   0.04   0.04   0.06         * L  O  S        A    *
* MAX DELAY  mins    0.00   0.04   0.04   0.07         * VEH HRS      1.7    *
* AVE QUEUE   veh       0      0      0      1         * COST  $     25.7    *
* MAX QUEUE   veh       0      0      0      1         *                     *
*                                                       *                     *
*******************************************************************************
```

Greenfield Ave & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1061 Greenfie SR 37 NB 2036                    15   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  891  321  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  048  000  148  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  603  473  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0   1212    196   1076            *                  *
* CAPACITY    veh     854   2317   1452   1982            * AVDEL s      3.5 *
* AVE DELAY  mins    0.00   0.05   0.05   0.07            * L  O  S        A *
* MAX DELAY  mins    0.00   0.06   0.05   0.08            * VEH HRS      2.4 *
* AVE QUEUE   veh       0      1      0      1            * COST  $     36.0 *
* MAX QUEUE   veh       0      1      0      1            *                  *
*                                                          *                  *
*******************************************************************************
```

Greenfield Ave & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1062 Greenfie SR 37 SB 2036                    15   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  167  000  265  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  182  443  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  529  349  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     432    625      0    878          *                     *
* CAPACITY    veh    1690   1879    811   2317          * AVDEL s      2.7    *
* AVE DELAY  mins    0.05   0.05   0.00   0.04          * L  O  S        A    *
* MAX DELAY  mins    0.05   0.05   0.00   0.05          * VEH HRS      1.4    *
* AVE QUEUE   veh       0      0      0      1          * COST  $     21.5    *
* MAX QUEUE   veh       0      1      0      1          *                     *
*                                                       *                     *
*******************************************************************************
```

Greenfield Ave & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1062 Greenfie SR 37 SB 2036                      16  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  193  000  435  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  170  777  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  444  177  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     628    947      0    621          *                     *
* CAPACITY    veh    1874   1880    562   2317          * AVDEL s      3.0    *
* AVE DELAY  mins    0.05   0.06   0.00   0.03          * L  O  S        A    *
* MAX DELAY  mins    0.05   0.07   0.00   0.04          * VEH HRS      1.9    *
* AVE QUEUE   veh       1      1      0      0          * COST  $     27.9    *
* MAX QUEUE   veh       1      1      0      0          *                     *
*                                                       *                     *
*******************************************************************************
```

Town and Country Blvd & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1071 Town&Cou SR 37 NB 2036                    15   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  196  014  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  169  000  143  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  020  120  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0    210    312    140         *                     *
* CAPACITY    veh    1032   2317   2167   2205         * AVDEL s      1.8    *
* AVE DELAY  mins    0.00   0.03   0.03   0.03         * L  O  S        A    *
* MAX DELAY  mins    0.00   0.03   0.04   0.03         * VEH HRS      0.3    *
* AVE QUEUE   veh       0      0      0      0         * COST  $      5.0    *
* MAX QUEUE   veh       0      0      0      0         *                     *
*                                                       *                     *
*******************************************************************************
```

Town and Country Blvd & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1071 Town&Cou SR 37 NB 2036                    16   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  599  209  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  469  000  437  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  094  537  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh       0    808    906    631         *                     *
* CAPACITY    veh     680   2317   1740   1856         * AVDEL s      3.2    *
* AVE DELAY  mins    0.00   0.04   0.07   0.05         * L  O  S        A    *
* MAX DELAY  mins    0.00   0.04   0.08   0.06         * VEH HRS      2.1    *
* AVE QUEUE   veh       0      1      1      1         * COST  $     31.6    *
* MAX QUEUE   veh       0      1      1      1         *                     *
*                                                       *                     *
*******************************************************************************
```

Town and Country Blvd & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1072 Town&Cou SR 37 SB 2036                    18   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  123  229  123  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  101  036  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  174  089  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     475    137      0    263         *                     *
* CAPACITY    veh    2129   2002   1083   2317         * AVDEL s      2.0    *
* AVE DELAY  mins    0.04   0.03   0.00   0.03         * L  O  S        A    *
* MAX DELAY  mins    0.04   0.04   0.00   0.03         * VEH HRS      0.5    *
* AVE QUEUE   veh       0      0      0      0         * COST  $      7.2    *
* MAX QUEUE   veh       0      0      0      0         *                     *
*                                                       *                     *
*******************************************************************************
```

Town and Country Blvd & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1072 Town&Cou SR 37 SB 2036                    19   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  232  559  234  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  529  574  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  658  316  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh    1025   1103      0    974             *                  *
* CAPACITY    veh    1622   1526    762   2317             * AVDEL s     5.8  *
* AVE DELAY  mins    0.10   0.14   0.00   0.04             * L  O  S       A  *
* MAX DELAY  mins    0.12   0.19   0.00   0.05             * VEH HRS     5.0  *
* AVE QUEUE   veh       2      3      0      1             * COST  $    75.0  *
* MAX QUEUE   veh       2      3      0      1             *                  *
*                                                          *                  *
*******************************************************************************
```

Pleasant St & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1081 Pleasant SR 37 NB 2036                    17   *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.00   8.00   8.00   8.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  133  089  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  046  000  104  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  147  052  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    222    150    199            *                  *
* CAPACITY    veh    1085   2317   2158   2179            * AVDEL s      1.8 *
* AVE DELAY  mins    0.00   0.03   0.03   0.03            * L  O  S        A *
* MAX DELAY  mins    0.00   0.03   0.03   0.03            * VEH HRS      0.3 *
* AVE QUEUE   veh       0      0      0      0            * COST  $      4.2 *
* MAX QUEUE   veh       0      0      0      0            *                  *
*                                                          *                  *
*******************************************************************************
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Pleasant St & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1081 Pleasant SR 37 NB 2036                    18   *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.00   8.00   8.00   8.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    3.60   7.20   7.20   7.20          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  596  316  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  051  000  252  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  551  384  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    912    303    935            *                  *
* CAPACITY    veh     847   2317   1666   1912            * AVDEL s      3.0 *
* AVE DELAY  mins    0.00   0.04   0.04   0.06            * L  O  S        A *
* MAX DELAY  mins    0.00   0.05   0.05   0.07            * VEH HRS      1.8 *
* AVE QUEUE   veh       0      1      0      1            * COST  $     27.0 *
* MAX QUEUE   veh       0      1      0      1            *                  *
*                                                          *                  *
*******************************************************************************
```

Pleasant St & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1082 Pleasant SR 37 SB 2036                    22   *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    8.00   8.00   4.00   8.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  156  121  156  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  098  125  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  146  010  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     433    223      0    156           *                    *
* CAPACITY    veh    2205   2112   1023   2317           * AVDEL s      1.9 *
* AVE DELAY  mins    0.03   0.03   0.00   0.03           * L  O  S        A *
* MAX DELAY  mins    0.04   0.03   0.00   0.03           * VEH HRS      0.4 *
* AVE QUEUE   veh       0      0      0      0           * COST  $      6.4 *
* MAX QUEUE   veh       0      0      0      0           *                    *
*                                                        *                    *
*******************************************************************************
```

Pleasant St & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1082 Pleasant SR 37 SB 2036                    23   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  160  251  313  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  186  599  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  514  122  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     724    785      0    636             *                  *
* CAPACITY    veh    1863   1827    710   2317             * AVDEL s     2.9 *
* AVE DELAY  mins    0.05   0.06   0.00   0.04             * L  O  S       A *
* MAX DELAY  mins    0.06   0.07   0.00   0.04             * VEH HRS     1.7 *
* AVE QUEUE   veh       1      1      0      0             * COST  $    26.1 *
* MAX QUEUE   veh       1      1      0      0             *                  *
*                                                          *                  *
*******************************************************************************
```

SR 32 & SR 37 NB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1101 SR 32/38 SR 37 NB 2036                    20   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00  12.00  12.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20  10.80  10.80           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  475  088  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  162  236  503  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  079 1077  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    563    901   1156            *                  *
* CAPACITY    veh     380   2317   2942   2696            * AVDEL s     2.1  *
* AVE DELAY  mins    0.00   0.03   0.03   0.04            * L  O  S       A  *
* MAX DELAY  mins    0.00   0.04   0.03   0.04            * VEH HRS     1.5  *
* AVE QUEUE   veh       0      0      0      1            * COST  $    22.4  *
* MAX QUEUE   veh       0      0      0      1            *                  *
*                                                          *                  *
*******************************************************************************
```

SR 32 & SR 37 NB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1101 SR 32/38 SR 37 NB 2036                    21   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    4.00   8.00  12.00  12.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    3.60   7.20  10.80  10.80           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  728  141  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  620  867  764  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  229  747  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh       0    869   2251    976           *                  *
* CAPACITY    veh     414   2317   2657   1818           * AVDEL s     6.6  *
* AVE DELAY  mins    0.00   0.04   0.15   0.07           * L  O  S       A  *
* MAX DELAY  mins    0.00   0.05   0.22   0.09           * VEH HRS     7.5  *
* AVE QUEUE   veh       0      1      6      1           * COST  $   112.1  *
* MAX QUEUE   veh       0      1      8      1           *                  *
*                                                          *                  *
*******************************************************************************
```

SR 32 & SR 37 SB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1102 SR 32/38 SR 37 SB 2036                      24  *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00  12.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20  10.80   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  117  374  224  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  456  339  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000 1078  555  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     715    795      0   1633             *                  *
* CAPACITY    veh    1152   2393    883   2317             * AVDEL s     5.1  *
* AVE DELAY  mins    0.14   0.04   0.00   0.09             * L  O  S       A  *
* MAX DELAY  mins    0.18   0.04   0.00   0.11             * VEH HRS     4.5  *
* AVE QUEUE   veh       2      0      0      2             * COST  $    67.0  *
* MAX QUEUE   veh       2      1      0      3             *                  *
*                                                          *                  *
*******************************************************************************
```

SR 32 & SR 37 SB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1102 SR 32/38 SR 37 SB 2036                    25   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00  12.00   4.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20  10.80   3.60   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  103  540  079  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  417  790  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000 1048  401  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     722   1207      0   1449            *                  *
* CAPACITY    veh    1283   2517    732   2317            * AVDEL s     4.1  *
* AVE DELAY  mins    0.11   0.05   0.00   0.07            * L  O  S       A  *
* MAX DELAY  mins    0.13   0.05   0.00   0.08            * VEH HRS     3.8  *
* AVE QUEUE   veh       1      1      0      2            * COST  $    57.3  *
* MAX QUEUE   veh       2      1      0      2            *                  *
*                                                          *                  *
*******************************************************************************
```

Allisonville Rd & 146th St EB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1111 Allisonv 146th EB 2036                    19   *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    8.00   8.00   8.00   4.00          * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   7.20   3.60          * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00          * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK am/op/pm     AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  834  104  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  392  000  173  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  037  581  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     938    565    618      0          *                    *
* CAPACITY    veh    2317   1648   2119    789          * AVDEL s      2.7   *
* AVE DELAY  mins    0.04   0.05   0.04   0.00          * L  O  S        A   *
* MAX DELAY  mins    0.05   0.06   0.04   0.00          * VEH HRS      1.6   *
* AVE QUEUE   veh       1      1      0      0          * COST  $     23.9   *
* MAX QUEUE   veh       1      1      0      0          *                    *
*                                                        *                    *
*******************************************************************************
```

Allisonville Rd & 146th St EB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1111 Allisonv 146th EB 2036                    20   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   8.00   8.00   4.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   7.20   7.20   3.60           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  000  472  287  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  431  000  516  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  384  964  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  000  000  000  0           *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     759    947   1348      0          *                     *
* CAPACITY    veh    2317   1775   1744    430          * AVDEL s      5.9    *
* AVE DELAY  mins    0.04   0.07   0.15   0.00          * L  O  S        A    *
* MAX DELAY  mins    0.04   0.08   0.20   0.00          * VEH HRS      5.0    *
* AVE QUEUE   veh       0      1      3      0          * COST  $     74.8    *
* MAX QUEUE   veh       1      1      4      0          *                     *
*                                                       *                     *
*******************************************************************************
```

Allisonville Rd & 146th St WB Ramps
Year 2036 AM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1112 Allisonv 146th WB 2036                    21   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   4.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   3.60   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     AM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  336  713  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  293  461  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  322  000  225  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh    1049      0    754    547            *                  *
* CAPACITY    veh    1827    698   2317   1779            * AVDEL s     3.4  *
* AVE DELAY  mins    0.08   0.00   0.04   0.05            * L  O  S       A  *
* MAX DELAY  mins    0.09   0.00   0.04   0.06            * VEH HRS     2.2  *
* AVE QUEUE   veh       1      0      0      0            * COST  $    33.6  *
* MAX QUEUE   veh       2      0      1      0            *                  *
*                                                          *                  *
*******************************************************************************
```

Allisonville Rd & 146th St EB Ramps
Year 2036 PM Peak
Alternative 1
Roundabout

```
*******************************************************************************
*                                                                             *
*  28:11:11              1112 Allisonv 146th WB 2036                    22   *
*                                                                             *
*******************************************************************************
*                                                 *                           *
