

# MEMORANDUM

**TO:** Wayne Zirolli, PE, Borough Engineer, Borough of Naugatuck  
Karen Svetz, PE, Regional Transportation Engineer, NVCOG

**FROM:** Kenny Cusano, PE, Weston & Sampson

**DATE:** February 21, 2019

**SUBJECT:** Rubber Avenue Reconstruction LOTCIP – Proposed Roundabout at Route 63

**cc:** A. Nafis, PE, Weston & Sampson  
L. Slonus, PE, PTOE, Weston & Sampson

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## Introduction

The purpose of this project is to reconstruct Rubber Avenue between the intersections of Melbourne Street and Elm Street in a contextually sensitive manner. The project includes full depth pavement reconstruction, sidewalk and crossing improvements, stormwater drainage improvements, and a proposed roundabout at the intersection of Rubber Ave and Route 63 (Cherry and Meadow Street), which is the subject of this memo. Rubber Ave is classified as an “Urban Collector” with a design speed of 35 mph, while Route 63 is classified as a “Principal Arterial”. Previously, the Rubber Ave and Route 63 intersection had been identified as a high frequency accident location and slated for traffic signal replacement under CTDOT SPN 0174-0419. This project is currently on hold for consideration of a roundabout rather than a new traffic signal.

## Traffic Volumes

An intersection analysis for Rubber Ave and Route 63 was completed based on traffic counts taken in December 2018, while schools were in session. Specifically, automatic traffic recorder counts were conducted along Rubber Avenue east of Andrew Avenue (approximately 1000 feet west of Route 63). The counts captured daily traffic volumes during a typical weekday and a typical Saturday. The resulting traffic counts indicated an Average Daily Traffic (ADT) volume of 12,726 vehicular trips. Intersection turning movement counts at project intersections were also conducted during the Weekday AM and PM peak period.

Design traffic volumes were developed for the years 2020 and 2040. A background growth rate of 0.5% per year was used to develop these future volumes. Additionally, future volumes anticipated to be generated by the potential redevelopment of the Risdon property (retail development across from Aetna Street) were included in the year 2040 design volumes. Traffic volume figures are attached.

## Operational Analysis

Project intersections were evaluated for Level of Service (LOS), capacity, and queuing using Synchro 10 software based on traffic volumes discussed above. This analysis formed the basis for proposed intersection improvements, approach lane configurations, and various roundabout design characteristics.

The intersection of Rubber Avenue and Route 63 (Cherry Street and Meadow Street) is a currently signalized and operates at a LOS C during the weekday AM and Saturday peak hours with 95-th percentile queues typically between 200 and 300 feet in length for through movements. Rubber Avenue left turn lane queues ranged between 75 to 100-feet for all study periods. During the weekday PM peak hour, the overall intersection operates at LOS D and over capacity. The northbound Route 63 through movement operates at LOS F. Queue lengths

(95<sup>th</sup> percentile) for the through movements during the weekday PM peak hour range from 225 to 300-feet, except for the northbound Route 63 through movement which has a longer queue of 550-feet.

Given future design volumes and existing signalized traffic control, the intersection degrades to LOS F during the year 2040 weekday PM peak hour and continues to operate over capacity. Queues increase in length for all study periods, with the longest queues experienced during the weekday PM peak hour. During the weekday PM peak hour, 95<sup>th</sup> percentile queue lengths for the through movements range from 250 to 375-feet, except for the northbound Route 63 through movement which has a longer queue of 625-feet.

With the Rubber Avenue Reconstruction LOTCIP project, construction of a single lane modern roundabout is proposed in place of the existing signalized intersection. With the exception of the Rubber Avenue eastbound approach, all approaches will provide a single lane. The Rubber Avenue eastbound approach will provide a separate right turn lane. The roundabout will improve intersection safety and address future capacity and queuing conditions.

Given the year 2020 build conditions, the roundabout is anticipated to operate with approach LOS of A and B during the weekday AM and Saturday midday peak hours. During the weekday PM peak hour, approach LOS range from A to D. There is reserve capacity during all year 2020 Build scenarios. Queue lengths are greatly reduced compared to signalization. The highest 95<sup>th</sup> percentile queue experienced is 125-feet, and is experienced during the weekday PM peak hour. During the weekday AM and Saturday midday peak hours, the highest 95<sup>th</sup> percentile queue experienced is 75-feet.

Given the year 2040 build conditions, the roundabout is anticipated to operate with approach LOS ranging from A to C during the weekday AM and Saturday midday peak hours. During the weekday PM peak hour, all approaches will operate at LOS D or better, with the exception of the Route 63 southbound approach which will operate at LOS E but under capacity (v/c of 0.88). Again, queue lengths are greatly reduced compared to signalization. The highest 95<sup>th</sup> percentile queue experienced is 250-feet, and is experienced during the weekday PM peak hour. During the weekday AM and Saturday midday peak hours, the highest 95<sup>th</sup> percentile queue experienced is 125-feet.

### **Crash Experience**

Accident data for the most recent three year period (2016, 2017, 2018) from the CT Crash Data Repository indicates that the intersection of Rubber Ave with Route 63 has experienced 23 crashes over the most recent three year period, of these 4 of included injuries. Crash patterns included 11 rear-ends, 5 angle crashes, 4 sideswipes, and 3 angle crashes involving nearby driveways. Crash data is attached.

FHWA lists modern roundabouts as a proven safety countermeasure to install at practical intersections and reduce crash severity. A roundabout will reduce speeds of vehicles, greatly reduce the number of conflict points, significantly reduce the chance for head-on and right-angle collisions, and provide safer conditions for pedestrians to navigate. The roundabout will also facilitate smooth flow of traffic into and through the intersections reducing the occurrence of rear-end type accidents. Safety is also improved by reducing potential crashes due to the elimination of left turn movements at a roundabout. Other benefits of a proposed roundabout include reduced overall pavement area at the intersection and lower future maintenance required compared to a signalized intersection.

### **Geometry and Rights of Way Impacts**

The proposed roundabout has an inscribed circle diameter of 104 feet, and an additional right turn lane at the Rubber Avenue eastbound approach. Based on the attached current conceptual design plan (see attached drawing HWY-3), there are no proposed Rights of Way impacts required for the construction of the roundabout, however, there is a potential for a minor defined sidewalk easement at the southeast corner of the roundabout due to the proximity of the property lines. The conceptual roundabout design accommodates SU-30 and WB-62 design vehicles as illustrated with drawing VEH-1, attached.

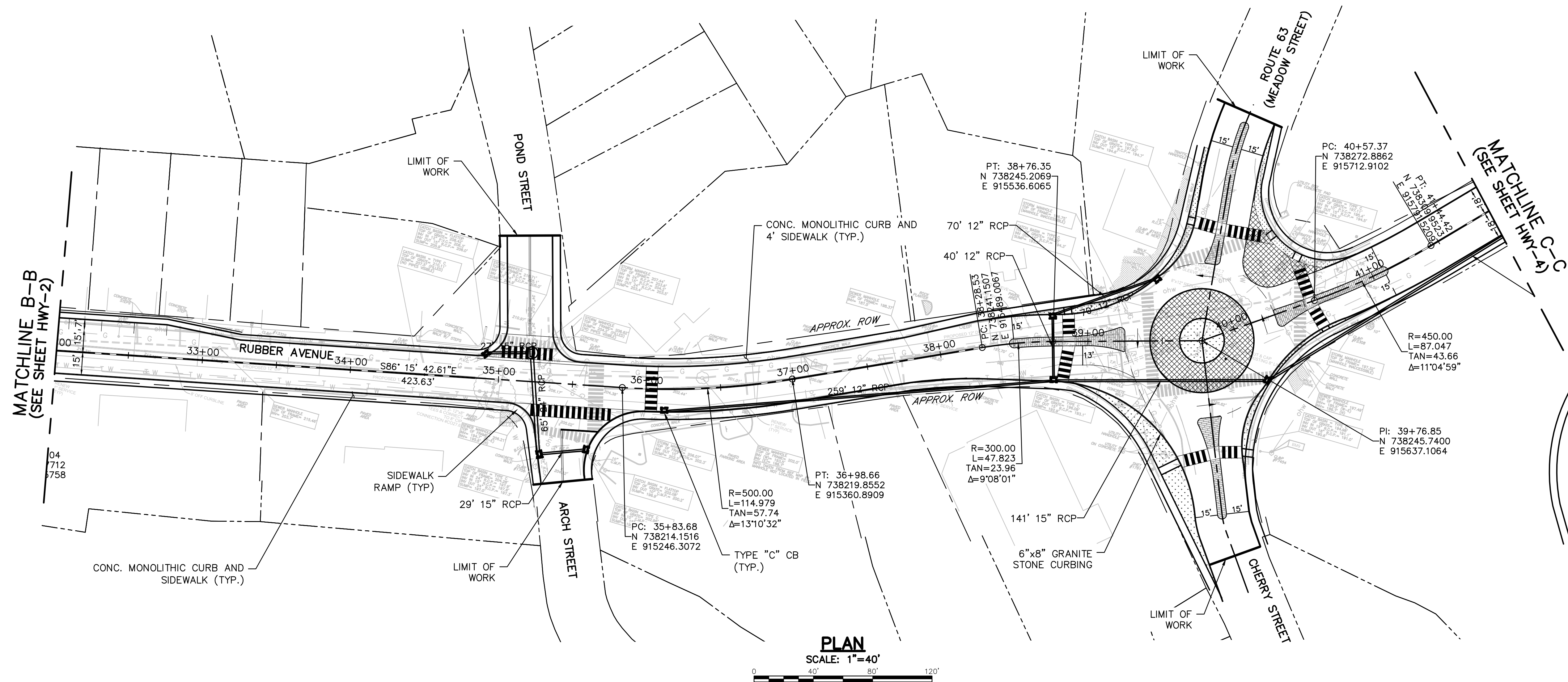
The roundabout requires the addition of splitter islands at the approaches to divide entering and exiting traffic and help calm traffic entering the intersection. The splitter island locations will affect three driveways adjacent to the intersection. These include two along the northerly leg of Route 63; the Dunkin Donuts exit only driveway (closest to the intersection on the southbound side within the northwest quadrant) and the Cumberland Farms full access driveway (closest to the intersection on the northbound side within the northeast quadrant). The third driveway is the pizza restaurant entrance only driveway located along the westerly Rubber Avenue leg of the intersection (closest driveway to the intersection on the westbound side within the northwest quadrant). The introduction of the splitter islands will limit access to rights-in and rights-out only. Vehicles previously turning left in or left out would need to complete a u-turn movement through the roundabout.

