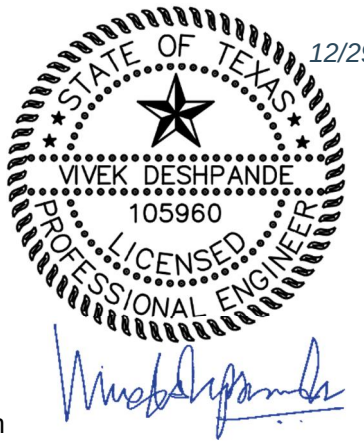
Kimley»Horn

TECHNICAL MEMORANDUM



12/29/2023

To: Mr. Danny Cameron
City of West University Place

From: Vivek Deshpande, P.E.
Kimley-Horn and Associates, Inc.
Firm Number F-928

Date: December 29, 2023

Subject: Stella Link Road at Weslayan Street
Intersection Geometry - Technical Memorandum

SUMMARY

Kimley-Horn has prepared this memorandum for the City of West University Place to evaluate existing geometry and operations at the intersection of Weslayan Street at Stella Link Road. This memorandum includes a description of existing conditions and alternatives for consideration. Based on collected traffic volumes, crash data, and capacity analysis results, no mitigation measures are recommended at this time. Two alternate intersection geometry configurations – Modified Access or a Mini-Roundabout – may be considered to proactively improve safety and operations in the vicinity of Weslayan Street at Stella Link Road. There are benefits and challenges with each alternative. This memorandum highlights some of the main characteristics of each alternative.

EXISTING CONDITIONS

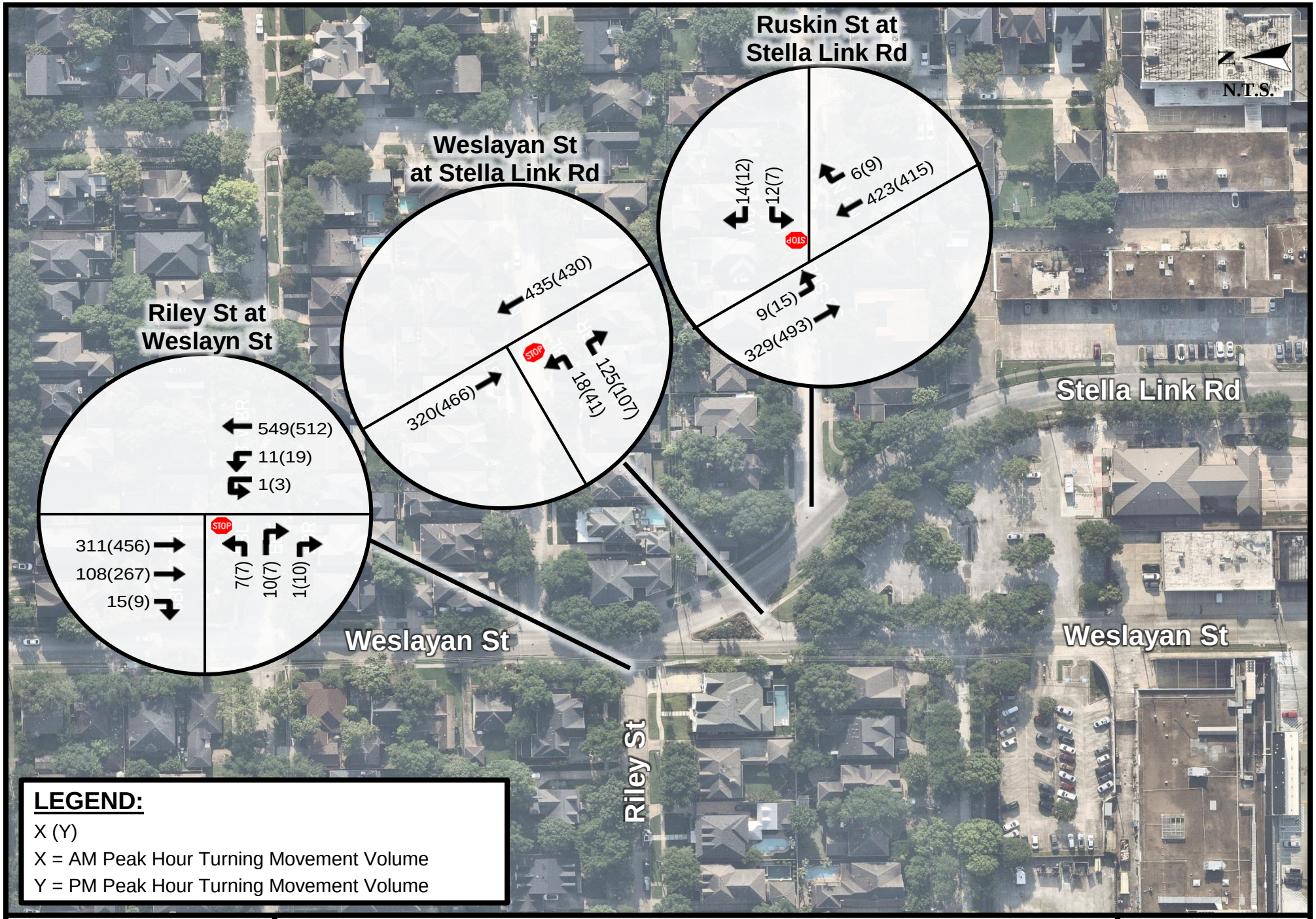
Under current alignment, just south of the intersection of Riley Street at Weslayan Street, Stella Link Road curves to join Weslayan Street. Northbound vehicles on Weslayan Street south of the intersection must utilize a turnaround to turn right onto southbound Stella Link Road (towards Bellaire Blvd) or left to continue northbound on Weslayan Street. This results in atypical intersection geometry that may create safety concerns for traffic flow along the corridor.

Volume Data

Turning movement counts were collected on Tuesday May 16, 2023 from 6:30 AM to 9:30 AM and 3:00 PM to 7:00 PM in 15-minute intervals at the following locations:

- Riley Street at Weslayan Street
- Weslayan Street at Stella Link Road
- Ruskin Street at Stella Link Road

Peak hours of the network were determined to be 7:30-8:30 AM and 5:00-6:00 PM. AM and PM peak hour volumes are provided as ***Exhibit 1***. Raw count data is provided as **Attachment A**.



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2023 EXISTING PEAK HOUR VOLUMES

EXHIBIT 1

Crash Data

Crash history was obtained from TxDOT's Crash Records Information System (C.R.I.S.) in the vicinity of the study intersection between January 1, 2020 and June 14, 2023. Raw crash data is provided as **Attachment B**. A summary of crash severity is provided as ***Table 1***.

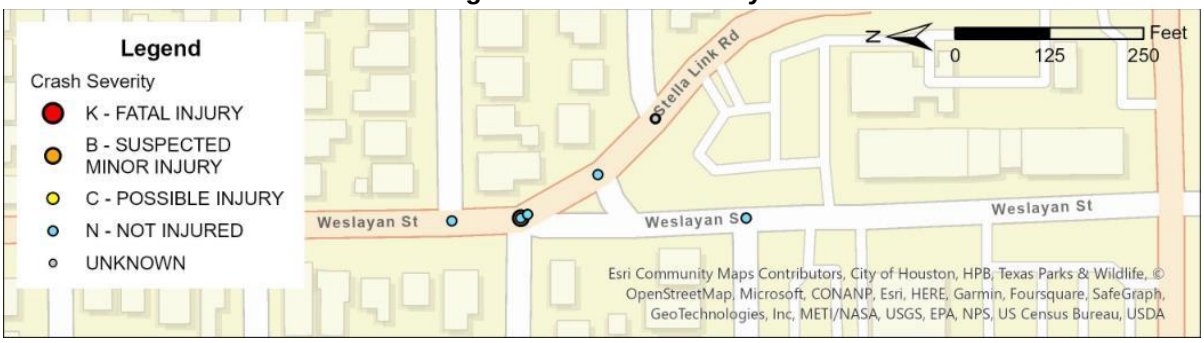
Table 1 – Crash History (2020 – 2023)

Crash Severity	2020	2021	2022	2023*	TOTAL
K – Fatal Injury	0	0	0	0	0
A – Incapacitating Injury	0	0	0	0	0
B – Non-Incapacitating Injury	1	0	0	0	1
C – Possible Injury	0	0	0	0	0
O – Not Injured	3	5	3	1	12
U – Unknown Injury	0	1	0	0	1
TOTAL	4	6	3	1	14

Notes:
*2023 Crash data available as of 6/14/2023.