* E    (m)    8.00   4.00   8.00   8.00           * TIME PERIOD    min     90  *
* L'   (m)   40.00  40.00  40.00  40.00           * TIME SLICE     min     15  *
* V    (m)    7.20   3.60   7.20   7.20           * RESULTS PERIOD min  15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00           * TIME COST     $/hr  15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00           * FLOW PERIOD    min  15 75  *
* DIA  (m)   55.00  55.00  55.00  55.00           * FLOW TYPE  pcu/veh    VEH  *
* GRAD SEP       0      0      0      0           * FLOW PEAK am/op/pm     PM  *
*                                                 *                           *
*******************************************************************************
* LEG NAME *PCU *FLOWS (1st exit 2nd etc...U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                             *    *  *              *         *
*NORTH LEG *1.04*  138  521  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*WEST LEG  *1.04*  000  000  000  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*SOUH LEG  *1.04*  000  931  549  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*EAST LEG  *1.04*  174  000  238  0          *1.00*50*0.75 0.891 0.75*15 45 75 *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*          *    *                             *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     659      0   1480    412             *                  *
* CAPACITY    veh    1755    786   2317   1261             * AVDEL s     4.0  *
* AVE DELAY  mins    0.05   0.00   0.07   0.07             * L  O  S       A  *
* MAX DELAY  mins    0.06   0.00   0.08   0.08             * VEH HRS     2.8  *
* AVE QUEUE   veh       1      0      2      0             * COST  $    42.1  *
* MAX QUEUE   veh       1      0      2      1             *                  *
*                                                          *                  *
*******************************************************************************
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	627	59	81	1087	173	143	99	117	16	148	146
Satd. Flow (prot)	1736	3471	1553	1736	3471	1553	1736	3190	0	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	1736	3471	1553	1736	3190	0	1736	1827	1553
Satd. Flow (RTOR)			62			182		123				154
Lane Group Flow (vph)	181	660	62	85	1144	182	151	227	0	17	156	154
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Total Split (s)	18.0	42.0	42.0	15.0	39.0	39.0	16.0	21.0	0.0	12.0	17.0	17.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	12.3	39.2	39.2	9.0	33.5	33.5	10.5	24.4		7.0	13.7	13.7
Actuated g/C Ratio	0.14	0.44	0.44	0.10	0.37	0.37	0.12	0.27		0.08	0.15	0.15
v/c Ratio	0.76	0.44	0.09	0.49	0.89	0.26	0.75	0.24		0.13	0.56	0.42
Control Delay	50.2	29.1	13.7	48.1	36.2	4.1	61.6	14.5		41.0	45.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	50.2	29.1	13.7	48.1	36.2	4.1	61.6	14.5		41.0	45.3	10.1
LOS	D	C	B	D	D	A	E	B		D	D	B
Approach Delay		32.3			32.8			33.3			28.5	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	100	180	8	46	312	0	84	22		9	85	0
Queue Length 95th (ft)	#197	234	41	92	#434	40	#173	59		30	#162	54
Internal Link Dist (ft)		2428			788			720			718	
Turn Bay Length (ft)	370		500	400		650	270			200		
Base Capacity (vph)	251	1512	711	193	1313	701	212	955		135	279	368
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.72	0.44	0.09	0.44	0.87	0.26	0.71	0.24		0.13	0.56	0.42

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 32.2 — Intersection LOS: C

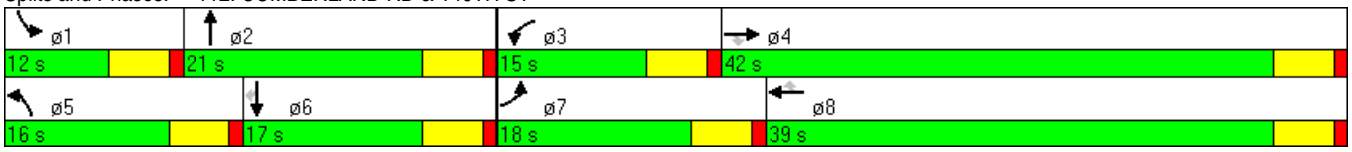
Intersection Capacity Utilization 72.0% — ICU Level of Service C

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 112: CUMBERLAND RD & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	213	486	0	0	1110	123	112	0	208	0	0	0
Satd. Flow (prot)	1736	1827	0	0	3419	0	0	1736	1553	0	0	0
Flt Permitted	0.130							0.950				
Satd. Flow (perm)	238	1827	0	0	3419	0	0	1736	1553	0	0	0
Satd. Flow (RTOR)					19				219			
Lane Group Flow (vph)	224	512	0	0	1297	0	0	118	219	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2						8		8			
Total Split (s)	21.0	71.0	0.0	0.0	50.0	0.0	19.0	19.0	19.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	69.0	69.0			53.0			11.0	11.0			
Actuated g/C Ratio	0.77	0.77			0.59			0.12	0.12			
v/c Ratio	0.61	0.37			0.64			0.55	0.57			
Control Delay	20.1	0.7			15.1			46.7	11.5			
Queue Delay	0.0	0.4			0.0			0.0	0.0			
Total Delay	20.1	1.1			15.2			46.7	11.5			
LOS	C	A			B			D	B			
Approach Delay		6.9			15.2			23.8				
Approach LOS		A			B			C				
Queue Length 50th (ft)	38	3			232			64	0			
Queue Length 95th (ft)	m90	3			377			115	62			
Internal Link Dist (ft)		320			894			155			149	
Turn Bay Length (ft)												
Base Capacity (vph)	449	1400			2021			270	427			
Starvation Cap Reductn	0	421			0			0	0			
Spillback Cap Reductn	0	0			19			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.50	0.52			0.65			0.44	0.51			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 57 (63%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 80.3%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1011: 126TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	426	137	507	715	0	0	0	0	273	0	206
Satd. Flow (prot)	0	3346	0	1736	1827	0	0	0	0	0	1736	1553
Flt Permitted				0.312							0.950	
Satd. Flow (perm)	0	3346	0	570	1827	0	0	0	0	0	1736	1553
Satd. Flow (RTOR)		46										217
Lane Group Flow (vph)	0	592	0	534	753	0	0	0	0	0	287	217
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases				6						4		4
Total Split (s)	0.0	28.0	0.0	35.0	63.0	0.0	0.0	0.0	0.0	27.0	27.0	27.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		26.0		61.0	61.0						19.0	19.0
Actuated g/C Ratio		0.29		0.68	0.68						0.21	0.21
v/c Ratio		0.59		0.69	0.61						0.78	0.43
Control Delay		28.9		11.7	4.2						48.7	7.0
Queue Delay		0.0		0.0	0.0						0.0	0.0
Total Delay		28.9		11.7	4.2						48.7	7.0
LOS		C		B	A						D	A
Approach Delay		28.9			7.3						30.8	
Approach LOS		C			A						C	
Queue Length 50th (ft)		143		134	46						151	0
Queue Length 95th (ft)		205		122	57						236	54
Internal Link Dist (ft)		429			320			211			184	
Turn Bay Length (ft)												
Base Capacity (vph)		1000		775	1239						424	544
Starvation Cap Reductn		0		0	6						0	0
Spillback Cap Reductn		0		0	0						0	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		0.59		0.69	0.61						0.68	0.40

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 74 (82%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 80.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1012: 126TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	472	0	0	827	92	79	124	157	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1792	1553	0	0	0
Flt Permitted	0.243							0.981				
Satd. Flow (perm)	444	1827	0	0	1827	1553	0	1792	1553	0	0	0
Satd. Flow (RTOR)						97			165			
Lane Group Flow (vph)	44	497	0	0	871	97	0	214	165	0	0	0
Turn Type	Perm	NA			NA	Perm	Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	67.0	67.0	0.0	0.0	67.0	67.0	23.0	23.0	23.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	64.9	64.9			64.9	64.9		15.1	15.1			
Actuated g/C Ratio	0.72	0.72			0.72	0.72		0.17	0.17			
v/c Ratio	0.14	0.38			0.66	0.08		0.71	0.41			
Control Delay	4.7	5.6			10.4	1.2		48.5	8.6			
Queue Delay	0.0	0.4			0.0	0.0		0.0	0.0			
Total Delay	4.7	6.1			10.4	1.2		48.5	8.6			
LOS	A	A			B	A		D	A			
Approach Delay		5.9			9.5			31.1				
Approach LOS		A			A			C				
Queue Length 50th (ft)	7	124			230	0		115	0			
Queue Length 95th (ft)	m13	141			387	13		185	51			
Internal Link Dist (ft)		320			714			141			200	
Turn Bay Length (ft)												
Base Capacity (vph)	320	1318			1318	1147		358	443			
Starvation Cap Reductn	0	384			0	0		0	0			
Spillback Cap Reductn	0	0			3	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.14	0.53			0.66	0.08		0.60	0.37			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 80 (89%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1021: 131ST ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	293	82	350	556	0	0	0	0	221	212	205
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	1781	1553
Flt Permitted				0.393							0.975	
Satd. Flow (perm)	0	1827	1553	718	1827	0	0	0	0	0	1781	1553
Satd. Flow (RTOR)			86									216
Lane Group Flow (vph)	0	308	86	368	585	0	0	0	0	0	456	216
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	31.0	31.0	22.0	53.0	0.0	0.0	0.0	0.0	37.0	37.0	37.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		32.7	32.7	52.2	52.2						27.8	27.8
Actuated g/C Ratio		0.36	0.36	0.58	0.58						0.31	0.31
v/c Ratio		0.46	0.14	0.63	0.55						0.83	0.34
Control Delay		27.1	6.3	10.8	9.1						42.2	4.6
Queue Delay		0.0	0.0	0.0	0.7						0.0	0.0
Total Delay		27.1	6.3	10.8	9.8						42.2	4.6
LOS		C	A	B	A						D	A
Approach Delay		22.6			10.2						30.1	
Approach LOS		C			B						C	
Queue Length 50th (ft)		140	0	51	99						232	0
Queue Length 95th (ft)		235	33	78	168						335	45
Internal Link Dist (ft)		506			320			184			192	
Turn Bay Length (ft)												
Base Capacity (vph)		664	619	609	1060						633	691
Starvation Cap Reductn		0	0	2	199						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.46	0.14	0.61	0.68						0.72	0.31

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green

Control Type: Actuated-Coordinated

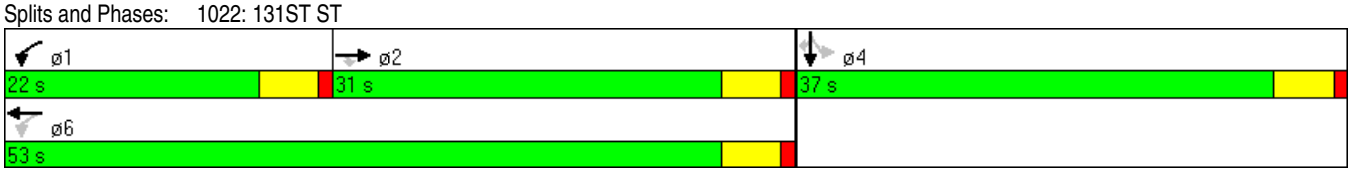
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 19.2 — Intersection LOS: B

Intersection Capacity Utilization 72.8% — ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1022: 131ST ST



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	121	0	0	264	82	72	0	52	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	44	127	0	0	278	86	76	0	55	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	364			127			537	580	127	592	537	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	364			127			537	580	127	592	537	321
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			83	100	94	100	100	100
cM capacity (veh/h)	1183			1446			439	407	917	379	431	715

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	44	127	364	76	55
Volume Left	44	0	0	76	0
Volume Right	0	0	86	0	55
cSH	1183	1700	1700	439	917
Volume to Capacity	0.04	0.07	0.21	0.17	0.06
Queue Length 95th (ft)	3	0	0	15	5
Control Delay (s)	8.2	0.0	0.0	14.9	9.2
Lane LOS	A			B	A
Approach Delay (s)	2.1		0.0	12.5	
Approach LOS				B	

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	92	81	131	205	0	0	0	0	71	0	141
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	97	85	138	216	0	0	0	0	75	0	148
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	216			182			779	631	139	631	674	216
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			182			779	631	139	631	674	216
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	100	100	79	100	82
cM capacity (veh/h)	1342			1381			235	356	903	361	336	819

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total	182	138	216	75	148
Volume Left	0	138	0	75	0
Volume Right	85	0	0	0	148
cSH	1700	1381	1700	361	819
Volume to Capacity	0.11	0.10	0.13	0.21	0.18
Queue Length 95th (ft)	0	8	0	19	16
Control Delay (s)	0.0	7.9	0.0	17.6	10.4
Lane LOS		A		C	B
Approach Delay (s)	0.0	3.1		12.8	
Approach LOS				B	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	147	0	0	666	117	72	0	185	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.321							0.950				
Satd. Flow (perm)	586	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						123			195			
Lane Group Flow (vph)	83	155	0	0	701	123	0	76	195	0	0	0
Turn Type	Perm	NA			NA	Perm	Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	68.0	68.0	0.0	0.0	68.0	68.0	22.0	22.0	22.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	63.0	63.0			63.0	63.0		17.0	17.0			
Actuated g/C Ratio	0.70	0.70			0.70	0.70		0.19	0.19			
v/c Ratio	0.20	0.12			0.55	0.11		0.23	0.43			
Control Delay	5.0	3.6			8.6	1.1		33.2	8.2			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	5.0	3.6			8.6	1.1		33.2	8.2			
LOS	A	A			A	A		C	A			
Approach Delay		4.1			7.4			15.2				
Approach LOS		A			A			B				
Queue Length 50th (ft)	10	19			166	0		37	0			
Queue Length 95th (ft)	22	32			247	14		76	56			
Internal Link Dist (ft)		320			1059			191			209	
Turn Bay Length (ft)												
Base Capacity (vph)	410	1279			1279	1124		328	452			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.20	0.12			0.55	0.11		0.23	0.43			

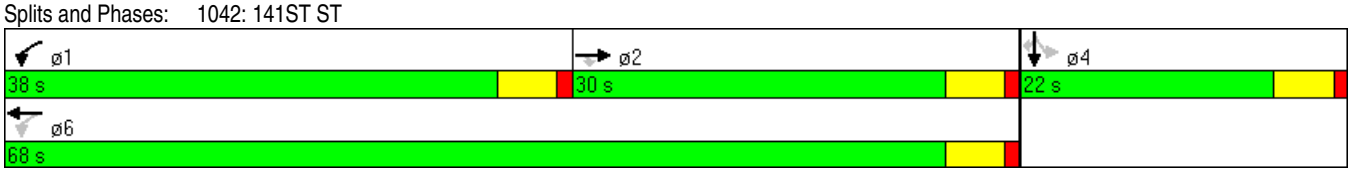
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 72 (80%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1041: 141ST ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	173	172	435	303	0	0	0	0	53	0	151
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	1736	1553
Flt Permitted				0.588							0.950	
Satd. Flow (perm)	0	1827	1553	1074	1827	0	0	0	0	0	1736	1553
Satd. Flow (RTOR)			181									159
Lane Group Flow (vph)	0	182	181	458	319	0	0	0	0	0	56	159
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	30.0	30.0	38.0	68.0	0.0	0.0	0.0	0.0	22.0	22.0	22.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		53.6	53.6	71.3	71.3						8.7	8.7
Actuated g/C Ratio		0.60	0.60	0.79	0.79						0.10	0.10
v/c Ratio		0.17	0.18	0.49	0.22						0.33	0.54
Control Delay		9.8	2.3	2.3	0.9						42.6	13.6
Queue Delay		0.0	0.0	0.1	0.3						0.0	0.0
Total Delay		9.8	2.3	2.4	1.2						42.6	13.6
LOS		A	A	A	A						D	B
Approach Delay		6.1			1.9						21.2	
Approach LOS		A			A						C	
Queue Length 50th (ft)		41	0	4	3						30	0
Queue Length 95th (ft)		93	31	18	14						65	55
Internal Link Dist (ft)		406			320			160			204	
Turn Bay Length (ft)												
Base Capacity (vph)		1089	999	1093	1447						328	422
Starvation Cap Reductn		0	0	87	610						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.17	0.18	0.46	0.38						0.17	0.38

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

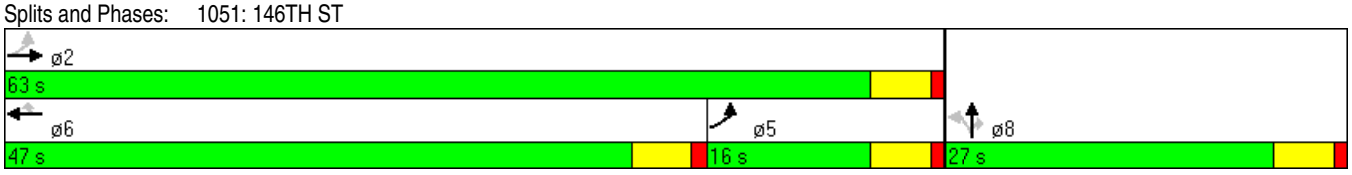
Splits and Phases: 1042: 141ST ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	265	729	0	0	1412	75	690	0	244	0	0	0
Satd. Flow (prot)	1736	3471	0	0	3471	1553	1649	1649	2733	0	0	0
Flt Permitted	0.084						0.950	0.950				
Satd. Flow (perm)	153	3471	0	0	3471	1553	1649	1649	2733	0	0	0
Satd. Flow (RTOR)						79			257			
Lane Group Flow (vph)	279	767	0	0	1486	79	363	363	257	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	16.0	63.0	0.0	0.0	47.0	47.0	27.0	27.0	27.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	58.4	58.4			42.4	42.4	21.6	21.6	21.6			
Actuated g/C Ratio	0.65	0.65			0.47	0.47	0.24	0.24	0.24			
v/c Ratio	0.95	0.34			0.91	0.10	0.92	0.92	0.30			
Control Delay	63.5	3.2			17.3	0.3	63.6	63.6	4.7			
Queue Delay	0.0	0.1			0.4	0.0	0.0	0.0	0.0			
Total Delay	63.5	3.3			17.8	0.3	63.6	63.6	4.7			
LOS	E	A			B	A	E	E	A			
Approach Delay		19.3			16.9			48.2				
Approach LOS		B			B			D				
Queue Length 50th (ft)	111	30			424	0	210	210	0			
Queue Length 95th (ft)	#268	37			#561	m1	#382	#382	31			
Internal Link Dist (ft)		320			2428			130			111	
Turn Bay Length (ft)						500						
Base Capacity (vph)	293	2252			1635	774	403	403	862			
Starvation Cap Reductn	0	333			0	0	0	0	0			
Spillback Cap Reductn	0	0			20	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.95	0.40			0.92	0.10	0.90	0.90	0.30			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 9 (10%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 103.0%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1051: 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	895	159	163	1939	0	0	0	0	99	0	533
Satd. Flow (prot)	0	3471	1553	1736	3471	0	0	0	0	0	1736	2733
Flt Permitted				0.209							0.950	
Satd. Flow (perm)	0	3471	1553	382	3471	0	0	0	0	0	1736	2733
Satd. Flow (RTOR)			167									29
Lane Group Flow (vph)	0	942	167	172	2041	0	0	0	0	0	104	561
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	51.0	51.0	14.0	65.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		47.1	47.1	60.4	60.4						19.6	19.6
Actuated g/C Ratio		0.52	0.52	0.67	0.67						0.22	0.22
v/c Ratio		0.52	0.19	0.45	0.88						0.28	0.91
Control Delay		15.5	2.5	2.9	5.4						31.4	53.2
Queue Delay		0.0	0.0	0.0	1.1						0.0	0.0
Total Delay		15.5	2.5	2.9	6.4						31.4	53.2
LOS		B	A	A	A						C	D
Approach Delay		13.6			6.2						49.8	
Approach LOS		B			A						D	
Queue Length 50th (ft)		178	0	6	215						49	168
Queue Length 95th (ft)		234	29	m6	m243						94	#272
Internal Link Dist (ft)		648			320			134			132	
Turn Bay Length (ft)			600									
Base Capacity (vph)		1817	893	392	2330						386	630
Starvation Cap Reductn		0	0	0	116						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.52	0.19	0.44	0.92						0.27	0.89

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 103.0%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1052: 146TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	539	0	0	708	415	170	0	23	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.216							0.950				
Satd. Flow (perm)	395	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						437			24			
Lane Group Flow (vph)	178	567	0	0	745	437	0	179	24	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	13.0	69.0	0.0	0.0	56.0	56.0	21.0	21.0	21.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	66.5	66.5			53.8	53.8		13.5	13.5			
Actuated g/C Ratio	0.74	0.74			0.60	0.60		0.15	0.15			
v/c Ratio	0.44	0.42			0.68	0.40		0.69	0.09			
Control Delay	8.4	6.0			17.1	2.1		49.6	13.5			
Queue Delay	0.0	1.2			0.0	0.0		0.0	0.0			
Total Delay	8.4	7.2			17.1	2.1		49.6	13.5			
LOS	A	A			B	A		D	B			
Approach Delay		7.5			11.6			45.3				
Approach LOS		A			B			D				
Queue Length 50th (ft)	14	45			277	0		96	0			
Queue Length 95th (ft)	m68	269			431	39		162	21			
Internal Link Dist (ft)		320			1380			131			123	
Turn Bay Length (ft)												
Base Capacity (vph)	412	1349			1091	1104		309	296			
Starvation Cap Reductn	0	535			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.43	0.70			0.68	0.40		0.58	0.08			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 13 (14%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1061: SR 238

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	443	182	349	529	0	0	0	0	265	0	167
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	1736	1553
Flt Permitted				0.297							0.950	
Satd. Flow (perm)	0	1827	1553	543	1827	0	0	0	0	0	1736	1553
Satd. Flow (RTOR)			192									176
Lane Group Flow (vph)	0	466	192	367	557	0	0	0	0	0	279	176
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	41.0	41.0	22.0	63.0	0.0	0.0	0.0	0.0	27.0	27.0	27.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		39.2	39.2	58.0	58.0						22.0	22.0
Actuated g/C Ratio		0.44	0.44	0.64	0.64						0.24	0.24
v/c Ratio		0.59	0.24	0.69	0.47						0.66	0.34
Control Delay		23.7	3.6	14.5	5.9						39.1	6.6
Queue Delay		0.0	0.0	0.0	0.5						0.1	0.0
Total Delay		23.7	3.6	14.5	6.4						39.2	6.6
LOS		C	A	B	A						D	A
Approach Delay		17.8			9.7						26.6	
Approach LOS		B			A						C	
Queue Length 50th (ft)		196	0	44	68						143	0
Queue Length 95th (ft)		314	40	110	88						230	50
Internal Link Dist (ft)		1957			320			157			101	
Turn Bay Length (ft)												
Base Capacity (vph)		795	785	575	1177						424	513
Starvation Cap Reductn		0	0	0	272						0	0
Spillback Cap Reductn		0	0	0	0						4	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.59	0.24	0.64	0.62						0.66	0.34

Intersection Summary

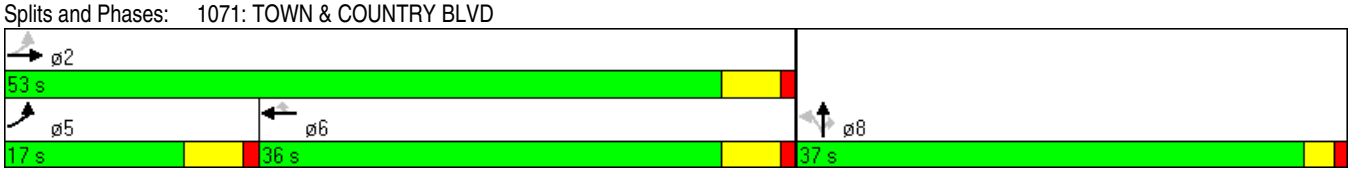
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 28 (31%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.1 Intersection LOS: B
Intersection Capacity Utilization 69.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1062: SR 238

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	196	0	0	120	20	143	0	169	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.626							0.950				
Satd. Flow (perm)	1144	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						21			178			
Lane Group Flow (vph)	15	206	0	0	126	21	0	151	178	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	17.0	53.0	0.0	0.0	36.0	36.0	37.0	37.0	37.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	3.0	3.0	3.0	4.0	4.0	4.0
Act Effct Green (s)	68.6	68.6			66.2	66.2		13.4	13.4			
Actuated g/C Ratio	0.76	0.76			0.74	0.74		0.15	0.15			
v/c Ratio	0.02	0.15			0.09	0.02		0.59	0.46			
Control Delay	1.2	1.2			5.3	3.1		44.1	9.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	1.2	1.2			5.3	3.1		44.1	9.3			
LOS	A	A			A	A		D	A			
Approach Delay		1.2			5.0			25.2				
Approach LOS		A			A			C				
Queue Length 50th (ft)	1	2			14	0		81	0			
Queue Length 95th (ft)	m2	13			58	10		132	52			
Internal Link Dist (ft)		299			591			133			141	
Turn Bay Length (ft)												
Base Capacity (vph)	951	1393			1344	1148		656	697			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.02	0.15			0.09	0.02		0.23	0.26			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 28 (31%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 39.9%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