### **Conclusion**

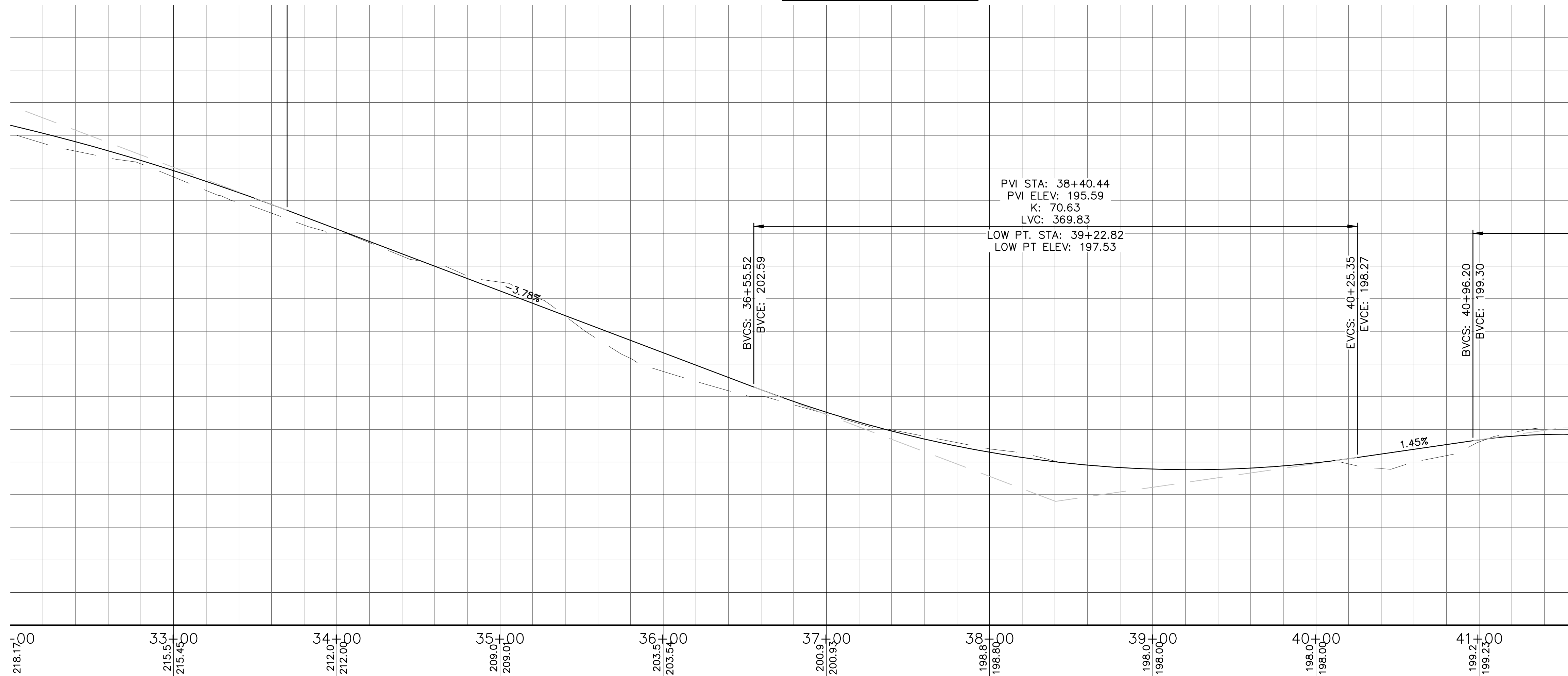
The borough of Naugatuck and Weston & Sampson respectfully request CTDOT review and consideration of replacement of the traffic signal at the intersection of Rubber Avenue and Route 63 with a modern roundabout.

### **Attachments:**

Concept Plan (drawing HWY-3)  
Vehicle Turning Plan (drawing VEH-1)  
Traffic Volumes  
Operational Analysis  
Crash Data



**PLAN**  
SCALE: 1"=40'



**CENTERLINE ROAD PROFILE**  
SCALE: 1"=40' HORZ, 1"=4' VERT



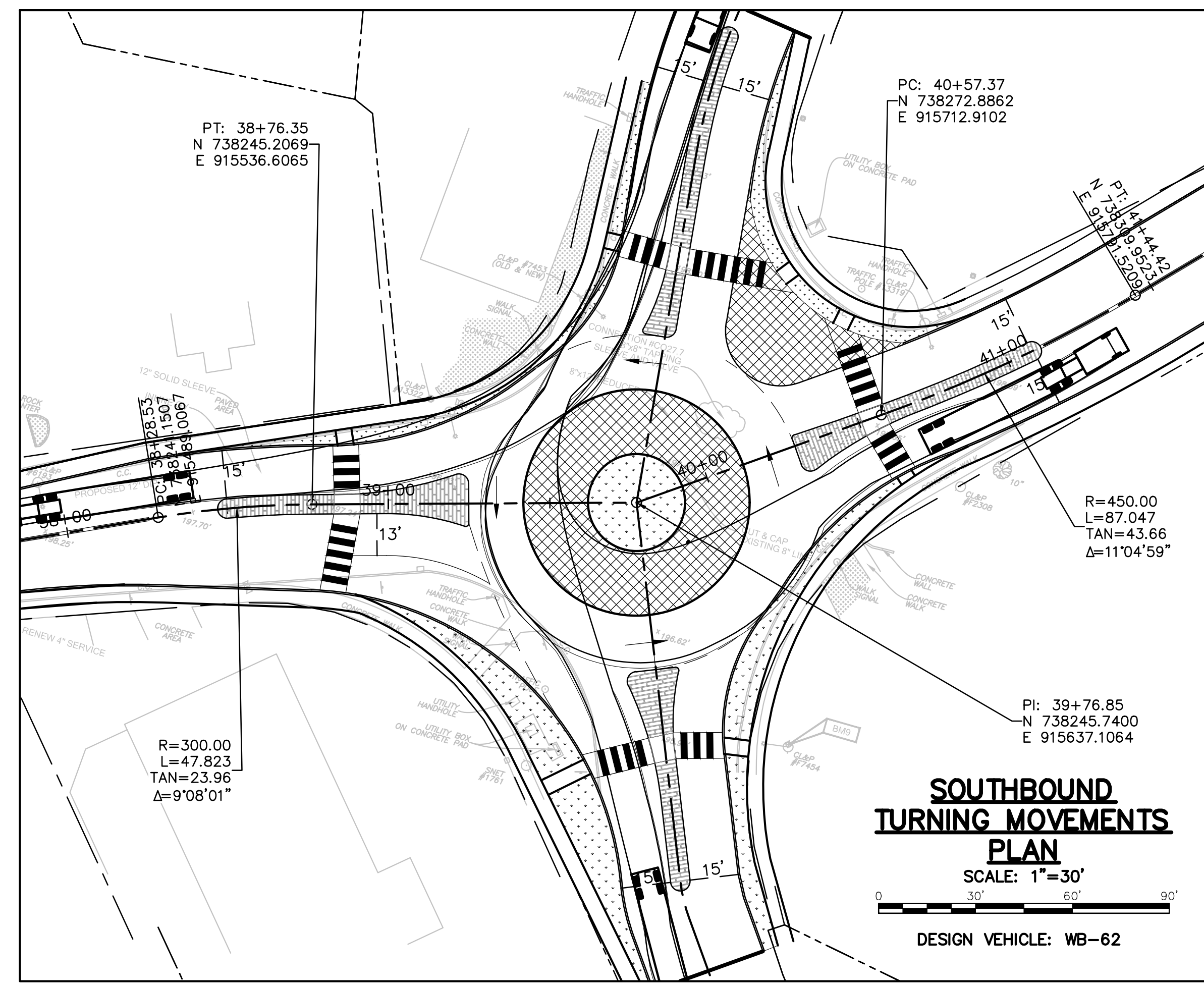
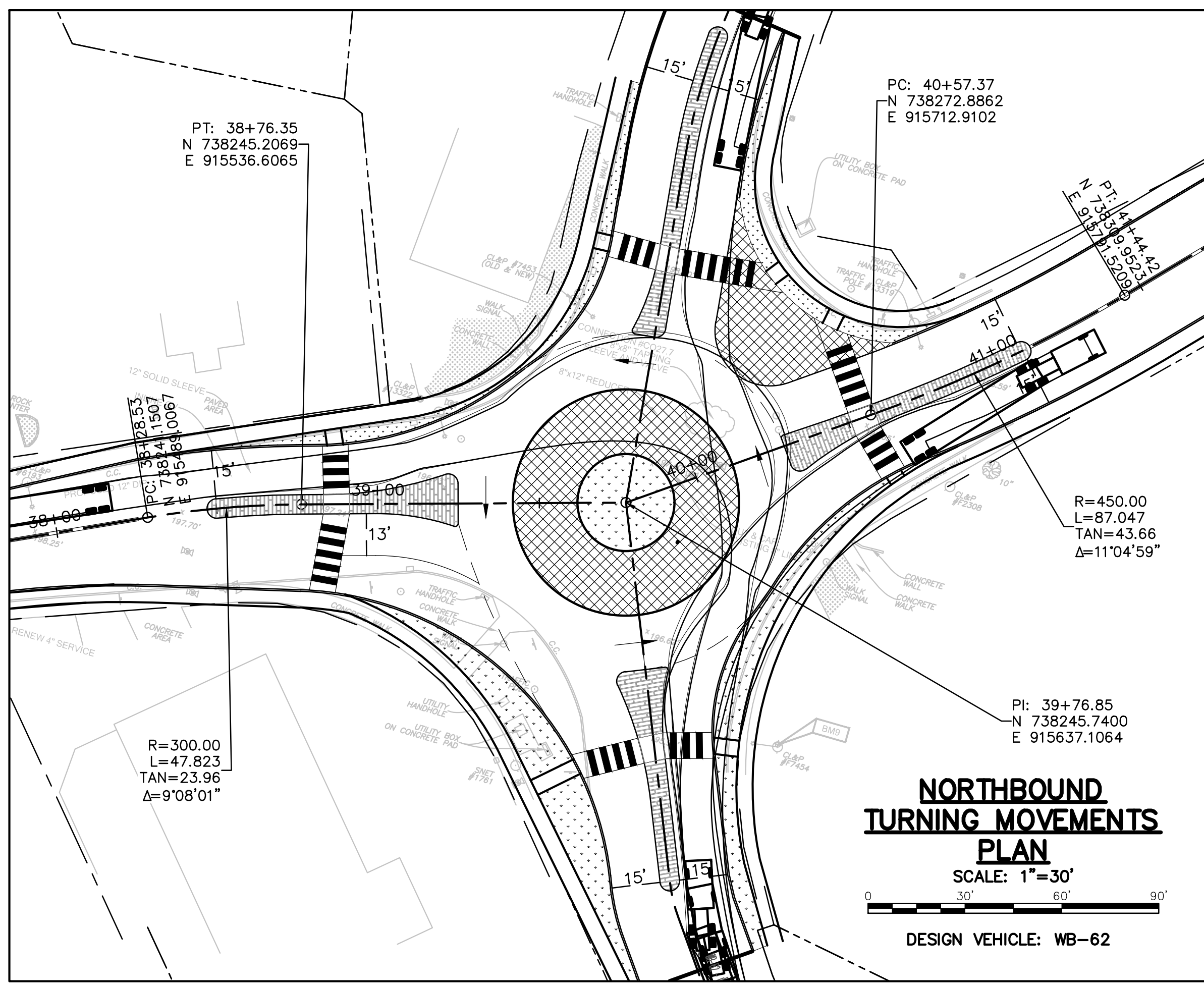
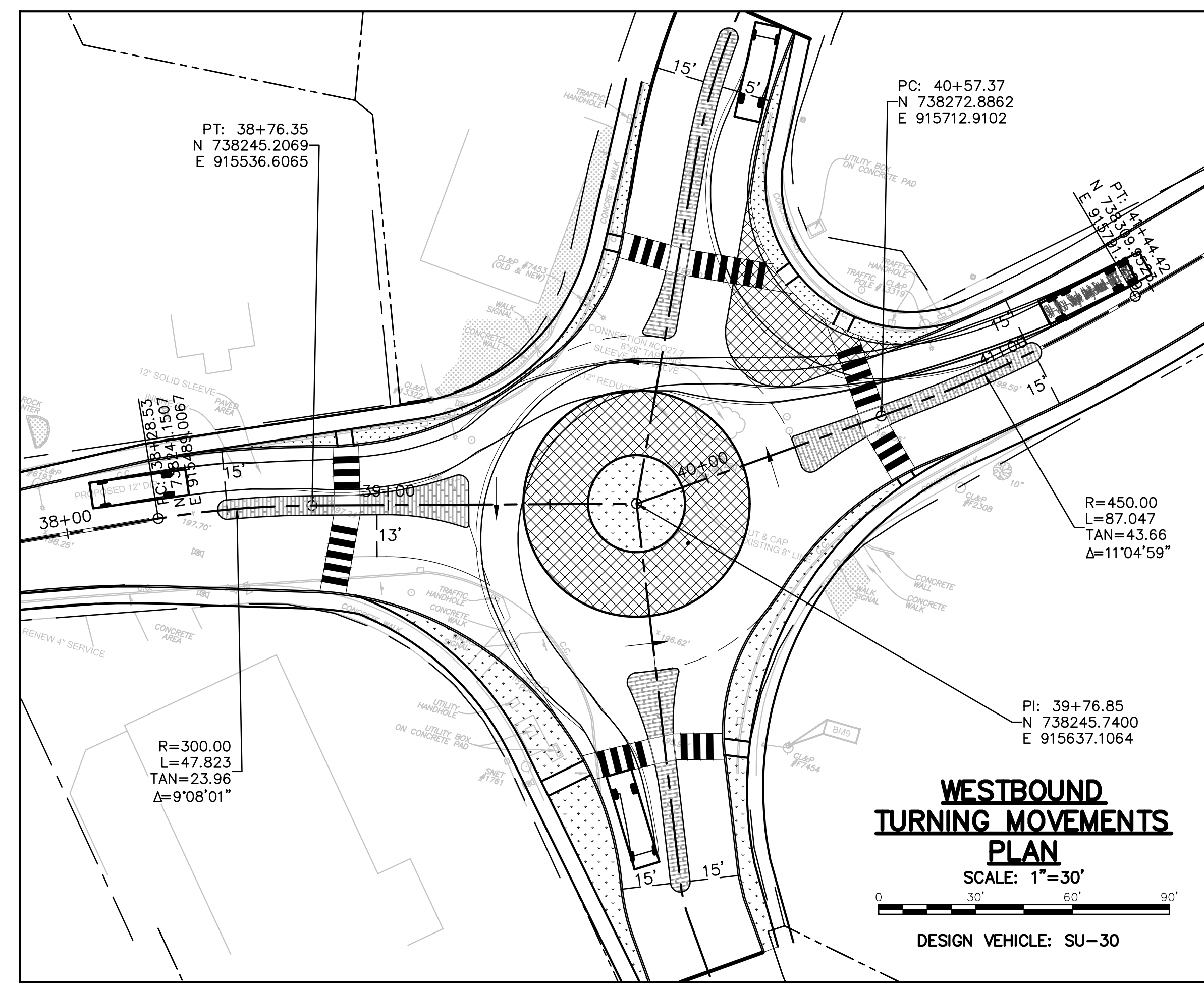
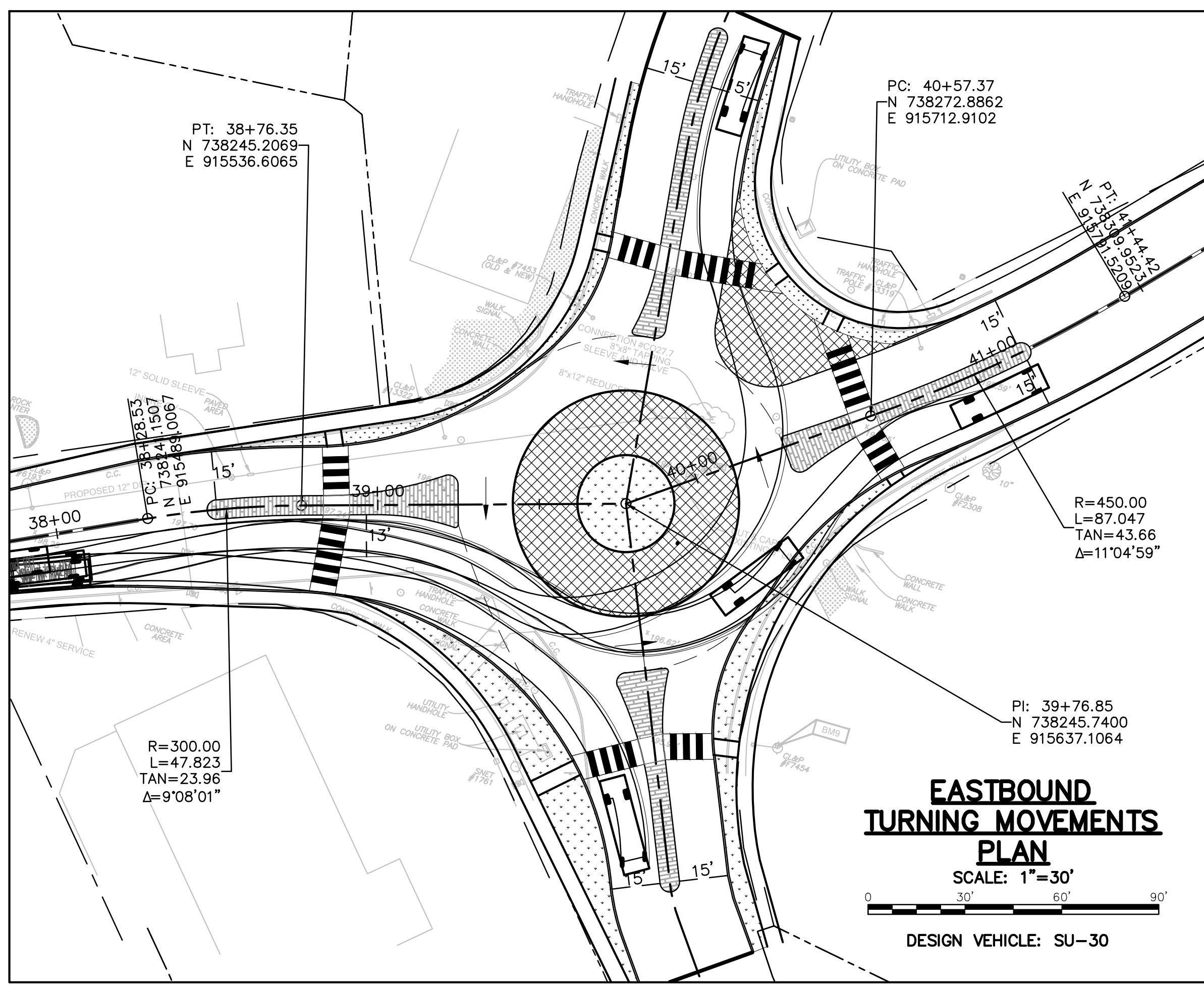
No.	Date	Dr. By	Ck. By	App. By	Description
A	P	R	O	V	E
					REGISTERED PROFESSIONAL ENGINEER
					JANUARY 2019
					DATE

