FRANCIS / ASSEMBLY INTERSECTION CONTROL EVALUATION REPORT

ASSEMBLY STREET AND FRANCIS AVENUE IN SPOKANE, WASHINGTON

Prepared for:

City of Spokane Washington State Department of Transportation

For Submittal to:

City of Spokane Washington State Department of Transportation



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SEPTEMBER 2025

CIVTECH PROJECT No. 22-1640

INTRODUCTION

CivTech has been retained to prepare an Intersection Control Evaluation (ICE) at the intersections of Assembly Street & Francis Avenue, Driscoll Boulevard & Assembly Avenue in Spokane, Washington. The intersection location and vicinity map are shown in **Figure 1**. The evaluation was conducted based on the guidelines set in Chapter 1300.05(3) Intersection Control Evaluation (ICE) Section of the Washington State Department of Transportation (WSDOT) Design Manual M 22-01.22 (October 2023).



Figure 1 - Vicinity Map

CivTech prepared this document using the 5-step ICE screening process that was coordinated with WSDOT to evaluate the alternatives and determine the best possible intersection type and design for this specified area.



BACKGROUND & PROJECT NEEDS

EXISTING ROADWAY NETWORK

The roadway classifications were obtained from the WSDOT Functional Classification Map.

Assembly Street is a north/south principal arterial roadway to the south and a minor arterial roadway to the north. The roadway begins south where it converts from Northwest Boulevard and continues north until it terminates at Woodside Avenue. The speed limit is 30 miles per hour (MPH) within the vicinity of the project.

Francis Avenue/Nine Mile Road is an east/west principal arterial roadway. Francis Avenue/Nine Mile Road is also classified as State Route 291, which is a WSDOT facility. The roadway begins to the east where it converts from Bigelow Gulch Road and continues west where it extends beyond the City limits as State Route 291. The speed limit is 35 MPH within the vicinity of the project.

Driscoll Boulevard is an east/west minor arterial roadway. The roadway begins to east where it converts from Cochran Street and continues west until it terminates at Assembly Street. The speed limit is 30 MPH within the vicinity of the project.

Nine Mile Road & Francis Avenue (1) is a three-legged unsignalized intersection with stop control in the northbound approach. The northbound approach consists of a through lane and a dedicated right-turn lane. The eastbound approach consists of a through lane and a dedicated right-turn lane. The westbound approach consists of a through lane.

Francis Avenue & N. Assembly St (2) is a four-legged unsignalized intersection with stop control in the northbound and southbound approaches. The northbound approach consists of a dedicated right-turn lane. The southbound approach consists of a shared left/through/right-turn lane. The eastbound approach consists of an exclusive left-turn lane, a through lane and a shared through/right-turn lane. The westbound approach consists of an exclusive left-turn lane, a through lane and a dedicated right-turn lane.

Nine Mile Road & Driscoll Boulevard (3) is a three-legged unsignalized intersection with stop control in the westbound approach. The northbound approach consists of two through lanes. The southbound approach consists of one through lane. The westbound approach consists of a dedicated right-turn lane.

Driscoll Boulevard & N. Assembly Street (4) is a three-legged unsignalized intersection with stop control in the southbound approach. The northbound approach consists of consists of a shared left/through/right-turn lane. The Southbound approach consists of a shared through/left-turn lane. The westbound approach consists of an exclusive left-turn lane and a through lane.

Nine Mile Road & N. Assembly Street (5) is a three-legged unsignalized intersection with stop control in the southbound approach. The southbound approach consists of one through lane. The northbound approach consists of one (1) through lane. The westbound approach consists of one exclusive left turn lane.

The existing peak hour volumes at these intersections are provided in **Figure 2**.



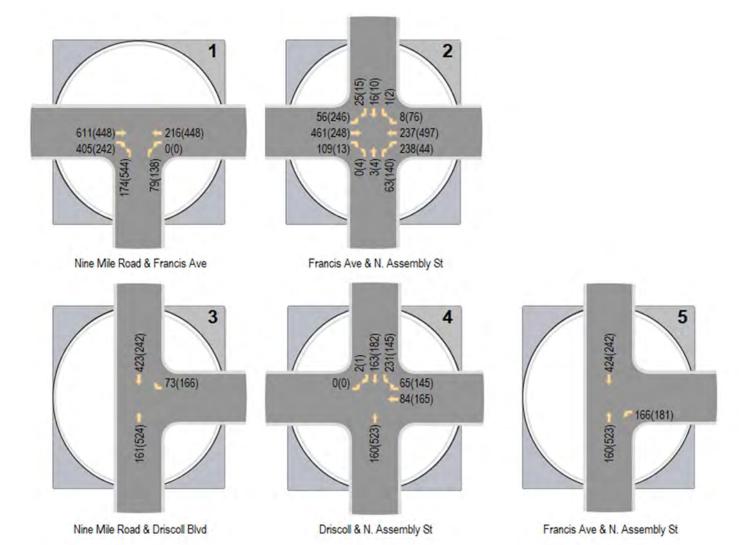


Figure 2 – Existing Peak Hour Volumes AM (PM)

PROJECT NEEDS

The evaluation spurred as the area is a funnel point for vehicles to get on and off from State Route 291 (Francis Avenue) and it currently experiences heavy delay during the peak hours due to the configuration among these three intersections, especially during the PM Peak Hour at the intersection of Nine Mile Road & Francis Avenue. This ICE document will review alternative options to help relieve the expected delay in the area.



INTERSECTION TRAFFIC CONTROL ALTERNATIVES

Alternative A – Assembly Street Connection.

Alternative A involves the connection of the Assembly Street roadway segment at Driscoll Boulevard. Assembly Street is re-aligned and connects with Assembly Street at Nine Mile/Francis Avenue. The Alternative A roadway network configuration is depicted in **Figure 3**.



Figure 3 - Alternative A Roadway Network



Alternative B – Two (2) signals on Francis, Driscoll Alignment Modification.

Alternative B includes the intersections of Assembly Street & Francis Avenue and Francis Avenue & Nine Mile Road to be signalized. This alternative will also remove the connector road from Assembly Street to Francis Avenue. The recommended roadway network configuration is depicted in **Figure 4**.



Figure 4 - Alternative B Roadway Network



Alternative C – 1 Signal on Francis, Driscoll modification with restrictions at Assembly.

Alternative C involves the intersection of Nine Mile Road & Francis Avenue to be signalized, the connector road from Assembly Street to Francis Avenue will be removed and the intersection of Assembly Street & Francis Avenue will have modifications to the northbound, southbound and eastbound approaches. The recommended roadway network configuration is depicted in **Figure 5**.

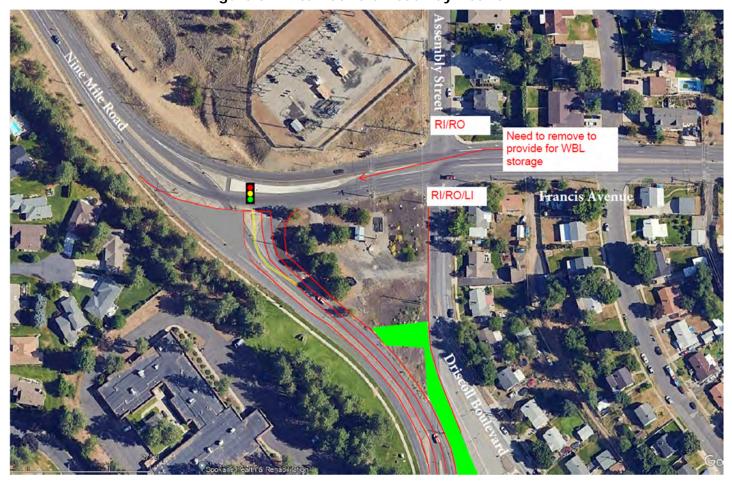


Figure 5 - Alternative C Roadway Network



Alternative D – Segment Termination (Assembly Steet).

Alternative D involves the termination of the Assembly Street roadway segment before Driscoll Boulevard. Assembly Street south of Francis is then connected directly to Nine Mile Road. At the existing intersection of Assembly St and Francis Avenue, the northbound and southbound approach are to be restricted to right-in/right-out. The proposed intersection of Assembly Street and Nine Mile Road requires the modification of the median to provide a left turn lane. To support future regional growth, it is recommended that both Nine Mile Road and Assembly Street and Assembly Street and Driscoll Boulevard should be signalized. The recommended roadway network configuration is depicted in **Figure 6**.



Figure 6 - Alternative D Roadway Network



Alternative D - Roundabouts.

This alternative involves intersection 1 (Francis Ave & Nine Mile Road) and intersection 4 (Assembly Street & Driscoll Boulevard) being analyzed as roundabouts. The intersection of Francis Avenue & Assembly Street will remain as it is. The roundabout at Francis Avenue and Nine Mile Road includes dual circulating lanes for southbound and northbound, as well as a southbound slip lane and a westbound slip lane. These slip lanes are needed to accommodate the existing and projected traffic volumes and limits the ability for future capacity upgrades should development continue or increase at a faster rate than projected. The recommended roadway network configuration is depicted in **Figure 7**.



Figure 7 – Alternative Roundabout



FUTURE DEVELOPMENTS

Three (3) adjacent future developments PM Peak hour volumes were considered in the background analysis, Volkman, Seven Mile Addition, and Sundance Medows. The location of each is shown in **Figure 8**. Volkman is proposed to include 825 single-family units and is anticipated to generate 660 total PM peak hour trips (416 in/244 out). Seven Mile Addition is a proposed 75-unit single family development anticipated to generate 79 total PM peak hour trips (49 in/30 out). Sundance Medows is projected to include 475 single family units and is anticipated to generate 470 total PM peak hour trips (296 in/174 out). The trip generation summary for the developments is shown in **Table 1**.



Figure 8 - Background Developments

Table 1 – Trip Generation Summary

Land Use	ADT			AM Peal	(Hour		PM Peak Hour					
Lanu Use	Avg. Rate*	Total	Avg. Rate*	In	Out	Total	Avg. Rate*	In	Out	Total		
Volkman [825 DU]	8.72	6,794	0.63	119	359	478	0.89	416	244	660		
Seven Mile Addition [65 DU]	10.45	679	0.78	13	38	51	1.22	49	30	79		
Sundance Medows [475 DU]	11.55	5,486	0.74	88	264	352	0.99	296	174	470		
Totals Trips		12,959		220	661	881		761	448	109		



For all three (3) developments, 35 percent of traffic is anticipated to originate and terminate to the south of the intersection Nine Mile Road & Assembly Street, 15 percent of traffic is anticipated to originate and terminate to the southeast of the intersection Driscoll Boulevard & Francis Avenue, and 50 percent of traffic is anticipated to originate and terminate to the east of the intersection Assembly Street & Francis Avenue. The Background Volumes are presented in **Figure 9**. The trip distribution can be seen in **Figure 10**.

25(29) 16(10) 1(2) 56(52) 8(13) 308(628) 735(580) 329(554) 968(592) 594(297) 0(0) 192(95) 238(246) Nine Mile Road & Francis Ave Francis Ave & N. Assembly St 3 601(297) 88(208) 0(0) 65(145) 99(207) 166(181) 250(622) 236(621) Driscoll & N. Assembly St Nine Mile Road & Driscoll Blvd Francis Ave & N. Assembly St

Figure 9 - Background Volumes





Figure 10 – Trip Distribution



OPERATIONAL & SAFETY PERFORMANCE ANALYSIS

As described previously, the operations of the intersections traffic controls were evaluated using the existing and background conditions. **Table 2** below shows the Levels of Service for the Existing Conditions scenario.

Table 2 - Existing Conditions LOS

				Baseline AM(PM) Peak Hour Delays (sec/veh)
ID	Intersection	Control [Cycle]	Approach/ Movement	Existing
1	Nine Mile Road & Francis Avenue	1-Way Stop (NB)	NB Left NB Right	42.2 E (280.0 F) 17.7 C (13.9 B)
2	Francis Avenue & N. Assembly St	2-Way Stop (NB/SB)	NB Right SB Shared EB Left WB Left	11.0 B (11.8 B) 51.4 F (38.7 E) 7.9 A (8.4 A) 10.1 B (10.0 A)
3	Nine Mil Road & Driscoll Boulevard	1-Way Stop (WB)	WB Right	10.2 B (15.4 C)
4	Driscoll Boulevard & N. Assembly Street	Yield (WB)	SB Left	8.3 A (8.4 A)
5	Nine Mile Road & N. Assembly Street	1-Way Stop (SB)	SB Thru	24.3 C (52.3 F)

The unsignalized intersection of **Nine Mile Road & Francis Avenue** in the existing scenario experiences a delay of 42.2 sec/veh (LOS E) and 280.0 sec/veh (LOS F) at the northbound left-turn movement during the AM and PM Peak Hour, respectively.

The unsignalized intersection of **Francis Avenue & N/ Assembly Street** in the existing scenario experiences a delay of 51.4 sec/veh (LOS F) and 38.7 sec/veh (LOS E) at the southbound shared movement during the AM and PM Peak Hour, respectively.

The unsignalized intersection of **Nine Mile Road & N. Assembly Street** in the existing scenario experiences a delay of 52.3 sec/veh (LOS F) at the southbound through movement during the PM Peak Hour. **Table 3** below shows the Background Scenario levels-of-service.

Table 3 – Background Scenario LOS

				Baseline AM(PM) Peak Hour Delays (sec/veh)
ID	Intersection	Control [Cycle]	Approach/ Movement	Background
1	Nine Mile Road & Francis Avenue	1-Way Stop (NB)	NB Left NB Right	490.2 F (717.7 F) 38.8 E (16.1 C)
2	Francis Avenue & N. Assembly St	2-Way Stop (NB/SB)	NB Right SB Shared EB Left WB Left	14.1 B (12.6 B) 13.6 B (94.8 F) 7.9 A (8.9 A) 10.8 B (10.7 B)
3	Nine Mil Road & Driscoll Boulevard	1-Way Stop (WB)	WB Right	13.4 B (20.4 C)
4	Driscoll Boulevard & N. Assembly Street	Yield (WB)	SB Left	8.7 A (8.6 A)
5	Nine Mile Road & N. Assembly Street	1-Way Stop (SB)	SB Thru	42.5 E (117.1 E)



With the inclusion of the surrounding development plus extrapolating the traffic volume to 2040, the unsignalized intersection of **Nine Mile Road & Francis Avenue** in the background scenario is expected to experience a delay of 490.2 F sec/veh (LOS E) and 717.7 sec/veh (LOS F) at the northbound left-turning movement, during the AM and PM Peak hour, respectively. The northbound right-turning movement is expected to experience a delay of 38.8 sec/veh (LOS E) during the AM Peak Hour.

The unsignalized intersection of **Francis Avenue & N. Assembly Street** in the background scenario is expected to experience a delay of 94.8 sec/veh (LOS F) at the southbound approach during the PM Peak Hour.

The unsignalized intersection of **Assembly Street & Driscoll Boulevard** is expected to experience a delay of 42.5 sec/veh (LOS E) and 117.1 sec/veh (LOS F) at the southbound through movement during the AM and PM Peak Hour, respectively.

TRAFFIC SIGNAL WARRANT ANALYSIS

CivTech utilized the 2024 Peak Hour traffic counts and ADT Volumes that were recorded by the City of Spokane in the signal warrant analysis below. The Peak Hour Traffic Counts were used to calculate a percentage to grow the City of Spokane 24-hour Traffic Counts.

As with the existing analysis, the traffic signal warrant analysis was accomplished in accordance with standard traffic signal warranting criteria found in the Manual on Uniform Traffic Control Devices, 2023 Edition (MUTCD). The MUTCD describes nine conditions under which a traffic signal might be warranted, designated Warrants 1 through 9. It indicates that, "The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the nine traffic signal warrants and other factors related to existing operation and safety at the study location." It then cautions that, "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Warrant 1: Eight-Hour Vehicular Volume

The Eight-Hour Vehicular Volume Warrant is intended for locations where either of the following two conditions, or a combination of both, exist for each of any 8 hours of an average day and is, thus, the principle reason to consider the installation of a traffic signal: a large volume of intersecting traffic or traffic volumes so heavy on the major street that entering vehicles suffer extensive delay or conflict.

CONDITION A: MINIMUM VEHICULAR VOLUME

Condition A, the Minimum Vehicular Volume, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 of the MUTCD (reproduced below) occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

CONDITION B: INTERRUPTION OF CONTINUOUS TRAFFIC

Condition B, the Interruption of Continuous Traffic, is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 of the MUTCD occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.



COMBINATION OF CONDITIONS A AND B

The combination of Conditions A and B is intended for application at locations where Condition A is not satisfied and Condition B is not satisfied and should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. (Emphasis added. CivTech was not made aware by either agency of any specific operational concerns with this intersection; therefore, it will be assumed for purposes of this analysis that this "combination warrant" is not applicable.) The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 80 percent columns of Conditions A and Condition B in Table 4C-1 of the MUTCD occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

	Table 4C-1.	Warrant	1, Eigi	ht-Hour	Vehicul	ar Volu	me							
	Cond	lition A—N	Vinimur	m Vehici	ular Volur	ne								
	Vehicles per hour on higher-volume													
Number	of lanes for	Vehicles r	er hour or	n major str€	eet (total of			•	direction					
moving traffic	on each approach	•	both ap	proaches)	•		on							
Major Street	Minor Street	100% ^a	80% ^b	. <u>70%°</u>	<u>56%⁴</u>	100% ^a	80%b	70% ^c	56% ^d					
1	1	500	400	350	280	150	120	105	84					
2 or more	1	600	480	420	336	150	120	105	84					
2 or more	2 or more	600	480	420	336	200	160	140	112					
1	2 or more	500	400	350	280	200	160	140	112					
	Conditio	n B—Inte	erruptio	n of Cor	ntinuous 1	Traffic								
							per hour	on higher	r-volume					
Number	of lanes for	Vehicles r	er hour or	n major stre	eet (total of			J	direction					
moving traffic	on each approach			proaches)	•			ly)						
Major Street	Minor Street	100% ^a	80% ^b	. <u>70%°</u>	<u>56%⁴</u>	100% ^a	80%b	70% ^c	56% ^d					
1	1	750	600	525	420	75	60	53	42					
2 or more	1	900			504	75	60	53	42					
2 or more	2 or more 900 720				504	100	80	70	56					
1	2 or more	750	600	525	420	100	80	70	56					
^a Basic minimum hou	ırly volume.													

^b Used for combination of Conditions A and B after adequate trial of other remedial measures.

Excerpt from MUTCD page 438

For each of the above, if the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70 percent columns in Table 4C-1 may be used in place of the 100 percent columns.

Warrant 2: Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 (this and all other referenced figures are attached) for the existing combination of approach lanes.



^c May be used when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major- street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-2 may be used in place of Figure 4C-1. The posted speed limit on the roadways analyzed are below 40 mph; therefore, Figure 4C-1 was used for this analysis.

Warrant 3: Peak-Hour

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. It shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

- A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:
 - 1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
 - 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
 - 3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

(For this warrant, CivTech prefers the less data-intensive Category B.)

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3 to satisfy the criteria in the second category of the Standard. The posted speed limit on the roadways analyzed are below 40 mph; therefore, Figure 4C-3 was used for this analysis



Table 4 - Traffic Signal Analysis Summary Warrants 1 - 3

Intersection		Wa				
	Condition A	Condition B	Combination of A & B	Overall	Warrant 2	Warrant 3
Existing Year						
Assembly Street & Driscoll Boulevard	No	No	No	No	No	No
Francis Avenue & Assembly Street	e & Assembly Street No No		No	No	No	No
Francis Avenue & Nine Mile Road	Yes Yes		Yes	Yes Yes		Yes

Table 4 summarizes the volume-based warrant analysis results for the existing year volumes. The warranting criteria for Warrants 2 and 3 were automatically calculated using formulae, not determined by the plotting method described in the MUTCD. The formulae, which approximate the curves of the MUTCD, were published in the *2023 Indiana MUTCD Revisions 1 & 2 & 3*.

ANALYSIS

The results of the volumes-based traffic signal warrants indicate that the traffic volumes for the existing scenario for the intersections of **Assembly Street & Driscoll Boulevard** and **Francis Avenue & Assembly Street** do <u>not</u> meet the criteria to warrant for a traffic signal.

The results of the volumes-based traffic signal warrants indicate that the traffic volumes for the existing scenario for the intersections of **Francis Avenue & Nine Mile Road** does meet the criteria to warrant for a traffic signal.

Table 5 below shows the AM Peak Hour Background Scenario levels-of-service considering Alternatives A through D.

Table 5 – AM Peak Hour Background Alternatives A-D Level-of-Service

ID	Intersection	Control [Cycle]	Approach/ Movement	Alternative A	Alternative B	Alternative C	Alternative D
		1-Way Stop (NB)	NB Left NB Right	-	-	-	-
1	Nine Mile Road & Francis Avenue	WBI		-	16.7 B 18.1 B 17.4 B 18.2 B 16.1 B 8.6 A 16.0 B 6.9 A [3.5 A]	· -	18.2 B 20.2 C 19.4 B 23.1 C 30.8 C 9.1 A 20.6 C
		Roundabout	WB Overall		1.4 A [· -	
		2-Way Stop (NB/SB)	NB Right SB Right WB Left	-	-	-	12.2 B 16.1 C 10.2 B
2	Francis Avenue & N. Assembly Street	2-Way Stop (NB/SB)	NB Left NB Shared SB Right EB Left WB Left	-	-	247.3 F 9.3 A 9.5 A 7.9 A 8.6 A	-



Table 5 - AM Peak Hour Background Alternatives A-D Level-of-Service

ID	Intersection	Control [Cycle]	Approach/ Movement	Alternative A	Alternative B	Alternative C	Alternative D
		Signal [90 sec]	NB Left NB Right NB Overall SB Left SB Right SB Overall EB Left EB Thru EB Right EB Overall WB Left WB Thru WB Right WB Overall Overall	46.6 D 15.6 B 35.2 D 147.5 F 20.9 C 24.3 C 58.9 E 37.7 D 0.0 A 40.4 D 67.4 E 23.4 C 23.4 C 45.0 D 39.6 D	51.7 D 16.0 B 36.9 D 147.5 F 19.9 B 23.3 C 56.3 E 37.5 D 0.0 A 39.9 D 61.3 E 23.3 C 23.3 C 42.0 D	-	-
3	Nine Mile Road & Driscoll Boulevard	1-Way Stop (WB)	WB Right	-	-	-	8.9 A
		1-Way Stop (WB)	SB Left WB Left WB Right	-	-	-	-
		Signal [90 sec]	NB Thru SB Left SB Thru SB Overall WB Left WB Right Overall	15.2 B 40.6 D 0.2 A 9.0 B 31.9 C 44.5 D 14.9 B			
4	Driscoll Boulevard & N. Assembly Street	Signal [60 sec]	NB Thru NB Right NB Overall SB Left SB Thru SB Overall WB Left WB Right WB Overall Overall	, 2			9.2 A 0.0 A 9.2 A 15.6 B 3.4 A 6.6 A 50.4 D 0.0 A 50.4 D 8.9 A
		Roundabout	NB Shared SB Shared WB Shared Overall		6.3 A 5.4 A 6.1 A 5.6 A	[0.40] [0.3]	
5	Nine Mile Road & N. Assembly Street	1-Way Stop (SB)	SB Thru	-	-	-	-

⁽¹⁾ Delay experienced by 10 assumed vehicles that do not currently exist

The signalized intersection of **Francis Avenue & N. Assembly Street** in the Alternative A scenario is expected to operate with a delay in the southbound, eastbound and westbound approach. The southbound left-turning movement experiences a delay of 147.5 sec/veh (LOS F) during the AM Peak Hour. The eastbound left-turning movement experiences a delay of 58.9 sec/veh (LOS E) during the AM Peak Hour. The westbound left-turning movement experiences a delay of 67.4 sec/veh (LOS F) during the AM Peak Hour.

The signalized intersection of **Francis Avenue & N. Assembly Street** in the Alternative B scenario is expected to operate with a delay in the eastbound and westbound approach. The southbound left-turning movement experiences a delay of 147.5 sec/veh (LOS F) during the AM Peak Hour. The eastbound right-turning movement



experiences a delay of 56.3 sec/veh (LOS E) during the AM Peak hour. The westbound left-turning movement experiences a delay of 61.3 sec/veh (LOS E) during the AM Peak Hour.

The unsignalized intersection of **Francis Avenue & N. Assembly Street** in the Alternative C scenario is expected to operate with a delay in the northbound approach. The northbound left-turning movement is expected to operate with a delay of 247.3 sec/veh (LOS F) during the AM Peak Hour.

Table 6 below shows the PM Peak Hour Background Scenario levels-of-service considering Alternatives A through D.

Table 6 - PM Peak Hour Background Alternatives A-D Level-of-Service

ID	Intersection	Control [Cycle]	Approach/ Movement	Alternative A	Alternative B	Alternative C	Alternative D
	1-Way NB Left Stop (NB) NB Right NB Left		-	-	-	-	
1	Nine Mile Road & Francis Avenue	Signal	NB Left NB Right NB Overall EB Thru WB Left WB Thru Overall		(29.8 C) (48.8 D) (39.4 D) (18.1 B) (12.8 B) (10.9 A) (23.7 C)	(29.8 C) (48.8 D) (39.4 D) (18.1 B) (12.8 B) (10.9 A) (23.7 C)	(25.0 C) (44.6 D) (34.9 D) (20.9 C) (35.4 D) (18.6 B) (27.3 C)
		Roundabout	NB SB WB Overall		(19.2 C (3.2 A [(2.6 A [(8.7 A [[0.271]) [0.361])	
		2-Way Stop (NB/SB)	NB Right SB Right WB Left		-	-	12.1 B 28.7 C 10.1 A
		2-Way Stop (NB/SB)	NB Left NB Shared SB Right EB Left WB Left		•	(2,351.5 F) (10.6 B) (11.3 B) (9.2 A) (8.9 A)	-
2	Francis Avenue & N. Assembly Street	Signal [90 sec]	NB Left NB Right NB Overall SB Left SB Right SB Overall EB Left EB Thru EB Right EB Overall WB Left WB Thru WB Right WB Overall Overall	(43.5 D) (19.2 B) (37.0 D) (122.5 F) (35.9 D) (39.8 D) (38.1 D) (49.4 D) (0.0 A) (48.2 D) (61.0 E) (43.8 D) (43.4 D) (48.5 D) (43.3 D)	(52.5 D) (19.9 C) (42.3 C) (122.5 F) (30.5 C) (34.4 C) (38.4 D) (46.5 D) (0.0 A) (45.7 D) (58.8 E) (42.4 D) (42.1 D) (46.9 D)	-	-
3	Nine Mile Road & Driscoll Boulevard	1-Way Stop (WB)	WB Right	-	-	-	(10.7 B)
4	Driscoll Boulevard & N. Assembly Street	1-Way Stop (WB)	SB Left WB Left WB Right	-	-	-	-



Table 6 – PM Peak Hour Background Alternatives A-D Level-of-Service

ID	Intersection	Control [Cycle]	Approach/ Movement	Alternative A	Alternative B	Alternative C	Alternative D
		Signal [90 sec]	NB Thru SB Left SB Thru SB Overall WB Left WB Right Overall	(24.0 C) (35.7 C) (0.2 A) (9.2 A) (22.7 C) (51.0 D) (23.6 C)	-	-	
		Signal [60 sec]	NB Thru NB Right NB Overall SB Left SB Thru SB Overall WB Left WB Right WB Overall Overall				(7.5 A) (0.0 A) (7.5 A) (6.3 A) (2.0 A) (3.1 A) (52.5 D) (0.0 A) (52.5 D) (52.5 D)
		Roundabout	NB Shared SB Shared WB Shared Overall		(5.5 A (20.8 C	[0.75]) [0.30]) [0.82]) [[0.82])	
5	Nine Mile Road & N. Assembly Street	1-Way Stop (SB)	SB Thru	-	-	-	-

⁽¹⁾ Delay experienced by 10 assumed vehicles that do not currently exist

The signalized intersection of **Francis Avenue & N. Assembly Street** in the Alternative A scenario is expected to operate with delays in the southbound and westbound approach. The southbound left-turning movement is expected to operate with a delay of 122.5 sec/veh (LOS F) during the PM Peak Hour. The westbound left-turning movement is expected to operate with a delay of 61.0 sec/veh (LOS E) during the PM Peak Hour.