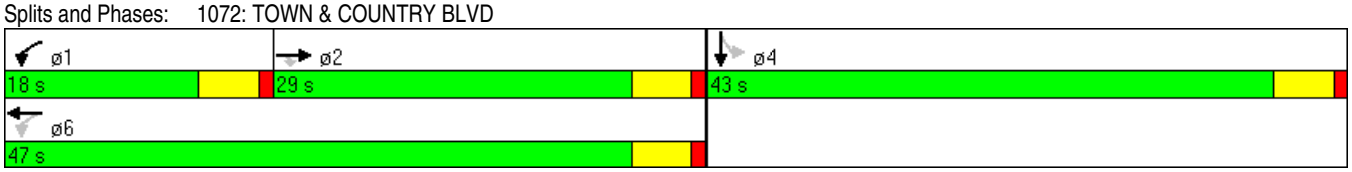
Splits and Phases: 1071: TOWN & COUNTRY BLVD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	36	101	89	174	0	0	0	0	174	229	123
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	3296	0
Flt Permitted				0.664							0.984	
Satd. Flow (perm)	0	1827	1553	1213	1827	0	0	0	0	0	3296	0
Satd. Flow (RTOR)			106								55	
Lane Group Flow (vph)	0	38	106	94	183	0	0	0	0	0	553	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		
Total Split (s)	0.0	29.0	29.0	18.0	47.0	0.0	0.0	0.0	0.0	43.0	43.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0
Act Effct Green (s)		49.4	49.4	59.8	59.8						20.2	
Actuated g/C Ratio		0.55	0.55	0.66	0.66						0.22	
v/c Ratio		0.04	0.12	0.11	0.15						0.71	
Control Delay		12.8	3.4	3.1	3.1						33.5	
Queue Delay		0.0	0.0	0.0	0.0						0.0	
Total Delay		12.8	3.4	3.1	3.1						33.5	
LOS		B	A	A	A						C	
Approach Delay		5.9			3.1						33.5	
Approach LOS		A			A						C	
Queue Length 50th (ft)		10	0	8	15						137	
Queue Length 95th (ft)		30	28	18	30						176	
Internal Link Dist (ft)		565			299			122			94	
Turn Bay Length (ft)												
Base Capacity (vph)		1003	901	881	1213						1423	
Starvation Cap Reductn		0	0	0	0						0	
Spillback Cap Reductn		0	0	0	0						0	
Storage Cap Reductn		0	0	0	0						0	
Reduced v/c Ratio		0.04	0.12	0.11	0.15						0.39	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 39.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1072: TOWN & COUNTRY BLVD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	133	0	0	52	147	104	0	46	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.665							0.950				
Satd. Flow (perm)	1215	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						155			48			
Lane Group Flow (vph)	94	140	0	0	55	155	0	109	48	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	20.0	59.0	0.0	0.0	39.0	39.0	31.0	31.0	31.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	71.3	72.3			62.4	62.4		11.1	11.1			
Actuated g/C Ratio	0.79	0.80			0.69	0.69		0.12	0.12			
v/c Ratio	0.09	0.10			0.04	0.14		0.51	0.21			
Control Delay	2.4	2.3			7.6	1.8		44.6	12.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	2.4	2.3			7.6	1.8		44.6	12.3			
LOS	A	A			A	A		D	B			
Approach Delay		2.3			3.3			34.7				
Approach LOS		A			A			C				
Queue Length 50th (ft)	8	12			11	0		59	0			
Queue Length 95th (ft)	18	25			29	25		105	30			
Internal Link Dist (ft)		320			970			108			70	
Turn Bay Length (ft)												
Base Capacity (vph)	1050	1468			1267	1124		502	483			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.09	0.10			0.04	0.14		0.22	0.10			

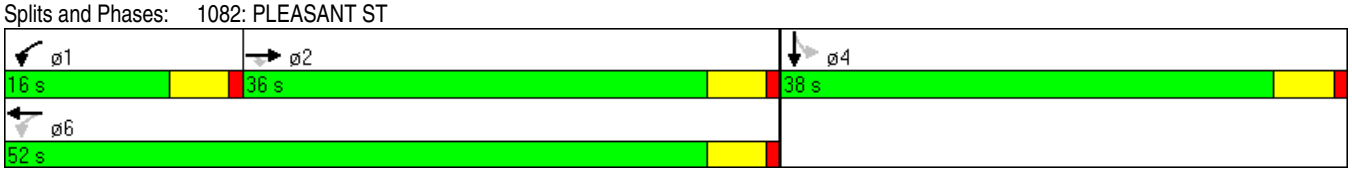
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 58 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 36.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1081: PLEASANT ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	125	98	10	146	0	0	0	0	97	121	156
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	3210	0
Flt Permitted				0.622							0.987	
Satd. Flow (perm)	0	1827	1553	1136	1827	0	0	0	0	0	3210	0
Satd. Flow (RTOR)			103								164	
Lane Group Flow (vph)	0	132	103	11	154	0	0	0	0	0	393	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		
Total Split (s)	0.0	36.0	36.0	16.0	52.0	0.0	0.0	0.0	0.0	38.0	38.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0
Act Effct Green (s)		65.3	65.3	67.7	67.7						12.3	
Actuated g/C Ratio		0.73	0.73	0.75	0.75						0.14	
v/c Ratio		0.10	0.09	0.01	0.11						0.68	
Control Delay		5.5	1.8	1.2	1.3						26.8	
Queue Delay		0.0	0.0	0.0	0.0						0.0	
Total Delay		5.5	1.8	1.2	1.3						26.8	
LOS		A	A	A	A						C	
Approach Delay		3.9			1.3						26.8	
Approach LOS		A			A						C	
Queue Length 50th (ft)		16	0	0	0						64	
Queue Length 95th (ft)		61	21	1	6						104	
Internal Link Dist (ft)		2803			320			174			105	
Turn Bay Length (ft)												
Base Capacity (vph)		1325	1155	927	1374						1281	
Starvation Cap Reductn		0	0	0	0						0	
Spillback Cap Reductn		0	0	0	0						0	
Storage Cap Reductn		0	0	0	0						0	
Reduced v/c Ratio		0.10	0.09	0.01	0.11						0.31	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 36.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1082: PLEASANT ST



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	121	0	0	253	121
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	127	0	0	266	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	330	330	394			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330	330	394			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	82	100			
cM capacity (veh/h)	661	707	1154			

Direction, Lane #	EB 1	SB 1
Volume Total	127	394
Volume Left	0	0
Volume Right	127	127
cSH	707	1700
Volume to Capacity	0.18	0.23
Queue Length 95th (ft)	16	0
Control Delay (s)	11.2	0.0
Lane LOS	B	
Approach Delay (s)	11.2	0.0
Approach LOS	B	

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	34.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	475	0	0	1077	79	503	236	162	0	0	0
Satd. Flow (prot)	1736	3471	0	0	3436	0	1579	3242	1553	0	0	0
Flt Permitted	0.110						0.950	0.975				
Satd. Flow (perm)	201	3471	0	0	3436	0	1579	3242	1553	0	0	0
Satd. Flow (RTOR)					11				171			
Lane Group Flow (vph)	93	500	0	0	1217	0	264	513	171	0	0	0
Turn Type	pm+pt	NA			NA		Prot	NA	Perm			
Protected Phases	5	2			6		3	8				
Permitted Phases	2								8			
Total Split (s)	14.0	60.0	0.0	0.0	46.0	0.0	30.0	30.0	30.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	55.0	55.0			44.7		25.0	25.0	25.0			
Actuated g/C Ratio	0.61	0.61			0.50		0.28	0.28	0.28			
v/c Ratio	0.37	0.24			0.71		0.60	0.57	0.31			
Control Delay	15.2	2.4			21.3		34.9	30.9	5.8			
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0			
Total Delay	15.2	2.4			21.3		34.9	30.9	5.8			
LOS	B	A			C		C	C	A			
Approach Delay		4.4			21.3			27.5				
Approach LOS		A			C			C				
Queue Length 50th (ft)	5	12			282		142	137	0			
Queue Length 95th (ft)	m25	m14			378		232	191	46			
Internal Link Dist (ft)		321			2459			169			132	
Turn Bay Length (ft)												
Base Capacity (vph)	276	2121			1711		439	901	555			
Starvation Cap Reductn	0	0			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.34	0.24			0.71		0.60	0.57	0.31			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 36 (40%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 92.1%	ICU Level of Service F
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

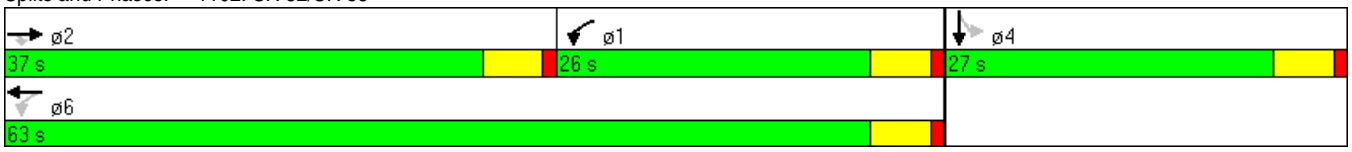
Splits and Phases: 1101: SR 32/SR 38

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	339	456	555	1078	0	0	0	0	224	374	117
Satd. Flow (prot)	0	3471	1553	1736	3471	0	0	0	0	0	3334	0
Flt Permitted				0.513							0.985	
Satd. Flow (perm)	0	3471	1553	937	3471	0	0	0	0	0	3334	0
Satd. Flow (RTOR)			166								24	
Lane Group Flow (vph)	0	357	480	584	1135	0	0	0	0	0	753	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		
Total Split (s)	0.0	37.0	37.0	26.0	63.0	0.0	0.0	0.0	0.0	27.0	27.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0
Act Effct Green (s)		32.2	32.2	58.2	58.2						21.8	
Actuated g/C Ratio		0.36	0.36	0.65	0.65						0.24	
v/c Ratio		0.29	0.73	0.74	0.51						0.91	
Control Delay		21.6	23.5	13.7	4.0						49.0	
Queue Delay		0.0	0.0	1.5	0.5						0.0	
Total Delay		21.6	23.5	15.3	4.5						49.0	
LOS		C	C	B	A						D	
Approach Delay		22.7			8.2						49.0	
Approach LOS		C			A						D	
Queue Length 50th (ft)		75	154	65	20						213	
Queue Length 95th (ft)		111	277	139	56						#321	
Internal Link Dist (ft)		161			321			175			128	
Turn Bay Length (ft)												
Base Capacity (vph)		1241	662	792	2244						833	
Starvation Cap Reductn		0	0	83	608						0	
Spillback Cap Reductn		0	0	0	0						0	
Storage Cap Reductn		0	0	0	0						0	
Reduced v/c Ratio		0.29	0.73	0.82	0.69						0.90	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 21.1 Intersection LOS: C
Intersection Capacity Utilization 92.1% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1102: SR 32/SR 38



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	0	392	0	0	0	0	581	37	104	834	0
Satd. Flow (prot)	0	1736	1553	0	0	0	0	3471	1553	1736	1827	0
Flt Permitted		0.950								0.352		
Satd. Flow (perm)	0	1736	1553	0	0	0	0	3471	1553	643	1827	0
Satd. Flow (RTOR)			171						39			
Lane Group Flow (vph)	0	182	413	0	0	0	0	612	39	109	878	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Total Split (s)	29.0	29.0	29.0	0.0	0.0	0.0	0.0	49.0	49.0	12.0	61.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0
Act Effct Green (s)		19.9	19.9					50.4	50.4	60.1	60.1	
Actuated g/C Ratio		0.22	0.22					0.56	0.56	0.67	0.67	
v/c Ratio		0.48	0.87					0.31	0.04	0.21	0.72	
Control Delay		33.7	38.2					12.7	4.3	0.7	10.1	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.8	
Total Delay		33.7	38.2					12.7	4.3	0.7	11.0	
LOS		C	D					B	A	A	B	
Approach Delay		36.8						12.2			9.8	
Approach LOS		D						B			A	
Queue Length 50th (ft)		87	132					105	0	0	193	
Queue Length 95th (ft)		145	#272					147	16	m1	196	
Internal Link Dist (ft)		127			208			633			323	
Turn Bay Length (ft)												
Base Capacity (vph)		463	540					1944	887	516	1221	
Starvation Cap Reductn		0	0					0	0	0	126	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.39	0.76					0.31	0.04	0.21	0.80	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 32 (36%), Referenced to phase 2:NBT and 6:SBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1111: ALLISONVILLE RD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	225	0	322	461	293	0	0	713	336
Satd. Flow (prot)	0	0	0	0	1736	1553	1736	1827	0	0	3471	1553
Flt Permitted					0.950		0.240					
Satd. Flow (perm)	0	0	0	0	1736	1553	438	1827	0	0	3471	1553
Satd. Flow (RTOR)						339						354
Lane Group Flow (vph)	0	0	0	0	237	339	485	308	0	0	751	354
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Total Split (s)	0.0	0.0	0.0	24.0	24.0	24.0	34.0	66.0	0.0	0.0	32.0	32.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0
Act Effct Green (s)					16.4	16.4	63.6	63.6			29.6	29.6
Actuated g/C Ratio					0.18	0.18	0.71	0.71			0.33	0.33
v/c Ratio					0.75	0.61	0.67	0.24			0.66	0.47
Control Delay					49.6	8.7	20.0	3.4			29.9	5.1
Queue Delay					0.0	0.0	6.3	0.2			0.0	0.0
Total Delay					49.6	8.7	26.3	3.7			29.9	5.1
LOS					D	A	C	A			C	A
Approach Delay					25.5			17.5			22.0	
Approach LOS					C			B			C	
Queue Length 50th (ft)					126	0	140	22			196	0
Queue Length 95th (ft)					203	70	263	43			265	61
Internal Link Dist (ft)		202			200			323			992	
Turn Bay Length (ft)												
Base Capacity (vph)					366	595	728	1291			1141	748
Starvation Cap Reductn					0	0	190	432			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.65	0.57	0.90	0.36			0.66	0.47

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 46 (51%), Referenced to phase 2:NBTL and 6:SBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1112: ALLISONVILLE RD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	1384	407	86	787	87	204	229	89	69	264	183
Satd. Flow (prot)	1736	3471	1553	1736	3471	1553	1736	3325	0	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	1736	3471	1553	1736	3325	0	1736	1827	1553
Satd. Flow (RTOR)			428			92		56				193
Lane Group Flow (vph)	258	1457	428	91	828	92	215	335	0	73	278	193
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Total Split (s)	22.0	42.0	42.0	12.0	32.0	32.0	17.0	21.0	0.0	15.0	19.0	19.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	16.0	39.4	39.4	7.0	28.0	28.0	12.0	19.6		8.8	14.0	14.0
Actuated g/C Ratio	0.18	0.44	0.44	0.08	0.31	0.31	0.13	0.22		0.10	0.16	0.16
v/c Ratio	0.83	0.96	0.46	0.67	0.77	0.17	0.93	0.44		0.43	0.98	0.48
Control Delay	51.0	40.5	4.0	65.9	34.1	6.2	84.6	28.6		46.1	88.5	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	51.0	40.5	4.0	65.9	34.1	6.2	84.6	28.6		46.1	88.5	9.7
LOS	D	D	A	E	C	A	F	C		D	F	A
Approach Delay		34.5			34.4			50.5			54.8	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	134	~460	17	51	226	0	123	74		40	159	0
Queue Length 95th (ft)	m#223	m#575	m42	#124	298	34	#257	119		82	#315	58
Internal Link Dist (ft)		2428			788			740			724	
Turn Bay Length (ft)	370		500	400		650	270			200		
Base Capacity (vph)	328	1520	921	135	1078	546	231	769		193	284	405
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.79	0.96	0.46	0.67	0.77	0.17	0.93	0.44		0.38	0.98	0.48

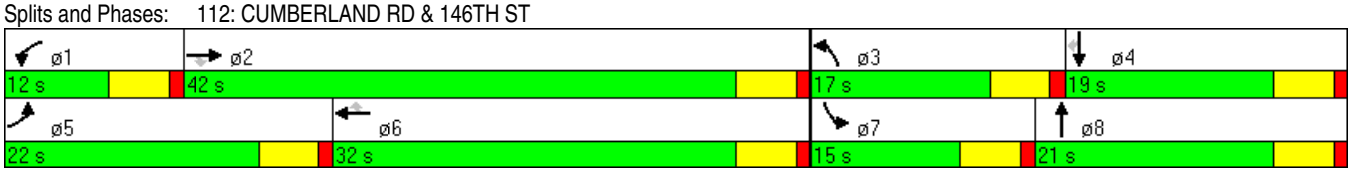
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 39.1	Intersection LOS: D
Intersection Capacity Utilization 86.0%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 112: CUMBERLAND RD & 146TH ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	372	648	0	0	886	121	190	0	371	0	0	0
Satd. Flow (prot)	1736	1827	0	0	3409	0	0	1736	1553	0	0	0
Flt Permitted	0.140							0.950				
Satd. Flow (perm)	256	1827	0	0	3409	0	0	1736	1553	0	0	0
Satd. Flow (RTOR)					19				295			
Lane Group Flow (vph)	392	682	0	0	1060	0	0	200	391	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2						8		8			
Total Split (s)	27.0	66.0	0.0	0.0	39.0	0.0	24.0	24.0	24.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	64.4	64.4			40.8			15.6	15.6			
Actuated g/C Ratio	0.72	0.72			0.45			0.17	0.17			
v/c Ratio	0.80	0.52			0.68			0.66	0.76			
Control Delay	16.3	6.7			23.7			45.2	19.6			
Queue Delay	1.6	3.4			0.2			0.0	0.0			
Total Delay	17.9	10.1			23.9			45.2	19.6			
LOS	B	B			C			D	B			
Approach Delay		13.0			23.9			28.2				
Approach LOS		B			C			C				
Queue Length 50th (ft)	14	296			254			106	48			
Queue Length 95th (ft)	#98	433			358			172	148			
Internal Link Dist (ft)		320			894			155			149	
Turn Bay Length (ft)												
Base Capacity (vph)	545	1306			1557			366	561			
Starvation Cap Reductn	53	511			0			0	0			
Spillback Cap Reductn	0	0			101			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.80	0.86			0.73			0.55	0.70			

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 47 (52%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 20.5 Intersection LOS: C

Intersection Capacity Utilization 74.4% ICU Level of Service D

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1011: 126TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	825	82	463	613	0	0	0	0	195	0	195
Satd. Flow (prot)	0	3423	0	1736	1827	0	0	0	0	0	1736	1553
Flt Permitted				0.159							0.950	
Satd. Flow (perm)	0	3423	0	290	1827	0	0	0	0	0	1736	1553
Satd. Flow (RTOR)		13										205
Lane Group Flow (vph)	0	954	0	487	645	0	0	0	0	0	205	205
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases				6						4		4
Total Split (s)	0.0	37.0	0.0	33.0	70.0	0.0	0.0	0.0	0.0	20.0	20.0	20.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		37.9		66.2	66.2						13.8	13.8
Actuated g/C Ratio		0.42		0.74	0.74						0.15	0.15
v/c Ratio		0.66		0.83	0.48						0.77	0.50
Control Delay		24.8		17.2	8.0						56.3	9.6
Queue Delay		0.3		1.9	3.6						0.0	0.0
Total Delay		25.1		19.1	11.6						56.3	9.6
LOS		C		B	B						E	A
Approach Delay		25.1			14.8						32.9	
Approach LOS		C			B						C	
Queue Length 50th (ft)		234		168	293						111	0
Queue Length 95th (ft)		324		87	377						#208	59
Internal Link Dist (ft)		429			320			211			184	
Turn Bay Length (ft)												
Base Capacity (vph)		1450		663	1344						289	430
Starvation Cap Reductn		0		73	589						0	0
Spillback Cap Reductn		114		0	0						0	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		0.71		0.83	0.85						0.71	0.48

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 74.4%	ICU Level of Service D
Analysis Period (min) 15	

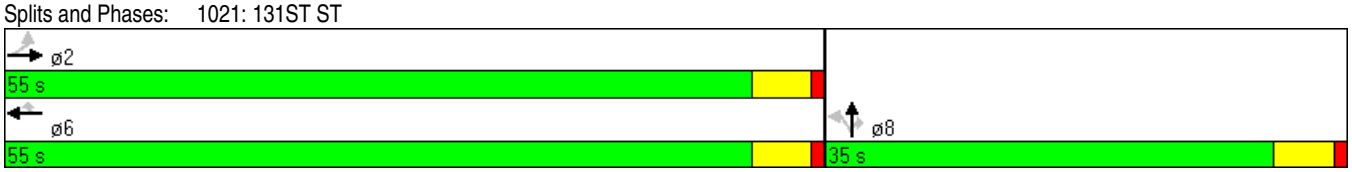
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1012: 126TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	742	0	0	363	307	186	225	251	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1787	1553	0	0	0
Flt Permitted	0.488							0.978				
Satd. Flow (perm)	892	1827	0	0	1827	1553	0	1787	1553	0	0	0
Satd. Flow (RTOR)						323			172			
Lane Group Flow (vph)	103	781	0	0	382	323	0	433	264	0	0	0
Turn Type	Perm	NA			NA	Perm	Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	55.0	55.0	0.0	0.0	55.0	55.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	53.7	53.7			53.7	53.7		26.3	26.3			
Actuated g/C Ratio	0.60	0.60			0.60	0.60		0.29	0.29			
v/c Ratio	0.19	0.72			0.35	0.31		0.83	0.46			
Control Delay	5.7	8.4			11.2	2.0		43.7	11.4			
Queue Delay	0.0	0.4			0.0	0.0		0.0	0.0			
Total Delay	5.7	8.8			11.2	2.0		43.7	11.4			
LOS	A	A			B	A		D	B			
Approach Delay		8.5			7.0			31.4				
Approach LOS		A			A			C				
Queue Length 50th (ft)	16	119			108	0		221	38			
Queue Length 95th (ft)	m20	m146			175	35		326	100			
Internal Link Dist (ft)		320			714			186			200	
Turn Bay Length (ft)												
Base Capacity (vph)	532	1090			1090	1057		596	632			
Starvation Cap Reductn	0	67			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.19	0.76			0.35	0.31		0.73	0.42			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 9 (10%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 77.4%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1021: 131ST ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	636	121	105	444	0	0	0	0	204	272	68
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	1789	1553
Flt Permitted				0.154							0.979	
Satd. Flow (perm)	0	1827	1553	281	1827	0	0	0	0	0	1789	1553
Satd. Flow (RTOR)			127									72
Lane Group Flow (vph)	0	669	127	111	467	0	0	0	0	0	501	72
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	35.0	35.0	35.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		42.2	42.2	51.8	51.8						28.2	28.2
Actuated g/C Ratio		0.47	0.47	0.58	0.58						0.31	0.31
v/c Ratio		0.78	0.16	0.40	0.44						0.89	0.13
Control Delay		30.1	3.6	11.9	9.2						49.6	6.1
Queue Delay		0.0	0.0	0.0	0.4						0.0	0.0
Total Delay		30.1	3.6	11.9	9.6						49.6	6.1
LOS		C	A	B	A						D	A
Approach Delay		25.9			10.1						44.2	
Approach LOS		C			B						D	
Queue Length 50th (ft)		338	0	23	130						261	0
Queue Length 95th (ft)		#548	32	m33	153						#434	28
Internal Link Dist (ft)		506			320			184			192	
Turn Bay Length (ft)												
Base Capacity (vph)		856	796	276	1052						596	566
Starvation Cap Reductn		0	0	0	220						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.78	0.16	0.40	0.56						0.84	0.13

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 26.6	Intersection LOS: C
Intersection Capacity Utilization 77.4%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1022: 131ST ST

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	368	0	0	150	125	121	0	104	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	105	387	0	0	158	132	127	0	109	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	289			387			822	887	387	931	822	224
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	289			387			822	887	387	931	822	224
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			53	100	83	100	100	100
cM capacity (veh/h)	1261			1160			272	257	656	191	281	811

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	105	387	289	127	109
Volume Left	105	0	0	127	0
Volume Right	0	0	132	0	109
cSH	1261	1700	1700	272	656
Volume to Capacity	0.08	0.23	0.17	0.47	0.17
Queue Length 95th (ft)	7	0	0	58	15
Control Delay (s)	8.1	0.0	0.0	29.3	11.6
Lane LOS	A			D	B
Approach Delay (s)	1.7		0.0	21.1	
Approach LOS				C	

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	51.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	263	209	63	208	0	0	0	0	205	0	67
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	277	220	66	219	0	0	0	0	216	0	71
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	219			497			809	738	387	738	848	219
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	219			497			809	738	387	738	848	219
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			100	100	100	32	100	91
cM capacity (veh/h)	1339			1057			258	321	657	315	277	816

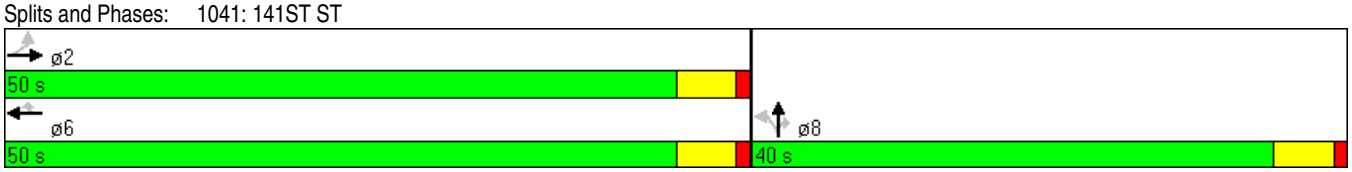
Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total	497	66	219	216	71
Volume Left	0	66	0	216	0
Volume Right	220	0	0	0	71
cSH	1700	1057	1700	315	816
Volume to Capacity	0.29	0.06	0.13	0.68	0.09
Queue Length 95th (ft)	0	5	0	118	7
Control Delay (s)	0.0	8.6	0.0	38.0	9.8
Lane LOS		A		E	A
Approach Delay (s)	0.0	2.0		31.0	
Approach LOS				D	

Intersection Summary				
Average Delay	8.9			
Intersection Capacity Utilization	51.5%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	590	0	0	574	109	248	0	487	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.264							0.950				
Satd. Flow (perm)	482	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						115			215			
Lane Group Flow (vph)	55	621	0	0	604	115	0	261	513	0	0	0
Turn Type	Perm	NA			NA	Perm	Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	50.0	50.0	0.0	0.0	50.0	50.0	40.0	40.0	40.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	45.0	45.0			45.0	45.0		35.0	35.0			
Actuated g/C Ratio	0.50	0.50			0.50	0.50		0.39	0.39			
v/c Ratio	0.23	0.68			0.66	0.14		0.39	0.70			