**CONCEPT PLANS**  
**JANUARY 2019**

BORROW OF NAUGATUCK		SCALE:	CONTRACT:	JOB NO.:	DR. BY:	DSN. BY:	CHK. BY:	APP. BY:
RUBBER AVENUE RECONSTRUCTION		AS SHOWN	2180733	2180733	LEC	LAS	ALN	ALN
ROADWAY PLAN AND PROFILE								
RUBBER AVE STA 32+00 TO STA 42+00								

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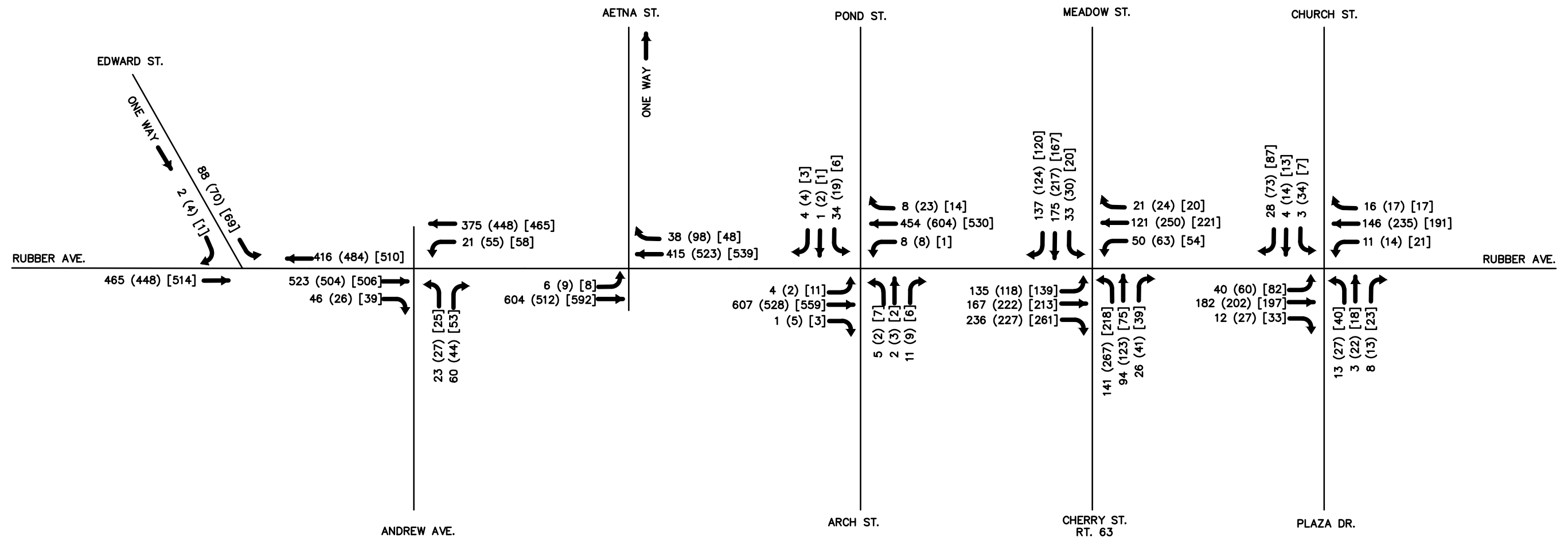
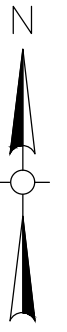
No.	Date	Dr. By	Ch. By	App. By	Description	
A	P	R	O	V	E	D