A total of 14 crashes were reported during the study period, one (1) of which was an injury crash. No pedestrian or bicyclist related crashes were reported during the study period. Crash severity in the vicinity of the study intersection is provided as **Figure 1**. The most commonly reported contributing factors were driver inattention (57% of crashes) and failure to yield right of way (43%).

Figure 1 – Crash Severity



Operations

Capacity analysis of the three locations in the vicinity of Weslayan Street at Stella Link Road was performed using *Synchro 11*™ software. Analysis consists of AM and PM peak hour Level of Service (LOS) analyses. LOS, which is a measure of the degree of congestion, ranges from LOS A (free flowing) to LOS F (a congested, forced flow condition). LOS D or better is generally deemed as acceptable operations for an urban/suburban area.

Analysis output is provided as **Attachment C**. A summary of reported delay and LOS at stop-controlled approaches is provided as ***Table 2***. Based on the analysis, 'Two-Way Stop' controlled approaches report an acceptable LOS D or better with the exception of Riley Street at Weslayan Street, which reports a LOS F during the PM peak hour. Traffic on Riley Street has to wait until they find an opening in traffic on Weslayan Street – Stella Link Road before turning left or right. Due to heavy traffic on Weslayan Street during AM and PM peak periods, traffic on side streets has to wait for longer – the increased delays pushes the operations to LOS F. However, based on queue analysis for the side streets, the queues are not anticipated to exceed one or two vehicles on Riley Street.

Table 2 – Existing LOS Summary

Study Intersections		AM Peak Hour		PM Peak Hour	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
Riley Street at Weslayan Street	EB	28.4	D	52.8	F
Weslayan Street at Stella Link Road	EB	20.9	C	26.5	D
Ruskin Street at Stella Link Road	WB	13.4	B	14.1	B

ALTERNATIVES

Although crash history and capacity analysis results do not indicate an immediate issue in the vicinity of Weslayan Street at Stella Link Road, two alternate intersection configuration options were considered to proactively improve safety and operations in the area: Access Modification (***Exhibit 2***) and Mini-Roundabout (***Exhibit 3***).

Alternatives were evaluated on the following criteria:

- Number of Conflict Points
- Impact on Speed
- Access Restriction
- Traffic Detour to Side Streets
- Cost of Construction
- Right-of-Way (R.O.W.) Acquisition
- Potential for Utility Conflicts
- Implementation Schedule

Access Modification

The first concept considered is to restrict northbound Weslayan Street between Riley Street and Ruskin Street. A concept is provided as ***Exhibit 2***. Existing segment of Weslayan Street between Riley Street and Ruskin Street will be modified per the exhibit – new curb will be installed to prevent any movements on Weslayan Street immediately south of Riley Street. The green shaded polygon may be redesigned as landscaping. The existing "turnaround" that allows northbound vehicles from Weslayan Street to turn onto Stella Link Road or continue north on Weslayan Street will be restriped to only serve southbound vehicles continuing onto Weslayan Street. Northbound vehicles on Weslayan Street south of Ruskin Street will be forced to turn left onto Ruskin Street. Similarly, eastbound vehicles on Ruskin Street will be forced to turn right on to Weslayan Street towards Bellaire Blvd. With these access restrictions, some existing traffic may detour to side streets such as Ruskin Street and Riley Street.

Some of the benefits of this concept are:

- No right-of-way acquisition is needed;
- No utility conflicts is anticipated;
- Construction cost for the proposed modifications is anticipated to be low;
- Access modifications may be constructed in a relatively short period of time;
- With the removal of the northbound approach of the turnaround, the number of conflict points is expected to decrease which may slightly improve safety at the intersection.

Some of the limitations of this concept are:

- No overall speed reductions are anticipated on Weslayan Street – Stella Link Road;
- Proposed modifications will create access restrictions compared to existing traffic flow;
- Some of the side streets may experience increased cut-through traffic due to access restrictions.

Analysis output from *Synchro 11™* is provided as **Attachment C**. A summary of reported delay and LOS at stop-controlled approaches based on modified access and expected redistribution of vehicles is provided in ***Table 3***. Stop-controlled LOS reports improvement at both remaining stop-controlled approaches, however, increased delay may be expected at the intersection of Ruskin Street at Weslayan Street which was not included in the analysis.

Table 3 – Access Modification LOS Summary

Study Intersections		AM Peak Hour		PM Peak Hour	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
Riley Street at Weslayan Street	EB	13.7	B	19.2	C
Ruskin Street at Stella Link Road	WB	13.3	B	13.8	B

RUSKIN ST

STELLA LINK RD

0 15 30

WESLAYAN ST

WESLAYAN ST

RILEY ST

RUSKIN ST

Kimley»Horn

ACCESS MODIFICATION CONCEPT

EXHIBIT 2

Mini-Roundabout

Due to existing intersection geometry and roadway alignment between Riley Street and Ruskin Street, a mini-roundabout (RAB) may be considered on Stella Link Road. A concept is provided as ***Exhibit 3***. The main features of the roundabout are summarized below:

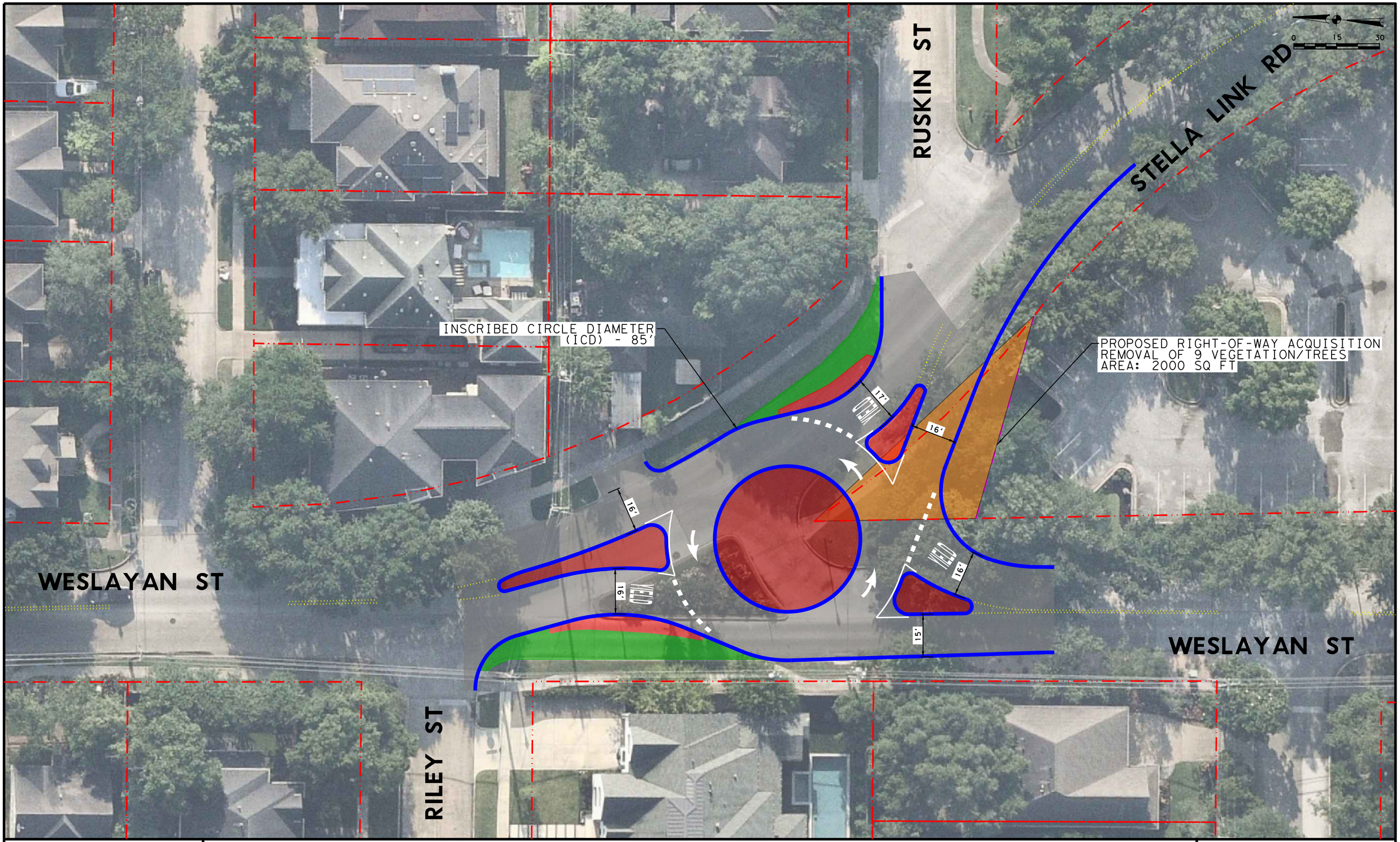
- Based on traffic volumes, a single lane roundabout is appropriate;
- The inscribed circle diameter of the min-RAB was assumed to be 85 feet;
- The circulating lane in the RAB was assumed to be approximately 15-16 feet;
- ***Exhibit 4*** shows Autoturn template for truck traffic movements and traversed path through the roundabout. The red shaded area is proposed to be raised or mountable curb to provide appropriate flow around the roundabout. The center island is anticipated to be mountable to allow larger truck traffic to go through roundabout;
- As shown in ***Exhibit 4***, northbound trucks will be able to navigate around the roundabout within the lane. Trucks in the southbound direction may need to utilize the traversable center median to travel south. Based on Autoturn template, the cab of a truck may need to swing to the right to allow the inside of the trailer to go over the island;
- At the two existing residential driveways between Riley Street and the roundabout, traffic movements may need to be limited to right-in-right-out only. Traffic from north turning left at these driveways will need continue south, go around the roundabout, and then make a right-turn into the driveway. Traffic from these driveways headed south towards Bellaire Blvd, will need to turn right on Weslayan Street, then turn left on to Riley Street, followed by another left-turn on Academy Street before coming out on Bellaire Blvd. While there may slight access modification at the two residential driveways, proposed operations are anticipated to be safer;
- Due to limited available space, additional right-of-way (ROW) will need to be acquired from the Bank of America parcel immediately south of the intersection. Based on preliminary layout, approximately 2,000 square feet of a corner clip may be needed. This is not based on any topographic survey and is only included for planning level consideration based on available aerial imagery.