Control Delay	7.8	13.5			21.2	2.9		21.9	18.8			
Queue Delay	0.0	1.6			0.0	0.0		0.0	0.0			
Total Delay	7.8	15.1			21.2	2.9		21.9	18.8			
LOS	A	B			C	A		C	B			
Approach Delay		14.5			18.3			19.9				
Approach LOS		B			B			B				
Queue Length 50th (ft)	15	197			244	0		105	138			
Queue Length 95th (ft)	m19	261			364	26		169	261			
Internal Link Dist (ft)		320			1059			191			209	
Turn Bay Length (ft)												
Base Capacity (vph)	241	914			914	834		675	735			
Starvation Cap Reductn	0	144			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.23	0.81			0.66	0.14		0.39	0.70			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 52 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 96.5%	ICU Level of Service F
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1041: 141ST ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	339	271	435	387	0	0	0	0	303	0	76
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	1736	1553
Flt Permitted				0.382							0.950	
Satd. Flow (perm)	0	1827	1553	698	1827	0	0	0	0	0	1736	1553
Satd. Flow (RTOR)			285									80
Lane Group Flow (vph)	0	357	285	458	407	0	0	0	0	0	319	80
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	33.0	33.0	28.0	61.0	0.0	0.0	0.0	0.0	29.0	29.0	29.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		37.7	37.7	59.5	59.5						20.5	20.5
Actuated g/C Ratio		0.42	0.42	0.66	0.66						0.23	0.23
v/c Ratio		0.47	0.35	0.70	0.34						0.81	0.19
Control Delay		24.0	4.3	18.0	12.3						48.5	7.5
Queue Delay		0.0	0.0	0.0	0.6						0.2	0.0
Total Delay		24.0	4.3	18.1	12.9						48.7	7.5
LOS		C	A	B	B						D	A
Approach Delay		15.2			15.6						40.4	
Approach LOS		B			B						D	
Queue Length 50th (ft)		146	0	178	153						169	0
Queue Length 95th (ft)		267	55	268	232						257	33
Internal Link Dist (ft)		406			320			160			204	
Turn Bay Length (ft)												
Base Capacity (vph)		764	815	727	1208						463	473
Starvation Cap Reductn		0	0	5	456						0	0
Spillback Cap Reductn		0	0	0	0						8	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.47	0.35	0.63	0.54						0.70	0.17

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 96.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1042: 141ST ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	482	1380	0	0	1172	296	275	0	596	0	0	0
Satd. Flow (prot)	1736	3471	0	0	3471	1553	1649	1649	2733	0	0	0
Flt Permitted	0.105						0.950	0.950				
Satd. Flow (perm)	192	3471	0	0	3471	1553	1649	1649	2733	0	0	0
Satd. Flow (RTOR)						312			109			
Lane Group Flow (vph)	507	1453	0	0	1234	312	144	145	627	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	28.0	66.0	0.0	0.0	38.0	38.0	24.0	24.0	24.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	61.0	61.0			33.0	33.0	19.0	19.0	19.0			
Actuated g/C Ratio	0.68	0.68			0.37	0.37	0.21	0.21	0.21			
v/c Ratio	0.97	0.62			0.97	0.41	0.41	0.42	0.95			
Control Delay	50.9	1.9			60.0	16.0	34.9	35.0	54.2			
Queue Delay	0.0	0.3			0.0	0.0	0.0	0.0	0.0			
Total Delay	50.9	2.3			60.0	16.0	34.9	35.0	54.2			
LOS	D	A			E	B	C	D	D			
Approach Delay		14.8			51.1			48.1				
Approach LOS		B			D			D				
Queue Length 50th (ft)	179	30			394	69	74	75	168			
Queue Length 95th (ft)	m#363	39			m#512	m116	134	135	#289			
Internal Link Dist (ft)		320			2428			130			111	
Turn Bay Length (ft)						500						
Base Capacity (vph)	525	2353			1273	767	348	348	663			
Starvation Cap Reductn	0	354			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.97	0.73			0.97	0.41	0.41	0.42	0.95			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 34.4	Intersection LOS: C
Intersection Capacity Utilization 79.2%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1051: 146TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1673	446	189	1258	0	0	0	0	189	0	396
Satd. Flow (prot)	0	3471	1553	1736	3471	0	0	0	0	0	1736	2733
Flt Permitted				0.067							0.950	
Satd. Flow (perm)	0	3471	1553	122	3471	0	0	0	0	0	1736	2733
Satd. Flow (RTOR)			469									189
Lane Group Flow (vph)	0	1761	469	199	1324	0	0	0	0	0	199	417
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	59.0	59.0	14.0	73.0	0.0	0.0	0.0	0.0	17.0	17.0	17.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0
Act Effct Green (s)		54.7	54.7	68.7	68.7						13.3	13.3
Actuated g/C Ratio		0.61	0.61	0.76	0.76						0.15	0.15
v/c Ratio		0.83	0.42	0.78	0.50						0.78	0.74
Control Delay		18.9	2.0	26.4	3.9						58.4	28.3
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay		18.9	2.0	26.4	4.2						58.4	28.3
LOS		B	A	C	A						E	C
Approach Delay		15.3			7.1						38.0	
Approach LOS		B			A						D	
Queue Length 50th (ft)		392	0	45	91						109	68
Queue Length 95th (ft)		505	36	m56	m109						#210	125
Internal Link Dist (ft)		627			320			134			132	
Turn Bay Length (ft)			600									
Base Capacity (vph)		2111	1128	255	2651						270	585
Starvation Cap Reductn		0	0	0	628						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.83	0.42	0.78	0.65						0.74	0.71

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 79.2%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1052: 146TH ST

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	321	891	0	0	473	603	148	0	48	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.354							0.950				
Satd. Flow (perm)	647	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						635			51			
Lane Group Flow (vph)	338	938	0	0	498	635	0	156	51	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	21.0	70.0	0.0	0.0	49.0	49.0	20.0	20.0	20.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	67.5	67.5			51.2	51.2		12.5	12.5			
Actuated g/C Ratio	0.75	0.75			0.57	0.57		0.14	0.14			
v/c Ratio	0.54	0.68			0.48	0.55		0.64	0.20			
Control Delay	4.9	6.5			14.7	3.1		48.9	11.8			
Queue Delay	0.3	1.3			0.0	0.0		0.0	0.0			
Total Delay	5.2	7.8			14.7	3.1		48.9	11.8			
LOS	A	A			B	A		D	B			
Approach Delay		7.1			8.2			39.7				
Approach LOS		A			A			D				
Queue Length 50th (ft)	53	211			159	0		84	0			
Queue Length 95th (ft)	m65	m224			280	53		145	31			
Internal Link Dist (ft)		320			1380			131			123	
Turn Bay Length (ft)												
Base Capacity (vph)	679	1370			1039	1157		289	301			
Starvation Cap Reductn	65	231			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.55	0.82			0.48	0.55		0.54	0.17			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 114.8%	ICU Level of Service H
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1061: SR 238

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	777	170	177	444	0	0	0	0	435	0	193
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	1736	1553
Flt Permitted				0.082							0.950	
Satd. Flow (perm)	0	1827	1553	150	1827	0	0	0	0	0	1736	1553
Satd. Flow (RTOR)			179									203
Lane Group Flow (vph)	0	818	179	186	467	0	0	0	0	0	458	203
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Total Split (s)	0.0	49.0	49.0	12.0	61.0	0.0	0.0	0.0	0.0	29.0	29.0	29.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Act Effct Green (s)		44.0	44.0	56.0	56.0						24.0	24.0
Actuated g/C Ratio		0.49	0.49	0.62	0.62						0.27	0.27
v/c Ratio		0.92	0.21	0.86	0.41						0.99	0.36
Control Delay		38.4	2.7	59.0	8.2						74.2	6.0
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay		38.4	2.7	59.0	8.5						74.2	6.0
LOS		D	A	E	A						E	A
Approach Delay		32.0			22.9						53.2	
Approach LOS		C			C						D	
Queue Length 50th (ft)		412	0	82	114						259	0
Queue Length 95th (ft)		#666	32	#182	153						#456	51
Internal Link Dist (ft)		1957			320			157			101	
Turn Bay Length (ft)												
Base Capacity (vph)		893	851	217	1137						463	563
Starvation Cap Reductn		0	0	0	224						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.92	0.21	0.86	0.51						0.99	0.36

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 35.5	Intersection LOS: D
Intersection Capacity Utilization 114.8%	ICU Level of Service H
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1062: SR 238

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	209	599	0	0	537	94	437	0	469	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	1736	0	1553	0	0	0
Flt Permitted	0.225						0.950					
Satd. Flow (perm)	411	1827	0	0	1827	1553	1736	0	1553	0	0	0
Satd. Flow (RTOR)						99			256			
Lane Group Flow (vph)	220	631	0	0	565	99	460	0	494	0	0	0
Turn Type	pm+pt	NA			NA	Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases	2					6	8		8			
Total Split (s)	14.0	56.0	0.0	0.0	42.0	42.0	34.0	0.0	34.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	3.0	4.0	3.0	4.0	4.0	4.0
Act Effct Green (s)	54.2	54.2			40.2	40.2	27.8		27.8			
Actuated g/C Ratio	0.60	0.60			0.45	0.45	0.31		0.31			
v/c Ratio	0.58	0.57			0.69	0.13	0.86		0.75			
Control Delay	11.4	3.1			26.6	4.1	45.4		20.5			
Queue Delay	0.0	0.5			0.1	0.0	0.0		0.0			
Total Delay	11.4	3.6			26.8	4.1	45.4		20.5			
LOS	B	A			C	A	D		C			
Approach Delay		5.6			23.4							
Approach LOS		A			C							
Queue Length 50th (ft)	18	66			267	0	235		116			
Queue Length 95th (ft)	m33	m84			398	29	#378		234			
Internal Link Dist (ft)		299			591			133			141	
Turn Bay Length (ft)												
Base Capacity (vph)	384	1099			816	749	598		703			
Starvation Cap Reductn	0	161			0	0	0		0			
Spillback Cap Reductn	0	0			17	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.57	0.67			0.71	0.13	0.77		0.70			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 83 (92%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 121.2%	ICU Level of Service H
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

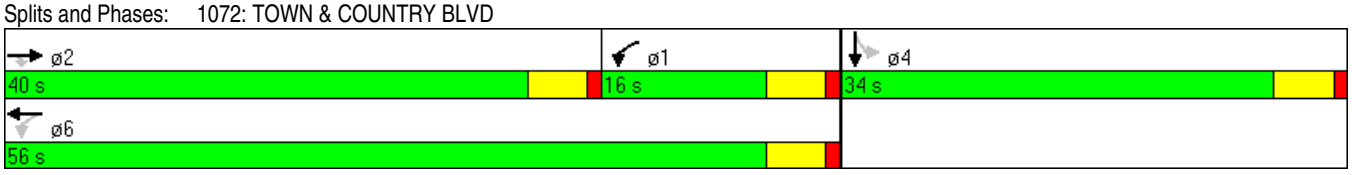
Splits and Phases: 1071: TOWN & COUNTRY BLVD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	574	529	316	658	0	0	0	0	234	559	232
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	0	3316	0
Flt Permitted				0.188							0.989	
Satd. Flow (perm)	0	1827	1553	343	1827	0	0	0	0	0	3316	0
Satd. Flow (RTOR)			107								45	
Lane Group Flow (vph)	0	604	557	333	693	0	0	0	0	0	1078	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		
Total Split (s)	0.0	40.0	40.0	16.0	56.0	0.0	0.0	0.0	0.0	34.0	34.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0
Act Effct Green (s)		35.0	35.0	51.0	51.0						29.0	
Actuated g/C Ratio		0.39	0.39	0.57	0.57						0.32	
v/c Ratio		0.85	0.83	0.91	0.67						0.98	
Control Delay		38.5	32.7	51.2	16.1						53.1	
Queue Delay		0.0	0.0	0.0	1.9						0.0	
Total Delay		38.5	32.7	51.2	18.0						53.1	
LOS		D	C	D	B						D	
Approach Delay		35.7			28.8						53.1	
Approach LOS		D			C						D	
Queue Length 50th (ft)		307	232	103	199						306	
Queue Length 95th (ft)		#501	#425	m#226	257						#451	
Internal Link Dist (ft)		565			299			122			94	
Turn Bay Length (ft)												
Base Capacity (vph)		711	669	365	1035						1099	
Starvation Cap Reductn		0	0	0	196						0	
Spillback Cap Reductn		0	0	0	0						0	
Storage Cap Reductn		0	0	0	0						0	
Reduced v/c Ratio		0.85	0.83	0.91	0.83						0.98	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 39.3 Intersection LOS: D
Intersection Capacity Utilization 121.2% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

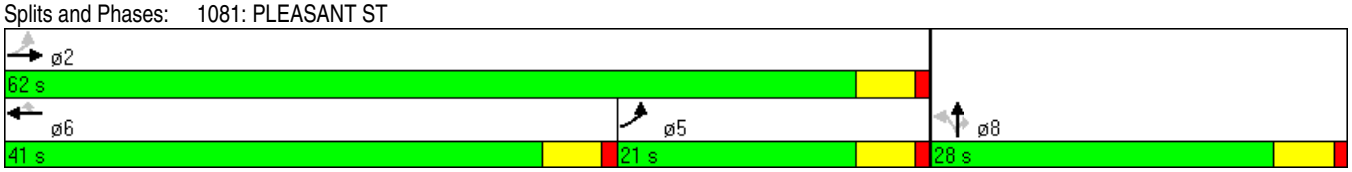
Splits and Phases: 1072: TOWN & COUNTRY BLVD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	316	596	0	0	384	551	252	0	51	0	0	0
Satd. Flow (prot)	1736	1827	0	0	1827	1553	0	1736	1553	0	0	0
Flt Permitted	0.418							0.950				
Satd. Flow (perm)	764	1827	0	0	1827	1553	0	1736	1553	0	0	0
Satd. Flow (RTOR)						580			54			
Lane Group Flow (vph)	333	627	0	0	404	580	0	265	54	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Total Split (s)	21.0	62.0	0.0	0.0	41.0	41.0	28.0	28.0	28.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	61.6	61.6			40.6	40.6		18.4	18.4			
Actuated g/C Ratio	0.68	0.68			0.45	0.45		0.20	0.20			
v/c Ratio	0.48	0.50			0.49	0.57		0.75	0.15			
Control Delay	6.2	3.7			21.0	4.1		46.6	8.8			
Queue Delay	0.1	0.8			0.0	0.0		0.0	0.0			
Total Delay	6.3	4.6			21.0	4.1		46.6	8.8			
LOS	A	A			C	A		D	A			
Approach Delay		5.2			11.0			40.2				
Approach LOS		A			B			D				
Queue Length 50th (ft)	10	19			158	0		141	0			
Queue Length 95th (ft)	m40	122			264	63		214	28			
Internal Link Dist (ft)		320			970			108			70	
Turn Bay Length (ft)												
Base Capacity (vph)	696	1251			825	1019		444	437			
Starvation Cap Reductn	41	335			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.51	0.68			0.49	0.57		0.60	0.12			

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 24 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 104.1%	ICU Level of Service G
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1081: PLEASANT ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	599	186	122	514	0	0	0	0	313	251	160
Satd. Flow (prot)	0	1827	1553	1736	1827	0	0	0	0	1736	1721	0
Flt Permitted				0.199						0.950		
Satd. Flow (perm)	0	1827	1553	364	1827	0	0	0	0	1736	1721	0
Satd. Flow (RTOR)			196								37	
Lane Group Flow (vph)	0	631	196	128	541	0	0	0	0	329	432	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		
Total Split (s)	0.0	45.0	45.0	12.0	57.0	0.0	0.0	0.0	0.0	33.0	33.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0
Act Effct Green (s)		42.8	42.8	54.9	54.9					25.1	25.1	
Actuated g/C Ratio		0.48	0.48	0.61	0.61					0.28	0.28	
v/c Ratio		0.73	0.23	0.39	0.49					0.68	0.85	
Control Delay		26.0	3.1	8.4	5.6					36.0	44.4	
Queue Delay		0.0	0.0	0.0	0.4					0.0	0.0	
Total Delay		26.0	3.1	8.4	6.0					36.0	44.4	
LOS		C	A	A	A					D	D	
Approach Delay		20.6			6.4						40.8	
Approach LOS		C			A						D	
Queue Length 50th (ft)		295	0	9	39					158	204	
Queue Length 95th (ft)		438	37	m34	86					248	#346	
Internal Link Dist (ft)		2803			320			174			105	
Turn Bay Length (ft)												
Base Capacity (vph)		868	841	330	1114					540	561	
Starvation Cap Reductn		0	0	0	202					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.73	0.23	0.39	0.59					0.61	0.77	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 104.1%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1082: PLEASANT ST

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	251	0	0	473	67
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	264	0	0	498	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	533	533	568			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	533	533	568			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	51	100			
cM capacity (veh/h)	504	543	994			

Direction, Lane #	EB 1	SB 1
Volume Total	264	568
Volume Left	0	0
Volume Right	264	71
cSH	543	1700
Volume to Capacity	0.49	0.33
Queue Length 95th (ft)	66	0
Control Delay (s)	17.8	0.0
Lane LOS	C	
Approach Delay (s)	17.8	0.0
Approach LOS	C	

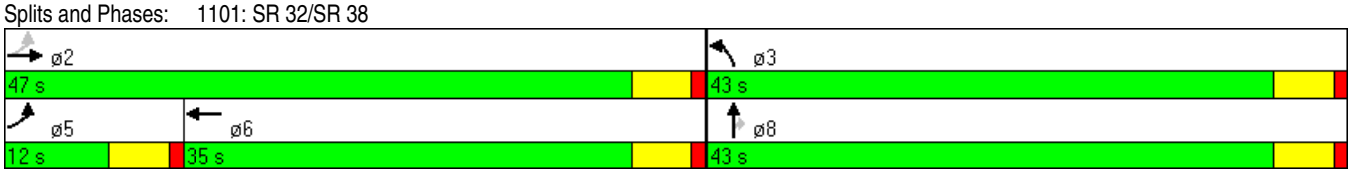
Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	728	0	0	747	229	764	867	620	0	0	0
Satd. Flow (prot)	1736	3471	0	0	3350	0	1579	3288	1553	0	0	0
Flt Permitted	0.114						0.950	0.989				
Satd. Flow (perm)	208	3471	0	0	3350	0	1579	3288	1553	0	0	0
Satd. Flow (RTOR)					48				125			
Lane Group Flow (vph)	148	766	0	0	1027	0	555	1162	653	0	0	0
Turn Type	pm+pt	NA			NA		Prot	NA	Perm			
Protected Phases	5	2			6		3	8				
Permitted Phases	2								8			
Total Split (s)	12.0	47.0	0.0	0.0	35.0	0.0	43.0	43.0	43.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	5.0	4.0	4.0	4.0
Act Effct Green (s)	42.0	42.0			30.0		38.0	38.0	38.0			
Actuated g/C Ratio	0.47	0.47			0.33		0.42	0.42	0.42			
v/c Ratio	0.69	0.47			0.89		0.83	0.84	0.90			
Control Delay	22.0	11.8			38.7		36.2	30.0	36.9			
Queue Delay	0.0	1.3			0.0		0.0	0.0	0.0			
Total Delay	22.0	13.1			38.7		36.2	30.0	36.9			
LOS	C	B			D		D	C	D			
Approach Delay		14.6			38.7			33.4				
Approach LOS		B			D			C				
Queue Length 50th (ft)	35	210			277		301	315	283			
Queue Length 95th (ft)	m#65	m278			#399		#507	410	#511			
Internal Link Dist (ft)		321			2459			169			132	
Turn Bay Length (ft)												
Base Capacity (vph)	216	1620			1149		667	1388	728			
Starvation Cap Reductn	0	600			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.69	0.75			0.89		0.83	0.84	0.90			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 30.6 Intersection LOS: C
Intersection Capacity Utilization 114.2% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1101: SR 32/SR 38



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	790	417	401	1048	0	0	0	0	79	540	103
Satd. Flow (prot)	0	3471	1553	1736	3471	0	0	0	0	0	3381	0
Flt Permitted				0.184							0.995	
Satd. Flow (perm)	0	3471	1553	336	3471	0	0	0	0	0	3381	0
Satd. Flow (RTOR)			117								20	
Lane Group Flow (vph)	0	832	439	422	1103	0	0	0	0	0	759	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		
Total Split (s)	0.0	36.0	36.0	26.0	62.0	0.0	0.0	0.0	0.0	28.0	28.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0
Act Effct Green (s)		34.2	34.2	57.5	57.5						22.5	
Actuated g/C Ratio		0.38	0.38	0.64	0.64						0.25	
v/c Ratio		0.63	0.66	0.84	0.50						0.88	
Control Delay		26.3	23.4	23.9	7.8						45.0	
Queue Delay		0.0	0.0	0.8	1.0						0.0	
Total Delay		26.3	23.4	24.7	8.7						45.0	
LOS		C	C	C	A						D	
Approach Delay		25.3			13.2						45.0	
Approach LOS		C			B						D	
Queue Length 50th (ft)		212	159	142	174						212	
Queue Length 95th (ft)		279	274	m189	m201						#311	
Internal Link Dist (ft)		161			321			175			128	
Turn Bay Length (ft)												
Base Capacity (vph)		1319	663	541	2218						879	
Starvation Cap Reductn		0	0	21	775						0	
Spillback Cap Reductn		0	0	0	0						0	
Storage Cap Reductn		0	0	0	0						0	
Reduced v/c Ratio		0.63	0.66	0.81	0.76						0.86	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of 1st Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 24.3 Intersection LOS: C
Intersection Capacity Utilization 114.2% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

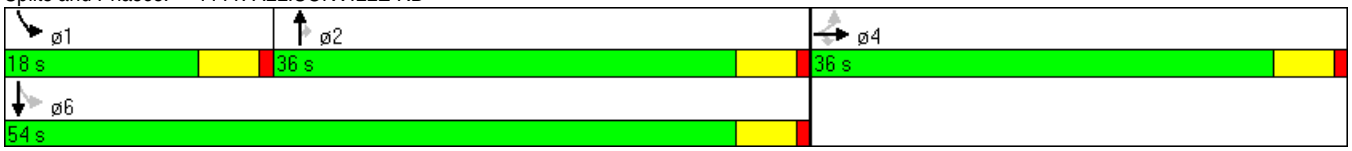
Splits and Phases: 1102: SR 32/SR 38

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	0	431	0	0	0	0	964	384	287	472	0
Satd. Flow (prot)	0	1736	1553	0	0	0	0	3471	1553	1736	1827	0
Flt Permitted		0.950								0.109		
Satd. Flow (perm)	0	1736	1553	0	0	0	0	3471	1553	199	1827	0
Satd. Flow (RTOR)			334						404			
Lane Group Flow (vph)	0	543	454	0	0	0	0	1015	404	302	497	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Total Split (s)	36.0	36.0	36.0	0.0	0.0	0.0	0.0	36.0	36.0	18.0	54.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0
Act Effct Green (s)		30.3	30.3					31.8	31.8	49.7	49.7	
Actuated g/C Ratio		0.34	0.34					0.35	0.35	0.55	0.55	
v/c Ratio		0.93	0.61					0.83	0.50	0.92	0.49	
Control Delay		53.2	10.5					34.1	4.7	63.0	2.5	
Queue Delay		0.6	0.0					0.1	0.0	0.0	0.2	
Total Delay		53.8	10.5					34.1	4.7	63.0	2.7	
LOS		D	B					C	A	E	A	
Approach Delay		34.1						25.7			25.5	
Approach LOS		C						C			C	
Queue Length 50th (ft)		291	48					277	0	95	18	
Queue Length 95th (ft)		#488	143					#367	60	#220	29	
Internal Link Dist (ft)		127			208			633			323	
Turn Bay Length (ft)												
Base Capacity (vph)		598	754					1226	810	332	1008	
Starvation Cap Reductn		0	0					0	0	0	98	
Spillback Cap Reductn		5	0					5	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.92	0.60					0.83	0.50	0.91	0.55	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 67 (74%), Referenced to phase 2:NBT and 6:SBTL, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

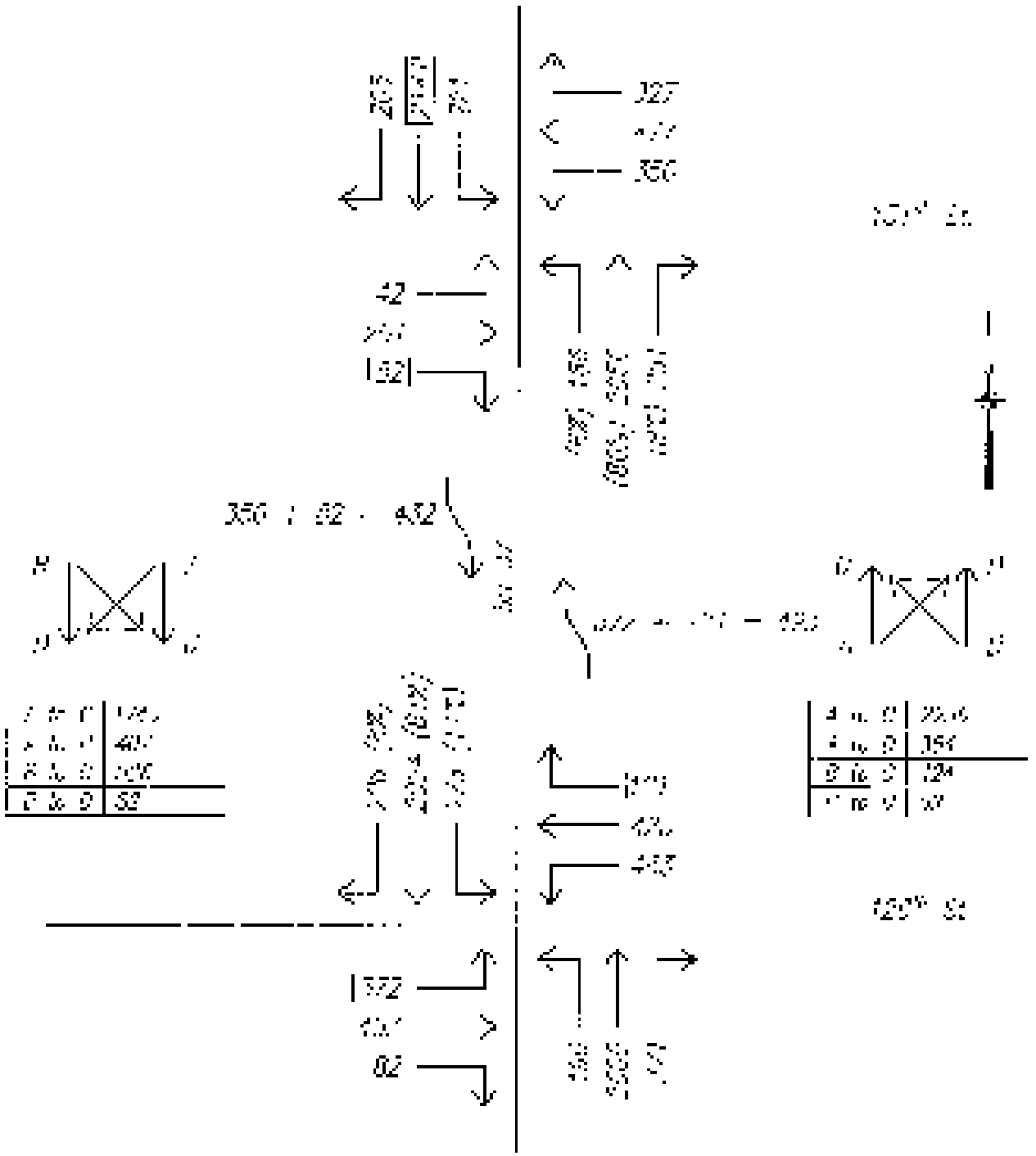
Splits and Phases: 1111: ALLISONVILLE RD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	238	0	174	549	931	0	0	521	138
Satd. Flow (prot)	0	0	0	0	1736	1553	1736	1827	0	0	3471	1553
Flt Permitted					0.950		0.345					
Satd. Flow (perm)	0	0	0	0	1736	1553	630	1827	0	0	3471	1553
Satd. Flow (RTOR)						163						145
Lane Group Flow (vph)	0	0	0	0	251	183	578	980	0	0	548	145
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Total Split (s)	0.0	0.0	0.0	24.0	24.0	24.0	37.0	66.0	0.0	0.0	29.0	29.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0
Act Effct Green (s)					16.7	16.7	63.3	63.3			26.3	26.3
Actuated g/C Ratio					0.19	0.19	0.70	0.70			0.29	0.29
v/c Ratio					0.78	0.43	0.69	0.76			0.54	0.26
Control Delay					51.7	10.4	13.1	9.6			29.8	6.0
Queue Delay					0.0	0.0	0.0	2.1			0.0	0.0
Total Delay					51.7	10.4	13.1	11.8			29.8	6.0
LOS					D	B	B	B			C	A
Approach Delay					34.3			12.3			24.8	
Approach LOS					C			B			C	
Queue Length 50th (ft)					134	9	87	147			141	0
Queue Length 95th (ft)					#221	64	m150	m178			196	44
Internal Link Dist (ft)		202			200			323			992	
Turn Bay Length (ft)												
Base Capacity (vph)					366	456	836	1284			1014	556
Starvation Cap Reductn					0	0	0	175			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.69	0.40	0.69	0.88			0.54	0.26

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 78 (87%), Referenced to phase 2:NBTL and 6:SBT, Start of 1st Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1112: ALLISONVILLE RD



Traffic Routing Diagram for Weave Analysis Between
126th and 131st Street Year 2036 Traffic Volumes (DHV)

Note: Volume numbers represent the peak hour (AM or PM) that would have the highest weaving conflict.