REGISTERED PROFESSIONAL ENGINEER  
 DATE: **JANUARY 2019**

**CONCEPT PLANS**  
**JANUARY 2019**

**BORROW OF NAUGATUCK**  
**RUBBER AVENUE RECONSTRUCTION**  
**VEHICLE TURNING PLAN**  
**ROUNDABOUT**

SCALE:	AS SHOWN	CADD NO.:	1
CONTRACT:	2180733	DR. BY:	LEC
DESIGN BY:	LAS	CHK. BY:	ALN
APP. BY:	ALN	FILE NO.:	VEH-1



**LEGEND:**

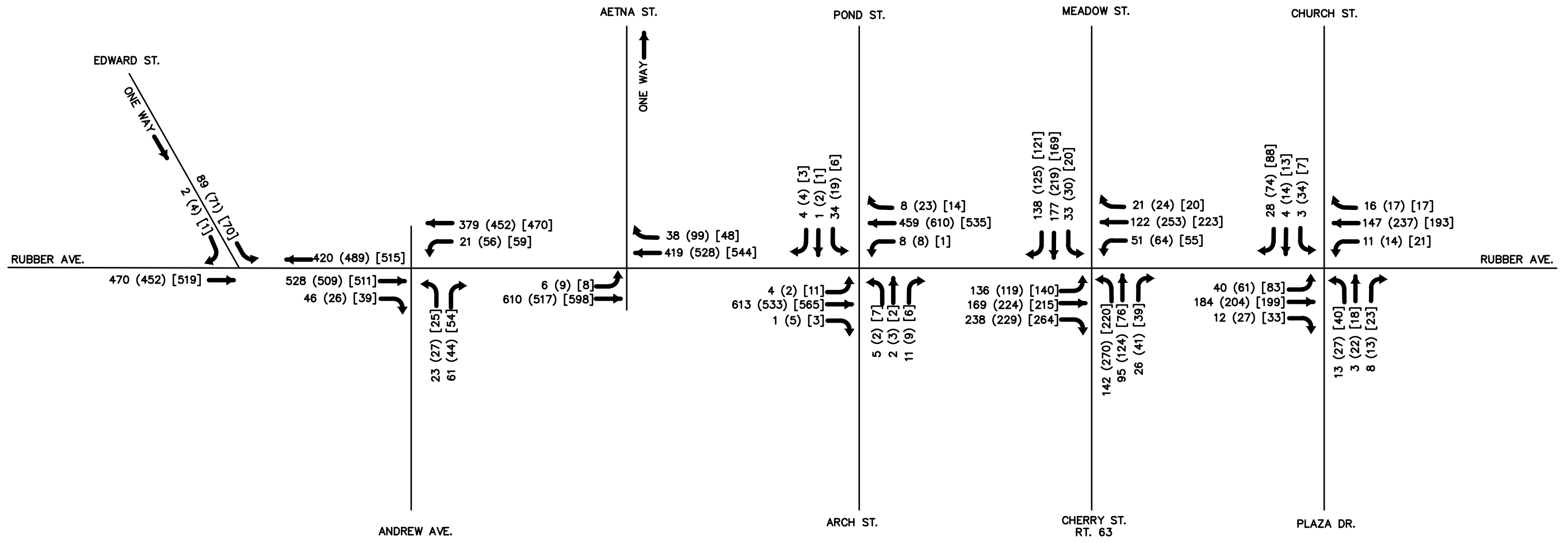
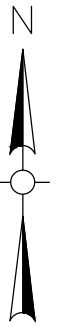
- XXX – WEEKDAY AM PEAK HOUR
- (XXX) – WEEKDAY PM PEAK HOUR
- [XXX] – SATURDAY MIDDAY PEAK HOUR

SCALE: N.T.S.

FIGURE 1  
EXISTING  
PEAK HOUR TRAFFIC VOLUMES

RUBBER AVENUE  
NAUGATUCK, CT





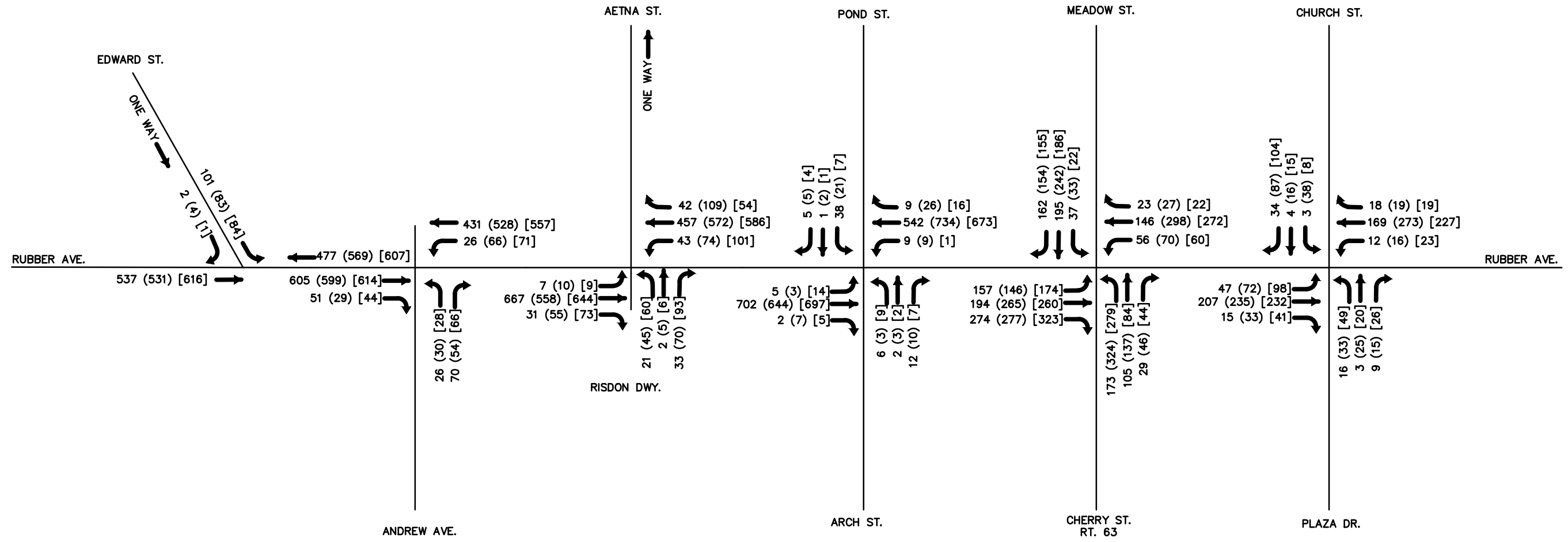
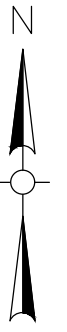
**LEGEND:**  
 XXX – WEEKDAY AM PEAK HOUR  
 (XXX) – WEEKDAY PM PEAK HOUR  
 [XXX] – SATURDAY MIDDAY PEAK HOUR

SCALE: N.T.S.

FIGURE 2  
 2020 OPENING YEAR  
 PEAK HOUR TRAFFIC VOLUMES

RUBBER AVENUE  
 NAUGATUCK, CT





**LEGEND:**  
 XXX – WEEKDAY AM PEAK HOUR  
 (XXX) – WEEKDAY PM PEAK HOUR  
 [XXX] – SATURDAY MIDDAY PEAK HOUR

SCALE: N.T.S.

FIGURE 3  
 2040 BASE YEAR  
 PEAK HOUR TRAFFIC VOLUMES  
 RUBBER AVENUE  
 NAUGATUCK, CT























TABLE 1- LEVEL OF SERVICE (LOS) AND CAPACITY (v/c) SUMMARY – WEEKDAY AM, PM & SATURDAY MIDDAY PEAK HOUR

APPROACH	MOVEMENT	2018 EXISTING						2020 NO BUILD						2020 BUILD						2040 NO BUILD						2040 BUILD						
		AM		PM		SATURDAY		AM		PM		SATURDAY		AM		PM		SATURDAY		AM		PM		SATURDAY		AM		PM		SATURDAY		
		LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	
<b>RUBBER AVE AT EDWARD STREET</b>																																
Edward Street SB:	LT/RT	F	0.65	C	0.27	D	0.29	F	0.66	C	0.28	D	0.30	F	0.66	C	0.28	D	0.30	F	0.88	D	0.36	D	0.39	F	0.96	D	0.36	E	0.48	
<b>RUBBER AVENUE AT ANDREW AVENUE</b>																																
Rubber Ave EB:	TH/RT	A	0.53	A	0.40	A	0.40	A	0.53	A	0.40	A	0.41	A	0.53	A	0.40	A	0.41	A	0.58	A	0.43	A	0.44	A	0.60	A	0.43	A	0.47	
Rubber Ave WB:	LT/TH	A	0.39	A	0.41	A	0.43	A	0.39	A	0.42	A	0.43	A	0.39	A	0.42	A	0.43	A	0.42	A	0.46	A	0.47	A	0.44	A	0.46	A	0.51	
Andrew Ave NB:	LT/RT	B	0.25	B	0.23	B	0.23	B	0.26	B	0.23	B	0.23	B	0.26	B	0.23	B	0.23	C	0.25	C	0.27	C	0.26	C	0.25	C	0.27	C	0.26	
Overall Intersection:		A	0.59	A	0.46	A	0.47	A	0.60	A	0.46	A	0.48	A	0.60	A	0.46	A	0.48	A	0.61	A	0.51	A	0.52	A	0.63	A	0.51	A	0.55	
<b>RUBBER AVENUE AT AETNA STREET (&amp; PROPOSED SITE DRIVE)</b>																																
Rubber Ave EB:	LT/TH/RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	0.01	A	0.01	A	0.01
Rubber Ave WB:	LT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	0.06	A	0.08	B	0.15
Risdon Dwy NB:	LT/TH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	0.19	F	0.40	F	1.15
	RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B	0.09	B	0.16	C	0.31
<b>RUBBER AVENUE AT POND STREET &amp; ARCH STREET</b>																																
Pond Street SB:	LT/TH/RT	F	0.58	D	0.05	D	0.07	F	0.60	D	0.16	D	0.07	F	0.60	D	0.16	D	0.07	F	0.89	E	0.22	E	0.10	F	1.03	E	0.22	E	0.14	
Arch Street NB:	LT/TH/RT	D	0.15	C	0.16	D	0.10	D	0.15	C	0.05	D	0.10	D	0.15	C	0.05	D	0.10	E	0.21	C	0.06	D	0.13	E	0.24	C	0.06	E	0.19	
<b>RUBBER AVENUE AT MEADOW STREET &amp; CHERRY STREET (ROUTE 63)</b>																																
Rubber Ave EB:	LT	B	0.35	B	0.43	B	0.43	B	0.35	B	0.43	B	0.40	-	-	-	-	-	-	B	0.40	B	0.50	B	0.49	-	-	-	-	-	-	
	TH/RT	B	0.64	C	0.72	C	0.71	C	0.64	C	0.73	C	0.70	-	-	-	-	-	-	C	0.71	C	0.79	C	0.80	-	-	-	-	-	-	
	LT/TH	-	-	-	-	-	-	-	-	-	-	-	-	A	0.41	B	0.50	A	0.43	-	-	-	-	-	-	B	0.49	B	0.57	B	0.54	
	RT	-	-	-	-	-	-	-	-	-	-	-	-	A	0.32	A	0.33	A	0.32	-	-	-	-	-	-	A	0.38	A	0.38	A	0.40	
Rubber Ave WB:	LT	C	0.34	C	0.42	C	0.32	C	0.35	C	0.43	C	0.31	-	-	-	-	-	-	C	0.36	C	0.56	C	0.48	-	-	-	-	-	-	
	TH/RT	C	0.46	D	0.74	C	0.60	C	0.47	D	0.74	C	0.64	-	-	-	-	-	-	C	0.48	D	0.77	C	0.69	-	-	-	-	-	-	
	LT/TH/RT	-	-	-	-	-	-	-	-	-	-	-	-	A	0.30	C	0.62	B	0.45							B	0.37	C	0.73	C	0.59	
Meadow Street SB:	LT/TH/RT	C	0.67	C	0.65	B	0.50	C	0.67	C	0.65	C	0.51	B	0.50	D	0.74	B	0.50	C	0.71	C	0.74	C	0.53	C	0.60	E	0.88	C	0.65	
Cherry Street NB:	LT/TH/RT	B	0.70	F	1.21	C	0.81	B	0.71	F	1.23	C	0.84	A	0.39	C	0.68	B	0.47	C	0.81	F	1.51	D	0.90	B	0.48	D	0.79	C	0.62	
Overall Intersection:		C	0.79	D	1.13	C	0.88	C	0.80	E	1.14	C	0.89	-	-	-	-	-	-	C	0.89	F	1.34	C	0.97	-	-	-	-	-	-	
<b>RUBBER AVENUE AT CHURCH STREET &amp; PLAZA DRIVE</b>																																
Rubber Ave EB:	LT	A	0.07	A	0.11	A	0.16	A	0.07	A	0.11	A	0.16	A	0.07	A	0.11	A	0.16	A	0.08	A	0.13	B	0.18	A	0.09	A	0.13	B	0.20	
	TH/RT	A	0.31	B	0.38	B	0.40	A	0.31	B	0.39	B	0.40	A	0.31	B	0.39	B	0.40	B	0.35	B	0.44	B	0.46	B	0.36	B	0.44	B	0.50	
Rubber Ave WB:	LT/TH/RT	A	0.29	B	0.46	B	0.42	A	0.29	B	0.46	B	0.42	A	0.29	B	0.46	B	0.42	B	0.32	C	0.53	B	0.48	B	0.34	C	0.53	C	0.51	
Church Street SB:	LT/TH/RT	A	0.06	B	0.22	B	0.20	A	0.06	B	0.23	B	0.20	A	0.06	B	0.23	B	0.20	A	0.07	B	0.26	B	0.24	A	0.08	B	0.26	B	0.26	
Plaza Drive NB:	LT	A	0.03	B	0.06	B	0.09	A	0.03	B	0.06	B	0.09	A	0.03	B	0.06	B	0.09	A	0.03	B	0.07	B	0.10	A	0.03	B	0.07	B	0.12	
	TH/RT	A	0.02	A	0.07	A	0.08	A	0.02	A	0.07	A	0.08	A	0.02	A	0.07	A	0.08	A	0.02	A	0.08	A	0.09	A	0.02	A	0.08	A	0.10	
Overall Intersection:		A	-	B	-	B	-	A	-	B	-	B	-	A	-	B	-	B	-	A	-	B	-	B	-	B	-	B	-	B	-	