Some of the main benefits of a mini-RAB are summarized below:

- Change overall context of the corridor and decrease vehicular speeds along the corridor;
- Decrease number of conflict points for both vehicular and pedestrian traffic both of which could result in improved safety at the intersection.
- A mini-roundabout will also allow all existing movements for regular vehicular traffic. For truck traffic some restrictions may be needed due to turning radii limitations – truck traffic from northbound Weslayan Street wishing to turn on to Stella Link Road towards Bellaire Blvd would need to be restricted. Due to geometry of the mini-roundabout, this movement will be almost a U-turn and truck traffic may not be able to negotiate this turn. However, based on existing signage, no truck traffic is allowed to go north on Weslayan Street so the access limitation at the mini-roundabout is not anticipated to impact existing traffic flow.

Below are some of the limitations of mini-roundabout concept:

- Additional ROW will be required to construct a mini-roundabout which is anticipated to increase overall cost;
- Mini-roundabout may have a long construction schedule due to ROW acquisition and potential relocation of existing underground utilities and drainage. This is based on preliminary review of the site – no subsurface utility survey information is available for the area.



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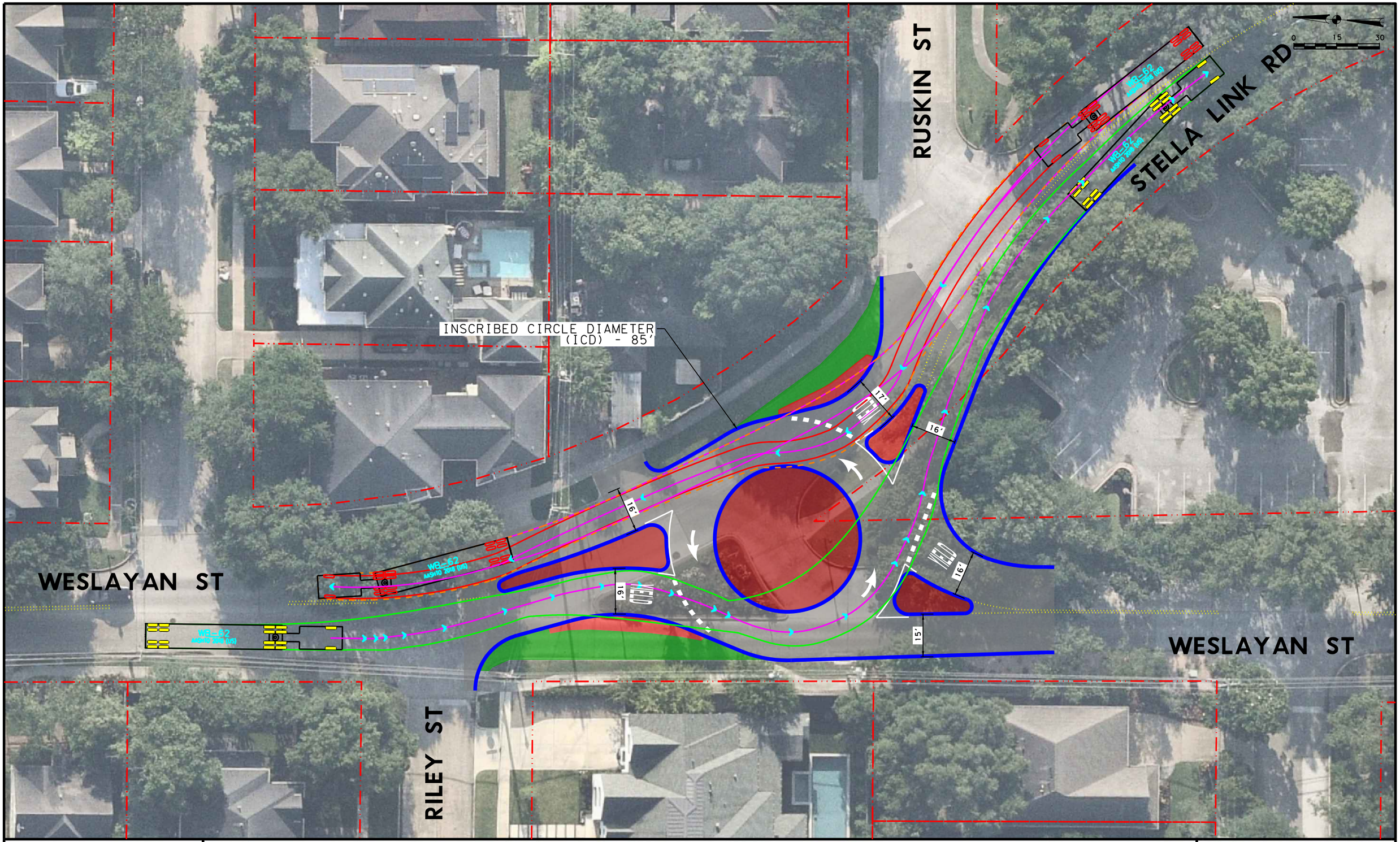
PRELIMINARY MINI-ROUNDABOUT CONCEPT

EXHIBIT 3



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PRELIMINARY MINI-ROUNDABOUT TRUCK TURNING TEMPLATES

EXHIBIT 4

Analysis output from *Synchro 11™* is provided as **Attachment C**. A summary of reported delay and LOS at stop-controlled approaches based on modified access and expected redistribution of vehicles is provided in ***Table 4***. Further analysis of the roundabout operation may be needed using a more specialized software tool for roundabouts.