The signalized intersection of **Francis Avenue & N. Assembly Street** in the Alternative B scenario is expected to operate with delays in the southbound and westbound approach. The southbound left-turning movement is expected to operate with a delay of 122.5 sec/veh (LOS F) during the PM Peak Hour. The westbound left-turning movement is expected to operate with a delay of 61.0 sec/veh (LOS E) during the PM Peak Hour.

The unsignalized intersection **Francis Avenue & N. Assembly Street** in the Alternative C scenario is expected to operate with a delay in the northbound left-turning movement of 2,351.5 sec/veh (LOS F) during the PM Peak Hour.

The signalized intersection **Nine Mile Road & Francis Avenue** in the Alternative D scenario is expected to operate with a delay in the northbound right-turning movement of 56.2 sec/veh (LOS F) during the PM Peak Hour.

The overall Levels of Service tables above show that Alternative D will provide the least amount of delay at the study intersections while providing the most access to existing (and future) residents. Based on LOS and operational characteristics, Alternative D will be used moving forward for the remainder of the analysis and ICE document.



FEASIBILITY

Alternative D was reviewed based on factors and other specific site issues in accordance with Chapter 1300 of the WSDOT Design Manual. **Table 7** will summarize the comparison of Alternative D when looking at a signal or roundabout configuration.

Traffic Signal System **Factor** Roundabout System Least Right-of-way Impacts **Best** Good Least Design Constraints Best Good Good Best Best Multimodal Accommodation Best Safety Benefit Best Good Lowest Maintenance/Operations Good Best Easiest Implementation/Constructability Best Good Lowest Initial Cost Best Good

Table 7 – Alternative Feasibility Comparison

The term "Best" is given to the intersection type that performs better between the roundabout and the traffic signal system. For example, the traffic signal system will require less right-of-way, therefore it is labeled as "Best" while the roundabout system is labeled as "Good". Similarly, the traffic signal system has the least design constraints, with regards to vertical and horizontal geometrics, when compared to the roundabout system. Another example is the maintenance and operations of the intersection type, in which the roundabout provides the "Best" overall performance when compared to the traffic signal, which was labeled as "Good".

Both the traffic signal system and roundabout system are feasible alternatives at this location. Because the existing intersections are all stop controlled intersections, the roundabout system didn't have as favorable crash reduction as expected when compared to the traffic signal system. Overall, the traffic signal system shows slightly better results than the roundabout system.

IMPROVEMENT COSTS

The costs for installing the traffic signal system or the roundabout system of Alternative D are summarized in **Table 8**.

With the alternative scenarios that involve a traffic signal to be implemented, it is recommended that advanced warning signs/beacons be added to alert drivers of upcoming traffic signals and the traffic signal timing change, which would enhance roadway safety and help reduce the likelihood of accidents. The advanced warning signs/beacons are also recommended due to the vertical profile of Francis Avenue and the horizontal curve that is present at the intersection of Francis Avenue and Nine-Mile Road. These advanced warning signs/beacons would be tied to the traffic signal timing, via fiber, and will alert drivers of the upcoming need to stop at a red indicator.

TABLE 8- Project Costs using Alternative D

Severity	Traffic Signal System	Roundabout System
Preliminary Engineering	\$699,892	\$885,084
Construction	\$8,048,763	\$8,093,089
Total Intersection Cost	\$8,748,655	\$8,978,173

2025 engineers' estimate of probable costs



The improvement costs noted in **Table 8** are for the total project costs, including improvements to the City of Spokane System and the WSDOT system. Further breakdown of costs by City versus WSDOT system are summarized in Table 9.

TABLE 9– Project Costs using Alternative D by Agency

O materials	Traffic Sig	nal System	Roundabout System					
Activity	City	WSDOT	City	WSDOT				
Preliminary Engineering	\$307,467	\$392,425	\$304,510	\$580,574				
Construction	\$3,535,867	\$4,512,896	\$2,751,807	\$5,341,282				
Total Intersection Cost	\$3,843,334	\$4,905,321	\$3,056,317	\$5,921,856				

2025 engineers' estimate of probable costs

SAFETY PERFORMANCE ANALYSIS

Crash Analysis

Crash data for the Study Area was obtained from the City of Spokane for the past six (6) years. In total, there have been 38 incidents within the Study Area since the beginning of 2018. The summary of intersection crash data is presented in **Table 10**.

TABLE 10 – 2018-2023 INTERSECTION CRASH DATA SUMMARY

	ID Intersection Nine Mile Road & Francis Avenue						In	cide	ents	in e	each	ı Ca	teg	ory					
ID			2018	2019	2020	2021	2022	2023	Injury	Fatality	Single Vehicle	Left Turn	Rear End	Head On	Sideswipe	Angle	DUI	Pedestrian	Bicycle
1	Nine Mile Road & Francis Avenue		2	1	2	2	1	0	3	0	0	2	0	0	0	6	0	0	0
3	Francis Avenue & N. Assembly Street		3	6	6	5	5	1	14	0	4	1	0	0	0	21	0	0	0
4	Driscoll Boulevard & N. Assembly Street		0	0	1	1	1	1	4	0	0	3	0	0	0	1	0	0	0

Table 10 shows that the intersection that had the most accidents occurred at the **Francis Avenue & N. Assembly Street** intersection. This intersection is currently restricted on the northbound approach to allow right-outs only. This intersection had 26 crashes throughout six (6) years while 21 of the 26 crashes (80%) were angle related. There have been no fatalities in the study area.

Of the eight (8) crashes at the intersection of **Nine Mile Road & Francis Avenue**, five (5) crashes had been listed as 'No Apparent Injury', two (2) crashes had been listed as a 'Possible Injury' and one (1) crash had been listed as 'Suspected Serious Injury'.

Of the twenty-six (26) crashes at the intersection of **Francis Avenue & N. Assembly Street**, eleven (11) crashes had been listed as 'No Apparent Injury', eight (8) crashes had a 'Possible Injury' and seven (7) crashes had been listed as 'Suspected Minor Injury'.

Of the four (4) crashes at the intersection of **Driscoll Boulevard & N. Assembly Street**, all crashes had been listed as 'Possible Injury'.



When calculating the crash rate for each intersection listed above, the intersection crash rates for all three have a rate less than 1 crash per million entering vehicles. This signifies that there are no abnormal circumstances occurring within these intersections. **Table 11** indicates the existing intersection crash rate per million entering vehicles.

Table 11 - Existing Intersection Crash Rates

Factor	Crash Rate per Million Entering Vehicles
Francis Avenue & Nine Mile Road	0.177
Francis Avenue & N. Assembly Street	0.384
Assembly Street & Driscoll Boulevard	0.258

The modifications that are presented also provide us with further Crash Modification Factors (CMF) and Crash Reduction Factors (CRF). **Table 12** represents the CRF's and CMF's for the modifications that were considered in this analysis.

Table 12 - Crash Reduction/Modification Factors

Configuration Type	CMF (CRF) [ID #]
Install a Traffic Signal w/Lefts	0.541 (45.9%)[7966]
Intersection to Roundabout	0.623 (37.7%)[10082]
Install Right-in-Right-out operations at Stop-Controlled Intersections	0.55 (45%)[9821]

Applying the crash modification factors from **Table 12** to the intersections listed in **Table 11** generates the potential crash rate reductions, shown in **Table 13**, at each intersection based on the installation of a traffic signal or a roundabout system of traffic control devices.

Table 13 – Updated Intersection Crash Rates

Factor	Crash Rate per Million (Traffic Signal w/Lefts)	Crash Rate per Million (Roundabout)
Francis Avenue & Nine Mile Road	0.110	0.096
Francis Avenue & N. Assembly Street	0.211	-
Assembly Street & Driscoll Boulevard	0.161	0.139

Based on the crash data provided, we can estimate the number of crashes each intersection will approximately decrease with the updated configuration based on Alternative D. These are summarized in **Table 14**.



Severity	Traffic Signal System	Roundabout System
K – Fatal Injury	0	0
A – Suspected Serious Injury	0.46	0.38
B – Suspected Minor Injury	3.67	3.02
C – Possible Injury	6.43	5.28
O – No Apparent Injury	7.34	6.03
Decrease in crashes Rounded to nearest whole #	17.9	14.7

The Study Area will experience a total decrease in crashes of approximately 17 crashes with the configuration signalized system of Alternative D and 14 crashes with the roundabout configuration.

Focusing only on the WSDOT system (Francis Avenue), the estimated decrease in crashes by system is summarized in **Table 15**.

Table 15 – Estimated Decrease in Crashes by System – WSDOT Only

Severity	Traffic Signal System	Roundabout System
K – Fatal Injury	0	0
A – Suspected Serious Injury	0.46	0.38
B – Suspected Minor Injury	3.67	3.02
C – Possible Injury	4.59	3.77
O – No Apparent Injury	7.34	6.03
Decrease in crashes Rounded to nearest whole #	16.1	13.2

The WSDOT system (Francis Avenue) will experience a total decrease in crashes of approximately 16 crashes with the configuration signalized system of Alternative D and 13 crashes with the roundabout configuration.

Benefit Cost Evaluation

Estimating the cost of crashes will be done to justify if the configuration will positively impact in an economic way. The Federal Highway Administration Safety Program: <u>Crash Costs for Highway Safety Analysis</u> (January 2018) document provides a national unit cost for each severity of crash, which is presented in **Table 16**.

Table 16 – Comprehensive Unit Cost (2016 dollars)

Severity	Crash Unit Cost
K – Fatal Injury	\$11,295,400
A – Suspected Serious Injury	\$655,000
B – Suspected Minor Injury	\$198,500
C – Possible Injury	\$125,600
O – No Apparent Injury	\$11,900

Using the crash cost unit from the table above and the crash data from **Table 10**, the estimated cost that must be spent on intersection improvements can be calculated. Using the total estimated cost and our updated crash modification rates, the amount of money that will be saved from using the intersection configurations from Alternative D can be calculated. This information can be seen in **Table 17**.



Coverity	Traffic Signal System		Roundabout System	
Severity	Crash Cost	Crash Benefit	Crash Cost	Crash Benefit
K – Fatal Injury	\$0	\$0	\$0	\$0
A – Suspected Serious Injury	\$655,000	\$300,645	\$655,000	\$245,935
B – Suspected Minor Injury	\$1,588,000	\$728,892	\$1,588,000	\$598,676
C – Possible Injury	\$1,758,400	\$807,106	\$1,758,400	\$662,917
O – No Apparent Injury	\$190, 4 00	\$87,394	\$190,400	\$71,781
Totals	\$4,191,800	\$1,924,036	\$4,191,800	\$1,580,309

Alternative D (signalized system) will provide the study area with a benefit of reducing crashes equal to approximately \$1,924,036, based on historic crash trends, exceeding the crash benefit of the roundabout system. Calculation Worksheets for the cost benefit analysis can be found in **Attachment D.**

Alternative D (roundabout system) will provide the study area with a benefit of reducing crashes equal to approximately \$1,580,309, based on historic crash trends. Calculation Worksheets for the cost benefit analysis can be found in **Attachment D.**

Focusing on the WSDOT system (Francis Avenue only), the intersection crash costs and benefits are summarized in **Table 18**.

Table 18 – Intersection Crash Cost per Severity & Cost Benefit

Coverity	Traffic Signal System		Roundabout System	
Severity	Crash Cost	Crash Benefit	Crash Cost	Crash Benefit
K – Fatal Injury	\$0	\$0	\$0	\$0
A – Suspected Serious Injury	\$655,000	\$300,645	\$655,000	\$245,935
B – Suspected Minor Injury	\$1,588,000	\$728,892	\$1,588,000	\$598,676
C – Possible Injury	\$1,256,000	\$576,504	\$1,256,000	\$473,512
O – No Apparent Injury	\$190,400	\$87,39 4	\$190,400	\$71,781
Totals	\$3,689,400	\$1,693,435	\$3,689,400	\$1,390,904

Alternative D (signalized system) just along Francis Avenue will provide the study area with a benefit of reducing crashes equal to approximately \$1,693,435, based on historic crash trends, exceeding the crash benefit of the roundabout system. Calculation Worksheets for the cost benefit analysis can be found in **Attachment D.**

Alternative D (roundabout system) just along Francis Avenue will provide the study area with a benefit of reducing crashes equal to approximately \$1,390,904, based on historic crash trends. Calculation Worksheets for the cost benefit analysis can be found in **Attachment D.**

The project benefit to cost can then be calculated for each system, using FHWA guidance. The Benefit to Cost Ratio (BCR) for the traffic signal system and the roundabout system are summarized in **Table 19**.



Table 19 –	Project	Benefit to	Cost Ratio
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Severity	Traffic Signal System	Roundabout System
System Costs (C)	\$8,748,655	\$8,978,173
System Crash Benefits	\$1,924,036	\$1,580,309
Worth of Benefits (WB)	\$23,049,954	\$18,932,097
Net Benefits (WB – C)	\$14,301,298	\$9,953,924
Benefit to Cost Ratio (NB/C)	2.63	2.11

Worth of Benefits calculated using FHWA criteria

As noted in **Table 19**, the traffic signal system BCR is 2.63 while the roundabout system BCR is 2.11. The traffic signal system has a higher BCR, meaning that there is more benefit from the traffic signal system when compared to the roundabout system.

Focusing on the WSDOT system (Francis Avenue only), the BCR for the traffic signal system and the roundabout system are summarized in **Table 20**.

Table 20 - Project Benefit to Cost Ratio

Severity	Traffic Signal System	Roundabout System
System Costs (C)	\$4,905,322	\$5,921,856
System Crash Benefits	\$1,693,435	\$1,390,904
Worth of Benefits (WB)	\$20,287,347	\$16,663,028
Net Benefits (WB – C)	\$15,382,025	\$10,741,171
Benefit to Cost Ratio (NB/C)	4.14	2.81

Worth of Benefits calculated using FHWA criteria

As noted in **Table 20**, the traffic signal system along Francis Avenue only has a BCR of 4.14 while the roundabout system BCR is 2.81. The traffic signal system has a higher BCR, meaning that there is more benefit from the traffic signal system when compared to the roundabout system.

ALTERNATIVES EVALUATION

The roundabout layout will require additional right-of-way along Assembly Street, specifically at the southernmost roundabout, to install the functional system when compared to the traffic signal system. In addition, the roundabout system will require impacts to the Avista property to the north to install the needed westbound bypass lane and sidewalk, including the need for a wall to contain the steep property slope. Shifting Francis Avenue to the south is not possible without significant utility costs, therefore the layout as noted herein requires walls to be installed with the roundabout layout whereas the traffic signal layout does not require additional walls.

The roundabout option limits the availability to expand in the future. The current layout requires dual circulating lanes in addition to bypass lanes (westbound and southbound). There are currently no three-lane circulating laned roundabouts in Washington – therefore it can be assumed no additional circulating lanes will be added in the future. The only capacity increasing item that can be added to the roundabout intersection is an approach meter, in the southbound-to-eastbound direction. On the other hand, the traffic signal layout offers additional capacity by adding a separate northbound right-turn lane, and the traffic signal timing can be modified to allow overlap phasing on the northbound right-turn movement in the future.



The installation of a traffic signal on Francis Avenue will allow additional coordination of traffic volume on Francis Avenue, offering the ability to create gaps for side street and driveway access while keeping the Francis Avenue corridor in coordination — ensuring platoons of cars can traverse the corridor with limited stops. Similarly, the traffic signal system will allow for the same driveway and side street gaps on Assembly Street through implementation of a coordination traffic signal timing plan. The roundabout system will not create gaps, instead it will lessen available gaps as traffic is continuously moving through the roundabout, thereby spacing

Table 21 – Alternative D Feasibility Comparison

Factor	Pros	Cons
Roundabout	 Best multimodal accommodation – slower traffic through intersection and larger pathways provided Lower overall maintenance costs 	 More right-of-way impacts More design constraints for speeds and vertical/horizontal deflection Construction phasing and implementation challenges Expandability in the future is limited (dual lanes recommended) More expensive to construct than traffic signals
Traffic Signal	 Least right-of-way impacts Least design constraints Better safety benefits than roundabout (due to dual lane roundabout comparison) Easiest to implement and construct Can be expanded to accommodate additional development traffic in the future Less expensive to construct than roundabouts 	 Higher maintenance and operations costs (with ITS advanced warning) Pedestrians have more conflict points than with a roundabout

In general, the construction costs are lower for the traffic signal option as the construction phasing will be less intensive due to the existing configuration. The roundabout option does require additional right-of-way and will require walls on the north side to accommodate pedestrian facilities.

The implementation of traffic signals also allows for the Francis Avenue corridor to be timed and synchronized to promote platooning through coordinated signal timing. This platooning will aid existing driveways and minor cross streets with access to and from Francis Avenue. Similarly, Assembly Street traffic signals can be coordinated allowing for gaps in the system for driveway and minor street access.

The signalized system identified within this analysis includes ITS devices along Francis Avenue for advanced warning of traffic signal timing changes. These devices are recommended due to the vertical curve just east of the subject site as well as the horizontal curve just west of the subject site. The intent of the devices is to alert drivers of changes about to happen and allow enough distance and time for driver reaction to the traffic signal phase changes. In addition, traffic count stations/loops can be added and provide real time information to the City and WSDOT through ITS connections into the regional system.

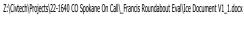


SELECTION

After carefully evaluating all available alternatives, CivTech recommends implementing **Alternative D with the traffic signals** for this Study Area. This configuration minimizes delays during the AM and PM Peak hour, offers safer vehicle routes and is expected to reduce crash incidents in the area, and can be expanded should development activities increase beyond what is projected.

Attachments (4)

- A. Synchro Reports
- B. Alternative D design
- C. Crash Data & Crash Rates Calculation Sheet
- D. Cost Benefit Calculation Sheets.





1: Nine Mile Rd & Français Ave HCM 6th TWSC

7.1					
		14/51			
FBT	EBR	WBL	WBI	NBL	NBR
•	7		•	7	7
611	405	0	216	174	79
611	405	0	216	174	79
0	0	0	0	0	0
Free	Free	Free	Free	Stop	Stop
-	None	-	Free	-	None
-	0	-	-	0	0
, # 0	-	-	0	1	-
-14	-	-	7	3	-
84	84	84	84	67	67
1	1	1	1	1	1
727	482	0	257	260	118
	611 611 0 Free - - # 0 -14 84	EBT EBR 1 1 405 611 405 0 0 Free Free - None - 0 # 0 -14 - 84 84 1 1	EBT EBR WBL 611 405 0 611 405 0 0 0 0 Free Free Free - None 0 - # 01484 84 84 1 1 1	EBT EBR WBL WBT 611 405 0 216 611 405 0 216 0 0 0 0 0 Free Free Free Free - None - Free - 0 # 0 0 -14 7 84 84 84 84 1 1 1 1 1	EBT EBR WBL WBT NBL 611 405 0 216 174 611 405 0 216 174 0 0 0 0 Stop Free Free Free Stop None - Free - 0 - - 0 # 0 - - 0 1 -14 - - 7 3 84 84 84 84 67 1 1 1 1 1

Major/Minor	Major1	Ma	or2		Minor1	
Conflicting Flow All	0	0	-	-	984	727
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	257	-
Critical Hdwy	-	-	-	-	7.01	6.51
Critical Hdwy Stg 1	-	-	-	-	6.01	-
Critical Hdwy Stg 2	-	-	-	-	6.01	-
Follow-up Hdwy	-	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	0	-	~ 235	401
Stage 1	-	-	0	-	425	-
Stage 2	-	-	0	-	755	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuve	r -	-	-	-	~ 235	401
Mov Cap-2 Maneuve	r -	-	-	-	342	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	755	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	34.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn11	NBLn2	EBT	EBR	WBT
Capacity (veh/h)	342	401	-	-	-
HCM Lane V/C Ratio	0.759	0.294	-	-	-
HCM Ctrl Dly (s/v)	42.2	17.7	-	-	-
HCM Lane LOS	Е	С	-	-	-
HCM 95th %tile Q (veh)	6	1.2	-	-	-

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22-1640 Assembly & Francis& Nine Mile/Driscoll Existing PM

1: Nine Mile Rd & Français Ave HCM 6th TWSC

Intersection						
Int Delay, s/veh	81.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	<u></u>	T T	WUL	VVD1	NDL	אטא 🏲
Traffic Vol, veh/h	482		0	T	544	138
Future Vol. veh/h	482	242	0	440	544	138
Conflicting Peds, #/hr	402	242	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	riee -		riee	Free	Stop -	None
Storage Length				riee -	0	0
Veh in Median Storage		-		0	1	-
Grade. %	,# 0 -14			7	3	
Peak Hour Factor	95	95	93	93	97	97
	95	95	93	93	0	0
Heavy Vehicles, % Mvmt Flow	507	255	0	482	561	142
IVIVMT FIOW	507	255	U	482	1 00	142
Major/Minor N	Major1	- 1	Major2	1	Minor1	
Conflicting Flow All	0	0	-	-	989	507
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	482	-
Critical Hdwy	-	-	-	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	0	-	~ 234	546
Stage 1	-	-	0	-	~ 560	-
Stage 2	-	-	0	-	577	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	_	-	~ 234	546
Mov Cap-2 Maneuver	-	-	-	-	~ 366	-
Stage 1	-	-	-	-	~ 560	-
Stage 2	-	-		-	577	
3						
			14/5			
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0		226.2	
HCM LOS					F	
Minor Lane/Major Mvm	t	NBLn11	VBLn2	EBT	EBR	WBT
Capacity (veh/h)		366	546			
HCM Lane V/C Ratio		1.532				
HCM Ctrl Dly (s/v)		280	13.9	-		
HCM Lane LOS		F	В	-		
HCM 95th %tile Q (veh	١	31.1	1			
,)	31.1				
Notes						
~: Volume exceeds cap	acity	\$: De	elay exc	eeds 30	00s	
+: Computation Not De	fined	*: All	major v	olume i	n plato	on

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Notes

-: Volume exceeds capacity
+: Computation Not Defined

*: All major volume in platoon

2: Assembly St & Francais Ave HCM 6th TWSC

22-1640 Assembly & Francis& Nine Mile/Driscoll	2: Assembly St & Français Ave
Existing PM	HCM 6th TWSC

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	Αħ		*	†	7			7		4	
Traffic Vol, veh/h	56	461	109	238	237	8	0	3	63	1	16	25
Future Vol. veh/h	56	461	109	238	237	8	0	3	63	1	16	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	0	-	100	-	-	0	-	-	-
Veh in Median Storage	,# -	1	-	-	1	-	-	1	-	-	1	-
Grade, %	-	1	-	-	7	-	-	2	-	-	5	-
Peak Hour Factor	94	94	94	90	90	90	76	76	76	56	56	56
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	60	490	116	264	263	9	0	4	83	2	29	45
	/lajor1		1	Major2		- 1	Minor1			/linor2		
Conflicting Flow All	272	0	0	606	0	0	-	1468	303	1158	1517	263
Stage 1	-	-	-	-	-	-	-	668	-	791	791	-
Stage 2	-	-	-	-	-	-	-	800	-	367	726	-
Critical Hdwy	4.1	-	-	4.115	-	-	-	6.9	7.1	8.3	7.5	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.9	-	7.1	6.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.9	-	7.5	6.5	-
Follow-up Hdwy	2.2	-	-2	2.2095	-	-	-	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1303	-	-	976	-	-	0	109	687	119	79	753
Stage 1	-	-	-	-	-	-	0	427	-	310	324	-
Stage 2	-	-	-	-	-	-	0	366	-	569	354	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1303	-	-	976	-	-	-	76	687	79	55	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	155	-	146	66	-
Stage 1	-	-	-	-	-	-	-	407	-	296	237	-
Stage 2	-	-	-	-	-	-	-	267	-	473	338	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.7			5			11			51.4		
HCM LOS							В			F		
Minor Lane/Major Mvm	t I	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR:	SBLn1			
Capacity (veh/h)		687	1303	-	-	976	-	-	149			
HCM Lane V/C Ratio		0.121	0.046	-	-	0.271	-	-	0.503			
HCM Ctrl Dly (s/v)		11	7.9	-	-	10.1	-	-	51.4			
HCM Lane LOS		В	Α	-	-	В	-	-	F			
HCM 95th %tile Q (veh)	0.4	0.1	-	-	1.1	-	-	2.4			

Lane Configurations 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SBR
Lane Configurations 1 7 7 4 4 4 97 76 246 428 13 4 4 140 2 10 Future Vol, veh/h 44 497 76 246 428 13 4 4 140 2 10	SBR
Traffic Vol, veh/h 44 497 76 246 428 13 4 4 140 2 10 Future Vol, veh/h 44 497 76 246 428 13 4 4 140 2 10	
Traffic Vol, veh/h 44 497 76 246 428 13 4 4 140 2 10 Future Vol, veh/h 44 497 76 246 428 13 4 4 140 2 10	
1 101 101 10 100 10 10 10 10 10 10 10 10	15
Conflicting Peds #/hr	15
	0
Sign Control Free Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	Stop
RT Channelized None None No	None
Storage Length 100 0 - 100 0	-
Veh in Median Storage, # - 1 1 1	-
Grade, % - 1 7 2 5	-
	73
Heavy Vehicles, % 0 0 0 0 0 0 0 0 0 0	0
Mvmt Flow 46 523 80 265 460 14 5 5 163 3 14	21
Major/Minor Major1 Major2 Minor1 Minor2	
Conflicting Flow All 474 0 0 603 0 0 1670 1659 302 1346 1685 4	460
Stage 1 655 655 - 990 990	-
Stage 2 1015 1004 - 356 695	-
	6.7
Critical Hdwy Stg 1 6.9 5.9 - 7.1 6.5	-
Critical Hdwy Stg 2 6.5 5.9 - 7.5 6.5	-
	3.3
	568
Stage 1 396 433 - 227 248	-
Stage 2 259 288 - 580 368	-
Platoon blocked, %	
	568
Mov Cap-2 Maneuver 96 128 - 103 70	-
Stage 1 379 415 - 217 181	-
Stage 2 169 211 - 419 353	-
Approach EB WB NB SB	
HCM Ctrl Dly, s/v 0.6 3.6 11.8 38.7	
HCM LOS B E	
Minor Lane/Major Mvmt NBLn1 EBL EBT EBR WBL WBT WBR SBLn1	
Capacity (veh/h) 688 1099 984 143	
HCM Lane V/C Ratio 0.237 0.042 0.269 0.259	
HCM Ctrl Dly (s/v) 11.8 8.4 10 38.7	
HCM Lane LOS B A A E	
HCM 95th %tile Q (veh) 0.9 0.1 1.1 1	

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22-1640 Assembly & Francis& Nine Mile/Driscoll 3: Assembly St/Nine Mile Rd & Driscoll Blvd Existing AM HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		7	1			1
Traffic Vol, veh/h	0	73	161	0	0	423
Future Vol, veh/h	0	73	161	0	0	423
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	e, # 1	-	0	-	-	0
Grade, %	0	-	2	-	-	1
Peak Hour Factor	72	72	65	65	85	85
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	0	101	248	0	0	498