HCS2000: Freeway Weaving Release 4.1f

Phone: Fax:
E-Mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: [illegible]
Analysis Time Period: PM Peak
Freeway/Dir of Travel: [illegible]
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: 20[illegible]
Description: [illegible] Viability Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	[illegible]	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	[illegible]	[illegible]
Volume ratio, VR	0.25	
Weaving ratio, R	[illegible]	

Conversions to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	o1	o2	w1	w2	
Volume, V	2256	69	361	420	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	[illegible]	[illegible]	[illegible]	[illegible]	v
Trucks and buses	[illegible]	[illegible]	[illegible]	[illegible]	%
Recreational vehicles	[illegible]	[illegible]	[illegible]	[illegible]	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	[illegible]	[illegible]	412	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	[illegible]	[illegible]
b (Exhibit 24-6)	[illegible]	[illegible]
c (Exhibit 24-6)	[illegible]	[illegible]
d (Exhibit 24-6)	[illegible]	[illegible]
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for

Unconstrained operation, Nw (Exhibit 24-7) 0.83
Maximum number of lanes, Nw (max) (Exhibit 24-7) [illegible]
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	32.25	pc/mi/ln
Level of service, LOS	D	
Capacity of base condition, cb	4372	pc/h
Capacity as a 15-minute flow rate, c	4240	pc/h
Capacity as a full-hour volume, ch	3897	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	931	2800	a
Average flow rate (pcph/ln)	1168	2350	b
Volume ratio, VR	0.25	0.45	c
Weaving ratio, R	0.40	N/A	d
Weaving length (ft)	410	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS2000: Freeway Weaving Release 4.1f

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: 8/1?/2001
Analysis Time Period: AM Peak
Freeway/Dir of Travel: [illegible]
Weaving Location: 13?st to ??th
Jurisdiction:
Analysis Year: 2??7
Description: [illegible] Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	5	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.30	
Weaving ratio, R	0.47	

Conversion to pc/h Under Base Conditions

	Non-Weaving V		Weaving V		
	A-C	B-D	A-D	B-C	
Volume, V	1754	82	407	350	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	482	23	113	97	v
Trucks and buses	4	10	4	10	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.952	0.980	0.952	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1988	95	461	408	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	[illegible]	4.00
c (Exhibit 24-6)	0.97	[illegible]
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.69	0.80
Weaving and non-weaving speeds, Si	51.77	55.57
Number of lanes required, Nw		

Number of lanes required for unconstrained operation, Nw (Exhibit 24-7) 1.10
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	20.15	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	4[illegible]	pc/h
Capacity as a 15-minute flow rate, c	4150	veh/h
Capacity as a full-hour volume, ch	3724	veh/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	[illegible]	2800	a
Average flow rate (pcphpl)	[illegible]	2350	b
Volume ratio, VR	[illegible]	[illegible]	c
Weaving ratio, R	0.47	N/A	d
Weaving length (ft)	410	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: United
Date Performed: [illegible]
Analysis Time Period: AM Peak
Freeway/Dir of Travel: SR [illegible] SB
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: [illegible]
Description: [illegible] SR [illegible] Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mi/h	
Weaving number of lanes, N	3		
Weaving segment length, L	[illegible]	ft	
Terrain type	Level		
Grade		%	
Length		mi	
Weaving type	A	Multilane or C-D	
Volume ratio, VR	0.34		
Weaving ratio, R	[illegible]		

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	o1	o2	w1	w2	
Volume, V	[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	432	[illegible]	[illegible]	[illegible]	v
Trucks and buses	4	[illegible]	[illegible]	[illegible]	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	[illegible]	[illegible]
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	[illegible]	1.30
d (Exhibit 24-6)	0.80	[illegible]
Weaving intensity factor, Wi	[illegible]	1.04
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for

Unconstrained operation, Nw (Exhibit 24-7) 1.11
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

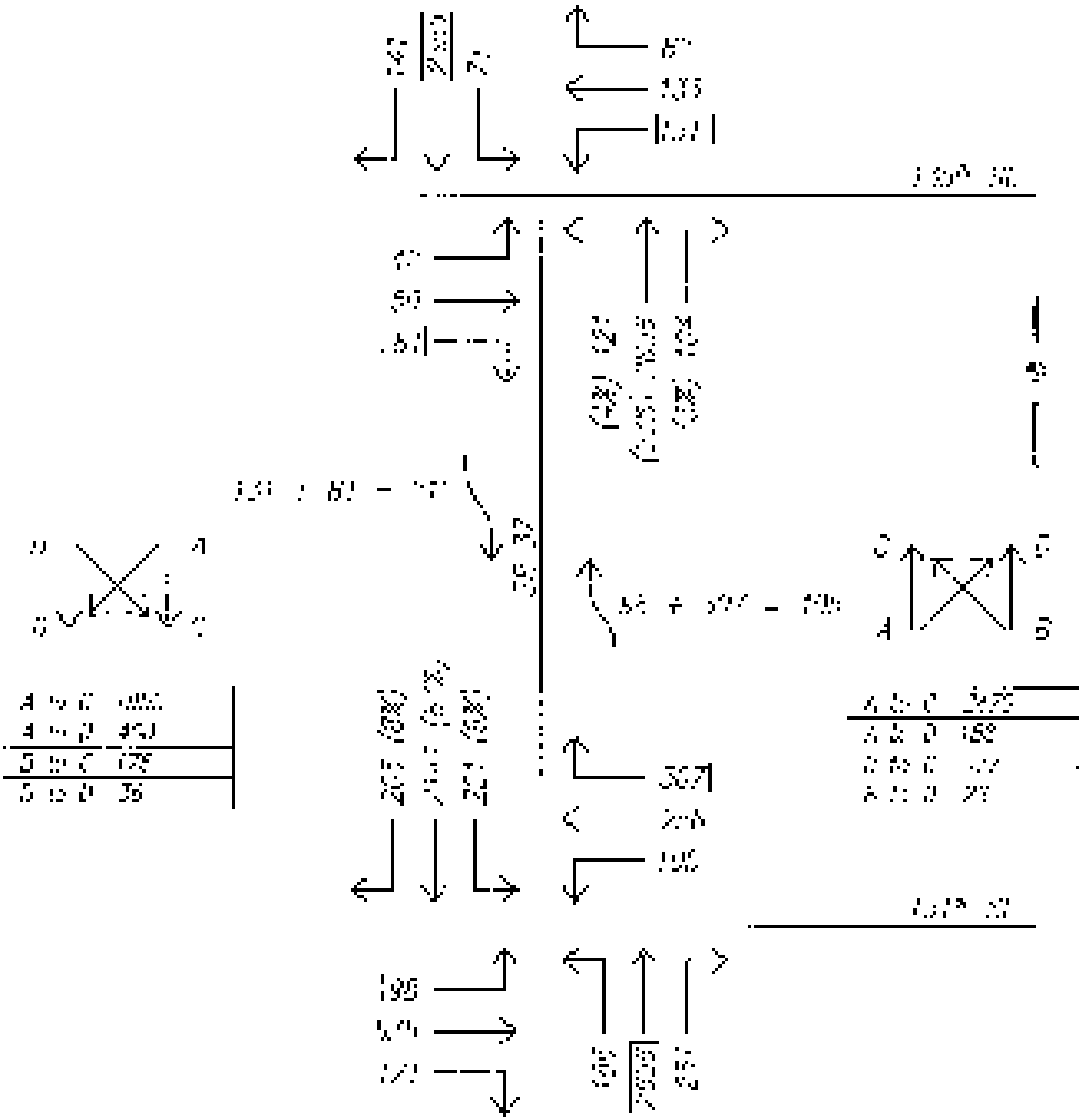
Weaving segment speed, S	54.43	mph
Weaving segment density, D	[illegible]	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	4892	pc/h
Capacity as a 15-minute flow rate, c	4613	pc/h
Capacity as a full-hour volume, ch	[illegible]	pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note
Weaving flow rate, Vw	874	2800	a
Average flow rate (pcphpl)	1904	2300	b
Volume ratio, VR	0.34	0.45	c
Weaving ratio, R	0.43	N/A	d
Weaving length (ft)	41[illegible]	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.



Traffic Routing Diagram for Weave Analysis Between 131st and 135th Street Year 2036 Traffic Volume (DHV)

Note: Volume numbers represent the peak hour (AM or PM) that would create the highest weaving conflict.

Phone: Fax:
E-Mail:

Operational Analysis

Analyst: SAF
Agency/Co.: Orbitd
Date Performed: 8/12/2011
Analysis Time Period: AM Peak
Freeway/Dir of Travel: SR 27 NB
Weaving Location: 103th to 105th
Jurisdiction:
Analysis Year: 2016
Description: SR 27 Mobility Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	57	
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Number of lanes...
Volume ratio, VR	0.18	
Weaving ratio, R	0.33	

Conversion to pc/h Under Base Conditions

	Non-Weaving V o1 A-C	Non-Weaving V o2 B-D	Weaving V w1 A-D	Weaving V w2 B-C	
Volume, V	2470	25	155	277	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	686	8	43	[illegible]	v
Trucks and buses	3	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.985	0.975	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2785	31	200	400	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.99	0.29
Weaving and non-weaving speeds, Si	35.06	45.74

Number of lanes required

Unconstrained operation, Nw (Exhibit 24-7)   0.54
Max number of lanes, Nw (max) (Exhibit 24-7)   1.40
Type of operation is   Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	24.48	mph
Weaving segment density, D	47.08	pc/mi/ln
Level of service, LOS	F	
Capacity of base condition, cb	4251	pc/h
Capacity as a 15-minute flow rate, c	4174	pc/h
Capacity as a full-hour volume, ch	3757	pc/h

Limitations on Weaving Segments

	If Max Exceeded See Note		
	Analyzed	Maximum	Note
Weaving flow rate, Vw	638	2800	a
Average flow rate (pcphpl)	151	2350	b
Volume ratio, VR	0.10	0.45	c
Weaving ratio, R	0.30	N/A	d
Weaving length (ft)	57	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

e. Four-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Phone: Fax:
E-Mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: 8/15/2011
Analysis Time Period: AM Peak
Freeway/Dir of Travel: [illegible]
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: [illegible]
Description: [illegible] Mobility Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.22	
Weaving ratio, R	0.27	

Conversion to pc/h Under Base Conditions

	Non-Weaving V o-a	Non-Weaving V b-d	Weaving V a-d	Weaving V b-c	
Volume, V	1955	35	410	175	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	543	10	114	49	v
Trucks and buses	2	[illegible]	2	2	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2215	40	455	195	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	[illegible]	2.83
Weaving and non-weaving speeds, Si	37.44	28.57

Number of lanes required for

Unconstrained operation, Nw (Exhibit 24-7) [illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7) [illegible]
Type of operation is Unconstrained

__________Weaving Segment Speed, Density, Level of Service and Capacity__________

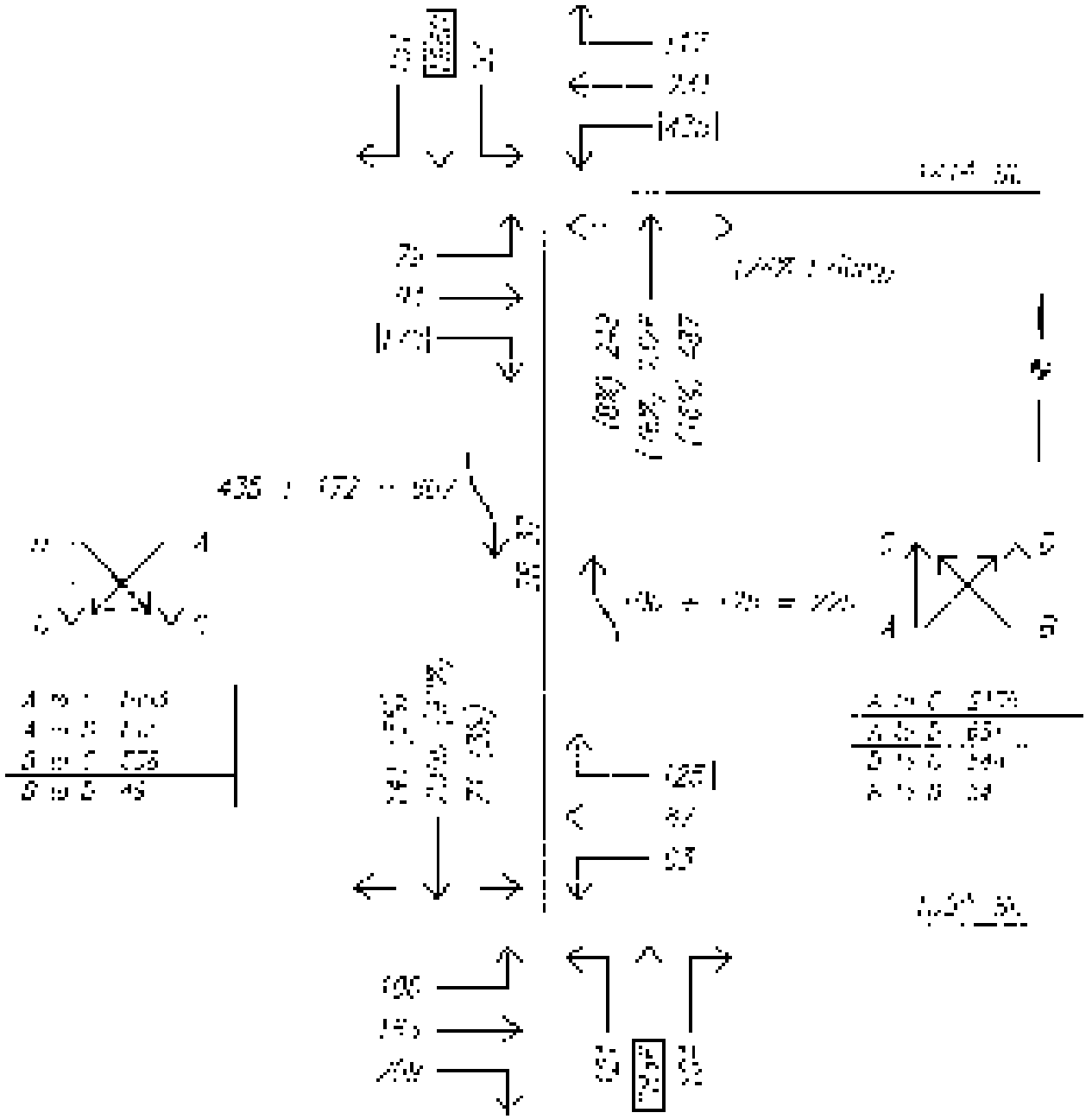
Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	19.52	pc/mi/ln
Level of service, LOS	E	
Capacity of base condition, cb	4255	pc/h
Capacity as a 15-minute flow rate, c	4045	pc/h
Capacity as a full-hour volume, ch	1004	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	[illegible]	2800	a
Average flow rate (pcphpl)	5??	2350	b
Volume ratio, VR	0.2?	0.45	c
Weaving ratio, R	[illegible]	N/A	d
Weaving length (ft)	[illegible]	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.



Traffic Routing Diagram for Weaver Analysis Between
135th and 141st Street Year 2036 Traffic Volumes (PM)

Note: Volume numbers represent the peak hour (AM or PM) that would apply for highest weaving conflict

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: [illegible]
Analysis Time Period: [illegible]
Freeway/Dir of Travel: [illegible] NB
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: [illegible]
Description: [illegible] Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	3	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	[illegible]
Volume ratio, VR	0.28	
Weaving ratio, R	0.20	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	2155	24	501	71	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	599	7	139	20	v
Trucks and buses	5	4	5	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2450	31	568	133	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.03	0.59
Weaving and non-weaving speeds, Si	58.09	67.35
Number of lanes required for		

Number of lanes required for unconstrained operation, Nw (Exhibit 24-7) [illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7) [illegible]
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	41.91	mph
Weaving segment density, D	28.34	pc/mi/ln
Level of service, LOS	[illegible]	
Capacity of base condition, cb	4775	pc/h
Capacity as a 15-minute flow rate, c	4641	pc/h
Capacity as a full-hour volume, ch	4183	pc/h

Limitations on Weaving Segments

		If Max Exceeded See Note	
	Analyzed	Maximum	Note
Weaving flow rate, Vw	561	2800	f
Average flow rate (pcphpl)	1173	2350	b
Volume ratio, VR	0.24	1.45	d
Weaving ratio, R	0.23	0.50	c
Weaving length (ft)	300	2500	a

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: [illegible]
Analysis Time Period: PM Peak
Freeway/Dir of Travel: [illegible]
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: 2036
Description: [illegible]

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	[illegible]	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	[illegible]	Multilane or C-D
Volume ratio, VR	0.37	
Weaving ratio, R	0.45	

Conversions to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	o1	o2	w1	w2	
Volume, V	[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	[illegible]	[illegible]	[illegible]	[illegible]	v
Trucks and buses	[illegible]	[illegible]	[illegible]	[illegible]	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.2[illegible]	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]
Number of lanes required for		

Speed ratio of adjustment, Fw (Exhibit 24-?)   1.27
Maximum number of lanes, Nw (Exhibit 24-7)   1.40
Type of operation is   Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	[illegible]	pc/mi/ln
Level of service, LOS	D	
Capacity of base condition, cb	[illegible]	pc/h
Capacity as a 15-minute flow rate, c	[illegible]	veh/h
Capacity as a full-hour volume, ch	[illegible]	veh/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note
Weaving flow rate, Vw	[illegible]	2800	f
Average flow rate (pcphpl)	1285	2300	b
Volume ratio, VR	0.35	0.45	c
Weaving ratio, R	[illegible]	N/A	d
Weaving length (ft)	[illegible]	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.

e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS2000: Freeway Weaving Release 4.1f

Phone: Fax:
E-Mail:

Operational Analysis

Analyst:	KAC
Agency/Co.:	[illegible]
Date Performed:	[illegible]/2011
Analysis Time Period:	PM Peak
Freeway/Dir of Travel:	[illegible]
Weaving Location:	[illegible]
Jurisdiction:	
Analysis Year:	2036
Description:	[illegible]

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	807	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane [illegible]
Volume ratio, VR	0.24	
Weaving ratio, R	0.22	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	1805	44	147	558	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	501	11	41	155	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2046	50	167	632	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]
Number of lanes required for		

Minimum required operation, Nw (Exhibit 24-7)	[illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7)	[illegible]
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	47.19	mph
Weaving segment density, D	21.46	pc/mi/ln
Level of service, LOS	[illegible]	
Capacity of base condition, cb	[illegible]	pc/h
Capacity as a 15-minute flow rate, c	[illegible]	veh/h
Capacity as a full-hour volume, ch	[illegible]	veh/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	[illegible]	2800	[illegible]
Average flow rate (pcph/ln)	[illegible]	2350	[illegible]
Volume ratio, VR	[illegible]	[illegible]	[illegible]
Weaving ratio, R	0.12	N/A	[illegible]
Weaving length (ft)	[illegible]	2500	[illegible]

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.

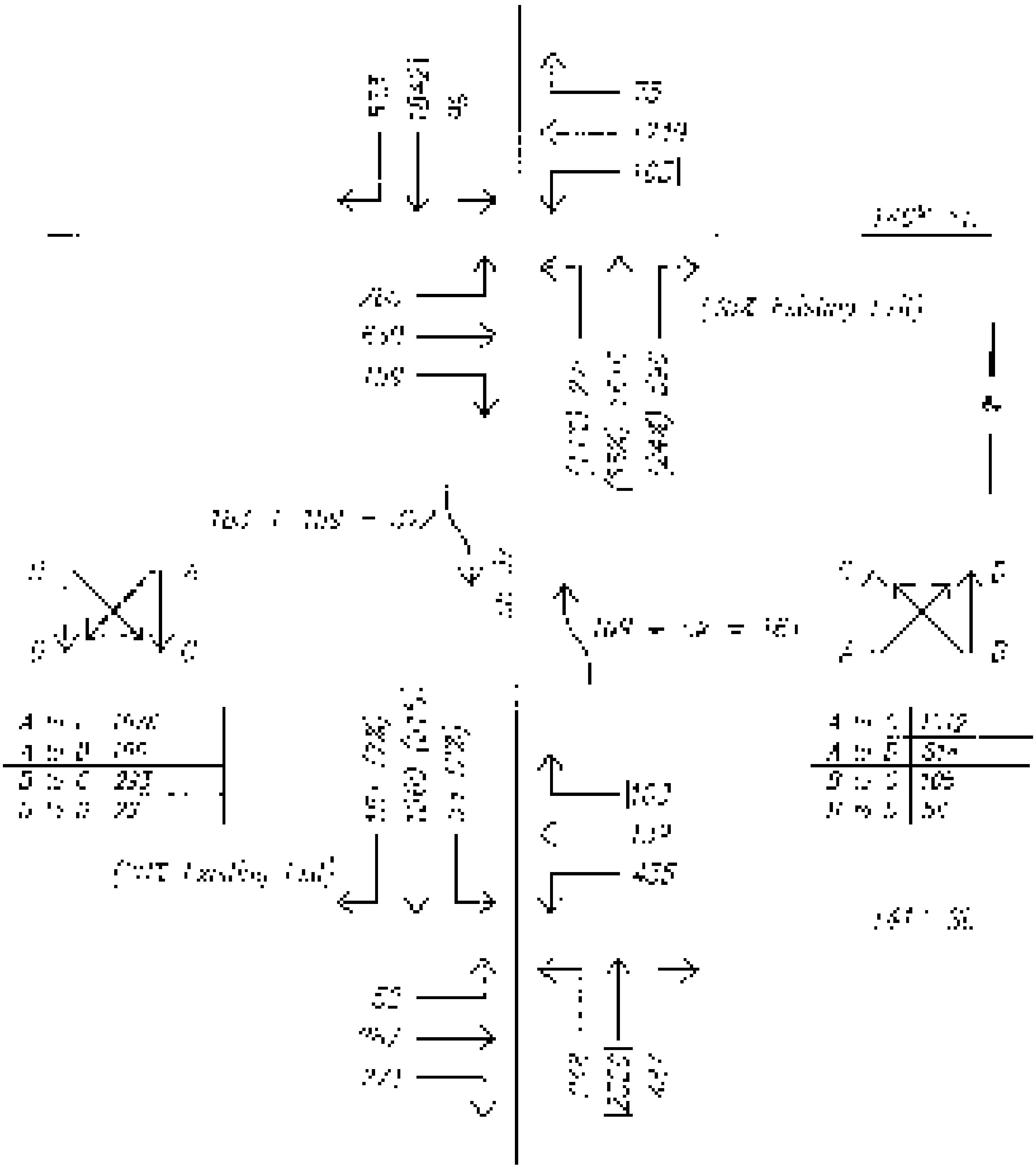
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: [illegible] pc/h (Type A), [illegible] (Type B), [illegible] (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than [illegible]. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.



Traffic Routing Diagram for Weave Analysis Between 141st and 146th Street Year 2036 Traffic Volumes (DHV)

Note: Volume numbers represent the peak hour (AM or PM) that would create the highest weaving condition.