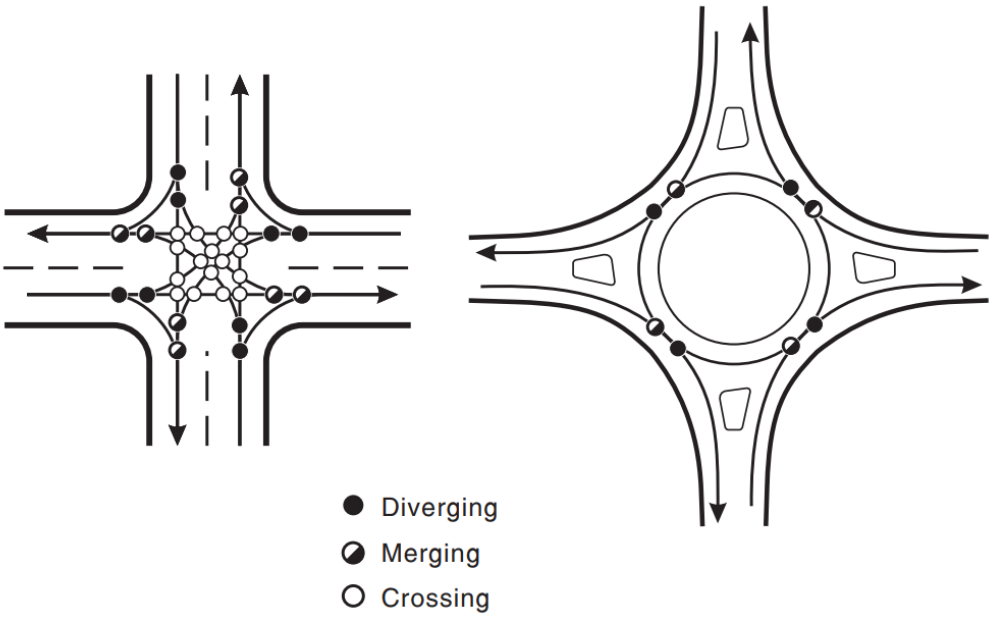
Table 4 – Mini-Roundabout LOS Summary

Study Intersections		AM Peak Hour		PM Peak Hour	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
Riley Street at Weslayan Street	EB	10.4	B	10.4	B
Weslayan Street at Stella Link Road	WB	7.0	A	6.8	A
	NB	5.3	A	6.6	A
	SB	5.7	A	9.5	A
	Int	**6.2**	**A**	**8.3**	**A**
Ruskin Street at Stella Link Road	WB	13.4	B	14.1	B

As mentioned previously, 'Conflict' points is one of the factors that was used to evaluate different configurations. A conflict point is an area where two vehicular streams to or from different directions may interact either head-on, or at an angle from right or left sides. ***Figure 2*** below compares theoretical conflict points between a traditional four-leg intersection and a roundabout. A single lane roundabout has eight (8) vehicular conflict points compared to 32 conflict points at a typical 4-legged intersection.

Figure 2 – Conflict Points Comparison

Source: Federal Highway Administration (FHWA) Roundabouts: An Informational Guide



RECOMMENDATIONS

Based on collected volume and crash data, observations, and capacity analysis results, no mitigation measures are recommended at this time. Two alternate geometry options: modified access and a mini-roundabout, may be considered to proactively improve safety and operations in the vicinity of Weslayan Street at Stella Link Road. A comparison of the alternatives is provided as **Table 5**.

Table 5 – Alternative Comparison

Factors	Existing	Access Modification	Mini-Roundabout
Conflict Points	High	Medium	Low
Impact on Speed	N/A	No	Lower
Access Restriction		Some	No
Traffic Detour to Side Streets		Yes	No
Cost of Construction		Low	High
R.O.W. Acquisition		No	Yes
Potential Utility Conflicts		No	Yes
Implementation Schedule		Short	Long

Attachments:

A. Volume Data
B. Crash Data
C. Synchro Output

A. VOLUME DATA

National Data & Surveying Services Intersection Turning Movement Count

Location: Weslayan St & Riley St
City: Houston
Control: 1-Way Stop(EB)

Project ID: 23-450085-008
Date: 5/16/2023

Data - Totals

NS/EW Streets:	Weslayan St				Weslayan St				Riley St				Riley St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:30 AM	0	0	0	0	25	11	2	0	2	2	0	0	0	0	31	0	73
6:45 AM	0	0	0	0	26	15	0	0	3	1	0	0	0	0	56	0	101
7:00 AM	0	0	0	0	42	19	1	0	2	1	1	0	0	0	90	0	156
7:15 AM	0	0	0	0	51	26	3	0	5	2	0	0	0	0	112	0	199
7:30 AM	0	0	0	0	80	24	4	0	2	2	0	0	1	1	153	0	267
7:45 AM	0	0	0	0	84	24	1	0	0	1	1	0	0	3	138	0	252
8:00 AM	0	0	0	0	63	33	4	0	4	3	0	0	0	2	126	0	235
8:15 AM	0	0	0	0	84	27	6	0	1	4	0	0	0	5	132	0	259
8:30 AM	0	0	0	0	67	26	2	0	2	2	1	0	0	2	142	0	244
8:45 AM	0	0	0	0	69	35	3	0	2	0	1	0	0	2	123	0	235
9:00 AM	0	0	0	0	60	37	2	0	2	2	2	0	0	2	108	0	215
9:15 AM	0	0	0	0	61	25	0	0	2	1	1	0	0	2	101	0	193
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	712	302	28	0	27	21	7	0	1	19	1312	0	2429
APPROACH %'s :					68.33%	28.98%	2.69%	0.00%	49.09%	38.18%	12.73%	0.00%	0.08%	1.43%	98.50%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	311	108	15	0	7	10	1	0	1	11	549	0	1013
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.926	0.818	0.625	0.000	0.438	0.625	0.250	0.000	0.250	0.550	0.897	0.000	0.949
						0.927				0.643				0.905			

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	79	25	0	0	3	1	2	0	0	2	97	0	209
11:15 AM	0	0	0	0	81	31	2	0	2	2	2	0	0	2	108	0	230
11:30 AM	0	0	0	0	63	44	1	0	2	0	2	0	0	2	95	0	209
11:45 AM	0	0	0	0	86	38	1	0	1	2	3	0	1	2	85	0	219
12:00 PM	0	0	0	0	82	38	2	0	1	1	1	0	0	3	105	0	233
12:15 PM	0	0	0	0	53	38	5	0	1	2	1	0	0	2	111	0	213
12:30 PM	0	0	0	0	82	31	1	0	1	0	2	0	0	3	106	0	226
12:45 PM	0	0	0	0	67	33	3	0	2	2	0	0	0	2	87	0	196
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	593	278	15	0	13	10	13	0	1	18	794	0	1735
APPROACH %'s :					66.93%	31.38%	1.69%	0.00%	36.11%	27.78%	36.11%	0.00%	0.12%	2.21%	97.66%	0.00%	
PEAK HR :	11:45 AM - 12:45 PM																TOTAL
PEAK HR VOL :	0	0	0	0	303	145	9	0	4	5	7	0	1	10	407	0	891
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.881	0.954	0.450	0.000	1.000	0.625	0.583	0.000	0.250	0.833	0.917	0.000	0.956
						0.914				0.667				0.925			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	0	0	0	0	83	50	3	0	2	2	0	0	0	4	111	0	255
3:15 PM	0	0	0	0	100	57	4	0	1	3	1	0	2	3	98	0	269
3:30 PM	0	0	0	0	117	46	5	0	0	2	3	0	0	6	117	0	296
3:45 PM	0	0	0	0	107	52	3	0	3	2	4	0	0	2	112	0	285
4:00 PM	0	0	0	0	105	74	3	0	1	3	1	0	0	4	115	0	306
4:15 PM	0	0	0	0	117	53	6	0	1	3	3	0	0	1	130	0	314
4:30 PM	0	0	0	0	117	72	3	0	3	2	6	0	0	7	113	0	323
4:45 PM	0	0	0	0	122	67	2	0	7	1	2	0	2	11	118	0	332
5:00 PM	0	0	0	0	122	73	4	0	4	4	3	0	0	8	137	0	355
5:15 PM	0	0	0	0	115	66	2	0	2	2	2	0	1	4	124	0	318
5:30 PM	0	0	0	0	107	58	0	0	1	1	5	0	1	4	119	0	296
5:45 PM	0	0	0	0	112	70	3	0	0	0	0	0	1	3	132	0	321
6:00 PM	0	0	0	0	117	52	2	0	0	1	2	0	1	4	101	0	280
6:15 PM	0	0	0	0	125	27	2	0	0	1	2	0	0	4	102	0	263
6:30 PM	0	0	0	0	94	44	5	0	2	2	0	0	0	0	90	0	237
6:45 PM	0	0	0	0	92	38	2	0	2	1	1	0	0	1	116	0	253
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1752	899	49	0	29	30	35	0	8	66	1835	0	4703
APPROACH %'s :					64.89%	33.30%	1.81%	0.00%	30.85%	31.91%	37.23%	0.00%	0.42%	3.46%	96.12%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	476	278	11	0	16	9	13	0	3	30	492	0	1328
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.975	0.952	0.688	0.000	0.571	0.563	0.542	0.000	0.375	0.682	0.898	0.000	0.935
						0.961				0.864				0.905			

Prepared by National Data & Surveying Services

Weslayan St & Riley St

Peak Hour Turning Movement Count

ID: 23-450085-008
City: Houston

Day: Tuesday
Date: 5/16/2023

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	11:45 AM - 12:45 PM
PM	04:30 PM - 05:30 PM