Major/Minor	Minor1	Ma	ajor1	Ma	jor2	
Conflicting Flow All	-	248	0	-	-	
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	796	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	796	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

HCM Ctrl Dly, s/v	10.2	0	0			
HCM LOS	В					

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 796	-
HCM Lane V/C Ratio	- 0.127	-
HCM Ctrl Dly (s/v)	- 10.2	-
HCM Lane LOS	- B	-
HCM 95th %tile Q (veh)	- 0.4	-

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22-1640 Assembly & Francis& Nine Mile/Driscoll 3: Assembly St/Nine Mile Rd & Driscoll Blvd Existing PM HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TTDL	7	1	HUIT	ODL	<u>□ □ □ □ □</u>
Traffic Vol. veh/h	0	166	524	0	0	242
Future Vol. veh/h	0	166	524	0	0	242
Conflicting Peds, #/hr	0	0	0	0	0	242
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	- Stop		-		-	
Storage Length	- 1	0		-	- 1	110116
Veh in Median Storage		-	0		_	0
Grade. %	0,# 1		2			1
Peak Hour Factor	90	90	93	93	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mymt Flow	0	184	563	0	0	299
IVIVIIIL I IOW	U	104	303	U	U	200
	Minor1		Major1	N	//ajor2	
Conflicting Flow All	-	563	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	530	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	530	-	-	-	-
Mov Cap-2 Maneuver		-		-	-	
Stage 1	-	-	-	-	-	-
Stage 2	-	-		-		
Jgu _						
Approach	WB		NB		SB	
HCM Ctrl Dly, s/v	15.4		0		0	
HCM LOS	C		U		U	
I IOW EOO						
Minor Lane/Major Mvn	nt	NBTV	VBLn1	SBT		
Capacity (veh/h)		-	530	-		
HCM Lane V/C Ratio		-	0.348	-		
HCM Ctrl Dly (s/v)		-	15.4	-		
HCM Lane LOS		-	С	-		
HCM 95th %tile Q (vel	h)	-	1.5	-		
	,					

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4: Assembly St & Driscoll Blvd HCM 6th TWSC

22-1640 Assembly & Francis& Nine Mile/Driscoll	4: Assembly St & Driscoll Blvd
Existing PM	HCM 6th TWSC

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*				†	7					4	
Traffic Vol. veh/h	0	0	0	1	84	65	0	0	0	231	163	2
Future Vol. veh/h	0	0	0	1	84	65	0	0	0	231	163	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	_	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage,	# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	1	-	-	1	-	-	4	-
Peak Hour Factor	92	92	92	77	77	77	25	25	25	80	80	80
Heavy Vehicles, %	0	0	2	0	0	0	2	2	2	0	0	0
Mvmt Flow	0	0	0	1	109	84	0	0	0	289	204	3
Major/Minor M	inor1		1	Major2					N	/lajor1		
Conflicting Flow All	937	-	-	207	0	0				193	0	0
Stage 1	784	-	-	-	-	-				-	-	-
Stage 2	153	-	-	-	-	-				-	-	-
Critical Hdwy	6.4	-	-	4.1	-	-				4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-				-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-				-	-	-
Follow-up Hdwy	3.5	-	-	2.2	-	-				2.2	-	-
Pot Cap-1 Maneuver	296	0	0	1376	-	-				1392	-	-
Stage 1	453	0	0	-	-	-				-	-	-
Stage 2	880	0	0	-	-	-				-	-	-
Platoon blocked, %					-	-					-	-
Mov Cap-1 Maneuver	226	0	-	1376	-	-				1392	-	-
Mov Cap-2 Maneuver	289	0	-	-	-	-				-	-	-
Stage 1	347	0	-	-	-	-				-	-	-
Stage 2	879	0	-	-	-	-				-	-	-
Approach	EB			WB						SB		
HCM Ctrl Dly, s/v	0			0.1						4.8		
HCM LOS	Α											
Minor Lane/Major Mvmt	E	EBLn1	WBL	WBT	WBR	SBL	SBT	SBR				
Capacity (veh/h)		-	1376	-	-	1392	-	-				
HCM Lane V/C Ratio				-	-	0.207	-	-				
HCM Ctrl Dly (s/v)		0	7.6	-	-	8.3	0	-				
HCM Lane LOS		Α	Α	-	-	Α	Α	-				
HCM 95th %tile Q (veh)		-	0	-	-	0.8	-	-				

Interception							
Intersection Int Delay, s/veh 2							
Int Delay, S/ven 2							
Movement EBL EBT EBR WBL WBT W	VBR I	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations 🎽	7					4	
	145	0	0	0	145	182	1
Future Vol, veh/h 0 0 0 165 1	145	0	0	0	145	182	1
Conflicting Peds, #/hr 0 0 0 0 0	0	0	0	0	0	0	0
Sign Control Stop Stop Stop Free Free Fr	ree S	Stop	Stop	Stop	Free	Free	Free
RT Channelized None No	one	-	-	None	-	-	None
Storage Length 0	0	-	-	-	-	-	-
Veh in Median Storage, # - 1 0	-	-	0	-	-	0	-
Grade, % - 0 1	-	-	1	-	-	4	-
Peak Hour Factor 92 92 91 91	91	92	92	92	86	86	86
Heavy Vehicles, % 2 2 2 0 0	0	2	2	2	0	0	0
Mvmt Flow 0 0 0 181 1	159	0	0	0	169	212	1
Maior/Minor Minor1 Maior2					loior1		
age and a second a	^			IN.	Major1	0	0
Conflicting Flow All 812	0				340	0	0
Stage 1 551	-				-		-
Stage 2 261 Critical Hdwy 6.42	-				4.1	-	-
						-	-
Critical Hdwy Stg 1 5.42	-				-	-	-
Critical Hdwy Stg 2 5.42 Follow-up Hdwy 3.518	-				2.2	-	-
	-					-	-
Pot Cap-1 Maneuver 348 0 0 0 -	-				1230	-	-
Stage 1 577 0 0 0 - Stage 2 783 0 0 0 -	-				-	-	-
	-				-	-	-
Platoon blocked, %	-				4000	-	-
Mov Cap-1 Maneuver 294 0	-				1230	-	-
Mov Cap-2 Maneuver 378 0	-				-	-	-
Stage 1 407 0	-				-	-	-
Stage 2 783 0	-				-	-	-
Approach EB WB		_			SB		
HCM Ctrl Dly, s/v 0 0					3.7		
HCM LOS A							
Miner Lene/Meier Mumt FDL nd WDT WDD ODL O	ODT (CDD					
,		SBR					
Capacity (veh/h) 1230	-	-					
HCM Lane V/C Ratio 0.137	-	-					
HCM Ctrl Dly (s/v) 0 8.4	0	-					
HCM Lane LOS A A	Α	-					
HCM 95th %tile Q (veh) 0.5		-					

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Existing PM

Intersection						
Int Delay, s/veh	5.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	N,		1			1
Traffic Vol, veh/h	166	0	160	0	0	424
Future Vol, veh/h	166	0	160	0	0	424
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	e, # 0	-	0	-	-	0
Grade, %	4	-	1	-	-	3
Peak Hour Factor	81	81	92	92	92	92
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	205	0	174	0	0	461

Major/Minor	Minor1	M	ajor1	М	ajor2	
Conflicting Flow All	635	-	0	-	-	-
Stage 1	174	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Critical Hdwy	7.2	-	-	-	-	-
Critical Hdwy Stg 1	6.2	-	-	-	-	-
Critical Hdwy Stg 2	6.2	-	-	-	-	-
Follow-up Hdwy	3.5	-	-	-	-	-
Pot Cap-1 Maneuver	387	0	-	0	0	-
Stage 1	829	0	-	0	0	-
Stage 2	577	0	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver		-	-	-	-	-
Mov Cap-2 Maneuver	387	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Approach	WB		NB		SB	
HCM Ctrl Dly, s/v	24.3		0		0	
HCM LOS	24.5 C		J		0	
110111 200	0					

Minor Lane/Major Mvmt	NB'	TWBLn1	SBT
Capacity (veh/h)		- 387	-
HCM Lane V/C Ratio		- 0.53	-
HCM Ctrl Dly (s/v)		- 24.3	-
HCM Lane LOS		- C	-
HCM 95th %tile Q (veh)		- 3	-

Int Delay, s/veh	Intersection	_					
Movement WBL WBR NBT NBR SBL SBT Lane Configurations Traffic Vol, veh/h 181 0 523 0 0 242 Future Vol, veh/h 181 0 523 0 0 242 Conflicting Peds, #lhr 0 0 0 0 0 0 242 Conflicting Peds, #lhr 0		10.4					
Lane Configurations	**		WDD	NDT	NDD	ODI	ODT
Traffic Vol, veh/h 181 0 523 0 0 242 Future Vol, veh/h 181 0 523 0 0 242 Conflicting Peds, #hr 0 2			WBR		NRK	SBL	
Future Vol, veh/h Conflicting Peds, #/hr Sign Control Stop Stop Free RT Channelized None RT Channelized None Storage Length O Storage Length O Storage Length O O O O O O O O O O O O O O O O O O O			^		0	0	
Conflicting Peds, #/hr 0 None			_				
Sign Control Stop RT Channelized Stop RT Channelized Stop RT Channelized Stop RT Channelized Free RT Channelized Free RT Channelized None RT Channelized							
RT Channelized - None - None - None - None Storage Length 0			_		-	-	
Storage Length							
Veh in Median Storage, # 0 - 0 - - 0 Grade, % 4 - 1 - - 3 Peak Hour Factor 85 85 94 81 81 Heavy Vehicles, % 0 0 0 0 0 0 20 Major/Minor Minor1 Major1 Major2 Major2 Conflicting Flow All 855 - 0 - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Grade, % 4 - 1 - - 3 Peak Hour Factor 85 85 94 94 81 81 Heavy Vehicles, % 0 299		-					
Peak Hour Factor							_
Heavy Vehicles, % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0							
Momit Flow 213 0 556 0 0 299 Major/Minor Minor1 Major1 Major2 Conflicting Flow All 855 - 0 - - Stage 1 556 - - - - - Stage 2 299 -							
Major/Minor Minor1 Major1 Major2 Conflicting Flow All 855 - 0 - - Stage 1 556 - - - - - Stage 2 299 - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Conflicting Flow All 855	WIVINT FIOW	213	U	000	U	U	299
Conflicting Flow All 855							
Stage 1 5566 -		Minor1		Major1	1	Major2	
Stage 2 299	Conflicting Flow All	855	-	- 0	-	-	-
Critical Hdwy 7.2 -			-		-	-	-
Critical Hdwy Stg 1 6.2 Critical Hdwy Stg 2 6.2 Critical Hdwy Stg 2 6.2			-		-	-	-
Critical Hdwy Stg 2 6.2 - - - - Follow-up Hdwy 3.5 - - - - Pot Cap-1 Maneuver 274 0 - 0 0 Stage 1 511 0 - 0 0 - Platoon blocked, % - - - - - Mov Cap-1 Maneuver 274 - - - - Mov Cap-2 Maneuver 274 - - - - Stage 1 511 - - - - Stage 2 708 - - - - Approach WB NB SB HCM Ctrl Dly, s/v 52.3 0 0 HCM LOS F Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -	Critical Hdwy		-		-	-	-
Follow-up Hdwy 3.5	Critical Hdwy Stg 1		-		-	-	-
Pot Cap-1 Maneuver 274 0 - 0 0 - Stage 1 511 0 - 0 0 - Stage 2 708 0 - 0 0 - 0 0 - 0 0 - 0 0 - 0 0 - Platon blocked, % -	Critical Hdwy Stg 2	6.2	-		-	-	-
Stage 1	Follow-up Hdwy	3.5	-		-	-	-
Stage 2	Pot Cap-1 Maneuver		0) -	0	0	-
Platoon blocked, % - - Mov Cap-1 Maneuver 274 - - - Mov Cap-2 Maneuver 274 - - - - Stage 1 511 - - - - Stage 2 708 - - - - Approach WB NB SB HCM Ctrl Dly, s/v 52.3 0 0 HCM LOS F Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -							-
Mov Cap-1 Maneuver 274 -		708	0) -	0	0	-
Mov Cap-2 Maneuver 274 -				-			-
Stage 1 511 -			-		-	-	-
Stage 2 708	Mov Cap-2 Maneuver	274	-		-	-	-
Approach		511	-		-	-	-
HCM Ctrl Dly, s/v 52.3 0 0 HCM LOS F Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -	Stage 2	708	-		-	-	-
HCM Ctrl Dly, s/v 52.3 0 0 HCM LOS F Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -							
HCM Ctrl Dly, s/v 52.3 0 0 HCM LOS F Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -	Annroach	WR		NB		SB	
HCM LOS F Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -							
Minor Lane/Major Mvmt NBTWBLn1 SBT Capacity (veh/h) - 274 -				U		U	
Capacity (veh/h) - 274 -	TOM EGG						
Capacity (veh/h) - 274 -							
		nt					
					-		
HCM Lane V/C Ratio - 0.777 -	HCM Lane V/C Ratio						
			-	- 52.3	-		
	HCM Ctrl Dly (s/v)						
HCM 95th %tile Q (veh) - 5.9 -	HCM Ctrl Dly (s/v) HCM Lane LOS		-		-		

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1: Nine Mile Rd & Français Ave HCM 6th TWSC

Intersection						
Int Delay, s/veh	72					
Marriage	EDT	EDD	WDI	MOT	NIDI	NDD
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	•	77		•	7	7
Traffic Vol, veh/h	968	594	0	308	263	79
Future Vol, veh/h	968	594	0	308	263	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage,	# 0	-	-	0	1	-
Grade, %	-14	-	-	7	3	-
Peak Hour Factor	84	84	84	84	67	67
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1152	707	0	367	393	118

Major/Minor	Major1	Ma	ijor2	Min	or1	
Conflicting Flow All	0	0	-	- 1	519 11	52
Stage 1	-	-	-	- 1	152	-
Stage 2	-	-	-	- ;	367	-
Critical Hdwy	-	-	-	- 7	.01 6.	51
Critical Hdwy Stg 1	-	-	-	- 6	5.01	-
Critical Hdwy Stg 2	-	-	-	- 6	5.01	-
Follow-up Hdwy	-	-	-	- 3.	509 3.3)9
Pot Cap-1 Maneuver	-	-	0	- ~	102 2	20
Stage 1	-	-	0	- ~	250	-
Stage 2	-	-	0	- 1	661	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuve	r -	-	-	- ~	102 2	20
Mov Cap-2 Maneuve	r -	-	-	- ~	200	-
Stage 1	-	-	-	- ~	250	-
Stage 2	-	-	-	- (661	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	\$ 385.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBT	
Capacity (veh/h)	200	220	-	-	-	
HCM Lane V/C Ratio	1.963	0.536	-	-	-	
HCM Ctrl Dly (s/v)	\$ 490.2	38.8	-	-	-	
HCM Lane LOS	F	Е	-	-	-	
HCM 95th %tile Q (veh)	29.1	2.8	-	-	-	

- Notes

 ~: Volume exceeds capacity
 +: Computation Not Defined

 *: All major volume in platoon

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background PM

1: Nine Mile Rd & Français Ave HCM 6th TWSC

206.9					
ERT	ERP	WRI	WRT	NRI	NBR
		WDL			INDIX.
		٥			138
		-			138
					138
-	•	-	-	-	•
					Stop
					None
	-			-	0
	-	-			-
	-	-			-
95		93		97	97
0	0	0	0	0	0
620	315	0	675	705	142
Major1		Majara		din and	
					000
-			-		620
			-		-
	-		-		-
	-		-		6.5
	-	-		-	-
-	-	-	-		-
-	-	-	-		3.3
-	-	0	-	~ 146	467
-	-	0	-	~ 487	-
-	-	0	-	~ 455	-
-	-		-		
_	-	-	-	~ 146	467
	-	-	-	~ 281	-
	-	_			-
_	_				
_				400	
EB		WB		NB	
0		0	\$	599.9	
				F	
t I				EBK	WBT
				-	-
			-	-	-
\$	717.7	16.1	-	-	-
	F	С	-	-	-
1)	57.6	1.3	-	-	-
,					
pacity fined		elay exc			
	## 482	## Company of the com	## Company Com	## Company of the com	## Company Com

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Notes
-: Volume exceeds capacity
+: Computation Not Defined
*: All major volume in platoon

2: Assembly St & Francais Ave HCM 6th TWSC

Background PM

2: Assembly St & Français Ave HCM 6th TWSC 22-1640 Assembly & Francis& Nine Mile/Driscoll

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	∱ }		*	•	7			7		4	
Traffic Vol, veh/h	56	735	192	238	329	8	0	3	63	1	16	25
Future Vol, veh/h	56	735	275	238	329	8	0	3	63	1	16	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	0	-	100	-	-	0	-	-	-
Veh in Median Storage	,# -	1	-	-	1	-	-	1	-	-	1	-
Grade, %	-	1	-	-	7	-	-	2	-	-	5	-
Peak Hour Factor	94	94	94	90	90	90	76	76	76	56	56	56
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	60	782	293	264	366	9	0	4	83	2	29	45
Majar/Minar	Anian4			Aniaro			Ain and			Ain au		
	Major1			Major2			Minor1	4050		Minor2	0000	200
Conflicting Flow All	375	0	0	1075	0	0	-	1952	538	1407	2089	366
Stage 1	-	-	-	-	-	-	-	1049	-	894	894	-
Stage 2	-	-	-	-	-	-	-	903	- 7.4	513	1195	- 0.7
Critical Hdwy	4.1	-	-	4.115	-	-	-	6.9	7.1	8.3	7.5	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.9	-	7.1	6.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.9	-	7.5	6.5	-
Follow-up Hdwy	2.2	-	-2	2.2095	-	-	-	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1195	-	-	651	-	-	0	52	478	74	30	650
Stage 1	-	-	-	-	-	-	0	273	-	264	283	-
Stage 2	-	-	-	-	-	-	0	325	-	449	188	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1195	-	-	651	-	-	-	29	478	39	~ 17	650
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	92	-	69	-	-
Stage 1	-	-	-	-	-	-	-	259	-	251	168	-
Stage 2	-	-	-	-	-	-	-	193	-	347	179	-
Approach	EB			WB			NB			SB		
	0.4			5.9			14.1			13.6		
HCM Ctrl Dly, s/v	0.4			5.9			14.1 B			13.6 B		
HCM LOS					_		В			В		
Minor Lane/Major Mvm	t	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR:	SBLn1			
Capacity (veh/h)		478	1195	-	-	651	-	-	491			
HCM Lane V/C Ratio		0.173	0.05	-	-	0.406	-	-	0.153			
HCM Ctrl Dly (s/v)		14.1	8.2	-	-	14.3	-	-	13.6			
HCM Lane LOS		В	A			В			В			
HCM 95th %tile Q (veh)	0.6	0.2	_	-	2	-	-	0.5			
Jour Jour & (VOI)	/	0.0	J.L						3.0			

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	ΦÞ		*	1	7			7*		44	
Traffic Vol, veh/h	44	497	76	246	428	13	4	4	140	2	10	15
Future Vol, veh/h	44	579	101	246	568	13	4	4	140	2	10	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	0	-	100	-	-	0	-	-	-
Veh in Median Storage,	# -	1	-	-	1	-	-	1	-	-	1	-
Grade, %	-	1	-	-	7	-	-	2	-	-	5	-
Peak Hour Factor	95	95	95	93	93	93	86	86	86	73	73	73
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	46	609	106	265	611	14	5	5	163	3	14	21
Major/Minor N	lajor1		N	Major2			Minor1		- 1	Minor2		
Conflicting Flow All	625	0	0	715	0	0	1920	1909	358	1540	1948	611
Stage 1	-	-	-	-	-	-	754	754	-	1141	1141	-
Stage 2			-				1166	1155		399	807	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.7	6.9	7.1	8.3	7.5	6.7
Critical Hdwy Stg 1	-		-	-			6.9	5.9	-	7.1	6.5	-
Critical Hdwy Stg 2	-	-	-	-	-		6.5	5.9	-	7.5	6.5	_
Follow-up Hdwy	2.2		-	2.2			3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	966	-	-	895	-	-	37	56	632	57	38	457
Stage 1	-		-	-			342	386	-	179	202	-
Stage 2	-	-	-	-	-	-	209	241	-	540	317	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	966	-	-	895	-	-	18	38	632	30	25	457
Mov Cap-2 Maneuver	-	-	-	-	-	-	64	97	-	75	33	-
Stage 1	-	-	-	-	-	-	326	367	-	170	142	-
Stage 2	-	-	-	-	-	-	127	170	-	377	302	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.5			3.2			12.7			94.8		
HCM LOS	0.0			0.2			В			F		
Minor Lane/Major Mvmt	1	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR :	SRI n1			
Capacity (veh/h)		632	966	LUI	LDIN	895	7701	**DI\\	74			
HCM Lane V/C Ratio		0.258	0.048		- 1	0.296	- 1		0.5			
HCM Ctrl Dly (s/v)		12.7	8.9	-	-	10.7		-	94.8			
HCM Lane LOS		12.7 B	0.9 A		- 1	10.7 B	- 1	- 1	94.0 F			
HCM 95th %tile Q (veh)		1	0.2	-		1.2	-		2.1			
now sour wille Q (ven)			0.2	-	-	1.2	-	-	۷.۱			

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22-1640 Assembly & Francis& Nine Mile/Driscoll 3: Assembly St/Nine Mile Rd & Driscoll Blvd Background AM HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		7	1			1
Traffic Vol, veh/h	0	88	250	0	0	601
Future Vol, veh/h	0	115	314	0	0	792
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	e, # 1	-	0	-	-	0
Grade, %	0	-	2	-	-	1
Peak Hour Factor	72	72	65	65	85	85
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	0	160	483	0	0	932

Major/Minor	Minor1	Ma	ajor1	Ma	ajor2	
Conflicting Flow All	-	483	0	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.2	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	588	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	588	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

HCM Ctrl Dly, s/v	13.4	0	0	
HCM LOS	В			

Minor Lane/Major Mvmt	NBTWBLn1	SBT
Capacity (veh/h)	- 588	-
HCM Lane V/C Ratio	- 0.272	-
HCM Ctrl Dly (s/v)	- 13.4	-
HCM Lane LOS	- B	-
HCM 95th %tile Q (veh)	- 1.1	-

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22-1640 Assembly & Francis& Nine Mile/Driscoll 3: Assembly St/Nine Mile Rd & Driscoll Blvd Background PM HCM 6th TWSC

Intersection						
Int Delay, s/veh	3.7					
•	WBL	WBR	NBT	NBR	SBL	SBT
Movement Lane Configurations	WDL	WDR		NDK	SBL	
	0		†	0	٥	1
Traffic Vol, veh/h	0	166	524	0	0	242
Future Vol, veh/h	0	208	622	0	0	299
Conflicting Peds, #/hr	-	•	-	•	-	•
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-		-	None	-	
Storage Length	-	0	-	-	-	-
Veh in Median Storage		-	0	-	-	0
Grade, %	0	-	2	-	-	1
Peak Hour Factor	90	90	93	93	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	231	669	0	0	369
Major/Minor I	Minor1	1	Major1	N	//ajor2	
Conflicting Flow All	-	669	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-		-	-		
Critical Hdwy	-	6.2	-	_		_
Critical Hdwy Stg 1	-	- 0.2		-		
Critical Hdwy Stg 2						_
Follow-up Hdwy		3.3				- :
Pot Cap-1 Maneuver	0	461		0	0	
				_	_	
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	U	_
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	461	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB		NB		SB	
HCM Ctrl Dly, s/v	20.4		0		0	
HCM LOS	С					
Minor Lane/Major Mvm	nt	NRTV	VBLn1	SBT		
Capacity (veh/h)		-	461	-		
HCM Lane V/C Ratio			0.501			
		-	20.4	-		
HCM Ctrl Dly (s/v)		-		-		
HCM Lane LOS	,	-	С	-		
HCM 95th %tile Q (veh	1)	-	2.8	-		

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4: Assembly St & Driscoll Blvd HCM 6th TWSC

22-1640 Assembly & Francis& Nine Mile/Drisco	Ш
Background PM	

4: Assembly St & Driscoll Blvd HCM 6th TWSC

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*				^	7"					4	
Traffic Vol., veh/h	0	0	0	0	99	65	0	0	0	314	255	2
Future Vol. veh/h	0	0	0	0	99	65	0	0	0	314	255	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage,	# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	1	-	-	1	-	-	4	-
Peak Hour Factor	92	92	92	77	77	77	25	25	25	80	80	80
Heavy Vehicles, %	0	0	2	0	0	0	2	2	2	0	0	0
Mvmt Flow	0	0	0	0	129	84	0	0	0	393	319	3
Major/Minor N	/linor1		1	Major2					I	/lajor1		
Conflicting Flow All	1278	-	-	-	-	0				213	0	0
Stage 1	1107	-	_	_	-	-				-		_
Stage 2	171	-			-					-		-
Critical Hdwy	6.4	-	-	-	-	-				4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-				-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-				-	-	-
Follow-up Hdwy	3.5	-	-	-	-	-				2.2	-	-
Pot Cap-1 Maneuver	185	0	0	0	-	-				1369	-	-
Stage 1	319	0	0	0	-	-				-	-	-
Stage 2	864	0	0	0	-	-				-	-	-
Platoon blocked, %					-	-					-	-
Mov Cap-1 Maneuver	120	0	-	-	-	-				1369	-	-
Mov Cap-2 Maneuver	173	0	-	-	-	-				-	-	-
Stage 1	207	0	-	-	-	-				-	-	-
Stage 2	864	0	-	-	-	-				-	-	-
Approach	EB			WB						SB		
HCM Ctrl Dly, s/v	0			0						4.8		
HCM LOS	Α											
Minor Lane/Major Mvmt	t	EBLn1	WBT	WBR	SBL	SBT	SBR					
Capacity (veh/h)		-	-	-	1369	-	-					
HCM Lane V/C Ratio												
HCM Ctrl Dly (s/v)		0	-	-	8.7	0	-					
HCM Lane LOS		A	-		A	A						
HCM 95th %tile Q (veh))	-	-	-	1.2	-	-					

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*1				1	7					4	
Traffic Vol, veh/h	0	0	0	0	165	145	0	0	0	145	182	1
Future Vol, veh/h	0	0	0	0	207	145	0	0	0	170	182	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage	e,# -	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	1	-	-	1	-	-	4	-
Peak Hour Factor	92	92	92	91	91	91	92	92	92	86	86	86
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	0	0	0
Mvmt Flow	0	0	0	0	227	159	0	0	0	198	212	1
Major/Minor	Minor1			Major2					1	Major1		
Conflicting Flow All	916	-	-	-	-	0				386	0	0
Stage 1	609	-	-	-	-	-				-	-	-
Stage 2	307	-	-	-	-	-				-	-	-
Critical Hdwy	6.42	-	-	-	-	-				4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-				-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-				-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-				2.2	-	-
Pot Cap-1 Maneuver	302	0	0	0	-	-				1184	-	-
Stage 1	543	0	0	0	-	-				-	-	-
Stage 2	746	0	0	0	-	-				-	-	-
Platoon blocked, %					-	-					-	-
Mov Cap-1 Maneuver	245	0	-	-	-	-				1184	-	-
Mov Cap-2 Maneuver	332	0	-	-	-	-				-	-	-
Stage 1	440	0	-	-	-	-				-	-	-
Stage 2	746	0	-	-	-	-				-	-	-
3												
Approach	EB	_		WB						SB		
HCM Ctrl Dly, s/v	0			0						4.2		
HCM LOS	A											
Minor Lane/Major Mvn	nt	EBLn1	WBT	WBR	SBL	SBT	SBR					
Capacity (veh/h)		-	-	-	1184	-	-					
HCM Lane V/C Ratio					0.167							
HCM Ctrl Dly (s/v)		0	-		8.6	0						
HCM Lane LOS		A			Α	A	-					
HCM 95th %tile Q (vel	h)	-			0.6	-	_					
0001 70010 & (101	.,				0.0							