Existing Conditions  
Weekday AM Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2018 Existing AM  
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	167	236	50	121	21	141	94	26	33	175	137
Future Volume (vph)	135	167	236	50	121	21	141	94	26	33	175	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Fr <sub>t</sub>	1.00	0.91		1.00	0.98			0.99			0.95	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1770	1699		1770	1822			2028			1754	
Fl <sub>t</sub> Permitted	0.49	1.00		0.50	1.00			0.41			0.94	
Satd. Flow (perm)	915	1699		938	1822			859			1661	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	150	186	262	56	134	23	157	104	29	37	194	152
RTOR Reduction (vph)	0	64	0	0	8	0	0	4	0	0	28	0
Lane Group Flow (vph)	150	384	0	56	149	0	0	286	0	0	355	0
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			5			6		
Actuated Green, G (s)	23.6	23.6		11.8	11.8			31.3			21.2	
Effective Green, g (s)	23.6	23.6		11.8	11.8			31.3			21.2	
Actuated g/C Ratio	0.36	0.36		0.18	0.18			0.47			0.32	
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	426	605		167	324			406			531	
v/s Ratio Prot	0.04	c0.23			0.08							
v/s Ratio Perm	0.08			0.06				c0.33			0.21	
v/c Ratio	0.35	0.64		0.34	0.46			0.70			0.67	
Uniform Delay, d <sub>1</sub>	15.1	17.7		23.8	24.3			13.8			19.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d <sub>2</sub>	0.5	2.2		1.2	1.0			5.5			3.2	
Delay (s)	15.6	19.9		25.0	25.4			19.3			22.7	
Level of Service	B	B		C	C			B			C	
Approach Delay (s)		18.8			25.3			19.3			22.7	
Approach LOS		B			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.8									C
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			66.2							19.3		
Intersection Capacity Utilization			81.7%									D
Analysis Period (min)			15									
c Critical Lane Group												



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	150	448	56	157	290	383
v/c Ratio	0.33	0.67	0.34	0.48	0.71	0.69
Control Delay	16.6	19.9	30.7	28.5	26.3	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	19.9	30.7	28.5	26.3	25.6
Queue Length 50th (ft)	36	104	19	50	82	115
Queue Length 95th (ft)	90	243	56	117	#242	240
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	454	1007	360	705	530	786
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	0.33	0.44	0.16	0.22	0.55	0.49




















**Intersection Summary**

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

Existing Conditions  
Weekday PM Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2018 Existing PM  
HCM Signalized Intersection Capacity Analysis

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	118	222	227	63	250	24	267	123	41	30	217	124		
Future Volume (vph)	118	222	227	63	250	24	267	123	41	30	217	124		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12		
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Fr <sub>t</sub>	1.00	0.92		1.00	0.99			0.99			0.95			
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00			
Satd. Flow (prot)	1770	1721		1770	1838			2021			1772			
Fl <sub>t</sub> Permitted	0.28	1.00		0.41	1.00			0.39			0.93			
Satd. Flow (perm)	524	1721		763	1838			808			1662			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89		
Adj. Flow (vph)	133	249	255	71	281	27	300	138	46	34	244	139		
RTOR Reduction (vph)	0	45	0	0	4	0	0	4	0	0	20	0		
Lane Group Flow (vph)	133	459	0	71	304	0	0	480	0	0	397	0		
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA			
Protected Phases	7	4			8			2			6			
Permitted Phases	4			8			5			6				
Actuated Green, G (s)	30.0	30.0		18.3	18.3			40.2			30.2			
Effective Green, g (s)	30.0	30.0		18.3	18.3			40.2			30.2			
Actuated g/C Ratio	0.37	0.37		0.22	0.22			0.49			0.37			
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0			
Lane Grp Cap (vph)	310	633		171	412			398			615			
v/s Ratio Prot	0.04	c0.27			0.17									
v/s Ratio Perm	0.12			0.09				c0.59			0.24			
v/c Ratio	0.43	0.72		0.42	0.74			1.21			0.65			
Uniform Delay, d <sub>1</sub>	18.5	22.2		27.0	29.4			20.6			21.2			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d <sub>2</sub>	1.0	4.1		1.6	6.8			114.2			2.3			
Delay (s)	19.5	26.3		28.7	36.2			134.8			23.6			
Level of Service	B	C		C	D			F			C			
Approach Delay (s)		24.9			34.7			134.8			23.6			
Approach LOS		C			C			F			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			54.3									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			1.13											
Actuated Cycle Length (s)			81.5								19.3			
Intersection Capacity Utilization			94.6%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	133	504	71	308	484	417
v/c Ratio	0.41	0.74	0.42	0.74	1.20	0.66
Control Delay	20.1	26.3	34.7	40.4	137.5	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	26.3	34.7	40.4	137.5	26.8
Queue Length 50th (ft)	44	188	31	145	~308	162
Queue Length 95th (ft)	78	295	70	226	#533	290
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	326	823	235	569	402	633
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	0.41	0.61	0.30	0.54	1.20	0.66

**Intersection Summary**

~ 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.

Existing Conditions  
Saturday Midday Peak Hour



Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2018 Existing Saturday  
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	213	261	54	221	20	218	75	39	20	167	120
Future Volume (vph)	139	213	261	54	221	20	218	75	39	20	167	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Fr <sub>t</sub>	1.00	0.92		1.00	0.99			0.98			0.95	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1770	1709		1770	1839			2011			1759	
Fl <sub>t</sub> Permitted	0.38	1.00		0.42	1.00			0.42			0.96	
Satd. Flow (perm)	710	1709		781	1839			867			1700	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	145	222	272	56	230	21	227	78	41	21	174	125
RTOR Reduction (vph)	0	55	0	0	4	0	0	5	0	0	26	0
Lane Group Flow (vph)	145	439	0	56	247	0	0	341	0	0	294	0
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			5			6		
Actuated Green, G (s)	26.6	26.6		16.6	16.6			36.0			25.8	
Effective Green, g (s)	26.6	26.6		16.6	16.6			36.0			25.8	
Actuated g/C Ratio	0.36	0.36		0.22	0.22			0.49			0.35	
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	341	615		175	413			422			593	
v/s Ratio Prot	0.03	c0.26			0.13							
v/s Ratio Perm	0.12			0.07				c0.39			0.17	
v/c Ratio	0.43	0.71		0.32	0.60			0.81			0.50	
Uniform Delay, d <sub>1</sub>	16.9	20.4		23.9	25.7			16.0			18.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d <sub>2</sub>	0.9	3.9		1.1	2.3			10.8			0.7	
Delay (s)	17.8	24.3		25.0	28.0			26.9			19.6	
Level of Service	B	C		C	C			C			B	
Approach Delay (s)		22.8			27.4			26.9			19.6	
Approach LOS		C			C			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.9				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			73.9				Sum of lost time (s)		19.3			
Intersection Capacity Utilization			87.5%				ICU Level of Service				E	
Analysis Period (min)			15									
c	Critical Lane Group											



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	145	494	56	251	346	320
v/c Ratio	0.38	0.76	0.32	0.60	0.81	0.52
Control Delay	18.9	25.5	31.3	33.0	34.8	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	25.5	31.3	33.0	34.8	21.2
Queue Length 50th (ft)	48	175	24	113	127	101
Queue Length 95th (ft)	86	284	58	185	#337	205
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	385	934	275	653	494	743
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	0.38	0.53	0.20	0.38	0.70	0.43

**Intersection Summary**

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

Year 2020 No Build  
Weekday AM Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2020 No Build AM  
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	169	238	51	122	21	142	95	26	33	177	138
Future Volume (vph)	136	169	238	51	122	21	142	95	26	33	177	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Fr <sub>t</sub>	1.00	0.91		1.00	0.98			0.99			0.95	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1770	1700		1770	1822			2028			1755	
Fl <sub>t</sub> Permitted	0.49	1.00		0.50	1.00			0.41			0.94	
Satd. Flow (perm)	913	1700		935	1822			855			1661	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	151	188	264	57	136	23	158	106	29	37	197	153
RTOR Reduction (vph)	0	64	0	0	8	0	0	4	0	0	27	0
Lane Group Flow (vph)	151	388	0	57	151	0	0	289	0	0	360	0
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			5			6		
Actuated Green, G (s)	23.7	23.7		11.8	11.8			31.5			21.4	
Effective Green, g (s)	23.7	23.7		11.8	11.8			31.5			21.4	
Actuated g/C Ratio	0.36	0.36		0.18	0.18			0.47			0.32	
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	427	605		165	323			405			534	
v/s Ratio Prot	0.04	c0.23			0.08							
v/s Ratio Perm	0.08			0.06				c0.34			0.22	
v/c Ratio	0.35	0.64		0.35	0.47			0.71			0.67	
Uniform Delay, d <sub>1</sub>	15.2	17.9		24.0	24.5			13.9			19.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d <sub>2</sub>	0.5	2.3		1.3	1.1			5.9			3.4	
Delay (s)	15.7	20.2		25.2	25.6			19.8			22.9	
Level of Service	B	C		C	C			B			C	
Approach Delay (s)		19.1			25.5			19.8			22.9	
Approach LOS		B			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.1								HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			66.5							19.3		
Intersection Capacity Utilization			82.2%								ICU Level of Service	E
Analysis Period (min)			15									
c	Critical Lane Group											