COUNT PERIODS

AM	6:30 AM - 09:30 AM
NOON	11:00 AM - 01:00 PM
PM	3:00 PM - 07:00 PM

SOUTHBOUND (Weslayan St)

AM	15	108	311	0	556	AM
NOON	9	145	303	0	411	NOON
PM	11	278	476	0	508	PM

EASTBOUND (Riley St)

AM	NOON	PM		
26	19	41	⇦	
0	0	0	↶	0
7	4	16	↰	0
10	5	9	→	1
1	7	13	↱	0
AM	NOON	PM		

WESTBOUND (Riley St)

	PM	NOON	AM
0	492	407	549
1 ←	30	10	11
0 ↙	3	1	1
0 ↶	0	0	0
⇨	485	308	321
	PM	NOON	AM

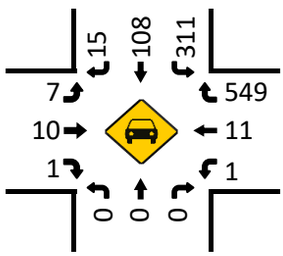
NORTHBOUND (Weslayan St)

PM	294	0	0	0	0	PM
NOON	153	0	0	0	0	NOON
AM	110	0	0	0	0	AM

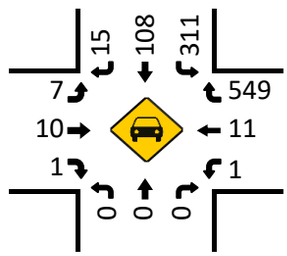
CONTROL: 1-Way Stop(EB)

TEV	1013 AM	891 NOON	1328 PM
PHF	0.95	0.96	0.94

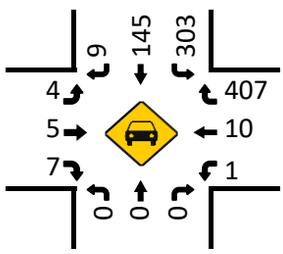
Totals (AM)



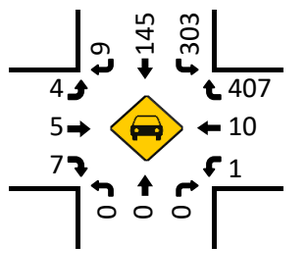
Totals (AM)



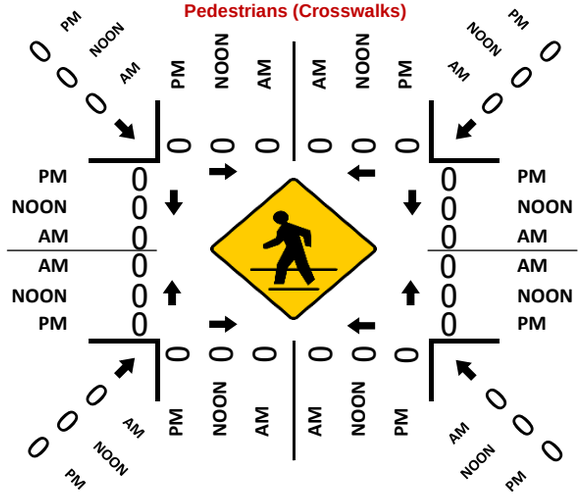
Totals (NOON)



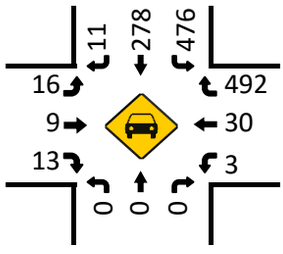
Totals (NOON)



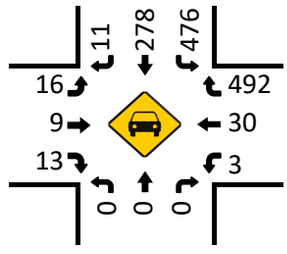
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Stella Link Rd & Weslayan St
City: Houston
Control: 1-Way Stop(EB)

Project ID: 23-450085-009
Date: 5/16/2023

Data - Totals

NS/EW Streets:	Stella Link Rd				Stella Link Rd				Weslayan St				Weslayan St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	0 WT	0 WR	0 WU	TOTAL
6:30 AM	0	27	0	0	0	27	0	0	4	0	0	0	0	0	0	0	58
6:45 AM	0	51	0	0	0	27	0	0	6	0	2	0	0	0	0	0	86
7:00 AM	0	68	0	0	0	42	0	0	21	0	2	0	0	0	0	0	133
7:15 AM	0	82	0	0	0	54	0	0	32	0	3	0	0	0	0	0	171
7:30 AM	0	120	0	0	0	82	0	0	33	0	3	0	0	0	0	0	238
7:45 AM	0	105	0	0	0	85	0	0	38	0	7	0	0	0	0	0	235
8:00 AM	0	103	0	0	0	64	0	0	23	0	4	0	0	0	0	0	194
8:15 AM	0	107	0	0	0	89	0	0	31	0	4	0	0	0	0	0	231
8:30 AM	0	112	0	0	0	70	0	0	31	0	5	0	0	0	0	0	218
8:45 AM	0	96	0	0	0	69	0	0	30	0	4	0	0	0	0	0	199
9:00 AM	0	90	0	0	0	60	0	0	19	0	4	0	0	0	0	0	173
9:15 AM	0	83	0	0	0	64	0	0	29	0	4	0	0	0	0	0	180
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1044	0	0	0	733	0	0	297	0	42	0	0	0	0	0	2116
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	87.61%	0.00%	12.39%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	435	0	0	0	320	0	0	125	0	18	0	0	0	0	0	898
PEAK HR FACTOR :	0.000	0.906	0.000	0.000	0.000	0.899	0.000	0.000	0.822	0.000	0.643	0.000	0.000	0.000	0.000	0.000	0.943
		0.906				0.899				0.794							

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	0 WT	0 WR	0 WU	TOTAL
11:00 AM	0	73	0	0	0	80	0	0	29	0	2	0	0	0	0	0	184
11:15 AM	0	83	0	0	0	83	0	0	24	0	5	0	0	0	0	0	195
11:30 AM	0	81	0	0	0	63	0	0	16	0	5	0	0	0	0	0	165
11:45 AM	0	68	0	0	0	88	0	0	20	0	6	0	0	0	0	0	182
12:00 PM	0	83	0	0	0	83	0	0	26	0	4	0	0	0	0	0	196
12:15 PM	0	85	0	0	0	55	0	0	27	0	5	0	0	0	0	0	172
12:30 PM	0	93	0	0	0	82	0	0	16	0	6	0	0	0	0	0	197
12:45 PM	0	71	0	0	0	69	0	0	18	0	6	0	0	0	0	0	164
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	637	0	0	0	603	0	0	176	0	39	0	0	0	0	0	1455
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	81.86%	0.00%	18.14%	0.00%					
PEAK HR :	11:45 AM - 12:45 PM																TOTAL
PEAK HR VOL :	0	329	0	0	0	308	0	0	89	0	21	0	0	0	0	0	747
PEAK HR FACTOR :	0.000	0.884	0.000	0.000	0.000	0.875	0.000	0.000	0.824	0.000	0.875	0.000	0.000	0.000	0.000	0.000	0.948
		0.884				0.875				0.859							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	0 WT	0 WR	0 WU	TOTAL
3:00 PM	0	94	0	0	0	85	0	0	23	0	7	0	0	0	0	0	209
3:15 PM	0	76	0	0	0	103	0	0	25	0	11	0	0	0	0	0	215
3:30 PM	0	97	0	0	0	119	0	0	26	0	3	0	0	0	0	0	245
3:45 PM	0	83	0	0	0	109	0	0	34	0	8	0	0	0	0	0	234
4:00 PM	0	89	0	0	0	105	0	0	27	0	8	0	0	0	0	0	229
4:15 PM	0	110	0	0	0	123	0	0	27	0	9	0	0	0	0	0	269
4:30 PM	0	92	0	0	0	119	0	0	24	0	12	0	0	0	0	0	247
4:45 PM	0	96	0	0	0	120	0	0	33	0	10	0	0	0	0	0	259
5:00 PM	0	109	0	0	0	128	0	0	37	0	9	0	0	0	0	0	283
5:15 PM	0	106	0	0	0	118	0	0	22	0	12	0	0	0	0	0	258
5:30 PM	0	108	0	0	0	108	0	0	16	0	12	0	0	0	0	0	244
5:45 PM	0	107	0	0	0	112	0	0	32	0	8	0	0	0	0	0	259
6:00 PM	0	90	0	0	0	117	0	0	13	0	7	0	0	0	0	0	227
6:15 PM	0	90	0	0	0	127	0	0	18	0	5	0	0	0	0	0	240
6:30 PM	0	70	0	0	0	96	0	0	19	0	7	0	0	0	0	0	192
6:45 PM	0	88	0	0	0	91	0	0	28	0	7	0	0	0	0	0	214
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1505	0	0	0	1780	0	0	404	0	135	0	0	0	0	0	3824
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	74.95%	0.00%	25.05%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	407	0	0	0	490	0	0	121	0	40	0	0	0	0	0	1058
PEAK HR FACTOR :	0.000	0.925	0.000	0.000	0.000	0.957	0.000	0.000	0.818	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.935
		0.925				0.957				0.875							