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Intersection						
Int Delay, s/veh	8.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	ň		1			1
Traffic Vol, veh/h	166	0	236	0	0	516
Future Vol, veh/h	166	0	236	0	0	516
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	e,# 0	-	0	-	-	0
Grade, %	4	-	1	-	-	3
Peak Hour Factor	81	81	92	92	92	92
Heavy Vehicles, %	0	0	1	1	0	0
Mymt Flow	205	0	257	0	0	561

Major/Minor	Minor1	M	ajor1	M	ajor2	
Conflicting Flow All	818	-	0	-	-	-
Stage 1	257	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Critical Hdwy	7.2	-	-	-	-	-
Critical Hdwy Stg 1	6.2	-	-	-	-	-
Critical Hdwy Stg 2	6.2	-	-	-	-	-
Follow-up Hdwy	3.5	-	-	-	-	-
Pot Cap-1 Maneuver	290	0	-	0	0	-
Stage 1	747	0	-	0	0	-
Stage 2	508	0	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver		-	-	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Approach	WB		NB		SB	
HCM Ctrl Dly, s/v	42.5		0		0	
HCM LOS	Е					

Minor Lane/Major Mvmt	NBTWE	3Ln1	SBT
Capacity (veh/h)		290	-
HCM Lane V/C Ratio	0	.707	
HCM Ctrl Dly (s/v)		42.5	-
HCM Lane LOS	-	Е	-
HCM 95th %tile Q (veh)	-	4.9	-

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20.3 WBL 181 181 181 r 0 Stop 0 ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	0 0 0 0 Stop None - - - - - - - - - - - - - - - - - - -	NBT	-	SBL 0 0 0 Free 81 0 0 0 Major2	SBT 243 300 0 Free None - 0 3 3 81 0 370
WBL 181 181 r 0 Stop 0 ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	0 0 0 Stop None - - - 85 0 0	523 621 0 Free 0 0 1 94 0 661 0 0	0 0 0 Free None - - - 94 0 0	0 0 0 Free - - - 81 0 0	243 300 0 Free None 0 3 81 0 370
181 181 181 r 0 Stop - 0 9ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	0 0 0 Stop None - - - 85 0 0	523 621 0 Free 0 0 1 94 0 661 0 0	0 0 0 Free None - - - 94 0 0	0 0 0 Free - - - 81 0 0	243 300 0 Free None 0 3 81 0 370
181 181 181 r 0 Stop - 0 9ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	0 0 0 Stop None - - - 85 0 0	523 621 0 Free 0 0 1 94 0 661 0 0	0 0 0 Free None - - - 94 0 0	0 0 0 Free - - - 81 0 0	243 300 0 Free None 0 3 81 0 370
181 181 r 0 Stop - 0 0 ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	0 0 Stop None - - - 85 0 0	523 621 0 Free - 0 1 94 0 661	0 0 Free None - - 94 0 0	0 0 Free - - - 81 0 0	243 300 0 Free None - 0 3 81 0 370
181 r 0 Stop 0 0 9e, # 0 213 Minor1 1031 661 370 7.2 6.2	0 0 Stop None - - - 85 0 0	621 0 Free - 0 1 94 0 661 Major1 0	0 0 Free None - - 94 0 0	0 0 Free - - - 81 0 0	300 0 Free None - 0 3 81 0 370
r 0 Stop - 0 0 9e, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	0 Stop None - - - 85 0 0	0 Free - 0 1 94 0 661 Major1 0	0 Free None - - 94 0 0	0 Free - - - 81 0 0 0 Major2	0 Free None - 0 3 81 0 370
Stop	Stop None - - - - - - - 85 0 0	Free - 0 1 94 0 661 0	Free None 94 0 0	Free 81 0 0 Wajor2	Free None - 0 3 81 0 370
0 ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	None	0 1 94 0 661 Major1 0	None 94 0 0	81 0 0 0 Major2	None - 0 3 81 0 370
0 ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	85 0 0	0 1 94 0 661 Major1 0 -	- - 94 0 0	- - 81 0 0 - -	0 3 81 0 370
ge, # 0 4 85 0 213 Minor1 1031 661 370 7.2 6.2	85 0 0	0 1 94 0 661 Major1 0 -	- 94 0 0	- 81 0 0 Wajor2	0 3 81 0 370
4 85 0 213 Minor1 1031 661 370 7.2 6.2	85 0 0	1 94 0 661 Major1 0 -	- 94 0 0	- 81 0 0 - Major2	3 81 0 370
85 0 213 Minor1 1031 661 370 7.2 6.2	85 0 0	94 0 661 Major1 0 -	94 0 0 0	81 0 0 Major2	81 0 370
0 213 Minor1 1031 661 370 7.2 6.2	0 0 - - -	0 661 Major1 0 -	0 0	0 0 Major2 -	0 370 - -
213 Minor1 1031 661 370 7.2 6.2	0 - - -	661 Major1 0 - -	- - -	0 Major2 -	370
Minor1 1031 661 370 7.2 6.2	- - - -	Major1 0 - -	- - - -	Major2 - -	
1031 661 370 7.2 6.2	- - -	0 - - -	-	- -	-
1031 661 370 7.2 6.2	- - -	0 - - -	-	- -	-
1031 661 370 7.2 6.2	- - -	0 - - -	-	- -	-
661 370 7.2 6.2	- - -	-		-	-
370 7.2 6.2	-	-	-	-	
7.2 6.2	-	-	-	-	
6.2		-	-		-
		-		-	-
6.2	-		-	-	-
		-	-	-	-
3.5	-	-	-	-	-
~ 207	0	-	0	0	-
447	0	-	0	0	-
648	0	-	0	0	-
					-
r ~ 207	_		_	_	-
r ~ 207	-	-			
447					
					-
048	-	-	-	-	-
WB		NB		SB	
118.8		0		0	
F		-		-	
/mt	NBTW				
	-		-		
,	-	1.029	-		
	-	118.8	-		
	-	F			
eh)	-	9.3	-		
,		0.0			
	\$: De	lay exc	ceeds 30	00s	
apacity					on
	MB 118.8 F	WB 118.8 F	WB NB 118.8 0 F WMT NBTWBLn1 - 207 0 - 1.029 - 118.8 - F eth) - 9.3 capacity \$: Delay exc	WB NB 118.8 0 F WMT NBTWBLn1 SBT - 207 - 0 - 1.029 118.8 F - eh) - 9.3 - capacity \$: Delay exceeds 3	WB NB SB 118.8 0 0 r 0 0 vmt NBTWBLn1 SBT - 207 - 0 - 1.029 - - 118.8 - - eh) - 9.3 - capacity \$: Delay exceeds 300s

22-1640 Assembly & Francis& Nine Mile/Driscoll Background PM

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 Synchro 11 Report

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2: Assembly St & Francais Ave Timings

	•	\rightarrow	•	1	•	1	Ť	>	ŧ	
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	*	^	7*	7	↑ ↑	14.54	Ta		ĵa	
Traffic Volume (vph)	56	384	530	238	237	174	3	1	16	
Future Volume (vph)	56	384	768	238	237	234	3	1	16	
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	
Protected Phases	3	8		7	4	5	2	1	6	
Permitted Phases			8							
Detector Phase	3	8	8	7	4	5	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0	
Total Split (s)	12.0	33.0	33.0	22.0	43.0	15.0	27.0	8.0	20.0	
Total Split (%)	13.3%	36.7%	36.7%	24.4%	47.8%	16.7%	30.0%	8.9%	22.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	7.3	24.1	24.1	17.1	35.8	11.1	35.2	4.6	21.7	
Actuated g/C Ratio	0.08	0.27	0.27	0.19	0.40	0.12	0.39	0.05	0.24	
v/c Ratio	0.43	0.45	0.91	0.85	0.21	0.76	0.25	0.02	0.18	
Control Delay (s/veh)	49.1	28.1	22.3	60.8	17.4	60.9	16.6	42.0	17.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	49.1	28.1	22.3	60.8	17.4	60.9	16.6	42.0	17.0	
LOS	D	С	С	Е	В	Е	В	D	В	
Approach Delay (s/veh)		25.4			38.8		44.7		17.7	
Approach LOS		С			D		D		В	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

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

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay (s/veh): 32.1 Intersection Capacity Utilization 61.9% Intersection LOS: C

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Assembly St & Français Ave



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22-1640 Assembly & Francis& Nine Mile/Driscoll Option A PM

2: Assembly St & Français Ave Timings

ane Configurations araffic Volume (vph)			\rightarrow	•	•	•	1	Ţ	-	¥
raffic Volume (vph)	Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
raffic Volume (vph)	Lane Configurations	*	ተተ	77	1	∱ î₃	14.54	ĵa		fa fa
um Type Prot NA Perm Prot NA DB B B DEO A C 4 C 4 5 2 1 6 witch Phase Inlimitum Split (s) 8.0 20.0 20.0 20.0 8.0 20.0 8.0 20.0 8.0 20.0 8.0 20.0 8.0 20.0 8.0 20.0 20.0 20.0 22.7 22.7 22.7 22.7 22.7 36.7 <td>Traffic Volume (vph)</td> <td>44</td> <td>363</td> <td>317</td> <td>246</td> <td></td> <td>555</td> <td>4</td> <td>2</td> <td>10</td>	Traffic Volume (vph)	44	363	317	246		555	4	2	10
rotected Phases	Future Volume (vph)	56	486	427	246	615	763	4	2	10
ermitted Phases	Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
elector Phase 3 8 8 7 4 5 2 1 6	Protected Phases	3	8		7	4	5	2	1	6
witch Phase	Permitted Phases			8						
Inimum Initial (s)	Detector Phase	3	8	8	7	4	5	2	1	6
Ilinimum Spilt (s)	Switch Phase									
otal Split (s) 11.0 20.0 20.0 24.0 33.0 30.0 38.0 8.0 16.0 otal Split (%) 12.2% 22.2% 22.2% 26.7% 36.7% 33.3% 42.2% 8.9% 17.8% ellow Time (s) 3.5	Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
otal Split (%) 12.2% 22.2% 22.2% 26.7% 36.7% 33.3% 42.2% 8.9% 17.8% ellow Time (s) 3.5	Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
ellow Time (s) 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5	Total Split (s)	11.0	20.0	20.0	24.0	33.0	30.0	38.0	8.0	16.0
II-Red Time (s)	Total Split (%)	12.2%	22.2%	22.2%	26.7%	36.7%	33.3%	42.2%	8.9%	17.8%
ost Time Adjust (s) 0.0	Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
otal Lost Time (s) 4.0 8.0 9.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 9.0 9.0 9.4 4.3 13.8 8.0 9.0 9.3 4.1 9.0 9.0 9.3 4.0 9.0 9.3 4.0	All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ead/Lag Lag Lag Lag Lag Lead Lead Lead Lag Lag Lag Lag Lead Lead Lead Lag Lead Lag Lag Lag Lag Lag Lead Lead Lag Lag <th< td=""><td>Lost Time Adjust (s)</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></th<>	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ead-Lag Optimize? Yes	Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
None None None None None None None None None C-Max None C-Max	Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
ct Effct Green (s) 7.8 16.5 16.5 18.0 30.7 25.8 41.9 4.3 13.8 ctuated g/C Ratio 0.09 0.18 0.18 0.20 0.34 0.29 0.47 0.05 0.15 (c Ratio 0.40 0.82 0.70 0.81 0.60 0.94 0.37 0.04 0.23 0.01rol Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 60.1 14.5 42.5 16.6 tueue Delay 0.0 0.0 0.0 0.0 0.0 10.1 0.4 0.0 0.0 total Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 70.2 14.9 42.5 16.6 OS D D A D C E B D B pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	
ctuated g/C Ratio 0.09 0.18 0.18 0.20 0.34 0.29 0.47 0.05 0.15 c Ratio 0.40 0.82 0.70 0.81 0.60 0.94 0.37 0.04 0.23 ontrol Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 60.1 14.5 42.5 16.6 ueue Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 70.2 14.9 42.5 16.6 OS D D A D C E B D B pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
de Ratio 0.40 0.82 0.70 0.81 0.60 0.94 0.37 0.04 0.23 ontrol Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 60.1 14.5 42.5 16.6 ueue Delay 0.0 0.0 0.0 0.0 0.0 10.1 0.4 0.0 0.0 otal Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 70.2 14.9 42.5 16.6 OS D D A D C E B D B pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Act Effct Green (s)	7.8	16.5	16.5	18.0	30.7	25.8	41.9	4.3	13.8
ontrol Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 60.1 14.5 42.5 16.6 ueue Delay 0.0 0.0 0.0 0.0 10.1 0.4 0.0 0.0 otal Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 70.2 14.9 42.5 16.6 OS D D A D C E B D B pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Actuated g/C Ratio									
tueue Delay (s/veh) 0.0 0.0 0.0 0.0 0.0 10.1 0.4 0.0 0.0 total Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 70.2 14.9 42.5 16.6 OS D D A D C E B D B proach Delay (s/veh) 31.2 35.1 55.4 17.7	v/c Ratio	0.40	0.82	0.70	0.81	0.60	0.94	0.37	0.04	0.23
otal Delay (s/veh) 47.1 48.0 9.9 53.3 27.9 70.2 14.9 42.5 16.6 OS D D A D C E B D B pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Control Delay (s/veh)	47.1	48.0	9.9	53.3	27.9	60.1	14.5	42.5	16.6
OS D D A D C E B D B pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Queue Delay	0.0	0.0	0.0	0.0	0.0	10.1	0.4	0.0	0.0
pproach Delay (s/veh) 31.2 35.1 55.4 17.7	Total Delay (s/veh)	47.1	48.0	9.9	53.3					16.6
	LOS	D		Α	D		Е	_	D	
pproach LOS C D E B	Approach Delay (s/veh)									
	Approach LOS		С			D		Е		В

Intersection Summary
Cycle Length: 90

Actuated Cycle Length: 90

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay (s/veh): 41.1 Intersection Capacity Utilization 58.4% Analysis Period (min) 15 Intersection LOS: D

ICU Level of Service B

Splits and Phases: 2: Assembly St & Français Ave



07/22/2025 CivTech Inc. -MZA Synchro 12 Report Page 1 22-1640 Assembly & Francis& Nine Mile/Driscoll Option A AM

2: Assembly St & Francais Ave HCM 7th Signalized Intersection Summary

	•	\rightarrow	•	•	—	•	•	†	/	-	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
Lane Configurations	*	^	7"	Ŋ	^ 1		16.54	ĵa		*	ĵa	
Traffic Volume (veh/h)	56	384	530	238	237	8	174	3	132	1	16	2
Future Volume (veh/h)	56	384	768	238	237	8	234	3	132	1	16	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.0
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1794	1513	1513	1513	1778	1778	1778	1661	1661	166
Adj Flow Rate, veh/h	60	409	0	264	263	9	308	4	174	2	29	4
Peak Hour Factor	0.94	0.94	0.94	0.90	0.90	0.90	0.76	0.76	0.76	0.56	0.56	0.5
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	0	0	
Cap, veh/h	76	556		288	904	31	377	16	675	3	202	31
Arrive On Green	0.04	0.16	0.00	0.20	0.32	0.32	0.11	0.46	0.46	0.00	0.34	0.3
Sat Flow, veh/h	1709	3409	1521	1441	2835	97	3284	34	1478	1581	587	9
Grp Volume(v), veh/h	60	409	0	264	133	139	308	0	178	2	0	
Grp Sat Flow(s),veh/h/ln	1709	1705	1521	1441	1437	1495	1642	0	1512	1581	0	149
Q Serve(g_s), s	3.1	10.3	0.0	16.2	6.2	6.3	8.2	0.0	6.5	0.1	0.0	3
Cycle Q Clear(g_c), s	3.1	10.3	0.0	16.2	6.2	6.3	8.2	0.0	6.5	0.1	0.0	3
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.98	1.00		0.
ane Grp Cap(c), veh/h	76	556		288	458	477	377	0	691	3	0	5
//C Ratio(X)	0.79	0.74		0.92	0.29	0.29	0.82	0.00	0.26	0.58	0.00	0.
Avail Cap(c a), veh/h	152	1099		288	623	648	401	0	691	70	0	5
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
Jpstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	0.62	0.00	0.62	1.00	0.00	1.
Jniform Delay (d), s/veh	42.6	35.8	0.0	35.3	23.0	23.0	38.9	0.0	15.0	44.9	0.0	20
Incr Delay (d2), s/veh	16.4	1.9	0.0	32.1	0.3	0.3	7.7	0.0	0.6	102.7	0.0	(
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
%ile BackOfQ(50%),veh/ln	1.7	4.3	0.0	8.1	2.1	2.2	3.7	0.0	2.3	0.1	0.0	1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.9	37.7	0.0	67.4	23.4	23.4	46.6	0.0	15.6	147.5	0.0	20
LnGrp LOS	Е	D		Е	С	С	D		В	F		
Approach Vol., veh/h		469			536			486			76	_
Approach Delay, s/veh		40.4			45.0			35.2			24.3	
Approach LOS		D			D			D			С	
••			•			•						
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.2	45.1	8.0	32.7	14.3	35.0	22.0	18.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	23.0	8.0	39.0	11.0	16.0	18.0	29.0				
Max Q Clear Time (g_c+I1), s	2.1	8.5	5.1	8.3	10.2	5.1	18.2	12.3				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.6	0.1	0.2	0.0	2.4				
ntersection Summary												
HCM 7th Control Delay, s/veh			39.6									
HCM 7th LOS			D									
Notes												
User approved pedestrian inter	val to be	a loce that	nhace r	nav arear	,							
Unsignalized Delay for [EBR] is						dalay and	intersect	ion delay				
Unagnalizeu Delay IUI [EBR] IS	exciuu	cu IIVIII Ci	aiculatiOff	o UI IIIE d	pproacti	uciay allu	iiilei seci	iori ueldy				

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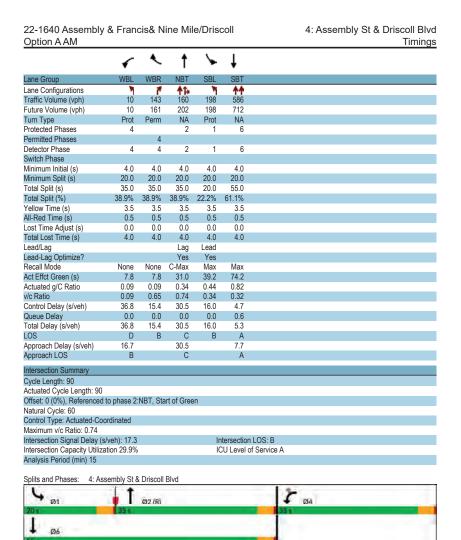
22-1640 Assembly & Francis& Nine Mile/Driscoll Option A PM

2: Assembly St & Francais Ave HCM 7th Signalized Intersection Summary

	ᄼ	→	•	•	—	•	•	†	/	-	ļ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	79	44	7	76	ΦÞ		16.54	fa fa		76	ĵa	
Traffic Volume (veh/h)	44	363	317	246	428	13	555	4	274	2	10	1
Future Volume (veh/h)	56	486	427	246	615	13	763	4	274	2	10	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.0
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1794	1527	1527	1527	1778	1778	1778	1661	1661	166
Adj Flow Rate, veh/h	59	512	0	265	661	14	887	5	319	3	14	49
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.86	0.86	0.86	0.73	0.73	0.73
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	(
Cap, veh/h	184	586		293	773	16	944	10	662	5	52	183
Arrive On Green	0.11	0.17	0.00	0.20	0.27	0.27	0.29	0.45	0.45	0.00	0.16	0.10
Sat Flow, veh/h	1709	3409	1521	1454	2904	61	3284	23	1487	1581	324	113
Grp Volume(v), veh/h	59	512	0	265	330	345	887	0	324	3	0	6
Grp Sat Flow(s),veh/h/ln	1709	1705	1521	1454	1450	1516	1642	0	1510	1581	0	145
Q Serve(q s), s	2.9	13.2	0.0	16.0	19.5	19.5	23.7	0.0	13.6	0.2	0.0	3.4
Cycle Q Clear(g_c), s	2.9	13.2	0.0	16.0	19.5	19.5	23.7	0.0	13.6	0.2	0.0	3.4
Prop In Lane	1.00		1.00	1.00	10.0	0.04	1.00	0.0	0.98	1.00	0.0	0.78
Lane Grp Cap(c), veh/h	184	586	1.00	293	386	403	944	0	673	5	0	23
V/C Ratio(X)	0.32	0.87		0.90	0.86	0.86	0.94	0.00	0.48	0.59	0.00	0.27
Avail Cap(c_a), veh/h	184	606		323	467	488	949	0.00	673	70	0.00	235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	0.66	0.00	0.66	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.1	36.3	0.0	35.1	31.4	31.4	31.3	0.0	17.6	44.8	0.0	33.
Incr Delay (d2), s/veh	1.0	13.1	0.0	25.9	12.5	12.1	12.2	0.0	1.6	77.7	0.0	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.4	0.0	7.6	7.9	8.3	10.7	0.0	4.8	0.2	0.0	1.4
Unsig. Movement Delay, s/veh		0.1	0.0	7.0	7.0	0.0	10.1	0.0		0.2	0.0	
LnGrp Delay(d), s/veh	38.1	49.4	0.0	61.0	43.8	43.4	43.5	0.0	19.2	122.5	0.0	35.9
LnGrp LOS	D	D	0.0	E	D	D	D	0.0	В	F	0.0	[
Approach Vol, veh/h		571			940			1211		•	66	
Approach Delay, s/veh		48.2			48.5			37.0			39.8	
Approach LOS		70.2 D			70.5 D			D D			D D	
• •			_								U	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	44.1	13.7	27.9	29.9	18.5	22.2	19.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	34.0	7.0	29.0	26.0	12.0	20.0	16.0				
Max Q Clear Time (g_c+I1), s	2.2	15.6	4.9	21.5	25.7	5.4	18.0	15.2				
Green Ext Time (p_c), s	0.0	2.0	0.0	2.5	0.1	0.1	0.2	0.3				
Intersection Summary												
HCM 7th Control Delay, s/veh			43.3									
HCM 7th LOS			D									
Notes												
User approved pedestrian inter	val to be	e less that	n phase r	max gree	1.							
Unsignalized Delay for [EBR] is						delay and	Intersect	ion delav				
	- 3/10/du	0 0			F P. 000011			ao.ay	•			

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22-1640 Assembly & Francis& Nine Mile/Driscoll 4: Assembly St & Driscoll Blvd Option A PM Timings Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) 10 372 669 173 510 Turn Type NA NA Perm Prot Protected Phases 2 6 Permitted Phases Detector Phase 4 2 1 4 6 Switch Phase Minimum Initial (s) 4.0 4.0 4.0 4.0 4.0 Minimum Split (s) 20.0 20.0 20.0 20.0 20.0 Total Split (s) 35.0 35.0 35.0 20.0 55.0 38.9% Total Split (%) 38.9% 61.1% 38.9% 22.2% Yellow Time (s) 3.5 3.5 3.5 3.5 3.5 All-Red Time (s) 0.5 0.5 Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 Total Lost Time (s) 4.0 4.0 4.0 4.0 4.0 Lead/Lag Lag Lead Lead-Lag Optimize? Yes Yes Recall Mode None None C-Max Max Max Act Effct Green (s) 9.3 72.7 Actuated g/C Ratio 0.10 0.10 0.34 0.42 0.81 v/c Ratio 0.64 0.29 0.22 0.06 0.78 Control Delay (s/veh) 33.2 14.9 27.9 20.7 5.3 Queue Delay 0.0 0.0 0.0 Total Delay (s/veh) 33.2 15.9 27.9 20.7 5.3 LOS Approach Delay (s/veh) 27.9 16.3 9.2 Approach LOS Intersection Summary Cycle Length: 90 Actuated Cycle Length: 90 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.78 Intersection Signal Delay (s/veh): 17.8 Intersection LOS: B Intersection Capacity Utilization 42.5% ICU Level of Service A Analysis Period (min) 15 Splits and Phases: 4: Assembly St & Driscoll Blvd F 004 Ø2 (R) 06

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22-1640 Assembly & Francis& Nine Mile/Driscoll Option A AM

4: Assembly St & Driscoll Blvd HCM 7th Signalized Intersection Summary

	•	•	†		>	ţ
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	4 12		79	44
Traffic Volume (veh/h)	10	143	160	10	198	586
Future Volume (veh/h)	10	161	202	10	198	712
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	1.00	No	1.00	1.00	No
Adj Sat Flow, veh/h/ln	1794	1794	1766	1766	1711	1711
Adj Flow Rate, veh/h	13	209	808	40	248	890
Peak Hour Factor	0.77	0.77	0.25	0.25	0.80	0.80
Percent Heavy Veh, %	0.77	0.77	2	2	0.00	0.00
Cap, veh/h	277	247	1714	85	290	2434
Arrive On Green	0.16	0.16	0.53	0.53	0.36	1.00
	1709	1521	3343	161	1629	3336
Sat Flow, veh/h						
Grp Volume(v), veh/h	13	209	417	431	248	890
Grp Sat Flow(s),veh/h/ln	1709	1521	1678	1737	1629	1625
Q Serve(g_s), s	0.6	12.0	14.1	14.1	12.7	0.0
Cycle Q Clear(g_c), s	0.6	12.0	14.1	14.1	12.7	0.0
Prop In Lane	1.00	1.00		0.09	1.00	
Lane Grp Cap(c), veh/h	277	247	884	915	290	2434
V/C Ratio(X)	0.05	0.85	0.47	0.47	0.86	0.37
Avail Cap(c_a), veh/h	589	524	884	915	290	2434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.41	0.41
Uniform Delay (d), s/veh	31.8	36.6	13.4	13.4	27.9	0.0
Incr Delay (d2), s/veh	0.1	7.9	1.8	1.7	12.7	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.9	5.4	5.6	4.9	0.1
Unsig. Movement Delay, s/veh	0.2	7.0	Ur	0.0	4.0	0.1
LnGrp Delay(d), s/veh	31.9	44.5	15.2	15.2	40.6	0.2
LnGrp LOS	C C	44.5 D	13.2 B	13.2 B	40.0 D	Α.2
		U		D	U	1138
Approach Vol, veh/h	222 43.7		848			9.0
Approach Delay, s/veh			15.2			
Approach LOS	D		В			Α
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.0	51.4		18.6		71.4
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	16.0	31.0		31.0		51.0
Max Q Clear Time (q c+l1), s	14.7	16.1		14.0		2.0
Green Ext Time (p c), s	0.1	4.8		0.6		7.9
u = 7:						
Intersection Summary			440			
HCM 7th Control Delay, s/veh			14.9			
HCM 7th LOS			В			

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22-1640 Assembly & Francis& Nine Mile/Driscoll Option A PM