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	151	452	57	159	293	387
v/c Ratio	0.34	0.68	0.35	0.48	0.72	0.69
Control Delay	16.7	20.2	30.9	28.7	27.1	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	20.2	30.9	28.7	27.1	25.8
Queue Length 50th (ft)	37	107	19	51	84	117
Queue Length 95th (ft)	90	247	57	119	#248	245
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	452	1003	356	701	524	783
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	0.33	0.45	0.16	0.23	0.56	0.49




















**Intersection Summary**

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

Year 2020 No Build  
Weekday PM Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2020 No Build PM  
HCM Signalized Intersection Capacity Analysis

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	119	224	229	64	253	24	270	124	41	30	219	125		
Future Volume (vph)	119	224	229	64	253	24	270	124	41	30	219	125		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12		
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Fr <sub>t</sub>	1.00	0.92		1.00	0.99			0.99			0.95			
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00			
Satd. Flow (prot)	1770	1722		1770	1838			2021			1772			
Fl <sub>t</sub> Permitted	0.28	1.00		0.40	1.00			0.39			0.93			
Satd. Flow (perm)	518	1722		747	1838			803			1662			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89		
Adj. Flow (vph)	134	252	257	72	284	27	303	139	46	34	246	140		
RTOR Reduction (vph)	0	45	0	0	4	0	0	4	0	0	20	0		
Lane Group Flow (vph)	134	464	0	72	307	0	0	484	0	0	400	0		
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA			
Protected Phases	7	4			8			2			6			
Permitted Phases	4			8			5			6				
Actuated Green, G (s)	30.1	30.1		18.4	18.4			40.2			30.2			
Effective Green, g (s)	30.1	30.1		18.4	18.4			40.2			30.2			
Actuated g/C Ratio	0.37	0.37		0.23	0.23			0.49			0.37			
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0			
Lane Grp Cap (vph)	309	635		168	414			395			615			
v/s Ratio Prot	0.04	c0.27			0.17									
v/s Ratio Perm	0.12			0.10				c0.60			0.24			
v/c Ratio	0.43	0.73		0.43	0.74			1.23			0.65			
Uniform Delay, d <sub>1</sub>	18.5	22.2		27.1	29.4			20.7			21.3			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d <sub>2</sub>	1.0	4.3		1.8	7.0			121.9			2.5			
Delay (s)	19.5	26.5		28.8	36.4			142.6			23.8			
Level of Service	B	C		C	D			F			C			
Approach Delay (s)		25.1			35.0			142.6			23.8			
Approach LOS		C			C			F			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			56.4									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			1.14											
Actuated Cycle Length (s)			81.6								19.3			
Intersection Capacity Utilization			95.2%										ICU Level of Service	F
Analysis Period (min)			15											
c	Critical Lane Group													



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	134	509	72	311	488	420
v/c Ratio	0.42	0.75	0.43	0.75	1.23	0.66
Control Delay	20.1	26.6	35.3	40.5	145.9	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	26.6	35.3	40.5	145.9	27.1
Queue Length 50th (ft)	44	191	32	146	~314	164
Queue Length 95th (ft)	79	299	70	228	#540	292
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	325	822	229	569	398	632
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	0.41	0.62	0.31	0.55	1.23	0.66

**Intersection Summary**




















- ~ 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.



Year 2020 No Build  
Saturday Midday Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2020 No Build Saturday  
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	215	264	55	223	20	220	76	39	20	169	121
Future Volume (vph)	140	215	264	55	223	20	220	76	39	20	169	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Fr <sub>t</sub>	1.00	0.92		1.00	0.99			0.98			0.95	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1770	1709		1770	1840			2012			1759	
Fl <sub>t</sub> Permitted	0.36	1.00		0.46	1.00			0.41			0.96	
Satd. Flow (perm)	673	1709		859	1840			858			1700	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	146	224	275	57	232	21	229	79	41	21	176	126
RTOR Reduction (vph)	0	54	0	0	4	0	0	5	0	0	26	0
Lane Group Flow (vph)	146	445	0	57	249	0	0	344	0	0	297	0
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			5			6		
Actuated Green, G (s)	27.7	27.7		15.9	15.9			36.0			25.9	
Effective Green, g (s)	27.7	27.7		15.9	15.9			36.0			25.9	
Actuated g/C Ratio	0.37	0.37		0.21	0.21			0.48			0.35	
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	362	631		182	390			411			587	
v/s Ratio Prot	0.04	c0.26			0.14							
v/s Ratio Perm	0.11			0.07				c0.40			0.18	
v/c Ratio	0.40	0.70		0.31	0.64			0.84			0.51	
Uniform Delay, d <sub>1</sub>	16.7	20.2		24.9	26.9			16.9			19.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d <sub>2</sub>	0.7	3.6		1.0	3.4			13.7			0.7	
Delay (s)	17.5	23.7		25.9	30.4			30.7			20.2	
Level of Service	B	C		C	C			C			C	
Approach Delay (s)		22.3			29.5			30.7			20.2	
Approach LOS		C			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.1				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		19.3			
Intersection Capacity Utilization			88.1%				ICU Level of Service				E	
Analysis Period (min)			15									
c	Critical Lane Group											



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	146	499	57	253	349	323
v/c Ratio	0.39	0.73	0.32	0.65	0.84	0.53
Control Delay	19.0	24.4	31.0	35.5	38.5	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	24.4	31.0	35.5	38.5	21.7
Queue Length 50th (ft)	48	179	24	114	130	103
Queue Length 95th (ft)	87	290	57	187	#344	208
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	382	899	290	626	469	714
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	0.38	0.56	0.20	0.40	0.74	0.45

**Intersection Summary**

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

Year 2020 Build  
Weekday AM Peak Hour

Rubber Avenue Reconstruction  
 9: Cherry St/Meadow St & Rubber Ave

2020 Build AM  
 HCM 2010 Roundabout

Intersection					
Intersection Delay, s/veh	9.7				
Intersection LOS	A				
Approach	EB		WB	NB	SB
Entry Lanes	2		1	1	1
Conflicting Circle Lanes	1		1	1	1
Adj Approach Flow, veh/h	603		216	293	387
Demand Flow Rate, veh/h	615		220	299	395
Vehicles Circulating, veh/h	297		423	384	358
Vehicles Exiting, veh/h	456		260	528	285
Follow-Up Headway, s	3.186		3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0		0	0	0
Ped Cap Adj	1.000		1.000	1.000	1.000
Approach Delay, s/veh	8.8		8.5	9.7	11.7
Approach LOS	A		A	A	B
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.563	0.437	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	346	269	220	299	395
Cap Entry Lane, veh/h	840	840	740	770	790
Entry HV Adj Factor	0.980	0.981	0.983	0.980	0.980
Flow Entry, veh/h	339	264	216	293	387
Cap Entry, veh/h	823	824	728	754	774
V/C Ratio	0.412	0.320	0.297	0.388	0.500
Control Delay, s/veh	9.5	8.0	8.5	9.7	11.7
LOS	A	A	A	A	B
95th %tile Queue, veh	2	1	1	2	3

Year 2020 Build  
Weekday PM Peak Hour

Intersection					
Intersection Delay, s/veh	17.4				
Intersection LOS	C				
Approach	EB		WB		SB
Entry Lanes	2		1		1
Conflicting Circle Lanes	1		1		1
Adj Approach Flow, veh/h	643		383		420
Demand Flow Rate, veh/h	656		391		429
Vehicles Circulating, veh/h	359		588		672
Vehicles Exiting, veh/h	742		339		307
Follow-Up Headway, s	3.186		3.186		3.186
Ped Vol Crossing Leg, #/h	0		0		0
Ped Cap Adj	1.000		1.000		1.000
Approach Delay, s/veh	10.5		18.1		26.3
Approach LOS	B		C		D
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.601	0.399	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	394	262	391	498	429
Cap Entry Lane, veh/h	789	789	628	736	577
Entry HV Adj Factor	0.980	0.981	0.980	0.980	0.979
Flow Entry, veh/h	386	257	383	488	420
Cap Entry, veh/h	773	774	615	721	565
V/C Ratio	0.499	0.332	0.623	0.677	0.743
Control Delay, s/veh	11.7	8.6	18.1	18.2	26.3
LOS	B	A	C	C	D
95th %tile Queue, veh	3	1	4	5	6

Year 2020 Build  
Saturday Midday Peak Hour






















Intersection					
Intersection Delay, s/veh	10.8				
Intersection LOS	B				
Approach	EB		WB	NB	SB
Entry Lanes	2		1	1	1
Conflicting Circle Lanes	1		1	1	1
Adj Approach Flow, veh/h	645		310	349	323
Demand Flow Rate, veh/h	657		316	357	330
Vehicles Circulating, veh/h	259		464	398	529
Vehicles Exiting, veh/h	600		291	518	251
Follow-Up Headway, s	3.186		3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0		0	0	0
Ped Cap Adj	1.000		1.000	1.000	1.000
Approach Delay, s/veh	8.8		11.4	11.4	13.3
Approach LOS	A		B	B	B
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.574	0.426	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	377	280	316	357	330
Cap Entry Lane, veh/h	872	872	710	759	666
Entry HV Adj Factor	0.980	0.982	0.982	0.979	0.980
Flow Entry, veh/h	370	275	310	349	323
Cap Entry, veh/h	855	857	698	743	653
V/C Ratio	0.432	0.321	0.445	0.470	0.496
Control Delay, s/veh	9.5	7.8	11.4	11.4	13.3
LOS	A	A	B	B	B
95th %tile Queue, veh	2	1	2	3	3

Year 2040 No Build  
Weekday AM Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2040 No Build AM  
HCM Signalized Intersection Capacity Analysis

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	151	186	263	56	135	23	157	105	29	37	195	153		
Future Volume (vph)	151	186	263	56	135	23	157	105	29	37	195	153		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12		
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Fr <sub>t</sub>	1.00	0.91		1.00	0.98			0.99			0.95			
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00			
Satd. Flow (prot)	1770	1699		1770	1821			2028			1754			
Fl <sub>t</sub> Permitted	0.48	1.00		0.48	1.00			0.39			0.94			
Satd. Flow (perm)	893	1699		895	1821			816			1654			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	168	207	292	62	150	26	174	117	32	41	217	170		
RTOR Reduction (vph)	0	63	0	0	8	0	0	4	0	0	27	0		
Lane Group Flow (vph)	168	436	0	62	168	0	0	319	0	0	401	0		
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA			
Protected Phases	7	4			8			2			6			
Permitted Phases	4			8			5			6				
Actuated Green, G (s)	25.7	25.7		13.7	13.7			34.5			24.3			
Effective Green, g (s)	25.7	25.7		13.7	13.7			34.5			24.3			
Actuated g/C Ratio	0.36	0.36		0.19	0.19			0.48			0.34			
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0			
Lane Grp Cap (vph)	419	610		171	348			393			562			
v/s Ratio Prot	0.04	c0.26			0.09									
v/s Ratio Perm	0.10			0.07				c0.39			0.24			
v/c Ratio	0.40	0.71		0.36	0.48			0.81			0.71			
Uniform Delay, d <sub>1</sub>	16.4	19.7		25.1	25.7			15.7			20.6			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d <sub>2</sub>	0.6	4.0		1.3	1.1			12.0			4.3			
Delay (s)	17.0	23.7		26.4	26.8			27.7			24.8			
Level of Service	B	C		C	C			C			C			
Approach Delay (s)		22.0			26.7			27.7			24.8			
Approach LOS		C			C			C			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			24.5									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.89											
Actuated Cycle Length (s)			71.5								19.3			
Intersection Capacity Utilization			88.2%										ICU Level of Service	E
Analysis Period (min)			15											
c	Critical Lane Group													