Prepared by National Data & Surveying Services

Stella Link Rd & Weslayan St

Peak Hour Turning Movement Count

ID: 23-450085-009
City: Houston

Day: Tuesday
Date: 5/16/2023

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	11:45 AM - 12:45 PM
PM	04:15 PM - 05:15 PM

COUNT PERIODS

AM	6:30 AM - 09:30 AM
NOON	11:00 AM - 01:00 PM
PM	3:00 PM - 07:00 PM

SOUTHBOUND (Stella Link Rd)

AM	0	320	0	0	560	AM
NOON	0	308	0	0	418	NOON
PM	0	490	0	0	528	PM

EASTBOUND (Weslayan St)

AM	NOON	PM	
0	0	0	
0	0	0	0
125	89	121	0
0	0	0	1
18	21	40	0
AM	NOON	PM	

WESTBOUND (Weslayan St)

PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	
PM	NOON	AM	

NORTHBOUND (Stella Link Rd)

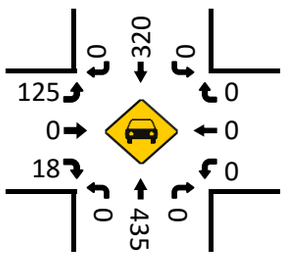
PM	530	0	0	407	0	PM
NOON	329	0	0	329	0	NOON
AM	338	0	0	435	0	AM

CONTROL

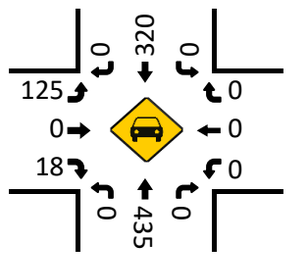
1-Way Stop(EB)

TEV	898 AM	747 NOON	1058 PM
PHF	0.94	0.95	0.93

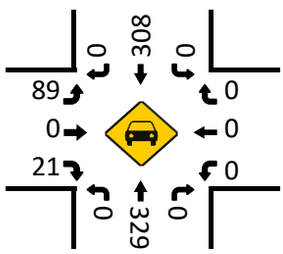
Totals (AM)



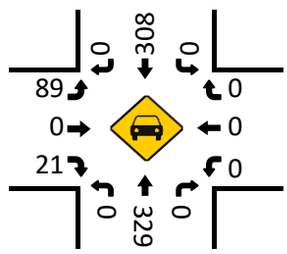
Totals (AM)



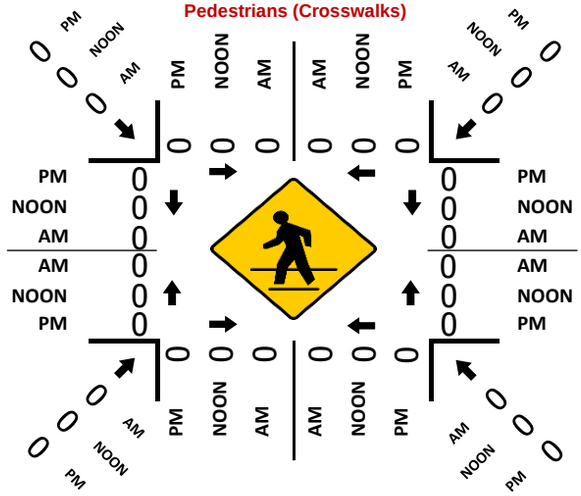
Totals (NOON)



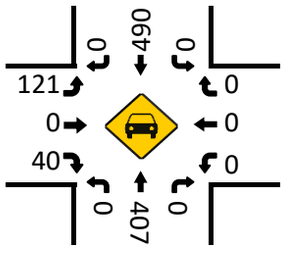
Totals (NOON)



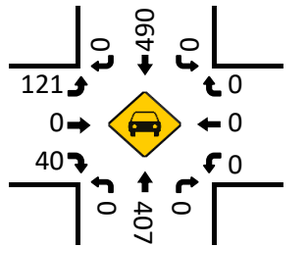
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Stella Link Rd & Ruskin St
City: Houston
Control: 1-Way Stop(WB)

Project ID: 23-450085-010
Date: 5/16/2023

Data - Totals

NS/EW Streets:	Stella Link Rd				Stella Link Rd				Ruskin St				Ruskin St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	0 WL	1 WT	0 WR	0 WU	TOTAL
6:30 AM	0	26	2	0	0	29	0	0	0	0	0	0	1	0	2	0	60
6:45 AM	0	50	0	0	2	26	0	0	0	0	0	0	1	0	0	0	79
7:00 AM	0	68	1	0	1	43	0	0	0	0	0	0	0	0	1	0	114
7:15 AM	0	77	1	0	0	58	0	0	0	0	0	0	3	0	6	0	145
7:30 AM	0	113	1	0	2	82	0	0	0	0	0	0	4	0	5	0	207
7:45 AM	0	100	2	0	4	89	0	0	0	0	0	0	3	0	5	0	203
8:00 AM	0	103	1	0	2	65	0	0	0	0	0	0	4	0	3	0	178
8:15 AM	0	107	2	0	1	93	0	0	0	0	0	0	1	0	1	0	205
8:30 AM	0	109	0	0	1	74	0	0	0	0	0	0	2	0	1	0	187
8:45 AM	0	97	2	0	2	69	0	0	0	0	0	0	0	0	2	0	172
9:00 AM	0	86	1	0	1	65	0	0	0	0	0	0	1	0	1	0	155
9:15 AM	0	80	0	0	1	66	0	0	0	0	0	0	1	0	2	0	150
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1016	13	0	17	759	0	0	0	0	0	0	21	0	29	0	1855
APPROACH %'s :	0.00%	98.74%	1.26%	0.00%	2.19%	97.81%	0.00%	0.00%					42.00%	0.00%	58.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	423	6	0	9	329	0	0	0	0	0	0	12	0	14	0	793
PEAK HR FACTOR :	0.000	0.936	0.750	0.000	0.563	0.884	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.700	0.000	0.958
		0.941				0.899								0.722			