4: Assembly St & Driscoll Blvd HCM 7th Signalized Intersection Summary

	•	•	†	~	/	Ţ
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	↑ D		*	*
Traffic Volume (veh/h)	10	310	523	10	145	428
Future Volume (veh/h)	10	372	669	10	173	510
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1794	1794	1766	1766	1711	1711
Adj Flow Rate, veh/h	11	409	727	11	201	593
Peak Hour Factor	0.91	0.91	0.92	0.92	0.86	0.86
Percent Heavy Veh, %	0	0	2	2	0	0
Cap, veh/h	498	443	1344	20	290	2014
Arrive On Green	0.29	0.29	0.40	0.40	0.36	1.00
Sat Flow, veh/h	1709	1521	3472	51	1629	3336
Grp Volume(v), veh/h	11	409	360	378	201	593
Grp Sat Flow(s), veh/h/ln	1709	1521	1678	1757	1629	1625
Q Serve(g_s), s	0.4	23.5	14.8	14.8	9.5	0.0
Cycle Q Clear(q c), s	0.4	23.5	14.8	14.8	9.5	0.0
Prop In Lane	1.00	1.00	14.0	0.03	1.00	0.0
Lane Grp Cap(c), veh/h	498	443	667	698	290	2014
V/C Ratio(X)	0.02	0.92	0.54	0.54	0.69	0.29
Avail Cap(c a), veh/h	589	524	667	698	290	2014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00 0.66
Upstream Filter(I)	1.00			1.00	0.66	
Uniform Delay (d), s/veh	22.7	30.9	20.8	20.8	26.9	0.0
Incr Delay (d2), s/veh	0.0	20.1	3.1	3.0	8.7	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.8	6.2	6.4	3.8	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	22.7	51.0	24.0	23.8	35.7	0.2
LnGrp LOS	С	D	С	С	D	Α
Approach Vol, veh/h	420		738			794
Approach Delay, s/veh	50.2		23.9			9.2
Approach LOS	D		С			Α
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.0	39.8		30.2		59.8
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	16.0	31.0		31.0		51.0
Max Q Clear Time (g_c+l1), s	11.5	16.8		25.5		2.0
Green Ext Time (p_c), s	0.2	4.0		0.8		4.7
Intersection Summary						
HCM 7th Control Delay, s/veh			23.6			
HCM 7th LOS			С			
			U			

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B AM

1: Nine Mile Rd & Français Ave Timings

	\rightarrow	•	•	•	•	
Lane Group	EBT	EBR	WBL	WBT	NBL	
Lane Configurations	^	7	*	ተተ	N/A/A	
Traffic Volume (vph)	502	514	254	216	174	
Future Volume (vph)	502	514	254	234	216	
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Detector Phase	2	2	1	6	4	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	
Total Split (s)	22.0	22.0	12.0	34.0	26.0	
Total Split (%)	36.7%	36.7%	20.0%	56.7%	43.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	
Act Effct Green (s)	18.0	18.0	30.0	30.0	22.0	
Actuated g/C Ratio	0.30	0.30	0.50	0.50	0.37	
v/c Ratio	0.55	0.67	0.80	0.17	0.42	
Control Delay (s/veh)	19.9	6.0	28.9	8.6	9.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	19.9	6.0	28.9	8.6	9.4	
LOS	В	Α	С	Α	Α	
Approach Delay (s/veh)	12.9			19.1	9.4	
Approach LOS	В			В	Α	
Intersection Summary						
Cycle Length: 60						
Actuated Cycle Length: 60						

Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 13.6 Intersection Capacity Utilization 55.1%

Intersection LOS: B
ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Nine Mile Rd & Français Ave



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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B PM

1: Nine Mile Rd & Francais Ave

Cane Configurations		→	•	•	—	•		
Traffic Volume (vph)	Lane Group	EBT	EBR	WBL	WBT	NBL		
Future Volume (vph)	Lane Configurations							
Furn Type	Traffic Volume (vph)		318					
Protected Phases 2 1 1 6 4 Permitted Phases 2 6 6 Deflector Phase 2 2 1 6 6 Deflector Phase 2 2 1 6 6 Deflector Phase 2 2 1 6 6 4 Deflector Phase 3 7 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6	Future Volume (vph)							
Permitted Phases 2	Turn Type		Perm	pm+pt				
Detector Phase 2 2 1 6 4	Protected Phases	2			6	4		
Switch Phase Swit	Permitted Phases							
Winimum Initial (s) 4.0 20.0 <td></td> <td>2</td> <td>2</td> <td>1</td> <td>6</td> <td>4</td> <td></td> <td></td>		2	2	1	6	4		
Minimum Split (s)								
Total Split (s) 22.0 22.0 12.0 34.0 26.0 Total Split (%) 36.7% 36.7% 20.0% 56.7% 43.3% Yellow Time (s) 3.5 3.5 3.5 3.5 3.5 All-Red Time (s) 0.5 0.5 0.5 0.5 0.5 Jall-Red Time (s) 4.0 4.0 4.0 4.0 4.0 Lead/Lag Lag Lag Lead Lead Lead/Lag Optimize? Yes Yes Yes Recall Mode C-Max C-Max None C-Max Max Act Effect Green (s) 18.0 18.0 30.0 30.0 22.0 Actuated g/C Ratio 0.30 0.50 0.50 0.37 0.0								
Total Split (%) 36.7% 36.7% 20.0% 56.7% 43.3% (rellow Time (s) 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5								
Action Time (s) 3.5 3.5 3.5 3.5 All-Red Time (s) 0.5 0.5 0.5 0.5 0.5 Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 Fotal Lost Time (s) 4.0 2.0 2.0 3.0 3.0 3.0 <								
All-Red Time (s)								
Cost Time Adjust (s)								
Actual Cost Time (s)		0.5						
Lag								
Approach Delay (siveh) 13.6 14.0 21.7					4.0	4.0		
Recall Mode								
Actuated g/C Ratio 0.30 0.30 0.50 0.50 0.37 Actuated g/C Ratio 0.30 0.30 0.50 0.50 0.37 Actuated g/C Ratio 0.54 0.54 0.72 0.46 0.81 Control Delay (s/veh) 19.8 5.0 22.6 10.9 21.7 Queue Delay 0.0 0.0 0.0 0.0 0.0 Collay (s/veh) 19.8 5.0 22.6 10.9 21.7 Collay (s/veh) 13.6 14.0 21.7 Approach Delay (s/veh) 13.6 14.0 21.7 Approach LOS B C B C Approach LOS B C B C C Approach LOS B C B C C Approach LOS B C B C B C C Approach LOS B C B C B C C Approach LOS B B C C B C B C B C B C B C B C B C B								
Actuated g/C Ratio 0.30 0.30 0.50 0.50 0.37								
//c Ratio								
Control Delay (s/veh)								
Queue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Total Delay (s/veh) 19.8 5.0 22.6 10.9 21.7 OS B A C B C Approach Delay (s/veh) 13.6 14.0 21.7 Approach LOS B B C Intersection Summary								
19.8 5.0 22.6 10.9 21.7								
Approach Delay (s/veh) 13.6 14.0 21.7 Approach LOS B B C Approach LOS B B C Intersection Summary Cycle Length: 60 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection LOS: B Intersection Capacity Utilization 63.0% ICU Level of Service B								
Approach Delay (s/veh) 13.6 14.0 21.7 Approach LOS B B C Intersection Summary Upcle Length: 60 Actuated Cycle Length: 60 Actuated Cycle Length: 60 Natural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection LOS: B Intersection Capacity Utilization 63.0% ICU Level of Service B								
Approach LOS B B C Intersection Summary Cycle Length: 60 Actuated Cycle Length: 60 Actuated Cycle Length: 60 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Valural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/weh): 16.4 Intersection LOS: B Intersection Capacity Utilization 63.0% ICU Level of Service B		_	Α	С	_	_		
Intersection Summary Cycle Length: 60 Actuated Cycle Length: 60 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Valural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection Capacity Utilization 63.0% ICU Level of Service B								
Cycle Length: 60 Actuated Cycle Length: 60 Actuated Cycle Length: 60 Actuated Cycle Length: 60 Actuated Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection Capacity Utilization 63.0% ICU Level of Service B	Approach LOS	В			В	С		
Actuated Öycle Length: 60 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Vatural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection Capacity Utilization 63.0% ICU Level of Service B	Intersection Summary							
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green Natural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection Capacity Utilization 63.0% ICU Level of Service B	Cycle Length: 60							
Natural Cycle: 50 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection Capacity Utilization 63.0% ICU Level of Service B	Actuated Cycle Length: 60							
Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.81 Intersection Signal Delay (s/veh): 16.4 Intersection Capacity Utilization 63.0% ICU Level of Service B	Offset: 0 (0%), Referenced	to phase 2	:EBT and	6:WBTL,	Start of 0	Green		
Maximum v/c Ratio: 0.81 ntersection Signal Delay (s/veh): 16.4 ntersection Capacity Utilization 63.0% ICU Level of Service B	Natural Cycle: 50	•						
ntersection Signal Delay (s/veh): 16.4 Intersection LOS: B ntersection Capacity Utilization 63.0% ICU Level of Service B	Control Type: Actuated-Cod	ordinated						
ntersection Capacity Utilization 63.0% ICU Level of Service B	Maximum v/c Ratio: 0.81							
	Intersection Signal Delay (s	/veh): 16.4			Ir	ntersection	LOS: B	
Analysis Period (min) 15	Intersection Capacity Utiliza	ation 63.0%)		10	CU Level o	f Service B	
	Analysis Period (min) 15							



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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B AM

1: Nine Mile Rd & Francais Ave HCM 7th Signalized Intersection Summary

	\rightarrow	•	1	•	•		
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	44	7	79	ተተ	444		
Traffic Volume (veh/h)	502	514	254	216	174	145	
Future Volume (veh/h)	502	514	254	234	216	145	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No	No		
Adj Sat Flow, veh/h/ln	2307	2307	1513	1513	1736	1736	
Adj Flow Rate, veh/h	598	0	302	279	269	273	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.67	0.67	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	1315		445	1437	606	539	
Arrive On Green	0.30	0.00	0.13	0.50	0.37	0.37	
Sat Flow, veh/h	4499	1955	1441	2949	1653	1471	
Grp Volume(v), veh/h	598	0	302	279	269	273	
Grp Sat Flow(s),veh/h/ln	2192	1955	1441	1437	1653	1471	
Q Serve(g_s), s	6.6	0.0	8.0	3.2	7.4	8.7	
Cycle Q Clear(g_c), s	6.6	0.0	8.0	3.2	7.4	8.7	
Prop In Lane		1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1315		445	1437	606	539	
V/C Ratio(X)	0.45		0.68	0.19	0.44	0.51	
Avail Cap(c_a), veh/h	1315		445	1437	606	539	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	0.00	0.90	0.90	1.00	1.00	
Uniform Delay (d), s/veh	17.0	0.0	12.4	8.3	14.4	14.8	
Incr Delay (d2), s/veh	1.1	0.0	3.7	0.3	2.3	3.4	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/In	3.2	0.0	2.7	0.9	2.9	3.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	18.2	0.0	16.1	8.6	16.7	18.1	
LnGrp LOS	В		В	Α	В	В	
Approach Vol, veh/h	598			581	542		
Approach Delay, s/veh	18.2			12.5	17.4		
Approach LOS	В			В	В		
Timor Assigned Dhe	1	2		4		6	
Timer - Assigned Phs Phs Duration (G+Y+Rc), s		22.0				34.0	
	12.0			26.0			
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	
Max Green Setting (Gmax), s	8.0	18.0		22.0		30.0	
Max Q Clear Time (g_c+l1), s	10.0	8.6		10.7		5.2	
Green Ext Time (p_c), s	0.0	2.7		1.5		1.8	
Intersection Summary							
HCM 7th Control Delay, s/veh			16.0				
HCM 7th LOS			В				
Notes							
		a the les	for b	ina ma			
User approved volume balancii Unsignalized Delay for [EBR, V						oach dal	ay and intersection
Unagnalizeu Delay IUI [EBR, V	א פון וו מא	skuluueu l	nom calc	nations 0	ı ıııe appi	udun uela	ay and intersection

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B PM

1: Nine Mile Rd & Francais Ave HCM 7th Signalized Intersection Summary

	→	*	₹	_	7	1
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	^	ř	*	^	A AA	
Traffic Volume (veh/h)	406	318	256	441	544	296
Future Volume (veh/h)	565	403	256	711	690	296
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	2322	2322	1527	1527	1750	1750
Adj Flow Rate, veh/h	595	0	275	765	508	523
Peak Hour Factor	0.95	0.95	0.93	0.93	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1323		449	1450	611	544
Arrive On Green	0.30	0.00	0.13	0.50	0.37	0.37
Sat Flow, veh/h	4527	1967	1454	2977	1666	1483
Grp Volume(v), veh/h	595	0	275	765	508	523
Grp Sat Flow(s), veh/h/ln	2206	1967	1454	1450	1666	1483
Q Serve(q s), s	6.5	0.0	7.5	10.7	16.7	20.7
Cycle Q Clear(g_c), s	6.5	0.0	7.5	10.7	16.7	20.7
Prop In Lane	0.0	1.00	1.00	10.7	1.00	1.00
Lane Grp Cap(c), veh/h	1323	1.00	449	1450	611	544
V/C Ratio(X)	0.45		0.61	0.53	0.83	0.96
Avail Cap(c_a), veh/h	1323		449	1450	611	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.50	0.50	1.00	1.00
Uniform Delay (d), s/veh	17.0	0.00	11.5	10.2	17.3	18.6
Incr Delay (d2), s/veh	1.1	0.0	1.2	0.7	12.5	30.2
	0.0	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3), s/veh						
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.2	3.0	7.7	10.8
Unsig. Movement Delay, s/veh		0.0	40.0	40.0	00.0	40.0
LnGrp Delay(d), s/veh	18.1	0.0	12.8	10.9	29.8	48.8
LnGrp LOS	В		В	В	С	D
Approach Vol, veh/h	595			1040	1031	
Approach Delay, s/veh	18.1			11.4	39.4	
Approach LOS	В			В	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	22.0		26.0		34.0
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	8.0	18.0		22.0		30.0
Max Q Clear Time (g_c+I1), s	9.5	8.5		22.7		12.7
Green Ext Time (p_c), s	0.0	2.7		0.0		5.0
u — 7·						
Intersection Summary			23.7			
HCM 7th Control Delay, s/veh HCM 7th LOS			23.7 C			
Notes						

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B AM

2: Assembly St & Français Ave Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	*	ተተ	7	J.	†	ايراير	fa fa	*	f)
Traffic Volume (vph)	56	384	530	238	237	174	3	1	16
Future Volume (vph)	56	384	642	238	237	192	3	1	16
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases			8						
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	12.0	31.0	31.0	24.0	43.0	13.0	27.0	8.0	22.0
Total Split (%)	13.3%	34.4%	34.4%	26.7%	47.8%	14.4%	30.0%	8.9%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	7.3	20.9	20.9	18.0	33.5	10.6	37.5	5.3	24.5
Actuated g/C Ratio	0.08	0.23	0.23	0.20	0.37	0.12	0.42	0.06	0.27
v/c Ratio	0.43	0.52	0.80	0.81	0.22	0.65	0.24	0.02	0.16
Control Delay (s/veh)	49.1	31.8	11.0	53.6	18.8	47.3	5.3	41.0	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.1	31.8	11.0	53.6	18.8	47.3	5.3	41.0	15.8
LOS	D	С	В	D	В	D	Α	D	В
Approach Delay (s/veh)		20.4			36.0		29.9		16.5
Approach LOS		С			D		С		В

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

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

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

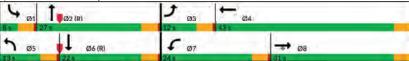
Intersection Signal Delay (s/veh): 25.9
Intersection Capacity Utilization 61.9%

Intersection LOS: C ICU Level of Service B

ntersection Capacity Utilization 61.9%

Analysis Period (min) 15

Splits and Phases: 2: Assembly St & Français Ave



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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B PM

2: Assembly St & Français Ave Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	76	ተተ	7	J.	Φß	ايرابر	fa fa	*	Îa
Traffic Volume (vph)	44	363	317	246	428	555	4	2	10
Future Volume (vph)	56	473	354	246	615	617	4	2	10
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases			8						
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	11.0	20.0	20.0	25.0	34.0	25.0	37.0	8.0	20.0
Total Split (%)	12.2%	22.2%	22.2%	27.8%	37.8%	27.8%	41.1%	8.9%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	9.4	16.6	16.6	18.2	27.3	21.3	41.6	4.6	17.9
Actuated g/C Ratio	0.10	0.18	0.18	0.20	0.30	0.24	0.46	0.05	0.20
v/c Ratio	0.33	0.80	0.64	0.79	0.68	0.92	0.37	0.04	0.18
Control Delay (s/veh)	43.1	46.1	9.3	51.4	31.5	52.9	3.7	42.0	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.1	46.1	9.3	51.4	31.5	52.9	3.7	42.0	14.4
LOS	D	D	Α	D	С	D	Α	D	В
Approach Delay (s/veh)		31.2			37.1		37.6		15.6
Approach LOS		С			D		D		В

Intersection Summary
Cycle Length: 90

Cycle Length: 90
Actuated Cycle Length: 90

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

Natural Cycle: 80

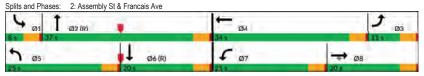
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Analysis Period (min) 15

Intersection Signal Delay (s/veh): 34.9 Intersection Capacity Utilization 58.4% Intersection LOS: C

ICU Level of Service B



07/22/2025 CivTech Inc. -MZA Synchro 11 Report Page 3 22-1640 Assembly & Francis& Nine Mile/Driscoll Background B AM

2: Assembly St & Francais Ave HCM 7th Signalized Intersection Summary

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	7	^	77	P.	∱ ∱		14.54	ħ		76	î»	
Traffic Volume (veh/h)	56	384	530	238	237	8	174	3	132	1	16	2
Future Volume (veh/h)	56	384	642	238	237	8	192	3	132	1	16	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	1
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.0
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1794	1513	1513	1513	1778	1778	1778	1661	1661	166
Adj Flow Rate, veh/h	60	409	0	264	263	9	253	4	174	2	29	4
Peak Hour Factor	0.94	0.94	0.94	0.90	0.90	0.90	0.76	0.76	0.76	0.56	0.56	0.5
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	0	0	
Cap, veh/h	76	552		292	907	31	321	15	673	3	211	32
Arrive On Green	0.04	0.16	0.00	0.20	0.32	0.32	0.10	0.46	0.46	0.00	0.36	0.3
Sat Flow, veh/h	1709	3409	1521	1441	2835	97	3284	34	1478	1581	587	91
Grp Volume(v), veh/h	60	409	0	264	133	139	253	0	178	2	0	7.
Grp Sat Flow(s),veh/h/ln	1709	1705	1521	1441	1437	1495	1642	0	1512	1581	0	149
Q Serve(q s), s	3.1	10.3	0.0	16.1	6.2	6.3	6.8	0.0	6.5	0.1	0.0	3.
Cycle Q Clear(q c), s	3.1	10.3	0.0	16.1	6.2	6.3	6.8	0.0	6.5	0.1	0.0	3.
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.98	1.00		0.6
Lane Grp Cap(c), veh/h	76	552	1.00	292	460	479	321	0	689	3	0	53
V/C Ratio(X)	0.79	0.74		0.90	0.29	0.29	0.79	0.00	0.26	0.58	0.00	0.1
Avail Cap(c a), veh/h	152	1023		320	623	648	328	0.00	689	70	0.00	53
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Upstream Filter(I)	0.82	0.82	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.0
Uniform Delay (d), s/veh	42.6	35.9	0.0	35.0	22.9	22.9	39.7	0.0	15.1	44.9	0.0	19.4
Incr Delay (d2), s/veh	13.7	1.6	0.0	26.3	0.3	0.3	12.0	0.0	0.9	102.7	0.0	0.
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	4.3	0.0	7.6	2.1	2.2	3.2	0.0	2.3	0.1	0.0	1.
Unsig. Movement Delay, s/veh		7.0	0.0	7.0	2.1	2.2	0.2	0.0	2.0	0.1	0.0	- 1.
LnGrp Delay(d), s/veh	56.3	37.5	0.0	61.3	23.3	23.3	51.7	0.0	16.0	147.5	0.0	19.
LnGrp LOS	50.5 E	D D	0.0	01.5 E	23.3 C	23.3 C	D D	0.0	В	147.5	0.0	19.
		469			536	- 0	U	431	D	- '	76	ı
Approach Vol, veh/h		39.9			42.0			36.9			23.3	
Approach Delay, s/veh		39.9 D			42.0 D			30.9 D			23.3 C	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.2	45.0	8.0	32.8	12.8	36.4	22.2	18.6				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	23.0	8.0	39.0	9.0	18.0	20.0	27.0				
Max Q Clear Time (g_c+l1), s	2.1	8.5	5.1	8.3	8.8	5.0	18.1	12.3				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.6	0.0	0.2	0.2	2.3				
Intersection Summary												
HCM 7th Control Delay, s/veh			39.0									
HCM 7th LOS			D									
Notes												
User approved pedestrian inter	rval to he	e less that	n phase r	nax greer	1.							
Unsignalized Delay for [EBR] is						delay and	Intersect	ion delav				
					F-12-1-2-2-11							

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background B PM

2: Assembly St & Francais Ave HCM 7th Signalized Intersection Summary

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	79	44	77	76	Φħ		16.56	ĵa		75	fa ef	
Traffic Volume (veh/h)	44	363	317	246	428	13	555	4	274	2	10	1
Future Volume (veh/h)	56	473	354	246	615	13	617	4	274	2	10	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.0
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1794	1527	1527	1527	1778	1778	1778	1661	1661	166
Adj Flow Rate, veh/h	59	498	0	265	661	14	717	5	319	3	14	4
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.86	0.86	0.86	0.73	0.73	0.7
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	(
Cap, veh/h	176	576		294	778	16	766	10	666	5	70	247
Arrive On Green	0.10	0.17	0.00	0.20	0.27	0.27	0.23	0.45	0.45	0.00	0.22	0.22
Sat Flow, veh/h	1709	3409	1521	1454	2904	61	3284	23	1487	1581	324	113
Grp Volume(v), veh/h	59	498	0	265	330	345	717	0	324	3	0	6
Grp Sat Flow(s),veh/h/ln	1709	1705	1521	1454	1450	1516	1642	0	1510	1581	0	145
Q Serve(q s), s	2.9	12.8	0.0	16.0	19.4	19.4	19.3	0.0	13.6	0.2	0.0	3.2
Cycle Q Clear(g_c), s	2.9	12.8	0.0	16.0	19.4	19.4	19.3	0.0	13.6	0.2	0.0	3.2
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.98	1.00		0.78
Lane Grp Cap(c), veh/h	176	576		294	389	406	766	0	676	5	0	317
V/C Ratio(X)	0.33	0.86		0.90	0.85	0.85	0.94	0.00	0.48	0.59	0.00	0.20
Avail Cap(c a), veh/h	176	606		339	483	505	766	0	676	70	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.5	36.4	0.0	35.0	31.2	31.2	33.8	0.0	17.5	44.8	0.0	28.8
Incr Delay (d2), s/veh	0.9	10.1	0.0	23.8	11.2	10.8	18.7	0.0	2.4	77.7	0.0	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.0	0.0	7.5	7.8	8.1	9.4	0.0	5.0	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	38.4	46.5	0.0	58.8	42.4	42.1	52.5	0.0	19.9	122.5	0.0	30.2
LnGrp LOS	D	D		Е	D	D	D		В	F		(
Approach Vol. veh/h		557			940			1041			66	
Approach Delay, s/veh		45.7			46.9			42.3			34.4	
Approach LOS		D			D			D			C	
**			•			•						
Timer - Assigned Phs	1_	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	44.3	13.3	28.1	25.0	23.6	22.2	19.2				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	33.0	7.0	30.0	21.0	16.0	21.0	16.0				
Max Q Clear Time (g_c+l1), s	2.2	15.6	4.9	21.4	21.3	5.2	18.0	14.8				
Green Ext Time (p_c), s	0.0	2.0	0.0	2.7	0.0	0.2	0.2	0.4				
Intersection Summary												
HCM 7th Control Delay, s/veh			44.5									
HCM 7th LOS			D									
Notes												
User approved pedestrian inter	rval to he	e less that	n phase r	max greer	1.							
Unsignalized Delay for [EBR] is						delay and	Intersect	ion delav				
	- 5/10/44			- 55 0				ao.ay				

07/22/2025 Synchro 11 Report CivTech Inc. -MZA Page 4 22-1640 Assembly & Francis& Nine Mile/Driscoll Background C AM

1: Nine Mile Rd & Français Ave Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	
Lane Configurations	^	*	, N	ተተ	A A A	
Traffic Volume (vph)	502	514	254	216	174	
Future Volume (vph)	502	514	254	234	216	
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Detector Phase	2	2	1	6	4	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	
Total Split (s)	22.0	22.0	12.0	34.0	26.0	
Total Split (%)	36.7%	36.7%	20.0%	56.7%	43.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	
Act Effct Green (s)	18.0	18.0	30.0	30.0	22.0	
Actuated g/C Ratio	0.30	0.30	0.50	0.50	0.37	
v/c Ratio	0.55	0.67	0.80	0.17	0.42	
Control Delay (s/veh)	19.9	6.0	28.9	8.6	9.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	19.9	6.0	28.9	8.6	9.4	
LOS	В	Α	С	Α	Α	
Approach Delay (s/veh)	12.9			19.1	9.4	
Approach LOS	В			В	Α	
Intersection Summary						

Cycle Length: 60

Actuated Cycle Length: 60

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

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 13.6 Intersection Capacity Utilization 55.1% Intersection LOS: B

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Nine Mile Rd & Français Ave



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22-1640 Assembly & Francis& Nine Mile/Driscoll Background C PM

1: Nine Mile Rd & Francais Ave

	\rightarrow	•	1	—	•	
Lane Group	EBT	EBR	WBL	WBT	NBL	
Lane Configurations	^	7	*	ተተ	7574	
Traffic Volume (vph)	406	318	256	441	544	
Future Volume (vph)	565	403	256	711	690	
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Detector Phase	2	2	1	6	4	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	
Total Split (s)	22.0	22.0	12.0	34.0	26.0	
Total Split (%)	36.7%	36.7%	20.0%	56.7%	43.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	
Act Effct Green (s)	18.0	18.0	30.0	30.0	22.0	
Actuated g/C Ratio	0.30	0.30	0.50	0.50	0.37	
v/c Ratio	0.54	0.54	0.72	0.46	0.81	
Control Delay (s/veh)	19.8	5.0	22.6	10.9	21.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	19.8	5.0	22.6	10.9	21.7	
LOS	В	Α	С	В	С	
Approach Delay (s/veh)	13.6			14.0	21.7	
Approach LOS	В			В	С	
Intersection Summary						
Cycle Length: 60						
Actuated Cycle Length: 60						
Offset: 0 (0%), Referenced to	o phase 2	:EBT and	6:WBTL,	Start of 0	Green	
Natural Cycle: 50						
Control Type: Actuated-Cool	rdinated					