HCS2000: Freeway Weaving Release [illegible]

Phone: Fax:
E-mail:

Operational Analysis

Analyst: DWT
Agency/Co.: Unitec
Date Performed: 8/15/2011
Analysis Time Period: PM Peak
Freeway/Dir of Travel: SR 37 NB
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: 2035
Description: SR 37 Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	3	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	[illegible]	
Weaving ratio, R	[illegible]	

Conversion to pc/h Under Base Conditions

	Non-Weaving V o1	Non-Weaving V o2	Weaving V w1	Weaving V w2	
Volume, V	[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	[illegible]	[illegible]	[illegible]	[illegible]	v
Trucks and buses	[illegible]	[illegible]	[illegible]		%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	[illegible]
b (Exhibit 24-6)	2.20	[illegible]
c (Exhibit 24-6)	[illegible]	[illegible]
d (Exhibit 24-6)	0.80	[illegible]
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for [illegible]

Unconstrained operation, Nw < Nw (max) (Exhibit 24-7)   1.15
Maximum number of lanes, Nw (max) (Exhibit 24-7)   1.40
Type of operation is   Unconstrained

__________Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	[illegible]	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	4647	pc/h
Capacity as a 15-minute flow rate, c	3987	veh/h
Capacity as a full-hour volume, ch	[illegible]	veh/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note: Maximum	Note
Weaving flow rate, Vw	1032	2800	a
Average flow rate (pcphpl)	[illegible]	2350	b
Volume ratio, VR	[illegible]	0.45	c
Weaving ratio, R	[illegible]	N/A	d
Weaving length (ft)	[illegible]	2500	-

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.

e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS2000: Freeway Weaving Release 4.1f

Phone: Fax:
E-Mail:

Operational Analysis

Analyst:	[illegible]
Agency/Co.:	United
Date Performed:	[illegible]
Analysis Time Period:	AM Peak
Freeway/Dir of Travel:	[illegible]
Weaving Location:	148th to 141st
Jurisdiction:	
Analysis Year:	[illegible]
Description:	SR [illegible] Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	[illegible]	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	[illegible]
Volume ratio, VR	0.21	
Weaving ratio, R	0.36	

Conversion to pc/h Under Base Conditions

	Non-Weaving V o1	Non-Weaving V o2	Weaving V w1	Weaving V w2	
	A-C	B-D	A-D	B-C	
Volume, V	[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	[illegible]	[illegible]	[illegible]	[illegible]	
Peak 15-min volume, v15	[illegible]	[illegible]	[illegible]	[illegible]	v
Trucks and buses	[illegible]	[illegible]	[illegible]	[illegible]	%
Recreational vehicles	[illegible]	[illegible]	[illegible]	[illegible]	%
Trucks and buses PCE, ET	[illegible]	[illegible]	[illegible]	[illegible]	
Recreational vehicle PCE, ER	[illegible]	[illegible]	[illegible]	[illegible]	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	[illegible]	[illegible]
b (Exhibit 24-6)	[illegible]	[illegible]
c (Exhibit 24-6)	[illegible]	[illegible]
d (Exhibit 24-6)	[illegible]	[illegible]
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]
Number of lanes required for [illegible]		

Unconstrained operation, Nw (Exhibit 24-7) 0.80
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

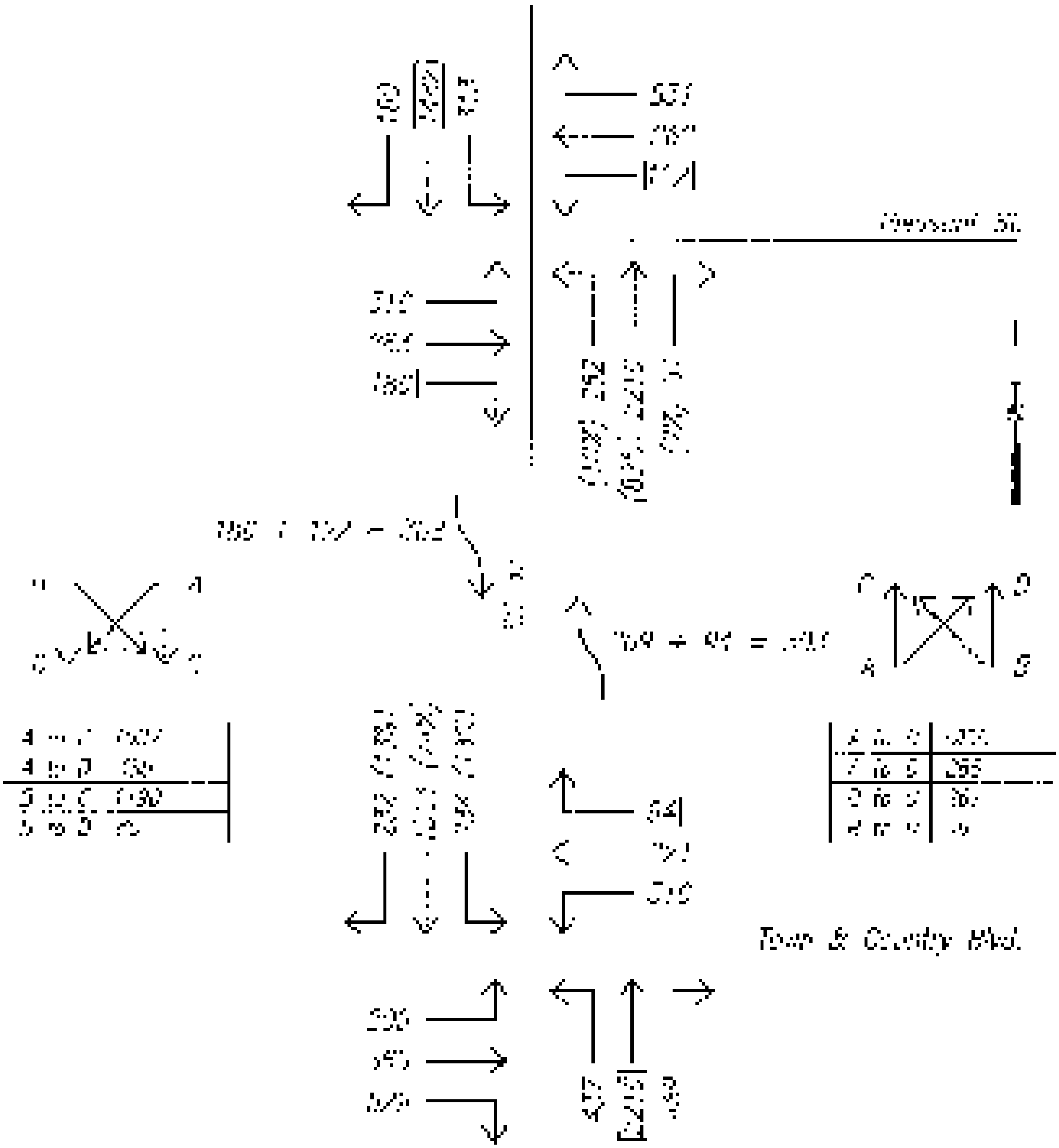
Weaving segment speed, S	42.07	mph
Weaving segment density, D	13.02	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	4547	pc/h
Capacity as a 15-minute flow rate, c	4135	pc/h
Capacity as a full-hour volume, ch	4017	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note
Weaving flow rate, Vw	572	4000	f
Average flow rate (pcphpl)	911	2350	b
Volume ratio, VR	0.21	0.80	h
Weaving ratio, R	0.37	N/A	i
Weaving length (ft)	600	2500	a

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.



Traffic Routing Diagram for Weave Analysis Between
Town & Country and Pleasant Street - Year 2036 Traffic Volumes (DHV)

Note: Volumes [illegible] the peak hour (AM or PM) [illegible] create the highest weaving conflict.

HCS2000: Freeway Weaving Release 4.1[illegible]

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: [illegible]
Analysis Time Period: [illegible] Peak
Freeway/Dir of Travel: SR 37 WB
Weaving Location: [illegible]
Jurisdiction:
Analysis Year: [illegible]
Description: [illegible] SR 37 Feasibility Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	[illegible]	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	[illegible]
Volume ratio, VR	0.21	
Weaving ratio, R	0.48	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	o1	o2	w1	w2	
Volume, V	[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	[illegible]	[illegible]	[illegible]	[illegible]	
Peak 15-min volume, v15	[illegible]	[illegible]	[illegible]	[illegible]	v
Trucks and buses	[illegible]	11	4	11	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	[illegible]	[illegible]
b (Exhibit 24-6)	[illegible]	[illegible]
c (Exhibit 24-6)	[illegible]	[illegible]
d (Exhibit 24-6)	[illegible]	[illegible]
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for

Unconstrained speed, Sw (Exhibit 24-7)　　[illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7)　　[illegible]
Type of operation is　　Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	57.31	mph
Weaving segment density, D	25.67	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	4095	pc/h
Capacity as a 15-minute flow rate, c	4058	pc/h
Capacity as a full-hour volume, ch	3850	pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note
Weaving flow rate, Vw	613	2800	a
Average flow rate (pcphpl)	958	2350	b
Volume ratio, VR	0.21	0.45	c
Weaving ratio, R	0.49	N/A	d
Weaving length (ft)	787	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Two-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: 8/[illegible]/2011
Analysis Time Period: PM
Freeway/Dir of Travel: [illegible]
Weaving Location: [illegible] St to [illegible]
Jurisdiction:
Analysis Year: 20[illegible]
Description: SR [illegible] Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	3	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.24	
Weaving ratio, R	0.37	

Conversion to pc/h Under Base Conditions

	Non-Weaving V (A-C)	Non-Weaving V (B-D)	Weaving V (A-D)	Weaving V (B-C)	
Volume, V	1037	86	385	226	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	[illegible]	22	107	63	v
Trucks and buses	3	4	5	[illegible]	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1249	96	438	256	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.[illegible]	0.[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for [illegible]

Number of weaving lanes, Nw (Exhibit 24-7)   [illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7)   [illegible]
Type of operation is   Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	18.[illegible]	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	[illegible]	pc/h
Capacity as a 15-minute flow rate, c	[illegible]	veh/h
Capacity as a full-hour volume, ch	[illegible]	veh/h

Limitations on Weaving Segments

		If Max Exceeded See Note	
	Analyzed	Maximum	Note
Weaving flow rate, Vw	[illegible]	2800	f
Average flow rate (pcphpl)	[illegible]	2350	[illegible]
Volume ratio, VR	[illegible]	[illegible]	[illegible]
Weaving ratio, R	[illegible]	N/A	[illegible]
Weaving length (ft)	[illegible]	2500	a

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.

e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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Phone: Fax:
E-mail:

Operational Analysis

Analyst:	[illegible]
Agency/Co.:	[illegible]
Date Performed:	[illegible]
Analysis Time Period:	[illegible]
Freeway/Dir of Travel:	[illegible]
Weaving Location:	[illegible]
Jurisdiction:	
Analysis Year:	[illegible]
Description: [illegible]	

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	[illegible]	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	[illegible]	
Volume ratio, VR	[illegible]	
Weaving ratio, R	[illegible]	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	[illegible]	[illegible]	[illegible]	[illegible]	
Volume, V	[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	[illegible]	[illegible]	[illegible]	[illegible]	
Peak 15-min volume, v15	[illegible]	[illegible]	[illegible]	[illegible]	v
Trucks and buses	[illegible]	[illegible]	[illegible]	[illegible]	%
Recreational vehicles	[illegible]	[illegible]	[illegible]	[illegible]	%
Trucks and buses PCE, ET	[illegible]	[illegible]	[illegible]	[illegible]	
Recreational vehicle PCE, ER	[illegible]	[illegible]	[illegible]	[illegible]	
Heavy vehicle adjustment, fHV	[illegible]	[illegible]	[illegible]	[illegible]	
Driver population adjustment, fP	[illegible]	[illegible]	[illegible]	[illegible]	
Flow rate, v	[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	[illegible]	[illegible]
b (Exhibit 24-6)	[illegible]	[illegible]
c (Exhibit 24-6)	[illegible]	[illegible]
d (Exhibit 24-6)	[illegible]	[illegible]
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]
Number of lanes required for		

Lanes required for unconstrained operation, Nw (Exhibit 24-7)   1.49
Maximum number of lanes, Nw (max) (Exhibit 24-7)   1.40
Type of operation is   Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	12.99	pc/mi/ln
Level of service, LOS	[illegible]	
Capacity of base condition, cb	5752	pc/h
Capacity as a 15-minute flow rate, c	5658	veh/h
Capacity as a full-hour volume, ch	5204	veh/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	1716	2800	a
Average flow rate (pcphpl)	1342	2210	b
Volume ratio, VR	0.37	0.45	c
Weaving ratio, R	[illegible]	N/A	d
Weaving length (ft)	29[illegible]	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.

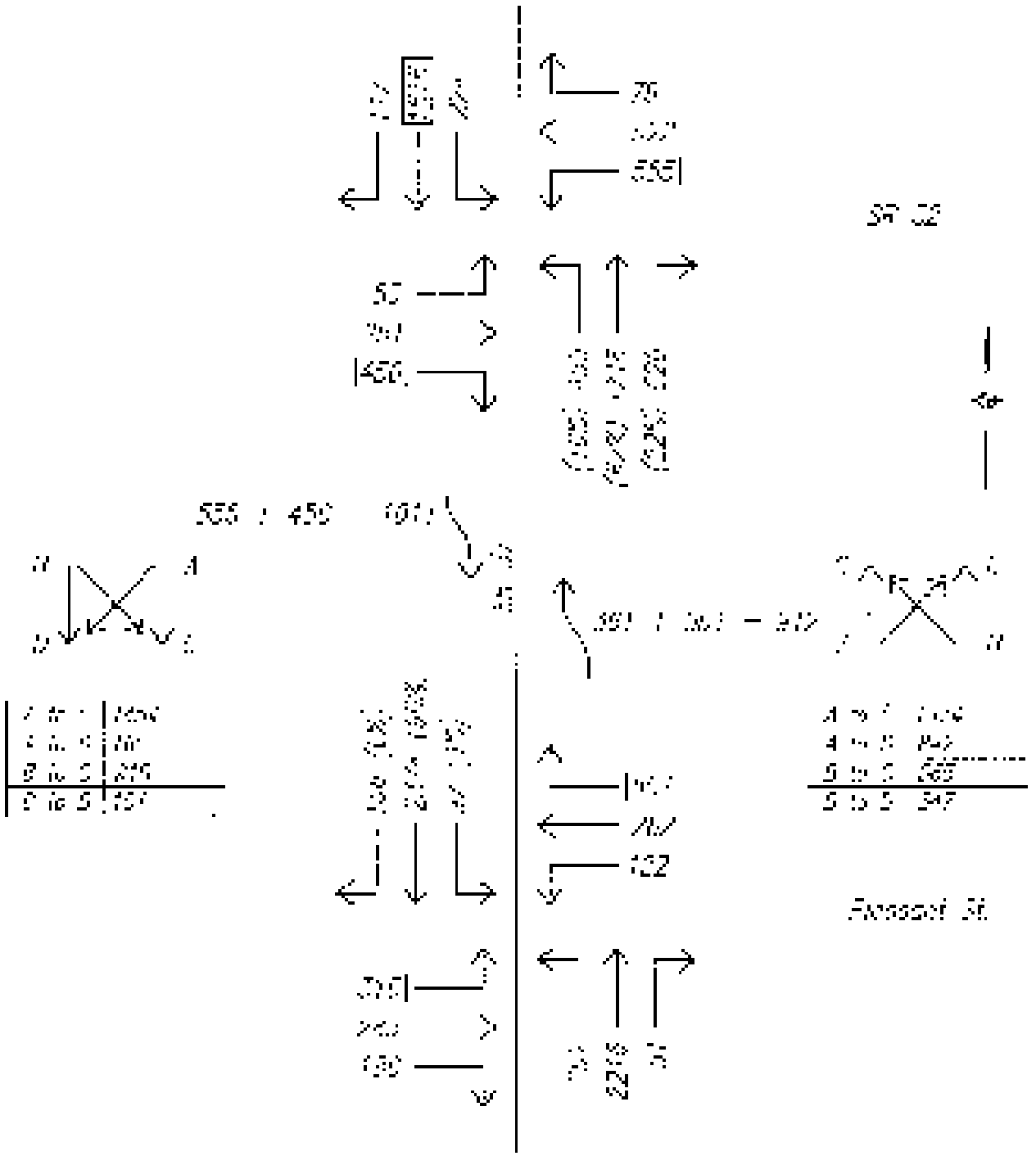
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.



Traffic Routing Diagram for Weave Analysis Between
Pleasant Street and Rt 22 - Year 2036 Traffic Volumes (DHV)

Note: Volumes shown represent the peak hour AM or PM, that would result in the highest weaving conflict.

Phone: Fax:
E-mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: United
Date Performed: 8/15/2011
Analysis Time Period: PM Peak
Freeway/Dir of Travel: SR 17 NB
Weaving Location: Pleasant Street to SR 32
Jurisdiction:
Analysis Year: 2030
Description: SR 17 Mobility Study

Inputs

Freeway free-flow speed, SFF	[illegible]	mph
Weaving number of lanes, N	[illegible]	
Weaving segment length, L	[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.4[illegible]	
Weaving ratio, R	0.4[illegible]	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V (o1)	V (o2)	V (w1)	V (w2)	
Volume, V	137[illegible]	[illegible]	[illegible]	[illegible]	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	382	[illegible]	[illegible]	157	v
Trucks and buses	[illegible]	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	[illegible]	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	15[illegible]	[illegible]	[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.1[illegible]	0.00[illegible]
b (Exhibit 24-6)	[illegible]	4.00
c (Exhibit 24-6)	[illegible]	1.30
d (Exhibit 24-6)	[illegible]	[illegible]
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for unconstrained operation, Nw (max) [illegible]

Unconstrained operation, Nw < Nw (max) [illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7) [illegible]
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	71.63	mph
Weaving segment density, D	57.55	pc/mi/ln
Level of service, LOS	[illegible]	
Capacity of base condition, cb	2641	pc/h
Capacity as a 15-minute flow rate, c	3364	pc/h
Capacity as a full hour volume, ch	3217	pc/h

Limitations on Weaving Segments

			If Max Exceeded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	1394	2800	a
Average flow rate (pcphpl)	1161	2350	b
Volume Ratio, VR	0.45	0.35	c
Weaving ratio, R	0.40	N/A	d
Weaving length (ft)	197	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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Phone: Fax:
E-Mail:

Operational Analysis

Analyst: [illegible]
Agency/Co.: [illegible]
Date Performed: 8/[illegible]/2011
Analysis Time Period: AM Peak
Freeway/Dir of Travel: [illegible]
Weaving Location: SR 92 to Pleasant St
Jurisdiction:
Analysis Year: 2035
Description: SR 92 Mobility Study

Inputs

Freeway free-flow speed, SF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1[illegible]	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.21	
Weaving ratio, R	0.1[illegible]	

Conversion to pc/h Under Base Conditions

	Non-Weaving V(o1)	Non-Weaving V(o2)	Weaving V(w1)	Weaving V(w2)	
	A-C	B-D	A-D	B-C	
Volume, V	1454	101	132	310	veh/h
Peak-hour factor, PHF	0.9[illegible]	0.9[illegible]	0.9[illegible]	0.9[illegible]	
Peak 15-min volume, v15	[illegible]	28	[illegible]	[illegible]	v
Trucks and buses	2	[illegible]	4	[illegible]	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.99[illegible]	0.9[illegible]	0.980	0.9[illegible]	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1645	11[illegible]	1[illegible]	[illegible]	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0[illegible]
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	[illegible]	[illegible]
Weaving and non-weaving speeds, Si	[illegible]	[illegible]

Number of lanes required for

Number of lanes required for unconstrained operation, Nw (Exhibit 24-7) [illegible]
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	[illegible]	mph
Weaving segment density, D	[illegible]	pc/mi/ln
Level of service, LOS	[illegible]	
Capacity of base condition, cb	[illegible]	pc/h
Capacity as a 15-minute flow rate, c	[illegible]	pc/h
Capacity as a full-hour volume, ch	[illegible]	pc/h

Limitations on Weaving Segments

		If Max Exceeded See Note	
	Analyzed	Maximum	Note
Weaving flow rate, Vw	1224	2800	a
Average flow rate (pcphpl)	[illegible]	2350	b
Volume ratio, VR	0.41	[illegible]	c
Weaving ratio, R	0.11	N/A	d
Weaving length (ft)	[illegible]	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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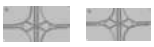
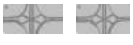
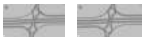
M E M O R A N D U M

DATE: November 13, 2012
TO: Brian Craig, PE; Devin Stettler, AICP
FROM: Ting Wei, PE, PTOE, AICP
RE: Traffic Simulation for SR 37 Mobility Study
CC: Clint Sparks, PE; Jeromy Grenard, PE, PTOE

Introduction

This memorandum has been prepared to summarize a traffic simulation performed by American Structurepoint, Inc. as part of the SR 37 Mobility Study. The traffic simulation focused on the roundabout traffic operations at the proposed interchanges along SR 37 from 126th Street to SR 32 in Hamilton County, Indiana. This memorandum is intended to be a supplement to the Traffic Operations Analysis report also prepared by American Structurepoint Inc. dated December 9, 2011.

The proposed roundabout interchanges included in the traffic simulations are:

- SR 37 and 126th Street 
- SR 37 and 131st Street 
- SR 37 and 135th Street 
- SR 37 and 141st Street 
- SR 37 and 146th Street (with the adjacent at-grade signal at Herriman Blvd) 
- SR 37 and Greenfield Avenue 
- SR 37 and Town & Country Blvd 
- SR 37 and Pleasant Street 
- SR 37 and SR 32 (with the adjacent at-grade signal at Cumberland Road) 
- 146th Street and Allisonville Road 

Click icon to view simulation.

Methodology

The traffic simulation was performed using VISSIM (version 5.40). The process to develop the traffic simulation is summarized below:

- The simulation was performed using the year 2036 AM and PM peak hour traffic forecast provided by United Consulting.
- The VISSIM network elements were created based on the preliminary 2D design developed as part of the SR 37 Mobility Study, which are also consistent with the proposed roundabout lane configurations for Alternative 1 in the Traffic Operation Analysis report.
- The VISSIM network includes the SR 37 mainline segments, the proposed on and off ramps at the study interchanges, and the proposed roundabouts within the interchanges. The crossing streets at the study interchanges are typically modeled to the next adjacent intersection, or for the distance deemed necessary to avoid unrealistic driver behaviors. Two existing traffic signals at 146th Street and Herriman Boulevard and at SR 32 and Cumberland Road were included in the traffic simulation due to their close proximity to the proposed interchanges.
- To obtain an efficient simulation speed, the overall VISSIM network was split into two: one for SR 37 from 126th Street to 146th Street and 146th Street from Allisonville Road to SR 37; the other for SR 37 from Greenfield Avenue to SR 32. The study interchanges were then linked in each VISSIM network with corresponding vehicle inputs.
- Based on previous research at Carmel single-lane roundabouts, priority rules, rather than conflict areas, were used to model the yield control at roundabouts. The minimum gap time in priority rules was 2.5 seconds for the closest conflicting lane and was increased by half a second for each subsequent conflicting lane. The minimum gap time in priority rules was 1.8 second for the non-conflicting lane of a right-turn movement. The desired safety distance in the Wiedemann 74 car following model was reduced by 20%.

It is recognized that the performance measures provided by VISSIM can be significantly different than those in the Traffic Operations Analysis report where RODEL was used. As explained in the Traffic Operations Analysis report, The RODEL analysis uses the capacity models described in the first edition of the FHWA Roundabout Guide (2000), and such models are expected to be appropriate for regions where drivers are familiar with roundabouts. VISSIM is based on microscopic traffic simulation and does not have an underlying capacity model. Therefore, it was determined that the main purpose of the traffic simulation at the proposed roundabout

interchanges is for visual inspection of the traffic operations rather than collecting performance measures.