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	0 WL	1 WT	0 WR	0 WU	TOTAL
11:00 AM	0	72	3	0	0	82	0	0	0	0	0	0	0	0	1	0	158
11:15 AM	0	83	1	0	0	88	0	0	0	0	0	0	1	0	2	0	175
11:30 AM	0	82	1	0	1	66	0	0	0	0	0	0	2	0	0	0	152
11:45 AM	0	63	1	0	2	93	0	0	0	0	0	0	1	0	4	0	164
12:00 PM	0	79	0	0	3	83	0	0	0	0	0	0	1	0	2	0	168
12:15 PM	0	85	1	0	0	61	0	0	0	0	0	0	2	0	2	0	151
12:30 PM	0	90	2	0	2	85	0	0	0	0	0	0	5	0	1	0	185
12:45 PM	0	71	1	0	2	74	0	0	0	0	0	0	1	0	0	0	149
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	625	10	0	10	632	0	0	0	0	0	0	13	0	12	0	1302
APPROACH %'s :	0.00%	98.43%	1.57%	0.00%	1.56%	98.44%	0.00%	0.00%					52.00%	0.00%	48.00%	0.00%	
PEAK HR :	11:45 AM - 12:45 PM																TOTAL
PEAK HR VOL :	0	317	4	0	7	322	0	0	0	0	0	0	9	0	9	0	668
PEAK HR FACTOR :	0.000	0.881	0.500	0.000	0.583	0.866	0.000	0.000	0.000	0.000	0.000	0.000	0.450	0.000	0.563	0.000	0.903
		0.872				0.866								0.750			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	0 WL	1 WT	0 WR	0 WU	TOTAL
3:00 PM	0	88	0	0	5	88	0	0	0	0	0	0	0	0	5	0	186
3:15 PM	0	75	0	0	3	108	0	0	0	0	0	0	1	0	1	0	188
3:30 PM	0	94	1	0	4	121	0	0	0	0	0	0	2	0	3	0	225
3:45 PM	0	84	1	0	0	114	0	1	0	0	0	0	0	0	1	0	201
4:00 PM	0	91	3	0	3	110	0	0	0	0	0	0	2	0	1	0	210
4:15 PM	0	101	2	0	3	131	0	0	0	0	0	0	1	0	3	0	241
4:30 PM	0	94	2	0	7	124	0	0	0	0	0	0	3	0	2	0	232
4:45 PM	0	90	2	0	4	125	0	0	0	0	0	0	6	0	5	0	232
5:00 PM	0	99	4	0	2	136	0	0	0	0	0	0	1	0	7	0	249
5:15 PM	0	105	0	0	2	124	0	0	0	0	0	0	1	0	2	0	234
5:30 PM	0	104	4	0	5	119	0	0	0	0	0	0	3	0	3	0	238
5:45 PM	0	107	1	0	6	114	0	0	0	0	0	0	2	0	0	0	230
6:00 PM	0	90	2	0	3	121	0	0	0	0	0	0	0	0	0	0	216
6:15 PM	0	91	2	0	1	131	0	0	0	0	0	0	0	0	0	0	225
6:30 PM	0	65	2	0	3	99	0	0	0	0	0	0	4	0	4	0	177
6:45 PM	0	86	3	0	2	97	0	0	0	0	0	0	0	0	2	0	190
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1464	29	0	53	1862	0	1	0	0	0	0	26	0	39	0	3474
APPROACH %'s :	0.00%	98.06%	1.94%	0.00%	2.77%	97.18%	0.00%	0.05%					40.00%	0.00%	60.00%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	384	10	0	16	516	0	0	0	0	0	0	11	0	17	0	954
PEAK HR FACTOR :	0.000	0.950	0.625	0.000	0.571	0.949	0.000	0.000	0.000	0.000	0.000	0.000	0.458	0.000	0.607	0.000	0.958
		0.956				0.964								0.636			

Prepared by National Data & Surveying Services

Stella Link Rd & Ruskin St

Peak Hour Turning Movement Count

ID: 23-450085-010
City: Houston

Day: Tuesday
Date: 5/16/2023

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	11:45 AM - 12:45 PM
PM	04:15 PM - 05:15 PM

COUNT PERIODS

AM	6:30 AM - 09:30 AM
NOON	11:00 AM - 01:00 PM
PM	3:00 PM - 07:00 PM

SOUTHBOUND (Stella Link Rd)

AM	0	329	9	0	437	AM
NOON	0	322	7	0	326	NOON
PM	0	516	16	0	401	PM

EASTBOUND (Ruskin St)

AM	NOON	PM
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

AM NOON PM

WESTBOUND (Ruskin St)

PM	NOON	AM
17	9	14
0	0	0
11	9	12
0	0	0
26	11	15

PM NOON AM

NORTHBOUND (Stella Link Rd)

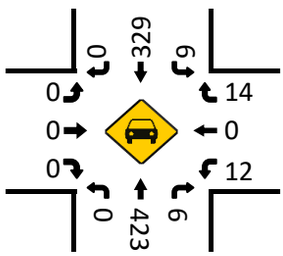
PM	527	0	0	384	10	PM
NOON	331	0	0	317	4	NOON
AM	341	0	0	423	6	AM

CONTROL

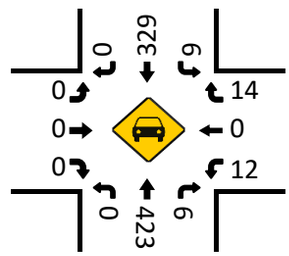
1-Way Stop(WB)

TEV	793 AM	668 NOON	954 PM
PHF	0.96	0.90	0.96

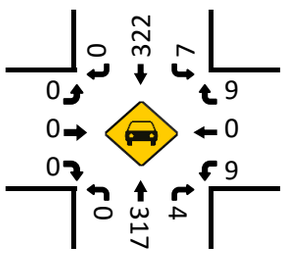
Totals (AM)



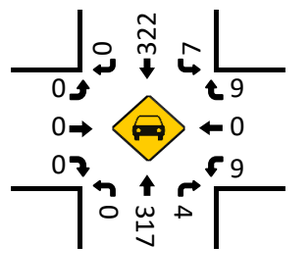
Totals (AM)



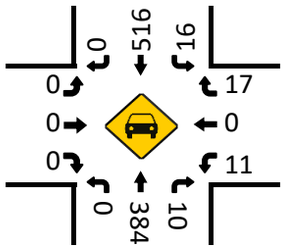
Totals (NOON)



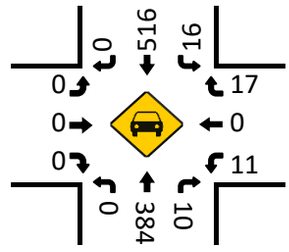
Totals (NOON)



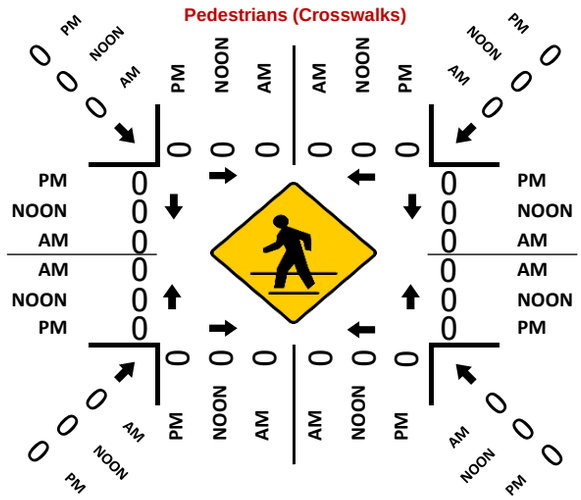
Totals (PM)



Totals (PM)



Pedestrians (Crosswalks)



B. CRASH DATA

Crash History

Weslayan St at Stella Link Rd

Crash Severity	2020	2021	2022	2023*	Total	%
K Fatal Injury	0	0	0	0	0	0%
A Incapacitating Injury	0	0	0	0	0	0%
B Non-Incapacitating Injury	1	0	0	0	1	7%
C Possible Injury	0	0	0	0	0	0%
O Not Injured	3	5	3	1	12	86%
U Unknown	0	1	0	0	1	7%
TOTAL	4	6	3	1	14	-

*Note - 2023 crash data available as of 6/14/2023

First Harmful Event	Count	%
BICYCLE	0	0%
PEDESTRIAN	0	0%
FIXED OBJECT	4	29%
PARKED CAR	0	0%
MOTOR VEHICLE IN TRANSPORT	10	71%
TOTAL	14	-

C. SYNCHRO OUTPUT

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	7	10	1	1	11	549	0	0	0	311	108	15
Future Vol, veh/h	7	10	1	1	11	549	0	0	0	311	108	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	11	1	1	12	578	0	0	0	327	114	16

Major/Minor	Minor1			Major2					Major1		
Conflicting Flow All	1079	1368	122	130	0	0			590	0	0
Stage 1	776	776	-	-	-	-			-	-	-
Stage 2	303	592	-	-	-	-			-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-			4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-			-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-			-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-			2.218	-	-
Pot Cap-1 Maneuver	242	147	929	1455	-	-			985	-	-
Stage 1	454	407	-	-	-	-			-	-	-
Stage 2	749	494	-	-	-	-			-	-	-
Platoon blocked, %					-	-				-	-
Mov Cap-1 Maneuver	155	0	929	1455	-	-			985	-	-
Mov Cap-2 Maneuver	155	0	-	-	-	-			-	-	-
Stage 1	291	0	-	-	-	-			-	-	-
Stage 2	748	0	-	-	-	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	28.4	0	7.5
HCM LOS	D		

Minor Lane/Major Mvmt	EBLn1	WBL	WBT	WBR	SBL	SBT	SBR
Capacity (veh/h)	173	1455	-	-	985	-	-
HCM Lane V/C Ratio	0.11	0.001	-	-	0.332	-	-
HCM Control Delay (s)	28.4	7.5	0	-	10.5	0	-
HCM Lane LOS	D	A	A	-	B	A	-
HCM 95th %tile Q(veh)	0.4	0	-	-	1.5	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	125	18	0	435	320	0
Future Vol, veh/h	125	18	0	435	320	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	19	0	463	340	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	803	340	-	0	-	0
Stage 1	340	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	353	702	0	-	-	0
Stage 1	721	-	0	-	-	0
Stage 2	634	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	353	702	-	-	-	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	721	-	-	-	-	-
Stage 2	634	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	377	-
HCM Lane V/C Ratio	-	0.404	-
HCM Control Delay (s)	-	20.9	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	1.9	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	14	423	6	9	329
Future Vol, veh/h	12	14	423	6	9	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	15	441	6	9	343