Splits and Phases: 1: Nine Mile Rd & Français Ave



Intersection LOS: B
ICU Level of Service B

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Maximum v/c Ratio: 0.81

Intersection Signal Delay (s/veh): 16.4

Intersection Capacity Utilization 63.0% Analysis Period (min) 15

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background C AM

1: Nine Mile Rd & Francais Ave HCM 7th Signalized Intersection Summary

	\rightarrow	•	•	•	•		
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	44	7	7	44	444		
Traffic Volume (veh/h)	502	514	254	216	174	145	
Future Volume (veh/h)	502	514	254	234	216	145	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A pbT)		1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No	No		
Adj Sat Flow, veh/h/ln	2307	2307	1513	1513	1736	1736	
Adj Flow Rate, veh/h	598	0	302	279	269	273	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.67	0.67	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	1315		445	1437	606	539	
Arrive On Green	0.30	0.00	0.13	0.50	0.37	0.37	
Sat Flow, veh/h	4499	1955	1441	2949	1653	1471	
Grp Volume(v), veh/h	598	0	302	279	269	273	
Grp Sat Flow(s),veh/h/ln	2192	1955	1441	1437	1653	1471	
Q Serve(q s), s	6.6	0.0	8.0	3.2	7.4	8.7	
Cycle Q Clear(g_c), s	6.6	0.0	8.0	3.2	7.4	8.7	
Prop In Lane		1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1315		445	1437	606	539	
V/C Ratio(X)	0.45		0.68	0.19	0.44	0.51	
Avail Cap(c a), veh/h	1315		445	1437	606	539	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	17.0	0.0	12.4	8.3	14.4	14.8	
Incr Delay (d2), s/veh	1.1	0.0	4.1	0.3	2.3	3.4	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.8	0.9	2.9	3.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	18.2	0.0	16.5	8.6	16.7	18.1	
LnGrp LOS	В		В	Α	В	В	
Approach Vol. veh/h	598			581	542		
Approach Delay, s/veh	18.2			12.7	17.4		
Approach LOS	В			В	В		
••							
Timer - Assigned Phs	1	2		4		6	
Phs Duration (G+Y+Rc), s	12.0	22.0		26.0		34.0	
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	
Max Green Setting (Gmax), s	8.0	18.0		22.0		30.0	
Max Q Clear Time (g_c+l1), s	10.0	8.6		10.7		5.2	
Green Ext Time (p_c), s	0.0	2.7		1.5		1.8	
Intersection Summary							
HCM 7th Control Delay, s/veh			16.1				
HCM 7th LOS			В				
Notes							
User approved volume balanci	ng amor	a the lane	es for turn	ning move	ement.		
Unsignalized Delay for [EBR, V						oach dela	av and intersection delay
The second secon					o appi	- 2011 2011	_, dolay

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 Synchro 11 Report

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22-1640 Assembly & Francis& Nine Mile/Driscoll Background C PM

1: Nine Mile Rd & Francais Ave HCM 7th Signalized Intersection Summary

EBT					
EDI	EBR	WBL	WBT	NBL	NBR
44	7	*	44	***	
406	318	256	441	544	296
565	403	256	711	690	296
	0	0		0	0
1.00	1.00		1.00	1.00	1.00
					1.00
1 00			1.00		1.00
	1.00	1.00			1.00
	2322	1527			1750
					523
					0.97
					0.51
	U				544
	0.00				0.37
					1483
					523
					1483
					20.7
6.5			10.7		20.7
	1.00				1.00
					544
					0.96
					544
1.00	1.00	1.00	1.00	1.00	1.00
					1.00
17.0	0.0	11.5	10.2	17.3	18.6
1.1	0.0	2.4	1.4	12.5	30.2
0.0	0.0	0.0	0.0	0.0	0.0
3.2	0.0	2.3	3.1	7.7	10.8
18.1	0.0	14.0	11.6	29.8	48.8
В		В	В	С	D
595			1040	1031	
				39.4	
	0				_
1					6
					34.0
			4.0		4.0
8.0	18.0		22.0		30.0
9.5	8.5		22.7		12.7
0.0	2.7		0.0		5.0
		2/1 1			
		U			
	406 565 0 1.00 1.00 No 2322 595 0.95 0.30 1323 0.30 6.5 6.5 6.5 1323 1.00 1.00 1.00 3.2 18.1 B 12.0 4.0 8.0 9.5	406 318 565 403 0 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.95 0.95 0.95 0	406 318 256 565 403 256 0 0 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2322 2322 1527 595 0 275 0.95 0.93 0 0 0 0 0 1323 449 0.30 0.00 0.13 4527 1967 1454 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 7.5 6.5 0.0 0.0 1.0 1.0 1.0 1.0	406	406

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2: Assembly St & Francais Ave HCM 7th TWSC 2: Assembly St & Francais Ave HCM 7th TWSC

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Traffic Vol, veh/h	Int Delay, s/veh	44.8											
Cane Configurations Cane Configurations	Movement	FRI	FRT	FRR	WRI	WRT	WRR	NRI	NRT	NRR	SBI	SRT	SRE
Traffic Vol, veh/h							WDIX		וטוו		ODL	ODI	7
Future Vol, veh/h Conflicting Peds, #/hr O O O O O O O O O O O O O							0		٥		٥	٥	
Conflicting Peds, #/hr									_				
Sign Control Free Free							-		-		-	-	
RT Channelized		-	_					-	-	-	_	-	-
Storage Length													
Veh in Median Storage, # - 1													
Grade, % - 1 7 2 5 - Peak Hour Factor 94 94 94 90 90 90 76 76 76 56 56 56 56 Heavy Vehicles, % 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0										-			
Peak Hour Factor				_	_								
Heavy Vehicles, %												-	
Major/Minor Major1 Major2 Minor1 Minor2													
Major/Minor Major1 Major2 Minor1 Minor2 Conflicting Flow All 272 0 - 409 0 0 1188 - 204 - - 136 Stage 1 - - - - 528 - - - - - Stage 2 - - - - 661 - - - - - - 7.9 - 7.1 - 7.4 Critical Hdwy Stg 1 - - - 6.9 -			-	-				-					
Conflicting Flow All 272 0	Mvmt Flow	60	409	683	264	263	9	253	0	178	0	0	73
Conflicting Flow All 272 0	Major/Minor I	Major1			Major2			Minor1		N	/linor2		
Stage 1			0			0			-			-	136
Stage 2				_									
Critical Hdwy													
Critical Hdwy Stg 1													
Critical Hdwy Stg 2					7.12								1.7
Follow-up Hdwy													
Pol Cap-1 Maneuver 1303 - 0 1275 154 0 *1009 0 0 877 Stage 1 - 0 - 0 - 593 0 - 0 0 - Stage 2 - 0 0 - 393 0 - 0 0 - O O O O O O O O O O O O O O O				_			_					_	
Stage 1				0									
Stage 2		1303		-					-			-	011
Platoon blocked, % - 0 - 0 0 0 Mov Cap-1 Maneuver 1303 - 1275 - ~107 - *1009 - 877 Mov Cap-2 Maneuver 5666 Stage 1 5666 Stage 2 286 Approach EB WB NB SB HCM Ctrl Dly, s/v 1 4.22 149.07 9.48 HCM LOS F A Minor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 Capacity (veh/h) 184 1009 1303 - 1275 - 877 HCM Lane V/C Ratio 1.374 0.176 0.046 - 0.207 - 0.083 HCM Ctrl Dly (s/v) 247.3 9.3 7.9 - 8.6 - 9.5 HCM Lane LOS F A A - A - A		_		-		-			-				-
Mov Cap-1 Maneuver 1303 - 1275 - ~ 107 ~ 1009 - 877 Mov Cap-2 Maneuver - - - - - 184 -		-		U		-			U		U	U	-
Mov Cap-2 Maneuver -		4000	-										077
Stage 1 - - - 566 -			-						-				
Stage 2			-	-	-	-	-		-	-		-	-
Approach EB WB NB SB			-	-	-	-	-		-	-		-	-
HCM Ctrl Dly, s/v 1 4.22 149.07 9.48 HCM LOS F A Minor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 Capacity (veh/h) 184 1009 1303 - 1275 - 877 HCM Lane V/C Ratio 1.374 0.176 0.046 - 0.207 - 0.083 HCM Ctrl Dly, s/v) 247.3 9.3 7.9 - 8.6 - 9.5 HCM Lane LOS F A A - A - A - A	Stage 2	-	-	-	-	-	-	286	-	-	-	-	-
HCM Ctrl Dly, s/v 1 4.22 149.07 9.48 HCM LOS F A Minor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 Capacity (veh/h) 184 1009 1303 - 1275 - 877 HCM Lane V/C Ratio 1.374 0.176 0.046 - 0.207 - 0.083 HCM Ctrl Dly, s/v) 247.3 9.3 7.9 - 8.6 - 9.5 HCM Lane LOS F A A - A - A - A	Annroach	FB			WR			NB			SB		
Minor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1													
Minor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 Capacity (veh/h) 184 1009 1303 - 1275 - 877 HCM Lane V/C Ratio 1.374 0.176 0.046 - 0.207 - 0.083 HCM Ctrl Dly (s/v) 247.3 9.3 7.9 - 86 - 9.5 HCM Lane LOS F A - A - A - A					7.22								
Capacity (veh/h) 184 1009 1303 - 1275 - 877 HCM Lane V/C Ratio 1.374 0.176 0.046 - 0.207 - - 0.083 HCM Ctrl Dly (s/v) 247.3 9.3 7.9 - 8.6 - - 9.5 HCM Lane LOS F A A - A - A	TIOW EOO							'					
HCM Lane V/C Ratio 1.374 0.176 0.046 - 0.207 0.083 HCM Ctrl Dly (s/v) 247.3 9.3 7.9 - 8.6 9.5 HCM Lane LOS F A A - A - A		ıt				EBT		WBT	WBR				
HCM Ctrl Dly (s/v) 247.3 9.3 7.9 - 8.6 9.5 HCM Lane LOS F A A - A - A	Capacity (veh/h)		184	1009	1303	-		-	-				
HCM Lane LOS F A A - A A	HCM Lane V/C Ratio					-		-	-				
	HCM Ctrl Dly (s/v)		247.3	9.3	7.9	-	8.6	-	-	9.5			
	HCM Lane LOS		F	Α	Α	-	Α	-	-	Α			
HCM 95th %tile Q(veh) 14.9 0.6 0.1 - 0.8 0.3	HCM 95th %tile Q(veh))	14.9	0.6	0.1	-	0.8	-	-	0.3			
Notes	Notes												_

Very Name	Intersection												
The Configurations	Int Delay, s/veh	650.8											
iffic Vol, veh/h 44 363 317 246 428 13 555 0 278 0 0 27 ture Vol, veh/h 56 473 354 246 615 13 617 0 278 0 0 28 difficiting Peds, #/hr 0 <td>Movement</td> <td>EBL</td> <td>EBT</td> <td>EBR</td> <td>WBL</td> <td>WBT</td> <td>WBR</td> <td>NBL</td> <td>NBT</td> <td>NBR</td> <td>SBL</td> <td>SBT</td> <td>SBR</td>	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ture Vol, veh/h 56 473 354 246 615 13 617 0 278 0 0 48 nflicting Peds, #hr 0	Lane Configurations	*	^	7	*	†		ř		7			77
Inflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Vol, veh/h	44	363	317	246	428	13	555	0	278	0	0	27
Control Free Free Free Free Free Free Free Free Stop	Future Vol, veh/h	56	473	354	246	615	13	617	0	278	0	0	48
Channelized - Free - None - None - None - None rarge Length 100 - 150 0 - 150 0 - 0 - 0 0 - 0 0 0 0 0 0 0 0 0 0 0 0	Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Arage Length	Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
h in Median Storage, # - 1	RT Channelized		-	Free	-	-	None	-	-	None	-	-	None
ade, % - 1 7 2 5 - ak Hour Factor 95 95 95 93 93 93 86 86 86 73 73 73 73 73 yay Yehicles, % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Storage Length	100	-	150	0	-	-	150	-	0	-	-	0
ak Hour Factor 95 95 95 93 93 93 86 86 86 73 73 73 ayy Vehicles,% 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Veh in Median Storage	,# -	. 1	-	-	1	-	-	1	-	-	1	-
avy Vehicles, % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Grade, %	-	. 1	-	-	7	-	-	2	-	-	5	-
Minor Major Major Minor Mino	Peak Hour Factor	95	95	95	93	93	93	86	86	86	73	73	73
Jor/Minor Major1 Major2 Minor1 Minor2 Minor2 Minor3 Minor4 Minor5 Minor5 Minor6 Minor6 Minor8	Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Inflicting Flow All 675 0 - 498 0 0 1475 - 249 - 338 Stage 1 616 5 Stage 2 860 5 tical Hdwy 4.1 - 4.1 - 7.9 - 7.1 - 7.4 tical Hdwy Stg 1 6.9 6.9 tical Hdwy Stg 2 6.9 6.9 Stage 1 0 - 1182 88 0 971 0 0 634 Stage 1 0 7516 0 - 0 0 - 0 0 Stage 2 0 7516 0 - 0 0 0 - 0 0 Stage 2 0 7516 0 - 0 0 0 - 0 0 Vap-1 Maneuver 926 - 1182 57 971 - 634 V Cap-1 Maneuver 926 - 1182 57 971 - 634 V Cap-2 Maneuver 926 - 1182 57 971 - 634 V Cap-2 Maneuver 926 - 1182 57 971 - 634 V Cap-2 Maneuver 926 - 182 203 88 M Ctrl Dly, s/v 0.97 2.51 \$ 1624.33 11.34 M LOS F B B MD Ctrl Dly, s/v 0.97 2.51 \$ 1624.33 11.34 M LOS F B B M S B M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane LOS F B A A A B B M Stift Witle Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3	Mvmt Flow	59	498	373	265	661	14	717	0	323	0	0	66
Inflicting Flow All 675 0 - 498 0 0 1475 - 249 - 338 Stage 1 616 Stage 2 860 860 Itical Hdwy 4.1 4.1 7.9 - 7.1 - 7.4 Itical Hdwy Stg 1 6.9 6.9 Itical Hdwy Stg 2 6.9													
Inflicting Flow All 675 0 - 498 0 0 1475 - 249 - 338 Stage 1 616 5 Stage 2 860 5 tical Hdwy 4.1 - 4.1 - 7.9 - 7.1 - 7.4 tical Hdwy Stg 1 6.9 6.9 tical Hdwy Stg 2 6.9 6.9 Stage 1 0 - 1182 88 0 971 0 0 634 Stage 1 0 7516 0 - 0 0 - 0 0 Stage 2 0 7516 0 - 0 0 0 - 0 0 Stage 2 0 7516 0 - 0 0 0 - 0 0 Vap-1 Maneuver 926 - 1182 57 971 - 634 V Cap-1 Maneuver 926 - 1182 57 971 - 634 V Cap-2 Maneuver 926 - 1182 57 971 - 634 V Cap-2 Maneuver 926 - 1182 57 971 - 634 V Cap-2 Maneuver 926 - 182 203 88 M Ctrl Dly, s/v 0.97 2.51 \$ 1624.33 11.34 M LOS F B B MD Ctrl Dly, s/v 0.97 2.51 \$ 1624.33 11.34 M LOS F B B M S B M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane LOS F B A A A B B M Stift Witle Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3	Major/Minor 1	Maior1			Maior2			Minor1			Minor2		
Stage 1	Conflicting Flow All					0	0	1475	-	249	-	-	338
Stage 2				_	-		-		_		-	_	-
tical Hdwy 4.1 4.1 7.9 - 7.1 7.4 tical Hdwy Stg 1 6.9 6.9 tow-up Hdwy Stg 2 6.9					-					-		-	-
tical Hdwy Stg 1	Critical Hdwy										-		
tical Hdwy Stg 2 6.9												-	
Nov-up Hdwy													
It Cap-1 Maneuver 926 - 0 1182 - - 88 0 971 0 0 634 Stage 1 - - 0 - - -516 0 0 0 - Stage 2 - 0 - - -292 0 - 0 0 v Cap-1 Maneuver 926 - 1182 - -57 -971 - -634 v Cap-2 Maneuver - - - -1182 - -57 -971 - -634 v Cap-2 Maneuver - - - -1182 - -57 -971 - -634 Stage 1 - - - - -483 -					22					3.3			3.3
Stage 1													
Stage 2				-		_	_		•		•	-	
toon blocked, % - 0 - 0 0 0 v Cap-1 Maneuver 926 - 1182 - ~57 971 - 634 v Cap-2 Maneuver 1182 - ~57 971 - 634 v Cap-2 Maneuver 118 634 Stage 1 203 203 Stage 2 203 203 Stage 2 203 203 Stage 2 203 203 M Ctrl Dly, s/v 0.97 2.51 \$1624.33 11.34 M LOS F B **Mort Lane Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 pacity (veh/h) 118 971 926 - 1182 - 634 M Ctrl Dly (s/v) \$2351.5 10.6 9.2 - 8.9 11.3 M Lane V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 M Ctrl Dly (s/v) \$2351.5 10.6 9.2 - 8.9 11.3 M Lane LOS F B A - A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 **test Volume exceeds capacity \$: Delay exceeds 300s				-					-			-	
v Cap-1 Maneuver 926 - 1182 - - 57 971 - 634 v Cap-2 Maneuver - - - - 118 - <td< td=""><td></td><td></td><td></td><td>U</td><td>0</td><td></td><td></td><td></td><td>U</td><td>0</td><td>U</td><td>U</td><td></td></td<>				U	0				U	0	U	U	
v Cap-2 Maneuver		റാട						-					624
Stage 1				-			-			9/1			
Stage 2			_										
Proach EB WB NB SB MC Ctrl Dly, s/v 0.97 2.51 \$1624.33 11.34 M LOS F B MC Ctrl Dly, s/v 0.97 2.51 \$1624.33 11.34 M LOS F B M ST WBR SBLn1 Pacity (veh/h) 118 971 926 - 1182 - 634 M Lore V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 M Lore Dly (s/v) \$2351.5 10.6 9.2 - 8.9 - 11.3 M Lore LOS F B A - A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 M Stile Word Stile Volume exceeds capacity \$100 Stile Volume			_		-				-		-	-	
M Ctrl Dly, s/v 0.97 2.51 \$ 1624.33 11.34 M LOS F B B Nor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 pacity (veh/h) 118 971 926 - 1182 - 634 M Lane V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane LOS F B A - A - B M 95ih %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s	Stage 2		-		-		-	~ 203	-			-	-
M Ctrl Dly, s/v 0.97 2.51 \$ 1624.33 11.34 M LOS F B B Nor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 pacity (veh/h) 118 971 926 - 1182 - 634 M Lane V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane LOS F B A - A - B M 95ih %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s					MD			ND			0.0		
Marco	Approach						0.1						
nor Lane/Major Mvmt NBLn1 NBLn2 EBL EBT WBL WBT WBR SBLn1 pacity (veh/h) 118 971 926 - 1182 - 634 ML Lane L/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 MC thr Dly (s/v) \$2351.5 10.6 9.2 - 8.9 - 111.3 ML Lane LOS F B A A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s		0.97			2.51		\$ 10						
pacity (veh/h) 118 971 926 - 1182 634 ML Alene V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 MCtrl Dly (s/v) \$2351.5 10.6 9.2 - 8.9 - 11.3 ML Alene LOS F B A - A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s	HCM LOS					_		F			В		
pacity (veh/h) 118 971 926 - 1182 634 ML Alene V/C Ratio 6.067 0.333 0.064 - 0.224 - 0.104 MCtrl Dly (s/v) \$2351.5 10.6 9.2 - 8.9 - 11.3 ML Alene LOS F B A - A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s													
M Lane V/C Ratio 6.067 0.333 0.064 - 0.224 0.104 M Ctrl Dly (s/v) \$2351.5 10.6 9.2 - 8.9 - 11.3 M Lane LOS F B A - A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s	Minor Lane/Major Mvm	t							WBR				
M Ctrl Dly (s/v) \$ 2351.5 10.6 9.2 - 8.9 - 11.3 M Lane LOS F B A - A - B M Stih Wtile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 M Stih Wtile Q(veh) 8.3 1.5 0.2 - 0.9 - 0.3 M Stih Wtile Q(veh) 8.5 Delay exceeds 300s	Capacity (veh/h)								-				
M Lane LOS F B A - A - B M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 - 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s	HCM Lane V/C Ratio							-					
M 95th %tile Q(veh) 78.3 1.5 0.2 - 0.9 0.3 tes Volume exceeds capacity \$: Delay exceeds 300s	HCM Ctrl Dly (s/v)	\$				-		-	-				
tes Volume exceeds capacity \$: Delay exceeds 300s	HCM Lane LOS							-	-				
Volume exceeds capacity \$: Delay exceeds 300s	HCM 95th %tile Q(veh)		78.3	1.5	0.2	-	0.9	-	-	0.3			
	Notes												
Computation Not Defined *: All major volume in platoon	~: Volume exceeds car	acity	\$: De	elay exc	eeds 30	00s							
							on						

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07/22/2025 CivTech Inc. -MZA

22-1640 Assembly & Francis& Nine Mile/Driscoll

Background C PM

22-1640 Assembly & Francis& Nine Mile/Driscoll 1: Assembly St & Nine Mile Rd/Francis Ave Option D - Background AM Timings

	\rightarrow	•	•	•	•	
Lane Group	EBT	EBR	WBL	WBT	NBL	
Lane Configurations	^	7	*	ተተ	444	
Traffic Volume (vph)	502	514	254	216	174	
Future Volume (vph)	833	845	254	327	285	
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Detector Phase	2	2	1	6	4	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	
Total Split (s)	22.0	22.0	12.0	34.0	26.0	
Total Split (%)	36.7%	36.7%	20.0%	56.7%	43.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
_ead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	C-Max	
Act Effct Green (s)	18.0	18.0	30.0	30.0	22.0	
Actuated g/C Ratio	0.30	0.30	0.50	0.50	0.37	
//c Ratio	0.91	0.95	0.91	0.24	0.50	
Control Delay (s/veh)	35.2	24.0	46.7	9.0	11.3	
Queue Delay	0.0	2.4	1.3	0.0	0.0	
Total Delay (s/veh)	35.2	26.3	48.0	9.0	11.3	
LOS	D	С	D	Α	В	
Approach Delay (s/veh)	30.7			26.1	11.3	
Approach LOS	С			С	В	
Intersection Summary						
Cycle Length: 60						
Actuated Cycle Length: 60						
Offset: 28 (47%), Reference	ed to phase	4:NBL,	Start of G	reen		
Natural Cycle: 70						
Control Type: Actuated-Cor	ordinated					

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay (s/veh): 26.1 Intersection LOS: C Intersection Capacity Utilization 55.1% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Assembly St & Nine Mile Rd/Francis Ave



09/08/2025 Synchro 12 Report CivTech Inc. -MZA Page 1

22-1640 Assembly & Francis& Nine Mile/Driscoll 1: Assembly St & Nine Mile Rd/Francis Ave Option D - Background PM

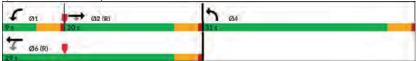
	→	•	•	←	•
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	^	7	*	ተተ	7574
Traffic Volume (vph)	406	318	256	441	544
Future Volume (vph)	630	543	256	822	924
Turn Type	NA	Perm	pm+pt	NA	Prot
Protected Phases	2		1	6	4
Permitted Phases		2	6		
Detector Phase	2	2	1	6	4
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	9.0	29.0	31.0
Total Split (%)	33.3%	33.3%	15.0%	48.3%	51.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	C-Max	C-Max	None	C-Max	Max
Act Effct Green (s)	16.0	16.0	25.0	25.0	27.0
Actuated g/C Ratio	0.27	0.27	0.42	0.42	0.45
v/c Ratio	0.68	0.67	1.09	0.64	0.84
Control Delay (s/veh)	23.9	6.4	102.8	16.6	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.9	6.4	102.8	16.6	18.9
LOS	С	Α	F	В	В
Approach Delay (s/veh)	15.8			37.1	18.9
Approach LOS	В			D	В
Intersection Summary					
Cycle Length: 60					
Actuated Cycle Length: 60					
Offset: 0 (0%), Referenced	to phase 2	:EBT and	6:WBTL	Start of 0	Green
Natural Cycle: 60	to pridoo E	.EDT and	0.11212,	Otal Cor .	510011
Control Tunes Astrotad Co.	andinated				

Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.09

Intersection Signal Delay (s/veh): 23.6 Intersection Capacity Utilization 62.7% Intersection LOS: C ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Assembly St & Nine Mile Rd/Francis Ave



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22-1640 Assembly & Francis& Nine Mile/Driscoll
Option D - Background AM

1: Assembly St & Nine Mile Rd/Francis Ave
HCM 7th Signalized Intersection Summary

	\rightarrow	•	•	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	44	7	79	44	7574	
Traffic Volume (veh/h)	502	514	254	216	174	135
Future Volume (veh/h)	833	845	254	327	285	135
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adi(A pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	1.00	1.00	No	No	1.00
Adj Sat Flow, veh/h/ln	2307	2307	1513	1513	1736	1736
Adj Flow Rate, veh/h	992	0	302	389	313	321
Peak Hour Factor	0.84	0.84	0.84	0.84	0.67	0.67
Percent Heavy Veh, %	1	0.04	1	1	1	1
		1	358			539
Cap, veh/h	1315	0.00		1437	606	
Arrive On Green	0.30	0.00	0.13	0.50	0.37	0.37
Sat Flow, veh/h	4499	1955	1441	2949	1653	1471
Grp Volume(v), veh/h	992	0	302	389	313	321
Grp Sat Flow(s),veh/h/ln	2192	1955	1441	1437	1653	1471
Q Serve(g_s), s	12.3	0.0	8.0	4.7	8.9	10.6
Cycle Q Clear(g_c), s	12.3	0.0	8.0	4.7	8.9	10.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1315		358	1437	606	539
V/C Ratio(X)	0.75		0.84	0.27	0.52	0.60
Avail Cap(c a), veh/h	1315		358	1437	606	539
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	14.3	8.7	14.8	15.4
Incr Delay (d2), s/veh	4.1	0.0	16.5	0.7	3.1	4.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.5	0.0	7.1	2.4	6.3	7.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	23.1	0.0	30.8	9.1	18.0	20.2
LnGrp LOS	С		С	Α	В	С
Approach Vol, veh/h	992			691	634	
Approach Delay, s/veh	23.1			18.6	19.1	
Approach LOS	С			В	В	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	22.0		26.0		34.0
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	8.0	18.0		22.0		30.0
Max Q Clear Time (g_c+l1), s	10.0	0.0		12.6		6.7
Green Ext Time (p c), s	0.0	0.0		1.6		2.6
Intersection Summary						
			00.0			
HCM 7th Control Delay, s/veh			20.6			
HCM 7th LOS			С			
Notes						
User approved pedestrian inte	ما ما امر	a laga Abas				
User approved volume balanci	ng amor	ig the lan	es for turr	iiig move	errient.	