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	168	499	62	176	323	428
v/c Ratio	0.38	0.74	0.36	0.50	0.82	0.73
Control Delay	18.5	24.0	32.4	29.9	36.2	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	24.0	32.4	29.9	36.2	28.2
Queue Length 50th (ft)	52	158	25	68	106	141
Queue Length 95th (ft)	98	283	61	129	#320	300
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	442	944	319	657	470	731
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	0.38	0.53	0.19	0.27	0.69	0.59





















**Intersection Summary**

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

Year 2040 No Build  
Weekday PM Peak Hour

Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2040 No Build PM  
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	248	253	70	279	27	298	137	46	33	242	138
Future Volume (vph)	132	248	253	70	279	27	298	137	46	33	242	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Fr <sub>t</sub>	1.00	0.92		1.00	0.99			0.99			0.95	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1770	1722		1770	1838			2021			1772	
Fl <sub>t</sub> Permitted	0.25	1.00		0.32	1.00			0.35			0.93	
Satd. Flow (perm)	461	1722		593	1838			737			1649	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	148	279	284	79	313	30	335	154	52	37	272	155
RTOR Reduction (vph)	0	44	0	0	4	0	0	4	0	0	20	0
Lane Group Flow (vph)	148	519	0	79	339	0	0	537	0	0	444	0
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			5			6		
Actuated Green, G (s)	31.6	31.6		19.8	19.8			40.1			30.1	
Effective Green, g (s)	31.6	31.6		19.8	19.8			40.1			30.1	
Actuated g/C Ratio	0.38	0.38		0.24	0.24			0.48			0.36	
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	298	655		141	438			356			598	
v/s Ratio Prot	0.05	c0.30			0.18							
v/s Ratio Perm	0.14			0.13				c0.73			0.27	
v/c Ratio	0.50	0.79		0.56	0.77			1.51			0.74	
Uniform Delay, d <sub>1</sub>	18.6	22.8		27.8	29.5			21.4			23.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d <sub>2</sub>	1.3	6.5		5.0	8.3			242.8			5.0	
Delay (s)	19.9	29.3		32.8	37.8			264.2			28.0	
Level of Service	B	C		C	D			F			C	
Approach Delay (s)		27.4			36.9			264.2			28.0	
Approach LOS		C			D			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			89.3				HCM 2000 Level of Service		F			
HCM 2000 Volume to Capacity ratio			1.34									
Actuated Cycle Length (s)			83.0				Sum of lost time (s)		19.3			
Intersection Capacity Utilization			102.7%				ICU Level of Service		G			
Analysis Period (min)			15									
c	Critical Lane Group											



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	148	563	79	343	541	464
v/c Ratio	0.48	0.81	0.56	0.78	1.50	0.75
Control Delay	21.4	29.9	44.1	41.9	262.5	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	29.9	44.1	41.9	262.5	32.1
Queue Length 50th (ft)	49	226	36	165	~404	197
Queue Length 95th (ft)	87	349	82	255	#628	#368
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	311	808	178	559	360	617
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	0.48	0.70	0.44	0.61	1.50	0.75

**Intersection Summary**

~ 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.

Year 2040 No Build  
Saturday Midday Peak Hour



Rubber Avenue Reconstruction  
9: Cherry St/Meadow St & Rubber Ave

2040 No Build Saturday  
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	155	238	291	60	247	22	243	84	44	22	186	134		
Future Volume (vph)	155	238	291	60	247	22	243	84	44	22	186	134		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12		
Total Lost time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Frt	1.00	0.92		1.00	0.99			0.98			0.95			
Flt Protected	0.95	1.00		0.95	1.00			0.97			1.00			
Satd. Flow (prot)	1770	1709		1770	1840			2011			1758			
Flt Permitted	0.31	1.00		0.32	1.00			0.41			0.96			
Satd. Flow (perm)	587	1709		604	1840			853			1695			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Adj. Flow (vph)	161	248	303	62	257	23	253	88	46	23	194	140		
RTOR Reduction (vph)	0	55	0	0	4	0	0	5	0	0	25	0		
Lane Group Flow (vph)	161	496	0	63	276	0	0	382	0	0	332	0		
Turn Type	pm+pt	NA		Perm	NA		custom	NA		Perm	NA			
Protected Phases	7	4			8			2			6			
Permitted Phases	4			8			5			6				
Actuated Green, G (s)	29.4	29.4		17.5	17.5			40.2			30.2			
Effective Green, g (s)	29.4	29.4		17.5	17.5			40.2			30.2			
Actuated g/C Ratio	0.36	0.36		0.22	0.22			0.50			0.37			
Clearance Time (s)	4.0	5.7		5.7	5.7			5.6			5.6			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0			
Lane Grp Cap (vph)	328	621		130	398			423			632			
v/s Ratio Prot	0.05	c0.29			0.15						0.20			
v/s Ratio Perm	0.13			0.10				c0.45			0.20			
v/c Ratio	0.49	0.80		0.48	0.69			0.90			0.53			
Uniform Delay, d1	18.8	23.1		27.8	29.2			18.6			19.8			
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00			
Incremental Delay, d2	1.2	7.1		2.8	5.2			22.1			0.8			
Delay (s)	19.9	30.2		30.6	34.4			40.7			20.6			
Level of Service	B	C		C	C			D			C			
Approach Delay (s)		27.9			33.7			40.7			20.6			
Approach LOS		C			C			D			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			30.3									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.97											
Actuated Cycle Length (s)			80.9								19.3			
Intersection Capacity Utilization			94.8%										ICU Level of Service	F
Analysis Period (min)			15											
c	Critical Lane Group													



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	161	551	63	280	387	357
v/c Ratio	0.47	0.82	0.48	0.70	0.90	0.54
Control Delay	21.3	30.2	40.5	38.3	47.5	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	30.2	40.5	38.3	47.5	22.5
Queue Length 50th (ft)	54	211	28	129	164	122
Queue Length 95th (ft)	95	337	67	207	#398	235
Internal Link Dist (ft)		373		344	218	224
Turn Bay Length (ft)						
Base Capacity (vph)	343	832	187	574	429	656
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	0.47	0.66	0.34	0.49	0.90	0.54

**Intersection Summary**

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

Year 2040 Build  
Weekday AM Peak Hour

Rubber Avenue Reconstruction  
 9: Cherry St/Meadow St & Rubber Ave

2040 Build AM  
 HCM 2010 Roundabout

Intersection					
Intersection Delay, s/veh	11.9				
Intersection LOS	B				
Approach	EB		WB	NB	SB
Entry Lanes	2		1	1	1
Conflicting Circle Lanes	1		1	1	1
Adj Approach Flow, veh/h	694		250	341	438
Demand Flow Rate, veh/h	707		255	348	447
Vehicles Circulating, veh/h	326		492	439	424
Vehicles Exiting, veh/h	545		295	594	323
Follow-Up Headway, s	3.186		3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0		0	0	0
Ped Cap Adj	1.000		1.000	1.000	1.000
Approach Delay, s/veh	10.2		10.2	12.0	15.3
Approach LOS	B		B	B	C
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.562	0.438	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	397	310	255	348	447
Cap Entry Lane, veh/h	816	816	691	728	739
Entry HV Adj Factor	0.982	0.981	0.979	0.979	0.979
Flow Entry, veh/h	390	304	250	341	438
Cap Entry, veh/h	801	800	677	713	724
V/C Ratio	0.487	0.380	0.369	0.478	0.604
Control Delay, s/veh	11.1	9.1	10.2	12.0	15.3
LOS	B	A	B	B	C
95th %tile Queue, veh	3	2	2	3	4

Year 2040 Build  
Weekday PM Peak Hour

Intersection					
Intersection Delay, s/veh	24.7				
Intersection LOS	C				
Approach	EB		WB	NB	SB
Entry Lanes	2		1	1	1
Conflicting Circle Lanes	1		1	1	1
Adj Approach Flow, veh/h	711		422	541	464
Demand Flow Rate, veh/h	726		431	552	473
Vehicles Circulating, veh/h	396		650	474	742
Vehicles Exiting, veh/h	819		376	648	339
Follow-Up Headway, s	3.186		3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0		0	0	0
Ped Cap Adj	1.000		1.000	1.000	1.000
Approach Delay, s/veh	12.3		24.9	25.4	42.7
Approach LOS	B		C	D	E
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.601	0.399	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	436	290	431	552	473
Cap Entry Lane, veh/h	760	760	590	703	538
Entry HV Adj Factor	0.980	0.979	0.979	0.980	0.980
Flow Entry, veh/h	427	284	422	541	464
Cap Entry, veh/h	745	745	577	689	527
V/C Ratio	0.573	0.381	0.731	0.785	0.879
Control Delay, s/veh	14.0	9.7	24.9	25.4	42.7
LOS	B	A	C	D	E
95th %tile Queue, veh	4	2	6	8	10

Year 2040 Build  
Saturday Midday Peak Hour

Intersection					
Intersection Delay, s/veh	15.0				
Intersection LOS	C				
Approach	EB		WB	NB	SB
Entry Lanes	2		1	1	1
Conflicting Circle Lanes	1		1	1	1
Adj Approach Flow, veh/h	788		369	425	378
Demand Flow Rate, veh/h	804		376	434	385
Vehicles Circulating, veh/h	285		572	484	650
Vehicles Exiting, veh/h	750		346	605	298
Follow-Up Headway, s	3.186		3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0		0	0	0
Ped Cap Adj	1.000		1.000	1.000	1.000
Approach Delay, s/veh	10.8		16.6	16.7	20.4
Approach LOS	B		C	C	C
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.573	0.427	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	461	343	376	434	385
Cap Entry Lane, veh/h	850	850	638	696	590
Entry HV Adj Factor	0.980	0.980	0.982	0.980	0.982
Flow Entry, veh/h	452	336	369	425	378
Cap Entry, veh/h	832	832	626	682	579
V/C Ratio	0.543	0.404	0.590	0.623	0.653
Control Delay, s/veh	12.0	9.2	16.6	16.7	20.4
LOS	B	A	C	C	C
95th %tile Queue, veh	3	2	4	4	5