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	805	444	0	0	447	0
Stage 1	444	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	352	614	-	-	1113	-
Stage 1	646	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	614	-	-	1113	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	454	1113	-
HCM Lane V/C Ratio	-	-	0.06	0.008	-
HCM Control Delay (s)	-	-	13.4	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	7	7	10	3	19	512	0	0	0	456	267	9
Future Vol, veh/h	7	7	10	3	19	512	0	0	0	456	267	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	8	11	3	21	563	0	0	0	501	293	10

Major/Minor	Minor1			Major2					Major1		
Conflicting Flow All	1609	1890	298	303	0	0			584	0	0
Stage 1	1300	1300	-	-	-	-			-	-	-
Stage 2	309	590	-	-	-	-			-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-			4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-			-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-			-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-			2.218	-	-
Pot Cap-1 Maneuver	115	70	741	1258	-	-			991	-	-
Stage 1	255	231	-	-	-	-			-	-	-
Stage 2	745	495	-	-	-	-			-	-	-
Platoon blocked, %					-	-				-	-
Mov Cap-1 Maneuver	45	0	741	1258	-	-			991	-	-
Mov Cap-2 Maneuver	45	0	-	-	-	-			-	-	-
Stage 1	100	0	-	-	-	-			-	-	-
Stage 2	742	0	-	-	-	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	52.8	0	7.7
HCM LOS	F		

Minor Lane/Major Mvmt	EBLn1	WBL	WBT	WBR	SBL	SBT	SBR
Capacity (veh/h)	101	1258	-	-	991	-	-
HCM Lane V/C Ratio	0.261	0.003	-	-	0.506	-	-
HCM Control Delay (s)	52.8	7.9	0	-	12.3	0	-
HCM Lane LOS	F	A	A	-	B	A	-
HCM 95th %tile Q(veh)	1	0	-	-	2.9	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	107	41	0	430	466	0
Future Vol, veh/h	107	41	0	430	466	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	45	0	467	507	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	974	507	-	0	-	0
Stage 1	507	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	279	566	0	-	-	0
Stage 1	605	-	0	-	-	0
Stage 2	631	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	279	566	-	-	-	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	605	-	-	-	-	-
Stage 2	631	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	325	-
HCM Lane V/C Ratio	-	0.495	-
HCM Control Delay (s)	-	26.5	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	2.6	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	12	415	9	15	493
Future Vol, veh/h	7	12	415	9	15	493
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	13	437	9	16	519

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	993	442	0	0	446	0
Stage 1	442	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	272	615	-	-	1114	-
Stage 1	648	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	615	-	-	1114	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	565	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	415	1114	-
HCM Lane V/C Ratio	-	-	0.048	0.014	-
HCM Control Delay (s)	-	-	14.1	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	11	11	425	421	15
Future Vol, veh/h	7	11	11	425	421	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	12	12	447	443	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	922	451	459	0	-	0
Stage 1	451	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	300	608	1102	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	296	608	1102	-	-	-
Mov Cap-2 Maneuver	296	-	-	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	628	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1102	-	431	-	-
HCM Lane V/C Ratio	0.011	-	0.044	-	-
HCM Control Delay (s)	8.3	0	13.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	14	423	6	9	309
Future Vol, veh/h	12	14	423	6	9	309
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	15	441	6	9	322

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	784	444	0	0	447	0
Stage 1	444	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	362	614	-	-	1113	-
Stage 1	646	-	-	-	-	-
Stage 2	721	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	358	614	-	-	1113	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	462	1113	-
HCM Lane V/C Ratio	-	-	0.059	0.008	-
HCM Control Delay (s)	-	-	13.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	17	19	412	736	9
Future Vol, veh/h	7	17	19	412	736	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	19	21	453	809	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1309	814	819	0	-	0
Stage 1	814	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	176	378	810	-	-	-
Stage 1	436	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	170	378	810	-	-	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	421	-	-	-	-	-
Stage 2	613	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.2	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	810	-	279	-	-
HCM Lane V/C Ratio	0.026	-	0.095	-	-
HCM Control Delay (s)	9.6	0	19.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	12	415	9	15	450
Future Vol, veh/h	7	12	415	9	15	450
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	13	437	9	16	474

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	948	442	0	0	446	0
Stage 1	442	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	289	615	-	-	1114	-
Stage 1	648	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	284	615	-	-	1114	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	430	1114	-
HCM Lane V/C Ratio	-	-	0.047	0.014	-
HCM Control Delay (s)	-	-	13.8	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	14	423	6	9	329
Future Vol, veh/h	12	14	423	6	9	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	15	441	6	9	343

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	805	444	0	0	447	0
Stage 1	444	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	352	614	-	-	1113	-
Stage 1	646	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	614	-	-	1113	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	454	1113	-
HCM Lane V/C Ratio	-	-	0.06	0.008	-
HCM Control Delay (s)	-	-	13.4	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	11	11	549	419	15
Future Vol, veh/h	7	11	11	549	419	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	12	12	578	441	16

Major/Minor	Minor2		Major2	
Conflicting Flow All	301	301	-	0
Stage 1	301	301	-	-
Stage 2	0	0	-	-
Critical Hdwy	6.42	6.52	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	-
Pot Cap-1 Maneuver	691	612	-	-
Stage 1	751	665	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	691	0	-	-
Mov Cap-2 Maneuver	691	0	-	-
Stage 1	751	0	-	-
Stage 2	-	0	-	-

Approach	EB	WB
HCM Control Delay, s	10.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	EBLn1	WBT	WBR
Capacity (veh/h)	691	-	-
HCM Lane V/C Ratio	0.027	-	-
HCM Control Delay (s)	10.4	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Intersection Delay, s/veh	6.2
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	463	152	457
Demand Flow Rate, veh/h	472	155	466
Vehicles Circulating, veh/h	136	348	0
Vehicles Exiting, veh/h	367	118	608
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.0	5.3	5.7
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	472	155	466
Cap Entry Lane, veh/h	1201	968	1380
Entry HV Adj Factor	0.981	0.983	0.980
Flow Entry, veh/h	463	152	457
Cap Entry, veh/h	1178	951	1352
V/C Ratio	0.393	0.160	0.338
Control Delay, s/veh	7.0	5.3	5.7
LOS	A	A	A
95th %tile Queue, veh	2	1	2

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	12	415	9	15	493
Future Vol, veh/h	7	12	415	9	15	493
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	13	437	9	16	519

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	993	442	0	0	446	0
Stage 1	442	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	272	615	-	-	1114	-
Stage 1	648	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	615	-	-	1114	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	565	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	415	1114	-
HCM Lane V/C Ratio	-	-	0.048	0.014	-
HCM Control Delay (s)	-	-	14.1	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	17	19	512	723	9
Future Vol, veh/h	7	17	19	512	723	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	19	21	563	795	10

Major/Minor	Minor2		Major2	
Conflicting Flow All	303	303	-	0
Stage 1	303	303	-	-
Stage 2	0	0	-	-
Critical Hdwy	6.42	6.52	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	-
Pot Cap-1 Maneuver	689	610	-	-
Stage 1	749	664	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	689	0	-	-
Mov Cap-2 Maneuver	689	0	-	-
Stage 1	749	0	-	-
Stage 2	-	0	-	-

Approach	EB	WB
HCM Control Delay, s	10.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	EBLn1	WBT	WBR
Capacity (veh/h)	689	-	-
HCM Lane V/C Ratio	0.038	-	-
HCM Control Delay (s)	10.4	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	467	161	804
Demand Flow Rate, veh/h	476	164	820
Vehicles Circulating, veh/h	118	513	0
Vehicles Exiting, veh/h	559	307	594
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	6.8	6.6	9.5
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	476	164	820
Cap Entry Lane, veh/h	1223	818	1380
Entry HV Adj Factor	0.981	0.980	0.980
Flow Entry, veh/h	467	161	804
Cap Entry, veh/h	1200	801	1353
V/C Ratio	0.389	0.201	0.594
Control Delay, s/veh	6.8	6.6	9.5
LOS	A	A	A
95th %tile Queue, veh	2	1	4