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22-1640 Assembly & Francis& Nine Mile/Driscoll Option D - Background PM

1: Assembly St & Nine Mile Rd/Francis Ave HCM 7th Signalized Intersection Summary

	→	•	•	←	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	44	7*	*	^	7574	
Traffic Volume (veh/h)	406	318	256	441	544	286
Future Volume (veh/h)	630	543	256	822	924	286
Initial Q (Qb), veh	0	0.0	0	0	0_1	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A pbT)	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	1.00	1.00	No	No	1.00
Adj Sat Flow, veh/h/ln	2322	2322	1527	1527	1750	1750
Adj Flow Rate, veh/h	663	0	275	884	624	648
Peak Hour Factor	0.95	0.95	0.93	0.93	0.97	0.97
	0.95	0.95	0.93			0.97
Percent Heavy Veh, %	-	U	-	0	0	-
Cap, veh/h	1176	0.00	332	1209	750	667
Arrive On Green	0.27	0.00	0.08	0.42	0.45	0.45
Sat Flow, veh/h	4527	1967	1454	2977	1666	1483
Grp Volume(v), veh/h	663	0	275	884	624	648
Grp Sat Flow(s),veh/h/ln	2206	1967	1454	1450	1666	1483
Q Serve(g_s), s	7.8	0.0	5.0	15.3	19.8	25.6
Cycle Q Clear(g_c), s	7.8	0.0	5.0	15.3	19.8	25.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1176		332	1209	750	667
V/C Ratio(X)	0.56		0.83	0.73	0.83	0.97
Avail Cap(c_a), veh/h	1176		332	1209	750	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.00	19.6	14.7	14.5	16.1
	2.0	0.0	15.8	3.9	10.5	28.4
Incr Delay (d2), s/veh						
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	3.2	5.0	8.4	12.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	20.9	0.0	35.4	18.6	25.0	44.6
LnGrp LOS	С		D	В	С	D
Approach Vol, veh/h	663			1159	1272	
Approach Delay, s/veh	20.9			22.6	34.9	
Approach LOS	С			С	С	
		•				•
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.0	20.0		31.0		29.0
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	5.0	16.0		27.0		25.0
Max Q Clear Time (g_c+l1), s	7.0	0.0		27.6		17.3
Green Ext Time (p_c), s	0.0	0.0		0.0		3.6
Intersection Summary						
HCM 7th Control Delay, s/veh			27.3			
HCM 7th LOS			C			
Notes						
Jser approved pedestrian inter Jser approved volume balancir						

09/08/2025 Synchro 12 Report CivTech Inc. -MZA Page 2 2: Assembly St & Francis Ave HCM 7th TWSC

2: Assembly St & Francis Ave HCM 7th TWSC

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		٨ħ		*	1	7			7			7
Traffic Vol, veh/h	0	583	10	10	475	8	0	0	10	0	0	61
Future Vol, veh/h	0	914	10	10	586	8	0	0	10	0	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	0	-	100	-	-	0	-	-	0
Veh in Median Storage	,# -	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	1	-	-	7	-	-	2	-	-	5	-
Peak Hour Factor	94	94	94	90	90	90	76	76	76	56	56	56
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	0	972	11	11	651	9	0	0	13	0	0	109

Major/Minor	Major1		N	lajor2		Mi	nor1		M	inor2		
Conflicting Flow All	-	0	0	983	0	0	-	-	491	-	-	651
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-		4.115	-	-	-	-	7.1	-	-	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-2	.2095	-	-	-	-	3.3	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	705	-	-	0	0	514	0	0	431
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	705	-	-	-	-	514	-	-	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0			0.17		1	2.19		1	6.15		
HCM LOS							В			С		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR S	BLn1
Capacity (veh/h)	514	-	-	705	-	-	431
HCM Lane V/C Ratio	0.026			0.016			0.253
						-	
HCM Ctrl Dly (s/v)	12.2	-	-	10.2	-	-	16.1
HCM Lane LOS	В	-	-	В	-	-	С
HCM 95th %tile Q(veh)	0.1	_	-	0	_	_	1

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		† 13		*	1	7			7			7
Traffic Vol, veh/h	0	694	10	10	674	13	0	0	10	0	0	45
Future Vol. veh/h	0	918	10	10	1055	13	0	0	10	0	0	45
Conflicting Peds, #/hr	0	0.0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	- 100	None	-	-	None	-	-	None	-	-	None
Storage Length	-		-	0		100	-		0	-		0
Veh in Median Storage	. # -	1	-	-	1	-	-	0	-		0	-
Grade, %	-, "	1			7			2			5	
Peak Hour Factor	95	95	95	93	93	93	86	86	86	73	73	73
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mymt Flow	0	966	11	11	1134	14	0	0	12	0	0	62
WITHING I IOW	U	300	- 11	- 11	1104	17	0	0	12	U	0	UZ
				4 : 0			r 4			4' 0		
	Major1			//ajor2			/linor1			Minor2		4404
Conflicting Flow All	-	0	0	977	0	0	-	-	488	-	-	1134
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.1	-	-	-	-	7.1	-	-	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.2	-	-	-	-	3.3	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	714	-	-	0	0	516	0	0	212
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	714	-	-	-	-	516	-	-	212
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0			0.09			12.13			28.73		
HCM LOS	U			0.00			В			D		
TIOW EOO												
					11/51							
Minor Lane/Major Mvm	nt r	VBLn1	EBT	EBR	WBL	WBT	WBR S					
Capacity (veh/h)		516	-	-	714	-	-	212				
HCM Lane V/C Ratio		0.023	-		0.015	-	-	0.29				
HCM Ctrl Dly (s/v)		12.1	-	-	10.1	-	-	28.7				
HCM Lane LOS		В	-	-	В	-	-	D				
HCM 95th %tile Q(veh))	0.1	-	-	0	-	-	1.2				

22-1640 Assembly & Francis& Nine Mile/Driscoll Option D - Background PM

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4: Assembly St & Driscoll Blvd Timings

	•	Ť	-	ţ	
Lane Group	WBL	NBT	SBL	SBT	Ø4
Lane Configurations	*y#	14	*	4	
Traffic Volume (vph)	10	160	198	586	
Future Volume (vph)	10	238	298	817	
Turn Type	pm+pt	NA	pm+pt	NA	
Protected Phases	7	2	1	6	4
Permitted Phases	4		6		
Detector Phase	7	2	1	6	
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	32.0	8.0	40.0	20.0
Total Split (%)	33.3%	53.3%	13.3%	66.7%	33%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	
Lead/Lag		Lag	Lead		
Lead-Lag Optimize?		Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None
Act Effct Green (s)	8.6	28.0	43.4	43.4	
Actuated g/C Ratio	0.14	0.47	0.72	0.72	
v/c Ratio	0.63	1.21	0.75	0.71	
Control Delay (s/veh)	13.9	127.8	27.5	10.1	
Queue Delay	0.0	0.0	0.0	0.4	
Total Delay (s/veh)	13.9	127.8	27.5	10.5	
LOS	В	F	С	В	
Approach Delay (s/veh)	13.9	127.8		15.0	
Approach LOS	В	F		В	
Intersection Summary					
Cycle Length: 60					
4 1 1 10 1 1 11 00					

Actuated Cycle Length: 60

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.21

Intersection Signal Delay (s/veh): 60.5 Intersection Capacity Utilization 49.5% Intersection LOS: E ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Assembly St & Driscoll Blvd



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22-1640 Assembly & Francis& Nine Mile/Driscoll Option D - Background PM

4: Assembly St & Driscoll Blvd

	•	†	-	ţ			
Lane Group	WBL	NBT	SBL	SBT	Ø4		
Lane Configurations	N/F	fà	*	1			
Traffic Volume (vph)	10	533	145	428			
Future Volume (vph)	10	800	213	585			
Turn Type	pm+pt	NA	pm+pt	NA			
Protected Phases	7	2	1	6	4		
Permitted Phases	4		6				
Detector Phase	7	2	1	6			
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0		
Total Split (s)	20.0	32.0	8.0	40.0	20.0		
Total Split (%)	33.3%	53.3%	13.3%	66.7%	33%		
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0	4.0	4.0	4.0			
Lead/Lag		Lag	Lead				
Lead-Lag Optimize?		Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None		
Act Effct Green (s)	14.3	28.0	37.7	37.7			
Actuated g/C Ratio	0.24	0.47	0.63	0.63			
v/c Ratio	0.89	1.08	0.86	0.59			
Control Delay (s/veh)	33.1	74.2	45.3	8.6			
Queue Delay	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	33.1	74.2	45.3	8.6			
LOS	С	Е	D	Α			
Approach Delay (s/veh)	33.1	74.2		18.4			
Approach LOS	С	Е		В			
Intersection Summary							
Cycle Length: 60							
Actuated Cycle Length: 60							
Offset: 0 (0%), Referenced	to phase 2	:NBT and	6:SBTL,	Start of G	ireen		
Matural Cualcu 00							

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay (s/veh): 43.6 Intersection Capacity Utilization 69.6% Analysis Period (min) 15

Intersection LOS: D ICU Level of Service C



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22-1640 Assembly & Francis& Nine Mile/Driscoll Option D - Background AM 4: Assembly St & Driscoll Blvd HCM 7th Signalized Intersection Summary

	•	•	†	-	-	ţ	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Υ		14		75	•	
Traffic Volume (veh/h)	10	149	160	10	198	586	
Future Volume (veh/h)	10	182	238	10	298	817	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No		No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1766	1766	1711	1683	
Adj Flow Rate, veh/h	13	0	952	0	324	888	
Peak Hour Factor	0.77	0.77	0.25	0.25	0.92	0.92	
Percent Heavy Veh, %	0	0	2	2	0	2	
Cap, veh/h	22		1271		451	1435	
Arrive On Green	0.01	0.00	0.72	0.00	0.07	0.85	
Sat Flow, veh/h	1592	0	1766	0	1629	1683	
Grp Volume(v), veh/h	14	0	952	0	324	888	
Grp Sat Flow(s),veh/h/ln	1715	0	1766	0	1629	1683	
Q Serve(g_s), s	0.5	0.0	19.7	0.0	2.7	9.9	
Cycle Q Clear(g_c), s	0.5	0.0	19.7	0.0	2.7	9.9	
Prop In Lane	0.93	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	24		1271		451	1435	
V/C Ratio(X)	0.59		0.75		0.72	0.62	
Avail Cap(c_a), veh/h	457		1271		451	1435	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	29.4	0.0	5.1	0.0	10.1	1.4	
Incr Delay (d2), s/veh	21.0	0.0	4.1	0.0	5.4	2.0	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(95%),veh/ln	0.6	0.0	8.9	0.0	5.5	1.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	50.4	0.0	9.2	0.0	15.6	3.4	
LnGrp LOS	D		Α		В	Α	
Approach Vol, veh/h	14		952			1212	
Approach Delay, s/veh	50.4		9.2			6.6	
Approach LOS	D		Α			Α	
Timer - Assigned Phs	1	2		4		6	
Phs Duration (G+Y+Rc), s	8.0	47.2		4.8		55.2	
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	
Max Green Setting (Gmax), s	4.0	28.0		16.0		36.0	
Max Q Clear Time (g_c+l1), s	4.7	21.7		2.5		11.9	
Green Ext Time (p_c), s	0.0	3.6		0.0		7.6	
Intersection Summary							
HCM 7th Control Delay, s/veh			8.0				
HCM 7th LOS			Α				
Notes							
Unsignalized Delay for [NBR, V	N/RR1 is	evcluded	from calc	ulations	of the ann	roach do	lay and intersection dolay
maignailead Dalay IOI [INDIX, V	פו [עומיי	oncluded	morn calc	uidilUII5 (n the app	roauri de	iay and intersection delay.

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22-1640 Assembly & Francis& Nine Mile/Driscoll Option D - Background PM

4: Assembly St & Driscoll Blvd HCM 7th Signalized Intersection Summary

	•	•	†	~	-	ţ
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Υ		T _a		*	•
Traffic Volume (veh/h)	10	310	533	10	145	428
Future Volume (veh/h)	10	423	800	10	213	585
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1794	1794	1766	1766	1683	1683
Adj Flow Rate, veh/h	11	0	870	0	232	636
Peak Hour Factor	0.91	0.91	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	19		1276		499	1438
Arrive On Green	0.01	0.00	0.72	0.00	0.07	0.85
Sat Flow, veh/h	1573	0	1766	0	1603	1683
Grp Volume(v), veh/h	12	0	870	0	232	636
Grp Sat Flow(s), veh/h/ln	1716	0	1766	0	1603	1683
Q Serve(q s), s	0.4	0.0	16.2	0.0	1.8	5.3
Cycle Q Clear(g_c), s	0.4	0.0	16.2	0.0	1.8	5.3
Prop In Lane	0.92	0.00		0.00	1.00	0.0
Lane Grp Cap(c), veh/h	21	0.00	1276	0.00	499	1438
V/C Ratio(X)	0.58		0.68		0.47	0.44
Avail Cap(c a), veh/h	458		1276		501	1438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	0.0	4.5	0.0	5.6	1.00
Incr Delay (d2), s/veh	23.0	0.0	3.0	0.0	0.7	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	4.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh		0.0	4.0	0.0	0.0	0.4
LnGrp Delay(d), s/veh	52.5	0.0	7.5	0.0	6.3	2.0
LnGrp LOS	52.5 D	0.0	7.5 A	0.0	0.5 A	2.0 A
	12		870			868
Approach Vol, veh/h Approach Delay, s/veh	52.5		7.5			3.1
Approach LOS	52.5 D		7.5 A			3.1 A
Approach LOS	U		А			А
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	7.9	47.4		4.7		55.3
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	4.0	28.0		16.0		36.0
Max Q Clear Time (g_c+l1), s	3.8	18.2		2.4		7.3
Green Ext Time (p c), s	0.0	4.5		0.0		4.8
Intersection Summary						
			E 7			
HCM 7th Control Delay, s/veh HCM 7th LOS			5.7 A			
			٨			
Notes						

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6: Nine Mile Rd/Assembly St HCM 7th TWSC

22-1640 Assembly & Francis& Nine Mile/Driscoll	6: Nine Mile Rd/Assembly St
Option D - Background PM	HCM 7th TWSC

Intersection			_		_	
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TTDL	T T	1	NUIN	ODL	<u>□</u>
Traffic Vol, veh/h	0	5	0	10	0	0
Future Vol. veh/h	0	5	111	10	0	331
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None	-	None	-	None
Storage Length	- 1	0	- 1	-		-
Veh in Median Storage		-	0			0
Grade. %	0,# 0		2			1
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mymt Flow	0	5	121	11	0	360
IVIVIIIT FIOW	0	5	121	- 11	U	300
	Minor1		Major1		/lajor2	
Conflicting Flow All	-	126	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	_	-	-	-	-	-
Follow-up Hdwy	-	3.318	-		-	-
Pot Cap-1 Maneuver	0	924	-	-	0	
Stage 1	0	-			0	
Stage 2	0	-	-	-	0	-
Platoon blocked, %					- 3	
Mov Cap-1 Maneuver	-	924			_	
Mov Cap-1 Maneuver		924				
Stage 1						
						-
Stage 2	-	-	-	-	-	-
Approach	WB		NB		SB	
HCM Ctrl Dly, s/v	8.92		0		0	
HCM LOS	Α					
Minor Lane/Major Mvr	nt	NBT	NBRV	VBLn1	SBT	
Capacity (veh/h)	iii.	IND I	ואוטואי	924	- 100	
			-			
HCM Lane V/C Ratio		-		0.006	-	
HCM Ctrl Dly (s/v)		-	-	8.9	-	
HCM Lane LOS		-	-	A	-	
HCM 95th %tile Q(veh	1)	-	-	0	-	

Intersection						
Int Delay, s/veh	0.1					
-		WDD	NDT	NDC	ODI	007
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		7	Þ			•
Traffic Vol, veh/h	0	5	0	10	0	0
Future Vol, veh/h	0	5	380	10	0	225
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
Grade, %	0	-	2	-	-	1
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	413	11	0	245
Major/Minor I	Minor1	N	/lajor1	N	//ajor2	
Conflicting Flow All	-	418	0	0	-	-
Stage 1	-	- 10	-	-		
Stage 2			- 1			
Critical Hdwy	-	6.22	-	-		-
					- 1	
Critical Hdwy Stg 1		-	-	-	-	
Critical Hdwy Stg 2	-	3.318		-	- 1	
Follow-up Hdwy		635	-			
Pot Cap-1 Maneuver	0		-	-	0	
Stage 1	0	-	-	-	0	-
Stage 2	U	-	-		U	
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	635	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB		NB		SB	
HCM Ctrl Dly, s/v	10.72		0		0	
HCM LOS	R		U		U	
I I GWI LOG	D					
Minor Lane/Major Mvm	nt	NBT	NBR\	NBLn1	SBT	
		-	-	635	-	
Capacity (veh/h)				0.009	-	
Capacity (veh/h) HCM Lane V/C Ratio		-				
Capacity (veh/h) HCM Lane V/C Ratio HCM Ctrl Dly (s/v)		-	-		-	
Capacity (veh/h) HCM Lane V/C Ratio					-	

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SITE LAYOUT

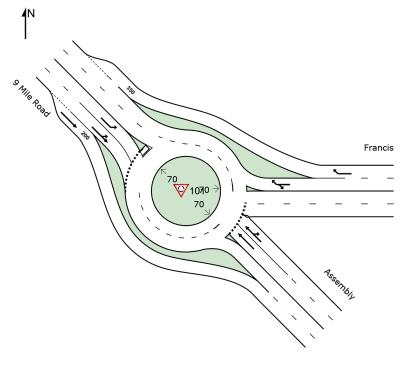
♥ Site: 101 [Francis & Assembly _v5 - AM (Site Folder: General)]

New Site

Site Category: Proposed Design 1

Roundabout

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SITE LAYOUT

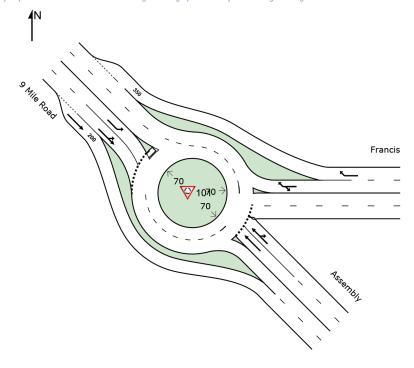
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New Site

Site Category: Proposed Design 1

Roundabout

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MOVEMENT SUMMARY

Site: 101 [Francis & Assembly _v5 - AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Site Category: Proposed Design 1

Roundabout

Vehic	cle Mo	ovement	Perfo	rma	nce										
Mov ID	Turn	Mov Class		lows HV]		rival lows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service		ack Of eue Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South	East:	Assembly													
8x	T1	All MCs	265	2.0	265	2.0	0.246	7.0	LOSA	1.0	24.8	0.55	0.45	0.55	26.4
18bx	R3	All MCs	145	2.0	145	2.0	0.246	6.8	LOSA	1.0	24.7	0.54	0.44	0.54	26.2
Appro	ach		410	2.0	410	2.0	0.246	6.9	LOSA	1.0	24.8	0.55	0.45	0.55	26.4
East:	Franc	is													
1b	L3	All MCs	254	3.0	254	3.0	0.199	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	32.5
16a	R1	All MCs	308	2.0	308	2.0	0.199	2.5	LOSA	0.0	0.0	0.00	0.00	0.00	32.9
Appro	ach		562	2.5	562	2.5	0.199	1.4	LOSA	0.0	0.0	0.00	0.00	0.00	32.7
North'	West:	9 Mile Ro	ad												
7ax	L1	All MCs	528	2.0	528	2.0	0.320	6.4	LOSA	1.6	39.6	0.45	0.28	0.45	28.4
4x	T1	All MCs	788	2.0	788	2.0	0.320	1.5	LOSA	1.6	39.6	0.10	0.06	0.10	31.8
Appro	ach		1316	2.0	1316	2.0	0.320	3.4	LOSA	1.6	39.6	0.24	0.15	0.24	30.3
All Ve	hicles		2288	2.1	2288	2.1	0.320	3.6	LOSA	1.6	39.6	0.23	0.17	0.23	30.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Civtech\Projects\22-1640 CO Spokane On Call_Francis Roundabout Eval\Sidra\Old\Francis & Assembly_v3.sip9

MOVEMENT SUMMARY

♥ Site: 101 [Francis & Assembly _v5 - PM (Site Folder:

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Site Category: Proposed Design 1

Roundabout

Vehic	le M	ovement	t Perfo	rma	nce										
Mov ID	Turn	Mov Class	F [Total		FI [Total]		Deg. Satn	Aver. Delay	Level of Service	Qı [Veh.	Back Of ueue Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South	East:	Assembly	/												
8x	T1	All MCs	856	2.0	856	2.0	0.730	19.4	LOS C	8.2	205.5	0.85	1.08	1.66	23.1
18bx	R3	All MCs	291	2.0	291	2.0	0.730	18.6	LOS C	8.2	205.5	0.85	1.07	1.65	23.1
Appro	ach		1147	2.0	1147	2.0	0.730	19.2	LOS C	8.2	205.5	0.85	1.08	1.66	23.1
East: I	Franc	is													
1b	L3	All MCs	256	3.0	256	3.0	0.348	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	32.3
16a	R1	All MCs	754	2.0	754	2.0	0.348	3.5	LOSA	0.0	0.0	0.00	0.00	0.00	32.9
Appro	ach		1010	2.3	1010	2.3	0.348	2.6	LOSA	0.0	0.0	0.00	0.00	0.00	32.7
North\	West:	9 Mile Ro	oad												
7ax	L1	All MCs	590	2.0	590	2.0	0.271	5.8	LOSA	1.3	31.9	0.43	0.27	0.43	28.4
4x	T1	All MCs	503	2.0	503	2.0	0.260	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	32.6
Appro	ach		1093	2.0	1093	2.0	0.271	3.2	LOSA	1.3	31.9	0.23	0.15	0.23	30.2
All Vel	hicles		3250	2.1	3250	2.1	0.730	8.7	LOSA	8.2	205.5	0.38	0.43	0.66	27.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6). Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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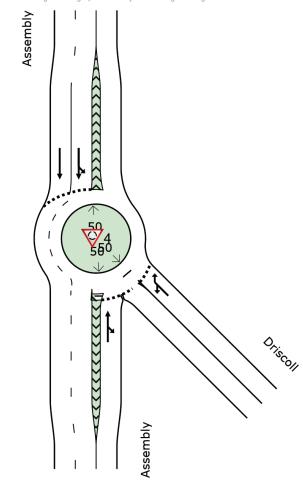
Project: Z:\Civtech\Projects\22-1640 CO Spokane On Call_Francis Roundabout Eval\Sidra\Old\Francis & Assembly_v3.sip9

SITE LAYOUT

Site Category: Proposed Design 1 Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





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Project: 2:CivtechProject42:C140

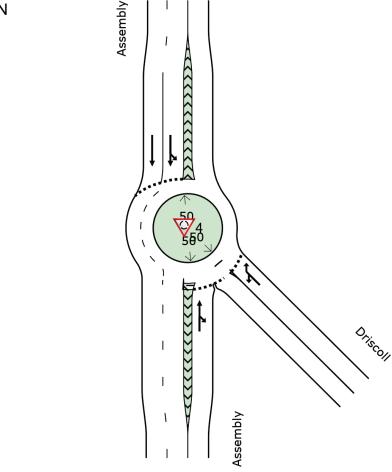
SITE LAYOUT

Site: 4 [Driscoll & Assembly PM (Site Folder: PM)]

Site Category: Proposed Design 1 Roundabout

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Project: 2:ICMtechtProjectsi22-1640 CO Spokane On Calli, Francia Roundabout EvalSidraiFrancia & Assembly Proposed_HT06182024.sip9

MOVEMENT SUMMARY

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Site Category: Proposed Design 1

Roundabout

Vehic	le M	ovement	Perfo	rma	nce										
Mov ID	Turn	Mov Class		lows HV]		rival lows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service		Back Of Jeue Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South	Asse	embly													
NBT	T1	All MCs	238	2.0	238	2.0	0.254	6.3	LOSA	1.3	32.3	0.42	0.54	0.42	34.5
NBR	R3	All MCs	12	2.0	12	2.0	0.254	6.5	LOS A	1.3	32.3	0.42	0.54	0.42	34.0
Appro	ach		249	2.0	249	2.0	0.254	6.3	LOSA	1.3	32.3	0.42	0.54	0.42	34.4
South	East:	Driscoll													
WBL	L3	All MCs	15	2.0	15	2.0	0.298	11.2	LOS B	1.4	34.7	0.41	0.57	0.41	34.1
WBR	R1	All MCs	248	2.0	248	2.0	0.298	5.8	LOS A	1.4	34.7	0.41	0.57	0.41	34.7
Appro	ach		263	2.0	263	2.0	0.298	6.1	LOSA	1.4	34.7	0.41	0.57	0.41	34.6
North:	Asse	mbly													
SBL	L1	All MCs	239	0.0	239	0.0	0.397	7.9	LOSA	2.7	67.8	0.12	0.53	0.12	34.2
SBT	T1	All MCs	858	0.0	858	0.0	0.397	4.7	LOSA	2.7	67.9	0.12	0.47	0.12	35.3
Appro	ach		1096	0.0	1096	0.0	0.397	5.4	LOSA	2.7	67.9	0.12	0.49	0.12	35.0
All Vel	hicles		1609	0.6	1609	0.6	0.397	5.6	LOSA	2.7	67.9	0.21	0.51	0.21	34.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 4 [Driscoll & Assembly PM (Site Folder: PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Site Category: Proposed Design 1

Roundabout

Vehic	le M	ovemen	Perfo	rmai	nce										
Mov ID	Turn	Mov Class		lows HV]		rival lows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% B Qu [Veh. veh	ack Of eue Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South	Asse	mbly													
NBT	T1	All MCs	743	2.0	743	2.0	0.754	9.1	LOSA	8.9	225.6	0.74	0.66	0.84	33.4
NBR	R3	All MCs	11	2.0	11	2.0	0.754	9.4	LOSA	8.9	225.6	0.74	0.66	0.84	32.9
Appro	ach		754	2.0	754	2.0	0.754	9.1	LOSA	8.9	225.6	0.74	0.66	0.84	33.4
South	East:	Driscoll													
WBL	L3	All MCs	11	2.0	11	2.0	0.818	26.1	LOS C	9.0	228.4	0.98	1.11	1.61	28.0
WBR	R1	All MCs	409	2.0	409	2.0	0.818	20.7	LOS C	9.0	228.4	0.98	1.11	1.61	28.4
Appro	ach		420	2.0	420	2.0	0.818	20.8	LOS C	9.0	228.4	0.98	1.11	1.61	28.4
North:	Asse	mbly													
SBL	L1	All MCs	208	2.0	208	2.0	0.303	7.9	LOSA	2.2	57.1	0.11	0.55	0.11	34.0
SBT	T1	All MCs	614	2.0	614	2.0	0.303	4.7	LOSA	2.3	57.3	0.11	0.47	0.11	35.2
Appro	ach		823	2.0	823	2.0	0.303	5.5	LOS A	2.3	57.3	0.11	0.49	0.11	34.9
All Vel	nicles		1997	2.0	1997	2.0	0.818	10.1	LOS B	9.0	228.4	0.53	0.69	0.70	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