Screenshots of the VISSIM network are provided in **Appendix A**. Video clips showing the traffic simulation at individual study interchange are provided in the accompanying DVD.

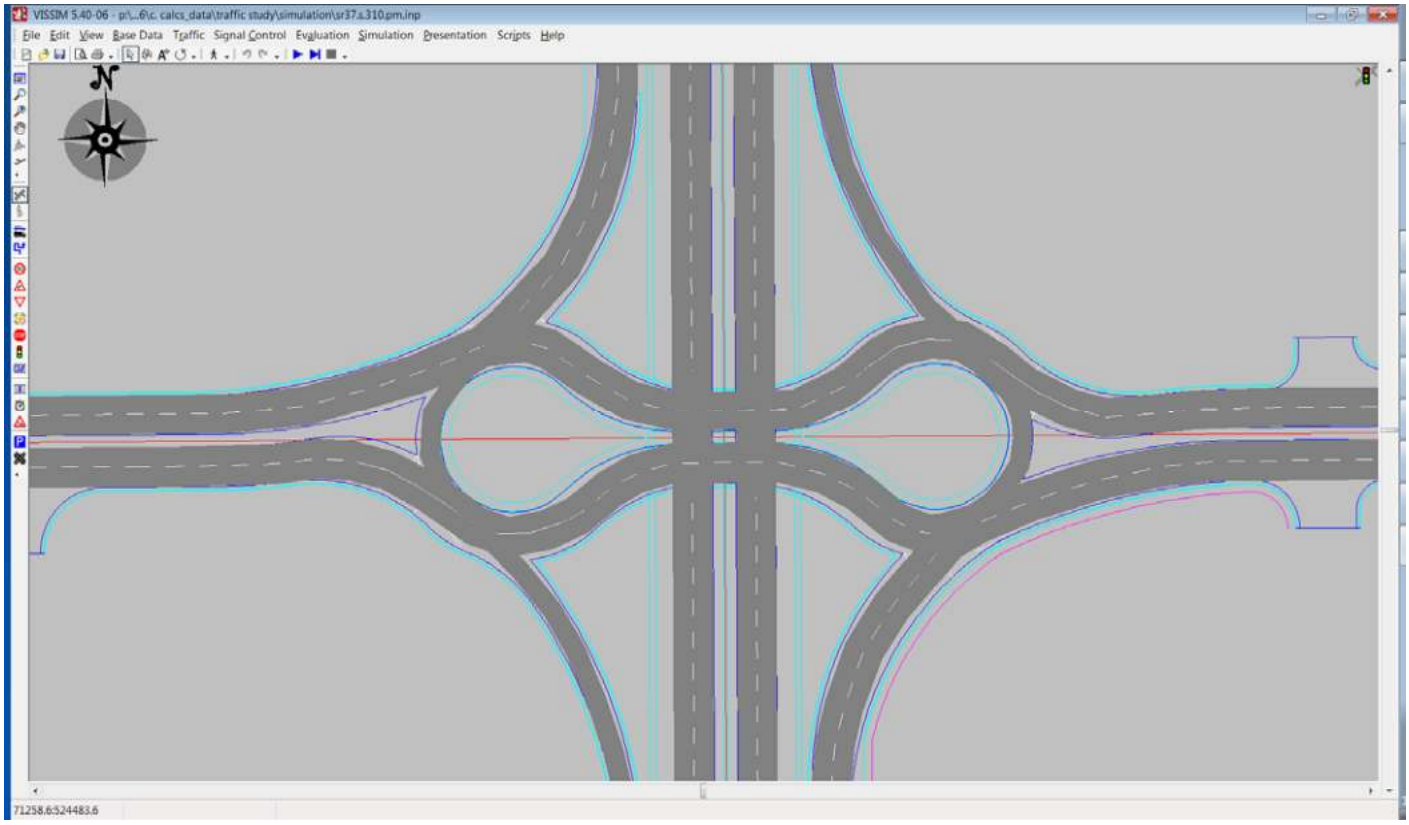
Findings

Based on the traffic simulation, all the study roundabout interchanges are expected to be functioning acceptably in the year 2036 AM and PM peak hours. The following observations are notable:

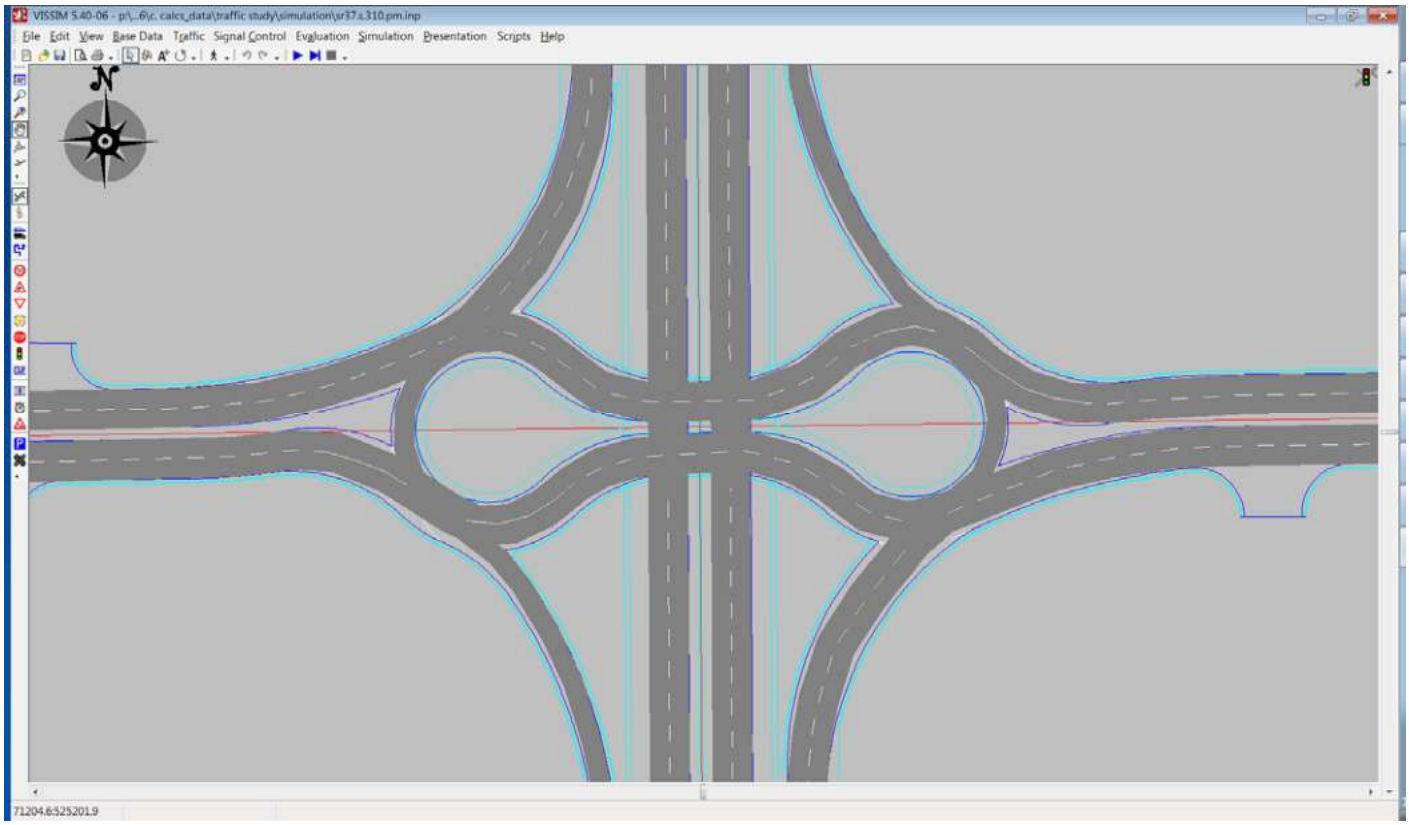
- The proposed interchange at SR 37 and 146th Street and the proposed interchange at SR 37 and SR 32 appear to be the two busiest interchanges.
    - At the SR 37 and 146th interchange, the traffic on the off ramp approaches will experience delay due to the heavy through traffic on 146th Street. The traffic simulation has shown that the adjacent signal at 146th Street and Herriman Boulevard will help to create usable vehicular gaps in the eastbound 146th Street traffic, benefiting the northbound off ramp traffic. The existing signal at 146th Street and Cumberland Road, further away from the interchange, is expected to have a similar but smaller effect on the westbound 146th Street traffic.
    - At the SR 37 and SR 32 interchange, a collector/distributor system has been proposed to eliminate weaving movements along the SR 37 mainline. The collector/distributor system will significantly increase the traffic on the off ramp approaches and through the roundabouts, therefore the off-ramps are expected to experience some delay. As the design of the interchange progresses, it is recommended that the designer evaluate options to reduce the delay on the off-ramp approaches.