	Crashld	Date Of Crash	Day of the Week Text Format	Time of Crash	Manner of Crash / Collision Impact Text Format	Crash Severity Text Format	Number Of Motor Vehicles	Number Of Non-Motorist	Milemarker	Roadway Name	Intersecting Roadway Name	Landmark Description	Distance From Nearest Landmark	Unit Of Measure From Nearest Landmark	Direction From Nearest Landmark	Weather Condition Text Format	Light Condition Text Format	Road Surface Condition Text Format	
AT CHURCH ST																			
1	277933	3/14/2016	Monday	15:17:00	Front to rear	Property Damage Only	2	0	0.09	Rubber Avenue	unknown	CHURCH ST	305	Feet	W	Rain	Daylight	Wet	
2	180841	3/27/2016	Sunday	6:43:00	Not Applicable	Property Damage Only	1	0	0	Rubber Avenue	OLD FIREHOUSE RD					Clear	Daylight	Dry	
3	193396	4/3/2016	Sunday	1:45:00	Not Applicable	Property Damage Only	1	0	0.03	Rubber Avenue		CHURCH ST	25	Feet	E	Rain	Dark-Light	Wet	
4	234172	6/16/2016	Thursday	22:11:00	Front to rear	Property Damage Only	2	0	0.1	Rubber Avenue	unknown	RT 63-MEADOW ST	100	Feet	E	Clear	Unknown	Dry	
5	372600	1/6/2017	Friday	13:53:00	Not Applicable	Injury of any type (Serious, N	1	1	0.03	Rubber Avenue	CHURCH ST					Clear	Daylight	Dry	
6	479884	1/1/2018	Monday	9:37:00	Not Applicable	Property Damage Only	2	0	0.01	RUBBER AV	unknown	Church St	72	Feet	E	Clear	Daylight	Dry	
7	506903	4/13/2018	Friday	14:54:00	Angle	Property Damage Only	2	0	0.08	RUBBER AV	unknown	Meadow Street	125	Feet	E	Clear	Daylight	Dry	
AT ROUTE 63																			
1	305227	1/14/2016	Thursday	16:24:00	Angle	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Dark-Light	Dry	
2	282961	5/5/2016	Thursday	23:01:00	Sideswipe, same direction	Property Damage Only	2	0	0.12	Meadow Street	RT 63-MEADOW ST					Clear	Dark-Light	Dry	
3	234176	6/20/2016	Monday	17:56:00	Front to rear	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
4	372348	9/7/2016	Wednesday	6:58:00	Angle	Injury of any type (Serious, N	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Wet	
5	372354	9/10/2016	Saturday	15:28:00	Front to rear	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
6	372389	10/3/2016	Monday	17:29:00	Angle	Injury of any type (Serious, N	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
7	372535	12/13/2016	Tuesday	14:36:00	Front to rear	Injury of any type (Serious, N	4	0	0.13	Rubber Avenue	unknown	RT 63-MEADOW ST	50	Feet	W	Clear	Daylight	Dry	
8	372572	1/12/2017	Thursday	15:42:00	Front to rear	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
9	378933	4/15/2017	Saturday	19:41:00	Front to rear	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Dark-Light	Dry	
10	377796	4/15/2017	Saturday	17:17:00	Front to rear	Property Damage Only	2	0	0.13	Rubber Avenue	unknown	RT 63-CHERRY ST	50	Feet	W	Clear	Daylight	Dry	
11	385847	5/6/2017	Saturday	14:53:00	Front to rear	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-CHERRY ST					Clear	Daylight	Dry	
12	386180	5/8/2017	Monday	20:51:00	Front to rear	Injury of any type (Serious, N	2	0	0.12	Rubber Avenue	RT 63-CHERRY ST					Clear	Dark-Light	Dry	
13	396227	6/2/2017	Friday	12:10:00	Front to rear	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-CHERRY ST					Clear	Daylight	Dry	
14	400873	6/20/2017	Tuesday	17:04:00	Angle	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
15	409380	7/14/2017	Friday	17:17:00	Sideswipe, same direction	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
16	420296	7/22/2017	Saturday	7:44:00	Angle	Property Damage Only	2	0	0.12	Rubber Avenue	RT 63-MEADOW ST					Clear	Daylight	Dry	
17	481003	1/3/2018	Wednesday	7:29:00	Angle	Property Damage Only	2	0	0.15	RUBBER AV	unknown	Cherry Street	112	Feet	W	Clear	Daylight	Dry	
18	492975	2/16/2018	Friday	18:16:00	Front to rear	Property Damage Only	2	0	0.12	RUBBER AV	63-N					Clear	Dark-Light	Dry	
19	572323	5/5/2018	Saturday	13:42:00	Sideswipe, opposite direction	Property Damage Only	2	0	0.12	RUBBER AV	63-N					Clear	Daylight	Dry	
20	571717	6/20/2018	Wednesday	15:55:00	Angle	Property Damage Only	2	0	0.16	RUBBER AV	unknown	Cherry Street	150	Feet	W	Clear	Daylight	Dry	
21	571751	7/12/2018	Thursday	8:49:00	Sideswipe, same direction	Property Damage Only	2	0	0.14	RUBBER AV	unknown	Cherry Street	10	Feet	W	Clear	Daylight	Dry	
22	571912	8/31/2018	Friday	11:51:00	Rear to rear	Property Damage Only	2	0	0.15	RUBBER AV	unknown	Rubber Avenue	100	Feet	S	Clear	Daylight	Dry	
23	572420	9/28/2018	Friday	9:10:00	Other	Property Damage Only	2	0	0.12	RUBBER AV	unknown	Meadow Street	100	Feet	W	Clear	Daylight	Dry	
AT ARCH ST																			
1	177403	2/17/2016	Wednesday	9:06:00	Front to rear	Property Damage Only	2	0	0.22	Rubber Avenue		POND ST	40	Feet	W	Clear	Daylight	Dry	
2	398096	6/10/2017	Saturday	12:45:00	Sideswipe, same direction	Property Damage Only	2	0	0.19	Rubber Avenue	unknown	ARCH ST	115	Feet	E	Clear	Daylight	Dry	
3	234204	7/13/2016	Wednesday	19:47:00	Sideswipe, same direction	Property Damage Only	2	0	0.21	Rubber Avenue		POND ST					Clear	Daylight	Dry
4	234226	7/27/2016	Wednesday	19:04:00	Angle	Property Damage Only	2	0	0.21	Rubber Avenue		POND ST					Clear	Daylight	Dry
5	431715	8/30/2017	Wednesday	12:48:00	Front to rear	Property Damage Only	2	0	0.2	Rubber Avenue	unknown	POND ST	88	Feet	E	Clear	Daylight	Dry	
6	457793	9/22/2017	Friday	15:06:00	Angle	Property Damage Only	2	0	0.21	Rubber Avenue	ARCH ST					Clear	Daylight	Dry	
7	457794	11/6/2017	Monday	16:26:00	Other	Property Damage Only	2	0	0.19	Rubber Avenue	unknown	POND ST	100	Feet	E	Clear	Daylight	Dry	
8	461136	12/1/2017	Friday	7:30:00	Front to rear	Property Damage Only	2	0	0.21	Rubber Avenue	ARCH ST					Clear	Daylight	Wet	
9	481007	1/4/2018	Thursday	14:41:00	Angle	Property Damage Only	2	0	0.21	RUBBER AV	ARCH ST					Snow	Daylight	Snow	
10	489355	2/1/2018	Thursday	16:37:00	Angle	Property Damage Only	2	0	0.21	RUBBER AV	ARCH ST					Clear	Daylight	Dry	
AT AETNA ST																			
1	372819	2/4/2017	Saturday	12:07:00	Front to rear	Property Damage Only	2	0	0.29	Rubber Avenue	AETNA ST					Clear	Daylight	Dry	
2	438820	9/23/2017	Saturday	20:10:00	Other	Property Damage Only	2	0	0.29	Rubber Avenue	AETNA ST					Clear	Dark-Light	Dry	
3	442266	10/7/2017	Saturday	11:05:00	Front to rear	Property Damage Only	2	0	0.3	Rubber Avenue	unknown	AETNA ST	64	Feet	W	Clear	Daylight	Dry	
4	456377	11/22/2017	Wednesday	18:13:00	Front to rear	Property Damage Only	2	0	0.32	Rubber Avenue	unknown	HOADLEY ST	2000	Feet	E	Clear	Dark-Light	Dry	
5	571681	5/31/2018	Thursday	0:37:00	Not Applicable	Injury of any type (Serious, N	1	0	0.29	RUBBER AV	AETNA ST					Clear	Dark-Light	Dry	
6	571807	8/17/2018	Friday	12:14:00	Not Applicable	Property Damage Only	2	0	0.29	RUBBER AV	AETNA ST					Clear	Daylight	Dry	
7	571923	9/13/2018	Thursday	16:30:00	Angle	Injury of any type (Serious, N	2	0	0.33	RUBBER AV	unknown	Aetna Street	200	Feet	W	Clear	Daylight	Dry	
8	573506	10/16/2018	Tuesday	20:17:00	Sideswipe, same direction	Property Damage Only	2	0	0.28	RUBBER AV	unknown	Andrew Avenue	500	Feet	E	Clear	Dark-Light	Dry	
AT ANDREW AVE																			
1	273229	1/7/2016	Thursday	14:34:00	Front to rear	Property Damage Only	2	0	0.37	Rubber Avenue	ANDREW AV					Clear	Daylight	Dry	
2	170237	2/5/2016	Friday	18:33:00	Sideswipe, same direction	Property Damage Only	2	0	0.37	Rubber Avenue	ANDREW AV					Snow	Dark-Light	Snow	
3	238727	8/24/2016	Wednesday	18:32:00	Angle	Injury of any type (Serious, N	2	0	0.37	Rubber Avenue	ANDREW AV					Clear	Daylight	Dry	
4	443897	9/24/2016	Saturday	2:06:00	Not Applicable	Property Damage Only	1	0	0.37	RUBBER AV	ANDREW AV					Clear	Dark-Light	Dry	
5	372456	11/9/2016	Wednesday	8:27:00	Front to rear	Property Damage Only	2	0	0.38	Rubber Avenue	unknown	ANDREW AV	50	Feet	W	Clear	Daylight	Dry	
6	372580	1/18/2017	Wednesday	8:19:00	Front to rear	Property Damage Only	2	0	0.37	Rubber Avenue	ANDREW AV					Rain	Daylight	Wet	
7	394575	5/28/2017	Sunday	12:58:00	Front to rear	Property Damage Only	2	0	0.37	Rubber Avenue	ANDREW AV					Clear	Daylight	Dry	

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8	410290	6/27/2017	Tuesday	16:33:00	Front to rear	Property Damage Only	2	0	0.36	Rubber Avenue	unknown	ANDREW AV	75	Feet	E	Clear	Daylight	Dry
9	429509	8/20/2017	Sunday	14:57:00	Angle	Property Damage Only	2	0	0.36	Rubber Avenue	unknown	ANDREW AV	65	Feet	E	Clear	Daylight	Dry
10	435310	9/12/2017	Tuesday	7:13:00	Angle	Property Damage Only	2	0	0.39	Rubber Avenue	unknown	ANDREW AV	113	Feet	W	Clear	Daylight	Dry
11	461139	12/1/2017	Friday	19:27:00	Front to rear	Injury of any type (Serious, N	2	0	0.39	Rubber Avenue	unknown	ANDREW AV	100	Feet	W	Clear	Dark-Light	Dry
12	571682	5/31/2018	Thursday	10:51:00	Front to rear	Property Damage Only	2	0	0.38	RUBBER AV	unknown	ANDREW AV	40	Feet	W	Clear	Daylight	Dry
13	575672	11/6/2018	Tuesday	16:55:00	Front to rear	Injury of any type (Serious, N	3	0	0.37	RUBBER AV	ANDREW AV					Rain	Dark-Light	Moving Wa
AT EDWARD ST																		
1	208048	5/21/2016	Saturday	9:38:00	Angle	Injury of any type (Serious, N	2	0	0.46	Rubber Avenue	EDWARD ST					Cloudy	Daylight	Dry
2	421641	7/26/2017	Wednesday	12:07:00	Sideswipe, same direction	Property Damage Only	2	0	0.46	Rubber Avenue	EDWARD ST					Clear	Daylight	Dry
3	452288	10/30/2017	Monday	22:21:00	Not Applicable	Property Damage Only	1	0	0.46	Rubber Avenue	EDWARD ST					Rain	Dark-Light	Wet
4	448496	10/29/2017	Sunday	23:43:00	Not Applicable	Injury of any type (Serious, N	1	0	0.5	Rubber Avenue	unknown	ANDREW AV	662	Feet	W	Rain	Dark-Not Li	Wet