- The traffic simulation has included two existing signals at 146th Street and Herriman Boulevard and at SR 32 and Cumberland Road due to their interactions with the proposed interchanges. While the signals may offer benefits such as creating usable vehicular gaps, the primary concern for signals close to roundabouts are the vehicle queues generated during the red portion of the signal cycle and the limited storage distance between the intersections. With optimized signal timings at these signals, the traffic simulation has shown that vehicle queues are not expected to extend into the roundabout interchanges. The only recommended change at these two signals is to prohibit eastbound and westbound left-

turns at the intersection of SR 32 and Cumberland Road due to the lack of dedicated left-turn lanes on SR 32.

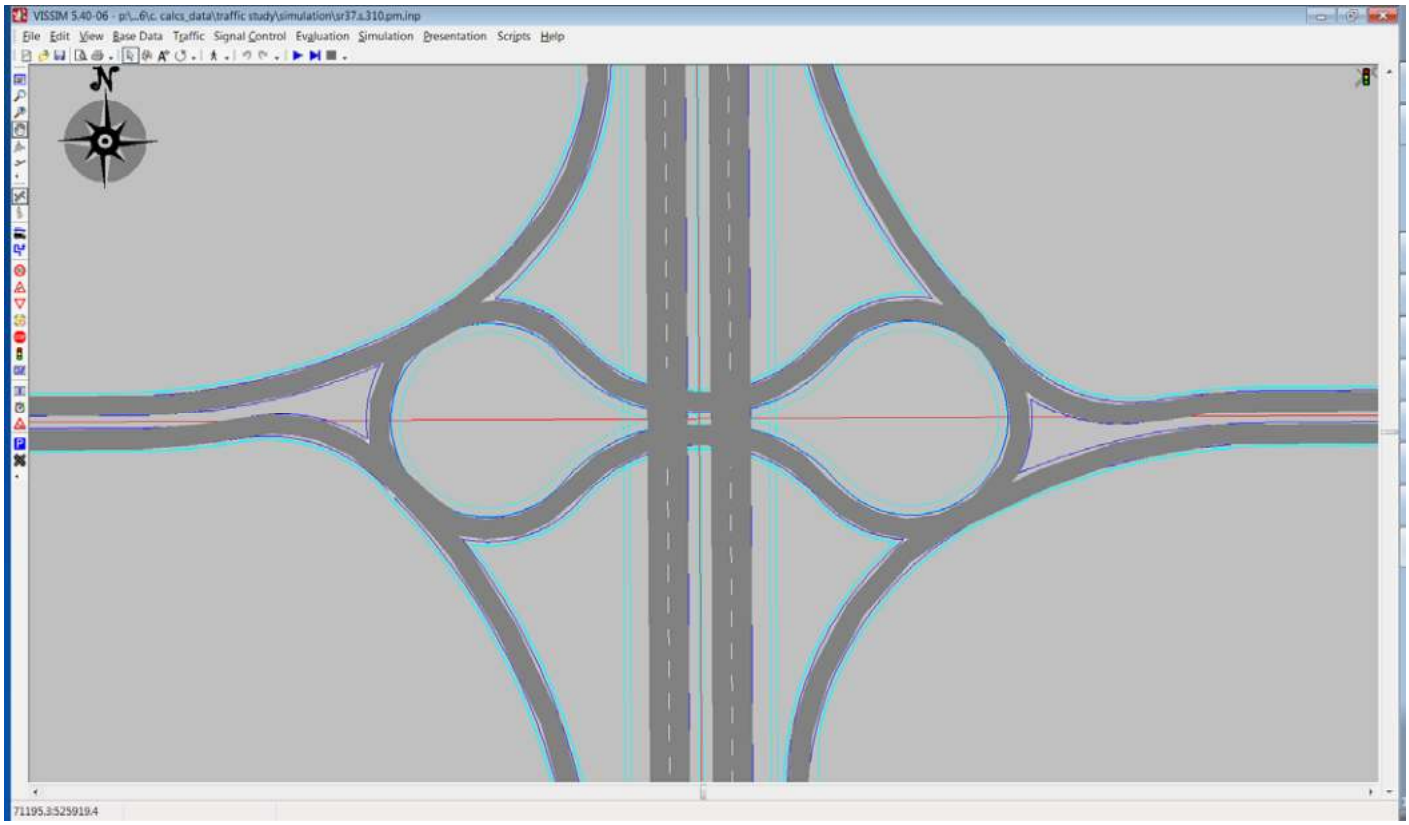
Appendix A Screenshots of VISSIM Network



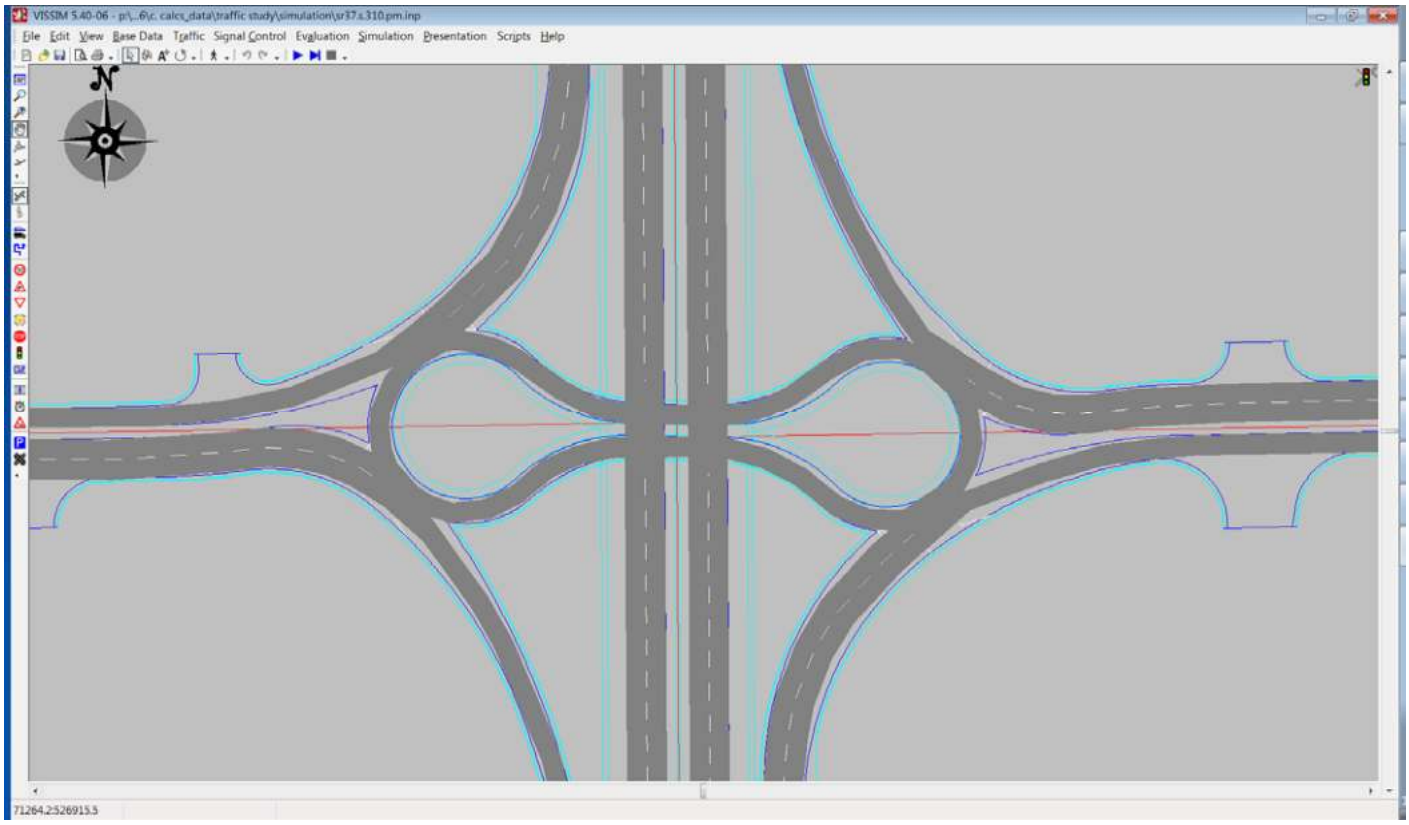
SR 37 and 126th Street



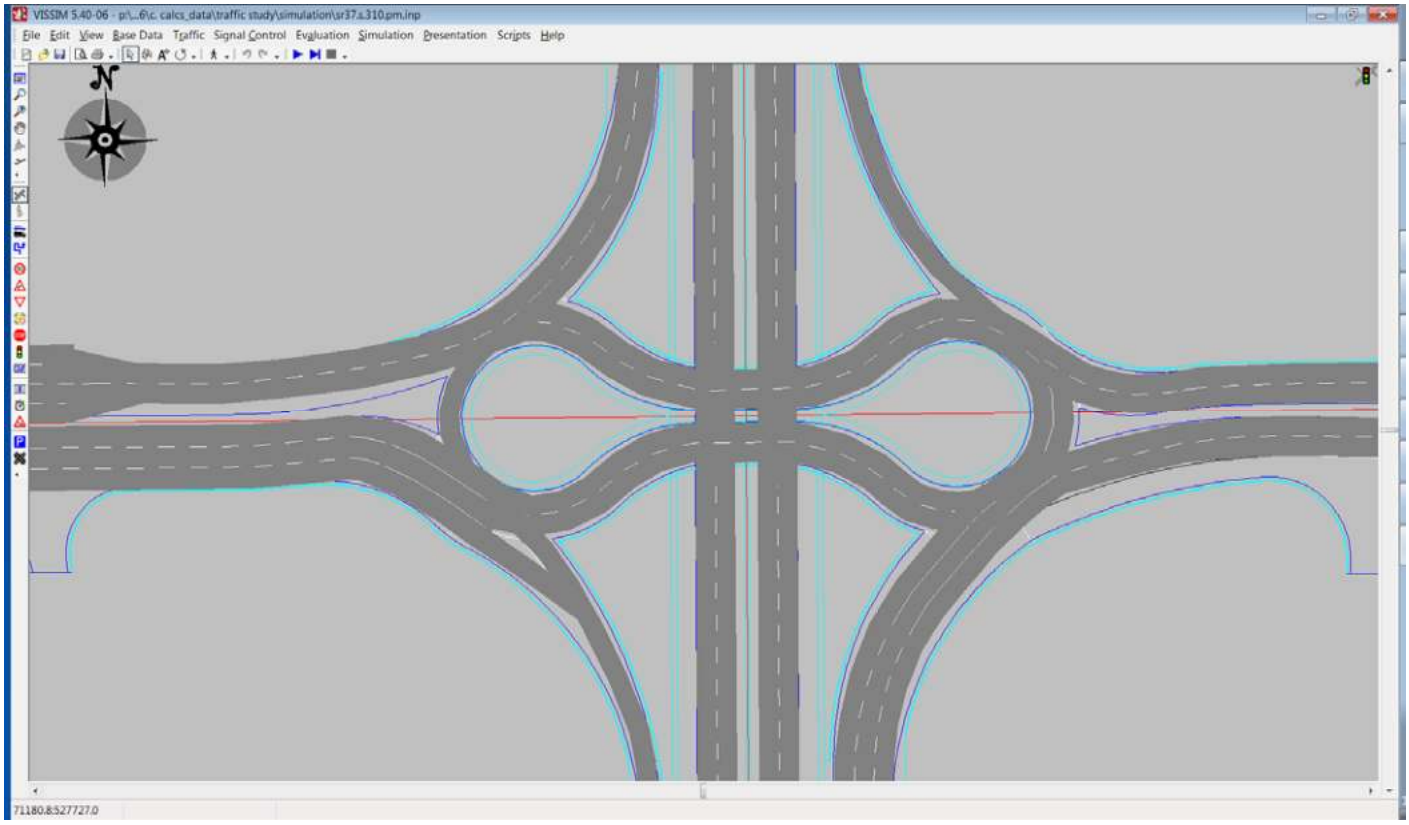
SR 37 and 131st Street



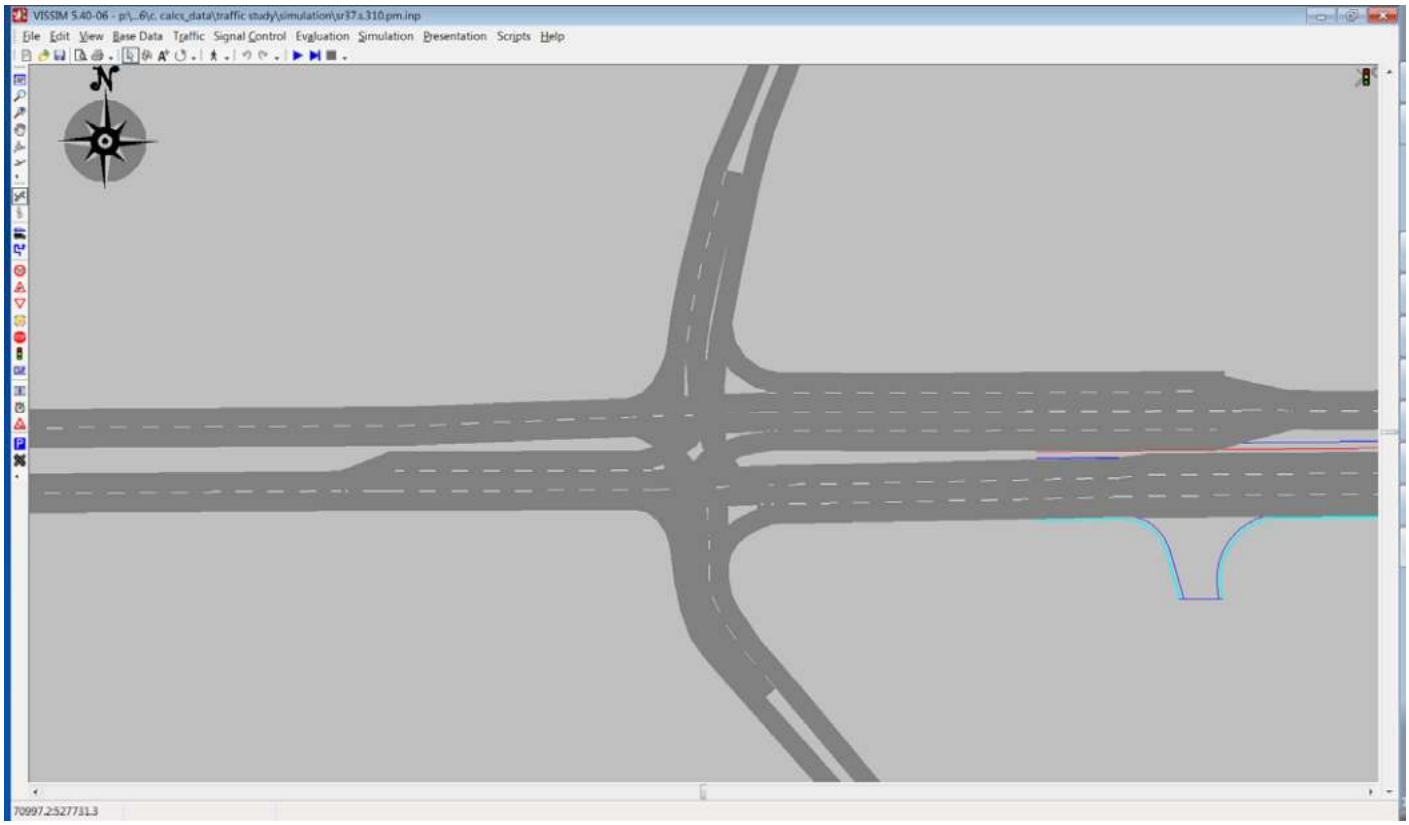
SR 37 and 135th Street



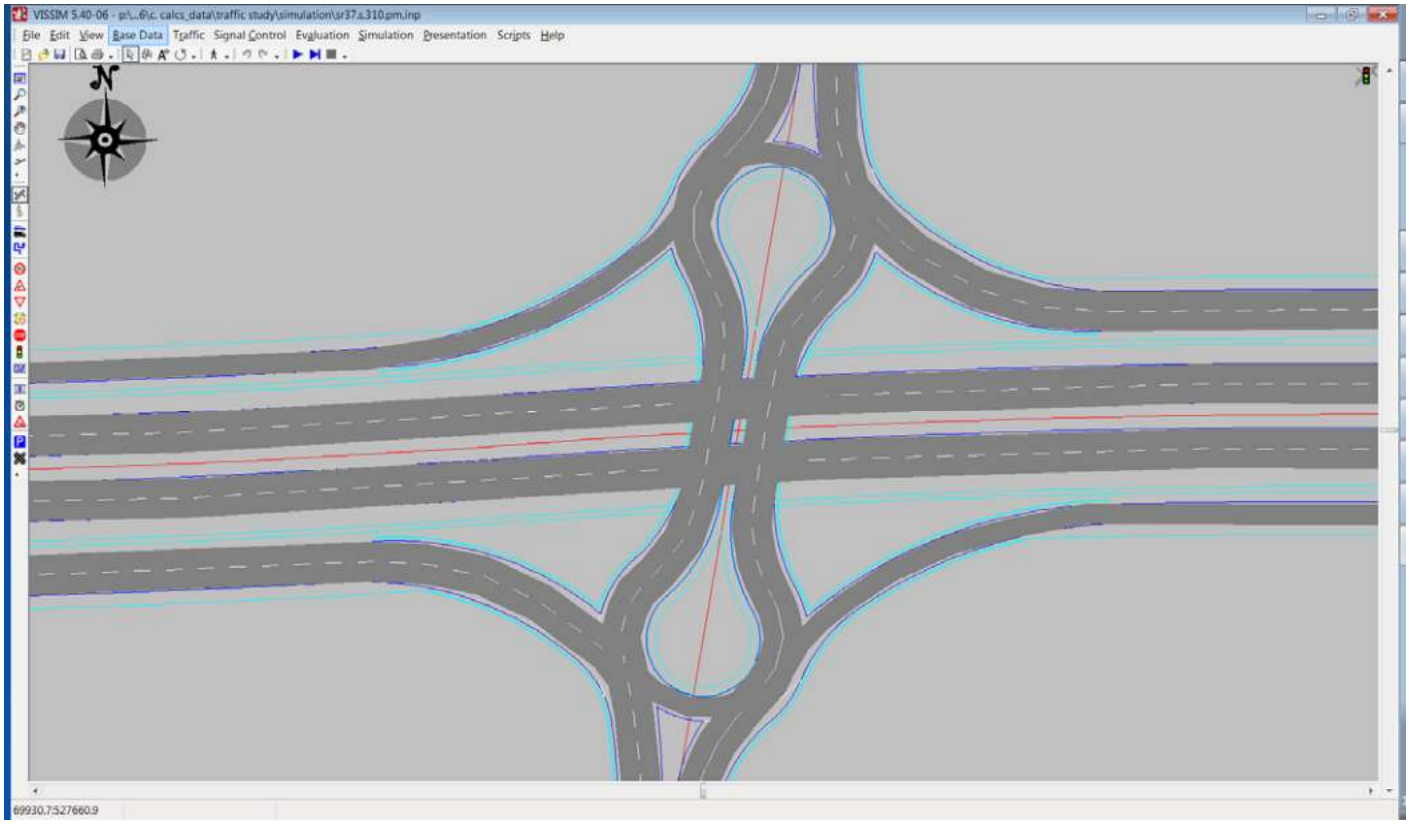
SR 37 and 141st Street



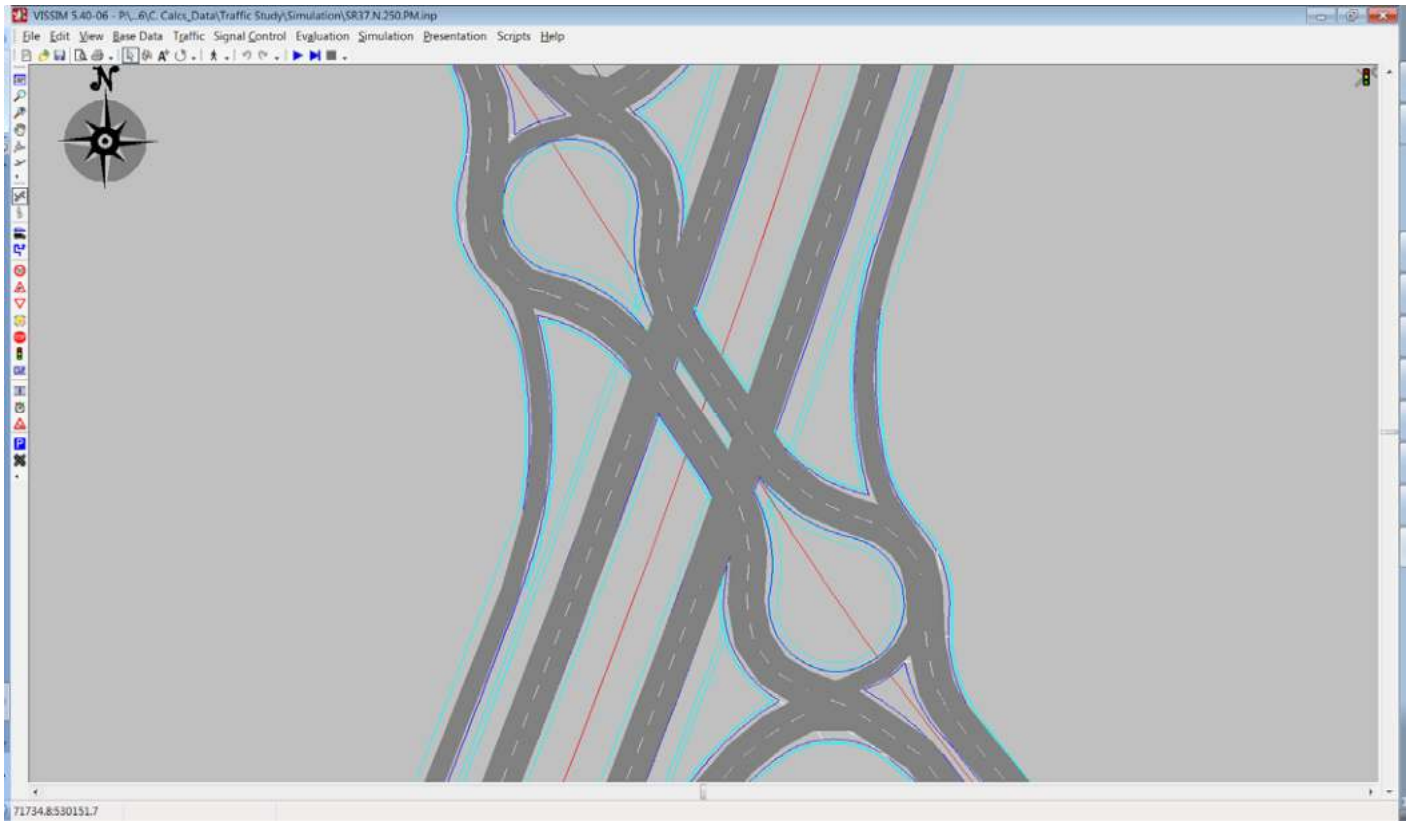
SR 37 and 146th Street



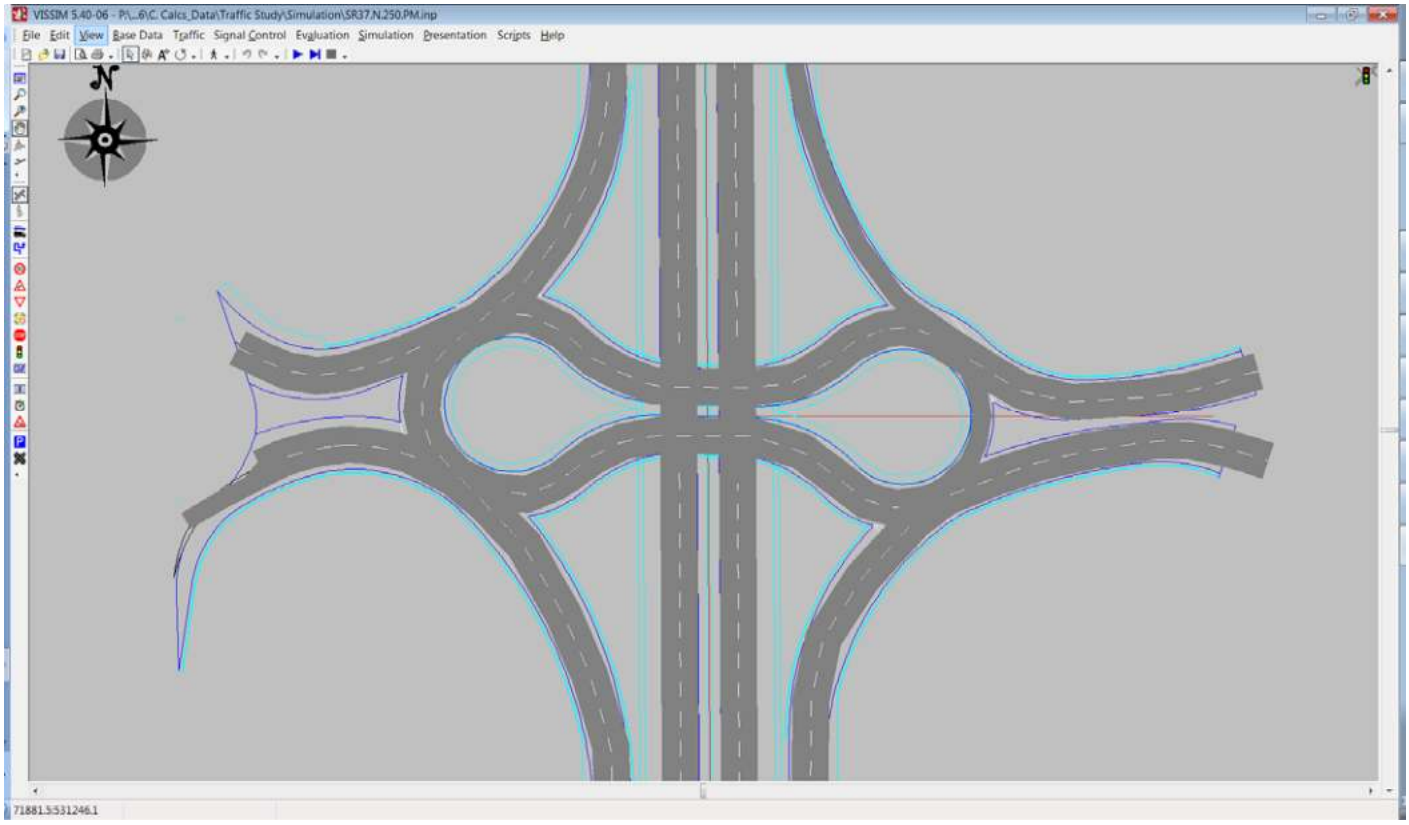
146th Street and Herriman Blvd



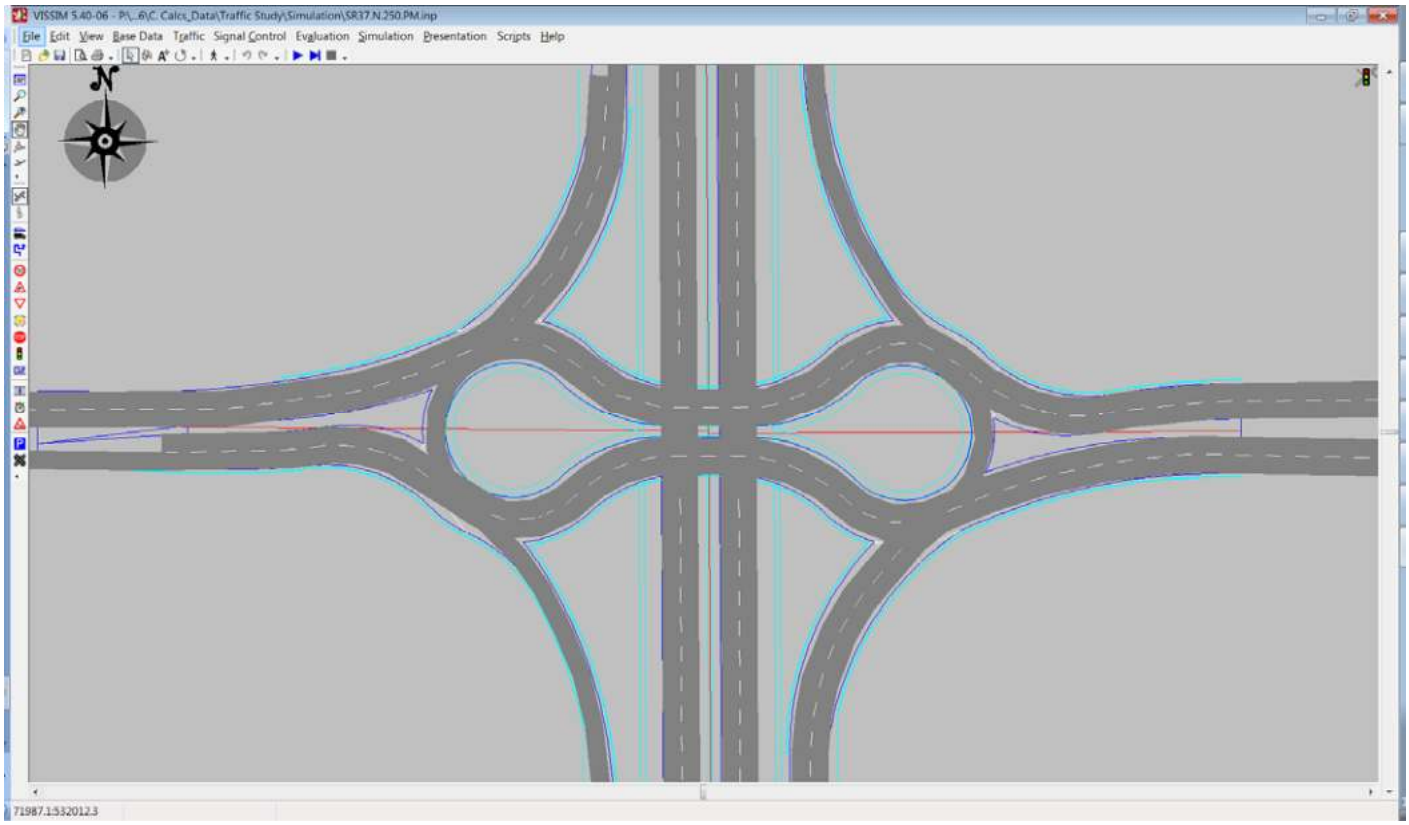
146th Street and Allisonville Road



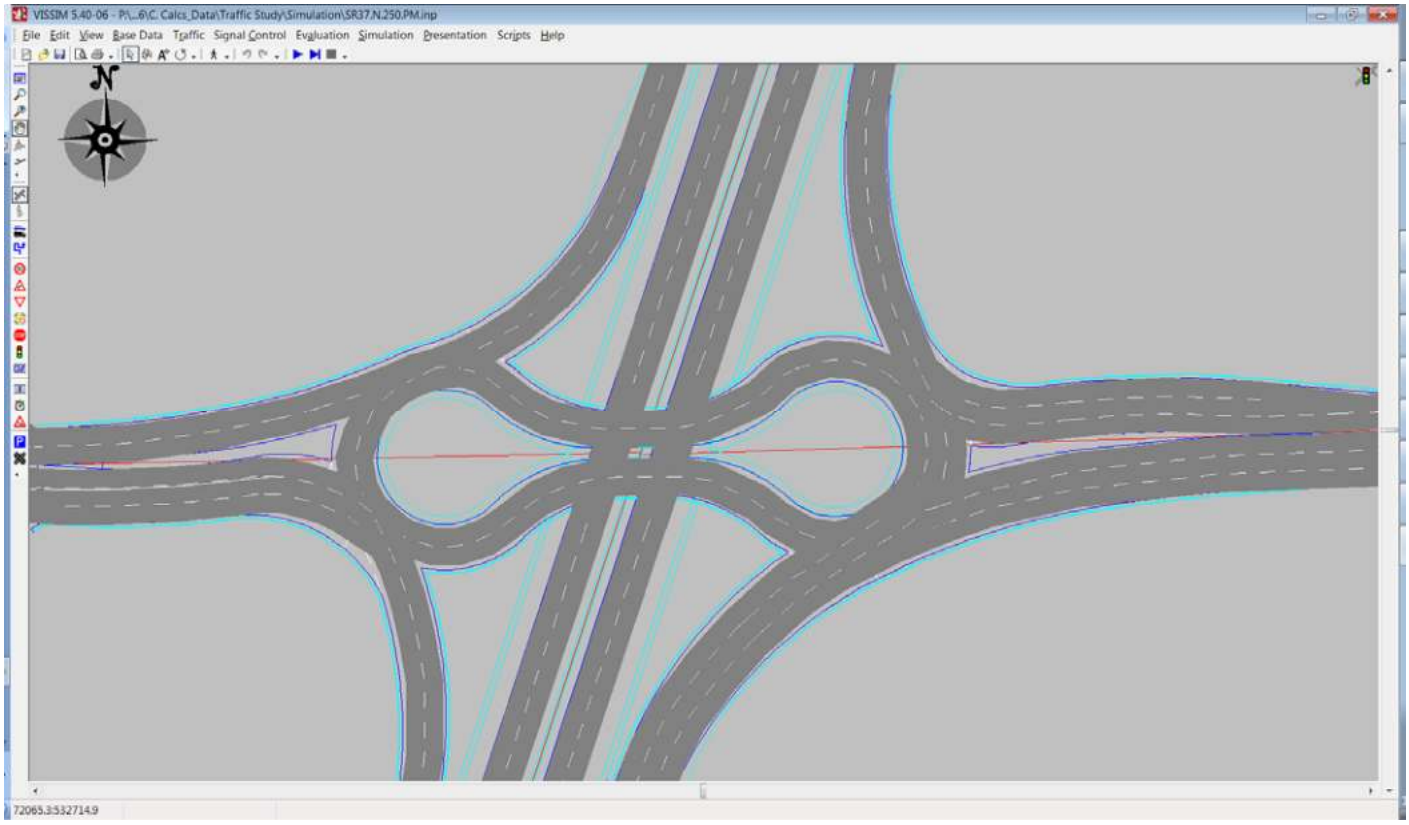
SR 37 and Greenfield Avenue



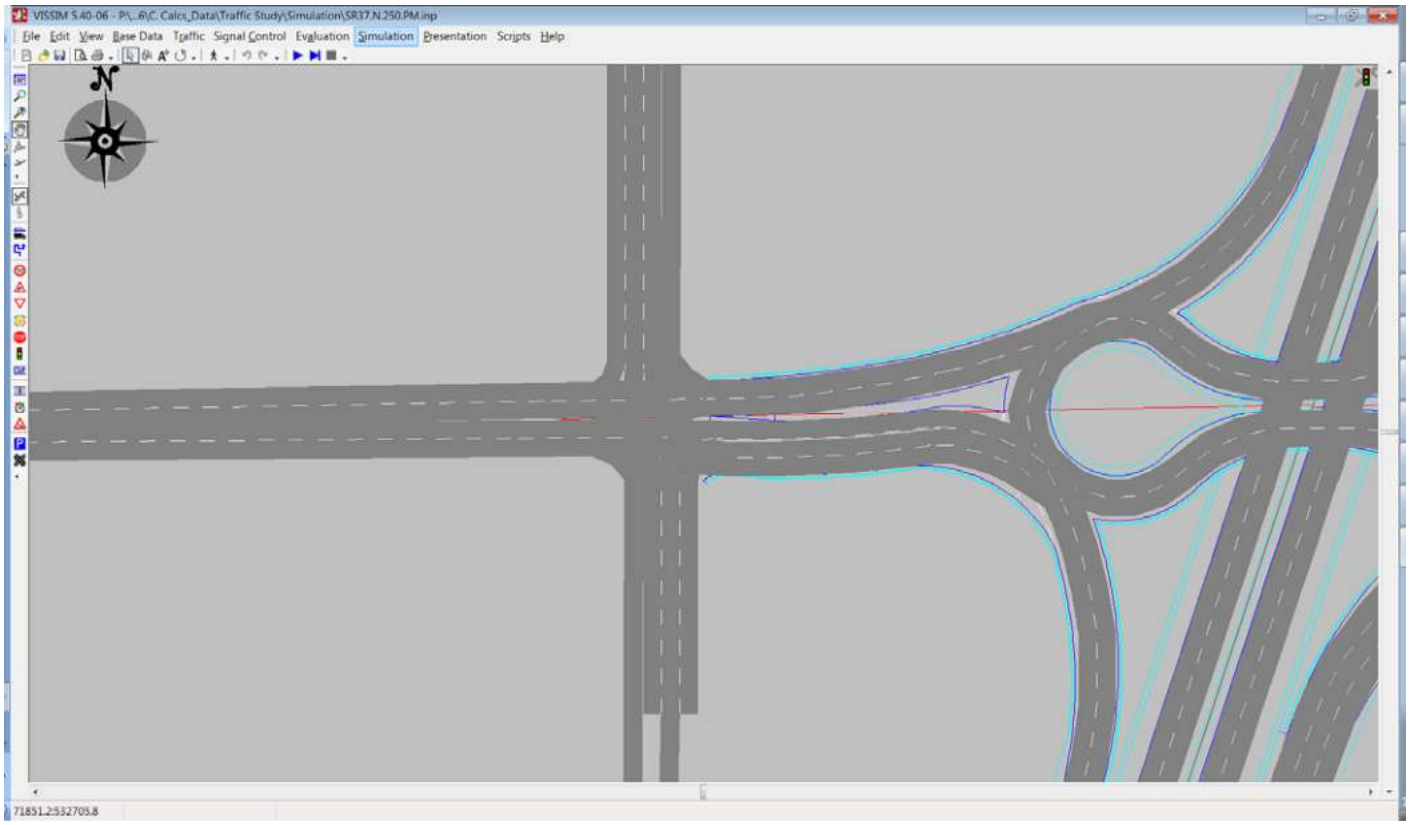
SR 37 and Town and Country Blvd



SR 37 and Pleasant Street



SR 37 and SR 32



SR 32 and Cumberland Road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