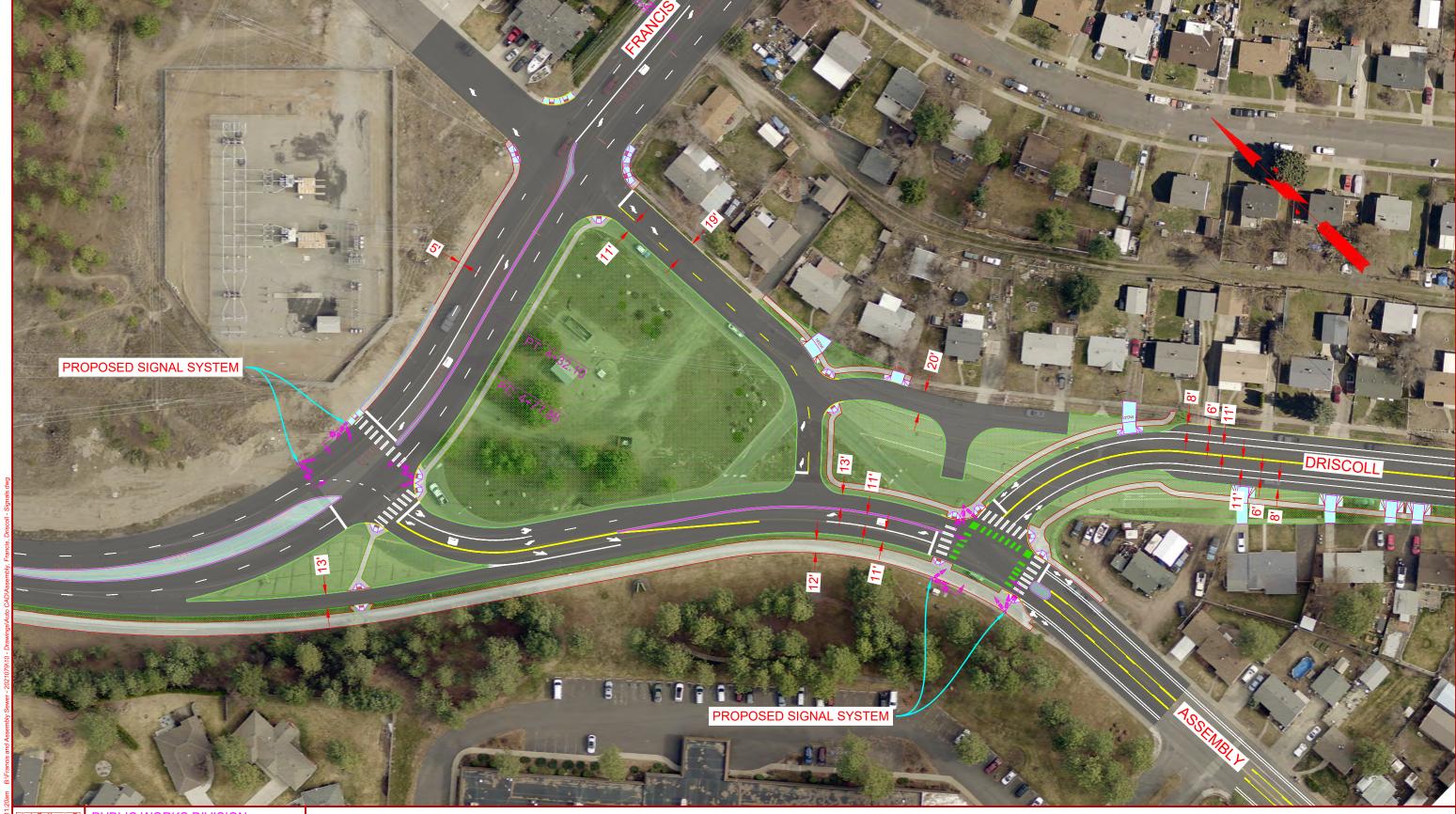
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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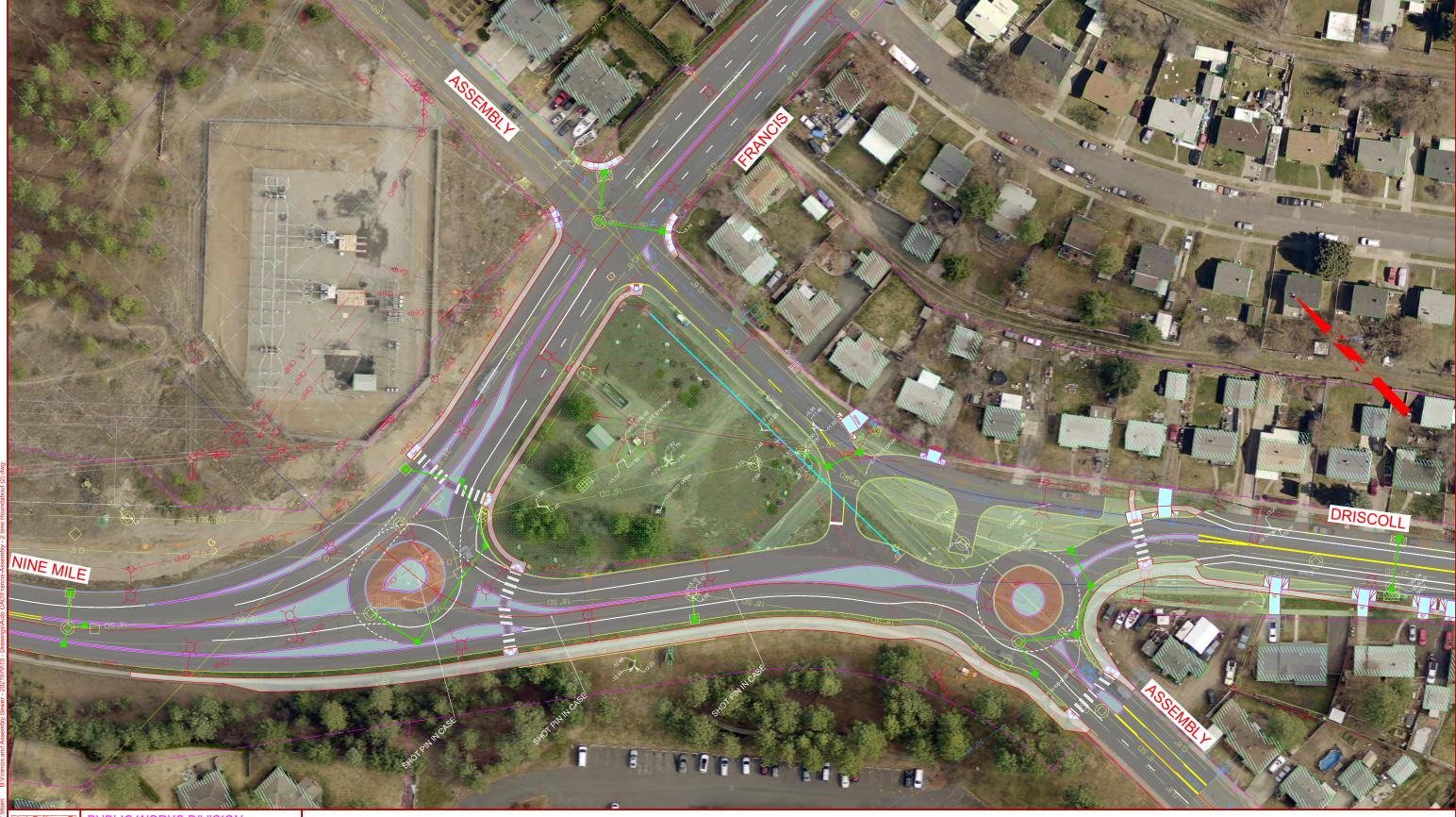
SPOKANE

PUBLIC WORKS DIVISION
INTEGRATED CAPITAL MANAGEMENT

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FRANCIS, ASSEMBLY & DRISCOLL

PROJECT # 2021079 INTERSECTIONS PROPOSED SIGNAL SYSTEMS



SPOKANE

SPOKANE

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FRANCIS - ASSEMBLY

PROJECT # 2021079 INTERSECTION DOUBLE ROUNDABOUT

														MOST
														SEVERE
					INDEXED	PRIMARY								INJURY
				REPORT	PRIMARY	TRAFFICW	BLOCK	SR ONLY HISTORY/	INTERSECTING					TYPE
JURISDICTION	COUNTY	CITY	INVESTIGATIVE AGENCY	NUMBER	TRAFFICWAY	AY	NUMBER	SUSPENSE	TRAFFICWAY	DATE	DAY NAME	TIME 24	TIME	CODE
State Route	Spokane	Spokane	Municipal/City Police	E845764	291	291		No		10/05/2018	Friday	21:22	9:22 PM	1
State Route	Spokane	Spokane	Municipal/City Police	E762943	291	291		No		01/26/2018	Friday	15:52	3:52 PM	1
State Route	Spokane	Spokane	Municipal/City Police	E926602	291	291		No		06/03/2019	Monday	07:23	7:23 AM	1
State Route	Spokane	Spokane	Municipal/City Police	EB11543	291	291		No		03/04/2021	Thursday	18:59	6:59 PM	1
State Route	Spokane	Spokane	Municipal/City Police	EA98877	291	291		No		01/13/2021	Wednesday	16:50	4:50 PM	7
State Route	Spokane	Spokane	Municipal/City Police	EA57974	291	291	_	No		08/23/2020	Sunday	16:41	4:41 PM	5
State Route	Spokane	Spokane	Municipal/City Police	EA90733	291	291		No		12/18/2020	Friday	19:28	7:28 PM	1
State Route	Spokane	Spokane	Municipal/City Police	EC78074	291	291		No		08/25/2022	Thursday	15:04	3:04 PM	7
			_											

														FIRST		FIRST		SECOND	
			SUSP											COLLISIO	FIRST	OBJECT	FIRST		SECOND
	FATAL	SUSP SER					# SUSP	# SUSP		TOTAL #				N TYPE	COLLISIO	STRUCK	OBJECT	N TYPE	COLLISIO
MOST SEVERE INJURY TYPE	COLS	INJ COLS	COLS	COLS	COLS	# FAT	SER INJ	MINOR INJ	# POS INJ	INJ	# VEH	# PEDS	# PEDAL	CODE	N TYPE	CODE	STRUCK	CODE	N TYPE
No Apparent Injury	0	0	0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
No Apparent Injury	0	0	0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
No Apparent Injury	0	0	0	0	0	0	0	0	0	0	2	0	0	28	From oppos	site directio	n - one left ti	urn - one str	aight
No Apparent Injury	0	0	0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
Possible Injury	0	0	0	1	1	0	0	0	1	1	2	0	0	28	From oppos	site directio	n - one left t	urn - one str	aight
Suspected Serious Injury	0	1	0	0	1	0	2	0	0	2	2	0	0	10	Entering at	angle			
No Apparent Injury	0	0	0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
Possible Injury	0	0	0	1	1	0	0	0	2	2	2	0	0	10	Entering at	angle			
_	_	_	_	_			_	_	_	_	_	_	_	_	_	_	_	_	

												FIRST								
												IMPACT								
												LOCATION								
												(City,								
												County &								
JUNCTION				ROADWAY	ROADWAY	ROADWAY				MISCELLA	FIRST	Misc	SR ONLY	SR ONLY			VEHICLE 1	VEHICLE 1		
RELATION	JUNCTION			SURFACE	SURFACE	CHARACT	ROADWAY	LIGHTING	LIGHTING	NEOUS	IMPACT	Trafficway	VEH 1	VEH 2			COMPASS	COMPASS	VEHICLE 1	VEHICLE 1
SHIP	RELATION	WEATHER		CONDITIO	CONDITIO	ERICTIC	CHARACT	CONDITIO	CONDITIO	TRAFFICW	LOCATION	s - 2010	MOVEMEN	MOVEMEN	VEHICLE 1	VEHICLE 1	DIRECTIO	DIRECTIO	TRAFFIC	POSTED
CODE	SHIP	CODE	WEATHER	N CODE	N	CODE	ERISTIC	N CODE	N	AY TYPE	CODE	forward)	T	T	TYPE	ACTION	N FROM	NTO	CONTROL	SPEED
1	At Intersect	3	Raining	2	Wet	3	Straight at I	4	Dark-Street	Lights On	A1	Lane 1 Incr	Turning Lef	Moving Stra	Pickup,Pan	Making Left	South	West	Stop Sign	/ay - Divided
1	At Intersect	1	Clear or Pa	1	Dry	6	Curve & Gra	3	Dusk		D1	Lane 1 Dec	Turning Lef	Moving Stra	Passenger	Making Left	South	Northwest	Stop Sign	y - Divided,
1	At Intersect	1	Clear or Par	1	Dry	2	Straight & G	1	Daylight		D2	Lane 2 Dec	Turning Lef	Moving Stra	Passenger	Making Left	East	South	No Traffic C	35
1	At Intersect	1	Clear or Pa	1	Dry			4	Dark-Street	Lights On	D1	Lane 1 Dec	Moving Stra	Moving Stra	Passenger	Going Strai	South	North	Stop Sign	30
1	At Intersect	1	Clear	1	Dry	3	Straight at I	4	Dark-Street	Lights On	D1	Lane 1 Dec	Turning Lef	Moving Stra	Pickup,Pan	Making Left	East	South	No Traffic C	Con Two d Way
1	At Intersect	1	Clear	1	Dry	6	Curve & Gra	1	Daylight		D2	Lane 2 Dec	Turning Lef	Moving Stra	Motorcycle	Making Left	South	West	Stop Sign	30
1	At Intersect	1	Clear or Pa	1	Dry	1	Straight & L	4	Dark-Street	Lights On	D1	Lane 1 Dec	Moving Stra	Moving Stra	Passenger	Going Strai	North	South	Stop Sign	/ay - Divided
1	At Intersect	1	Clear or Pa	1	Dry	6	Curve & Gra	1	Daylight		D2	Lane 2 Dec	Moving Stra	Moving Stra	Pickup,Pan	Starting in	North	South	Stop Sign	Two Way

											MV		
											DRIVER		
											CONTRIB		
	VEHICLE 1			VEHICLE 2	VEHICLE 2		VEHICLE		VEHICLE 2		UTING		
VEHICLE 1	ROADWAY			COMPASS	COMPASS		2		ROADWAY		CIRCUMS	WA STATE	WA STATE
ROADWAY	SURFACE	VEHICLE 2	VEHICLE 2	DIRECTIO	DIRECTIO	VEHICLE 2 TRAFFIC	POSTED		SURFACE	MV DRIVER CONTRIBUTING	TANCE 1	PLANE	PLANE
TYPE	TYPE	TYPE	ACTION	N FROM	NTO	CONTROL	SPEED	VEHICLE 2 ROADWAY TYPE	TYPE	CIRCUMSTANCE 1 (UNIT 1)	(UNIT 2)	SOUTH - X	SOUTH - Y
I, no Barrier	Blacktop	Passenger	Going Strai	East	West	No Traffic Control		Two Way - Divided, no Barrier	Blacktop	Did Not Grant RW to Vehicle	None	2384881.18	883010.12
with Barrier	Blacktop	Pickup,Pan	Going Straig	West	East	No Traffic Control		Two Way - Divided, with Barrier	Blacktop	Inattention	None	2384864.59	883034.48
with Barrier	Blacktop	Passenger	Going Strai	West	East	No Traffic Control	35	Two Way - Divided, with Barrier	Blacktop	Did Not Grant RW to Vehicle	None	2384873.87	883013.04
	Concrete	Passenger	Going Strai	West	East	No Traffic Control	30	Two Way - Divided, no Barrier	Concrete	Unknown Distraction	None	2384864.84	883034.92
- Undivided	Blacktop	Pickup,Pan	Going Strai	West	East	No Traffic Control		Two Way - Undivided	Blacktop	Did Not Grant RW to Vehicle	None	2384879.93	883035.06
with Barrier	Blacktop	Motorcycle	Negotiating	West	East	No Traffic Control	35	Two Way - Divided, with Barrier	Blacktop	Disregard Traffic Sign and Signals	None	2384868.7	883009.29
I, no Barrier	Blacktop	Passenger	Going Strai	West	East	No Traffic Control		Two Way - Divided, with Barrier	Blacktop	Did Not Grant RW to Vehicle	None	2384864.84	883034.92
- Undivided	Blacktop	Pickup,Pan	Going Strai	West	East	No Traffic Control		Two Way - Undivided	Blacktop	Did Not Grant RW to Vehicle	None	2384880.25	883006.72

														MOST			
					INDEXED			SR ONLY	INTERSEC					SEVERE			
			INVESTIGA		PRIMARY	PRIMARY		HISTORY/	TING					INJURY			
JURISDICT			TIVE	REPORT	TRAFFICW	TRAFFICW	BLOCK	SUSPENS	TRAFFICW					TYPE	MOST SEVERE INJURY	FATAL	SUSP SER
ION	COUNTY	CITY	AGENCY	NUMBER	AY	AY	NUMBER	Е	AY	DATE	DAY NAME	TIME 24	TIME	CODE	TYPE	COLS	INJ COLS
State Route	Spokane	Spokane	Municipal/0	E912595	291	291		No		04/19/2019	Friday	20:12	8:12 PM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/0	E995320	291	291		No		12/18/2019	Wednesday	08:32	8:32 AM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/0	EA05247	291	291		No		01/21/2020	Tuesday	03:33	3:33 AM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/0	EA34361	291	291		No		05/16/2020	Saturday	20:07	8:07 PM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/(EA47511	291	291		No		07/15/2020	Wednesday	16:00	4:00 PM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/0	EA51948	291	291		No		08/02/2020	Sunday	12:16	12:16 PM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/(291		No		03/11/2021	Thursday	13:41	1:41 PM	1	No Apparent Injury	0	0
City Street	Spokane	Spokane	Municipal/(EB39053	W FRANCIS	W FRANCIS	AVE	No	W NINE MIL	06/13/2021	Sunday	13:28	1:28 PM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/(EC61653	291	291		No		07/05/2022	Tuesday	10:30	10:30 AM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/(EC71024	291	291		No		08/04/2022	Thursday	10:46	10:46 AM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/(ED15442	291	291		No		12/13/2022	Tuesday	09:46	9:46 AM	1	No Apparent Injury	0	0
State Route	Spokane	Spokane	Municipal/(E781829	291	291		No		03/17/2018	Saturday	16:30	4:30 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(E920949	291	291		No		05/12/2019	Sunday	19:45	7:45 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(E940415	291	291		No		07/16/2019	Tuesday	11:55	11:55 AM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(E997407	291	291		No		12/25/2019	Wednesday	22:07	10:07 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(EA41004	291	291		No		06/17/2020	Wednesday	21:18	9:18 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(EB41729	291	291		No		06/22/2021	Tuesday	17:36	5:36 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(EB57176	291	291		No		08/06/2021	Friday	15:56	3:56 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(EC17007	291	291		No		02/03/2022	Thursday	12:09	12:09 PM	7	Possible Injury	0	0
State Route	Spokane	Spokane	Municipal/(E847237	291	291		No		10/09/2018	Tuesday	07:38	7:38 AM	6	Suspected Minor Injury	0	0
City Street	Spokane	Spokane	Municipal/0			W NINE MIL	6200	No	N DRISCOL	04/20/2019	Saturday	18:12	6:12 PM	6	Suspected Minor Injury	0	0
State Route	Spokane	Spokane	Municipal/0	E957738		291		No		09/07/2019		14:03	2:03 PM	6	Suspected Minor Injury	0	0
State Route	Spokane	Spokane	Municipal/0	EA31349	291	291		No		04/30/2020	Thursday	14:24	2:24 PM	6	Suspected Minor Injury	0	0
State Route	Spokane	Spokane	State Patro			291		No				16:54	4:54 PM	6	Suspected Minor Injury	0	0
City Street	Spokane	Spokane	Municipal/0	ED73467	W NINE MIL	W NINE MIL	6200	No	N ASSEMBL	06/24/2023	Saturday	20:44	8:44 PM	6	Suspected Minor Injury	0	0
State Route	Spokane	Spokane	Municipal/0	EC66597	291	291		No		07/18/2022	Monday	15:02	3:02 PM	0	Unknown	0	0

	•	1			1									1		1
											FIRST		FIRST		SECOND	
SUSP											COLLISIO	FIRST	OBJECT	FIRST	COLLISIO	SECOND
MINOR INJ	POSS INJ	TOTAL INJ		# SUSP	# SUSP		TOTAL#				N TYPE	COLLISIO	STRUCK	OBJECT	N TYPE	COLLISIO
COLS	COLS	COLS	# FAT	SER INJ	MINOR INJ	# POS INI	INJ	# VEH	# PEDS	# PEDAL	CODE	N TYPE	CODE	STRUCK	CODE	N TYPE
0	0	0	0		0	0		2	0		10	Entering at		Omoon	0001	N I I I
0	0	0	0	0	0	0		2	0			Entering at				
0	0	0	0	0	0	0		1	0			Fixed object		Street Light	Pole or Bas	e
0	0	0	0	0	0	0		2	0			Entering at		<u> </u>		
0	0	0	0	0	0	0	0	2	0			Entering at				
0	0	0	0	0	0	0	0	2	0	0		Entering at				
0	0	0	0	0	0	0	0	2	0	0		Entering at				
0	0	0	0	0	0	0	0	2	0	0				n - one left tı	ırn - one str	aight
0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
0	0	0	0	0	0	0	0	2	0	0	10	Entering at	angle			
0	1	1	0	0	0	2	2	2	0	0	10	Entering at	angle			
0	1	1	0	0	0	1	1	1	0	0	50	Fixed object	14	Metal Sign I	50	Fixed objec
0	1	1	0	0	0	1	1	2	0	0	10	Entering at	angle			
0	1	1	0	0	0	1	1	2	0	0	10	Entering at	angle			
0	1	1	0	0	0	1	1	2	0	0	10	Entering at	angle			
0	1	1	0	0	0	2	2	2	0			Entering at	angle		50	Fixed objec
0	1	1	0	0	0	1	1	2	0		10	Entering at				
0	1	1	0				1	2	0			Entering at				
1	0	1	0	0	3	0	3	2	0			Entering at				
1	0	1	0		1	1	2	2	0	0		Entering at				
1	0	1	0		1	1	2	2	0			Entering at				
1	0	1	0		1	2		2	0			Entering at				
1	0	1	0	0	1	0		1	0			Fixed object		Linear Curb	50	Fixed objec
1	0	1	0	0	1	0		2	0	0		Entering at				
0	0	0	0	0	0	0	0	1	0	0	50	Fixed object	14	Metal Sign I	Post	

											•	
												FIRST
												IMPACT
												LOCATION
												(City,
UNICTION				DO A DIAVAV	DO A DIAVAV	DO A DIAVAV				MICOELLA	FIDOT	County &
JUNCTION	ILINIOTIONI				ROADWAY		DO A DIA/AV	LICUTING	LIGHTING	MISCELLA	FIRST	Misc
RELATION SHIP	RELATION	\\/_\T ED			SURFACE CONDITIO	ERICTIC	ROADWAY CHARACT			NEOUS TRAFFICW	IMPACT	Trafficway s - 2010
CODE	SHIP	CODE	WEATHER	N CODE	N	CODE	ERISTIC	N CODE	N	AY TYPE	CODE	forward)
1	At Intersect		Clear or Pa		Dry	6	Curve & Gra		Dusk	ATTIFE	D1	Lane 1 Dec
1	At Intersect		Clear or Pa		Dry	6	Curve & Gra		Daylight		D1	Lane 1 Dec
	Not at Inter		Clear	4	Ice	6	Curve & Gra		Daylight Dark-Street	· Lights ∩n	DL	Decreasing
1	At Intersect		Clear or Pa	•	Dry	6	Curve & Gra		Daylight	Ligitta Oii	D1	Lane 1 Dec
1	At Intersect		Clear or Pa		Dry	2	Straight & G		Daylight		D1	Lane 1 Dec
1	At Intersect		Clear or Pa		Dry	2	Straight & G		Daylight		D1	Lane 1 Dec
1	At Intersect		Clear or Pa		Dry	5	Curve & Lev		Daylight		D1	Lane 1 Dec
1	At Intersect		Clear		Dry		Curve & Lev		Daylight			Lane of Prin
	At Intersect		Clear or Pa			6	Curve & Gra		Daylight		D1	Lane 1 Dec
1	At Intersect		Clear or Pa		Dry	5	Curve & Lev		Daylight		D1	Lane 1 Dec
1	At Intersect		Clear	4	Ice	6	Curve & Gra		Daylight		D1	Lane 1 Dec
1	At Intersect		Clear or Pa	1	Dry	7	Curve at Hi		Daylight		D1	Lane 1 Dec
5	At Intersect	1	Clear or Pa	1	Dry	1	Straight & L	1	Daylight		D0	Past Right S
1	At Intersect	1	Clear or Pa	1	Dry	6	Curve & Gra		Daylight		D1	Lane 1 Dec
1	At Intersect	1	Clear or Pa	1	Dry	1	Straight & L	4	Dark-Street	Lights On	D1	Lane 1 Dec
1	At Intersect	1	Clear	1	Dry			4	Dark-Street	Lights On	D1	Lane 1 Dec
1	At Intersect	1	Clear	1	Dry	6	Curve & Gra	1	Daylight		D1	Lane 1 Dec
1	At Intersect	1	Clear or Pa	1	Dry	6	Curve & Gra	1	Daylight		D1	Lane 1 Dec
1	At Intersect	2	Overcast	3	Snow/Slush	1		1	Daylight		D1	Lane 1 Dec
1	At Intersect		Raining	2	Wet	6	Curve & Gra		Daylight		D1	Lane 1 Dec
1	At Intersect	1	Clear or Pa	1	Dry	6	Curve & Gra	1	Daylight		C1	Lane of Prin
1	At Intersect	1	Clear or Pa	1	Dry	6	Curve & Gra	1	Daylight		D1	Lane 1 Dec
1	At Intersect	1	Clear	1	Dry	2	Straight & G	1	Daylight		D2	Lane 2 Dec
4	Not at Inter	1	Clear	1	Dry	6	Curve & Gra	1	Daylight		A8	Median Sho
1	At Intersect	1	Clear	1	Dry	6	Curve & Gra	3	Dusk		C1	Lane of Prin
1	At Intersect	1	Clear	1	Dry	6	Curve & Gra	1	Daylight		DL	Decreasing

CD ONLY	SR ONLY				VEHICLE 1				VEHICLE 1	
SR ONLY VEH 1	VEH 2							VEHICI E 1	ROADWAY	
		VEHICLE 1	VEHICLE 1			TRAFFIC		ROADWAY		
T	T	TYPE	ACTION	N FROM	NTO	CONTROL	SPEED	TYPE	TYPE	VEHICLE 2 TYPE
	Moving Stra	Passenger			North		30	Other		Pickup,Panel Truck or Vanette under 10,000 lb
		Pickup,Pan			West			with Barrier		Pickup,Panel Truck or Vanette under 10,000 lb
_	_	Pickup,Pan	_		East	No Traffic C		Other	Blacktop	
		Pickup,Pan					y - Divided,		· ·	Passenger Car
_		Passenger			West		35	Other	Blacktop	Passenger Car
Turning Lef	Moving Stra	Passenger	Making Left	South	Northwest	Stop Sign	30	with Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Passenger	Making Left	South	Northwest	Stop Sign	30	with Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
nary Trafficw	vay	Passenger	Going Strai	South	North	Stop Sign		Two Way - [Blacktop	Passenger Car
Turning Lef	Moving Stra	Pickup,Pan	Making Left	South	North	Stop Sign	30	One Way	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Passenger	Making Left	South	North	Stop Sign	30	with Barrier	Blacktop	Passenger Car
Moving Stra	Moving Stra	Pickup,Pan	Starting in 1	South	Northwest	Stop Sign	30	with Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Pickup,Pan	Making Left	East	West	Stop Sign	25	Other	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Moving Stra	Unknown o	Pickup,Pan	Going Strai	West	East	No Traffic C	ʻʻon Dix lided,	with Barrier	Blacktop	
Turning Lef	Moving Stra	Passenger	Making Left	South	Northwest	Stop Sign	/ay - Divided	d, no Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Pickup,Pan	Making Left	South	North	Stop Sign	30	with Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Moving Stra	Moving Stra	Pickup,Pan	Starting in 1	South	North	Stop Sign	30	with Barrier	Concrete	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Pickup,Pan	Making Left	South	Northwest	Stop Sign	y - Divided,	with Barrier	Blacktop	Passenger Car
		Passenger			West		30	l, no Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Passenger (Making Left	Southeast	Northwest	Stop Sign			Blacktop	Passenger Car
Moving Stra	Moving Stra	Passenger	Starting in 1	South	Northwest	Stop Sign	35	with Barrier	Blacktop	Passenger Car
nary Trafficw		Passenger	- U			Stop Sign		Two Way - [Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
		Pickup,Pan			Northwest		30	with Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Turning Lef	Moving Stra	Pickup,Pan	Making Left	South	North	Stop Sign	30	l, no Barrier	Blacktop	Pickup,Panel Truck or Vanette under 10,000 lb
Moving Stra	Unknown o	Motorcycle	Negotiating	South	North	No Traffic C	35	with Barrier	Blacktop	
nary Trafficw		Passenger	_		South	Stop Sign		Two Way - l	Blacktop	Passenger Car
Turning Rig	Unknown o	Pickup,Pan	Making Righ	Northwest	South	No Traffic C	30	Other	Blacktop	

								MV		
						VEHICLE		DRIVER		
	VELUOLE	\/ELUQLE 0		VELUOLE		2		CONTRIB		
	VEHICLE 2			VEHICLE		ROADWA		UTING	\A/A CTATE	VA/A CTATE
	COMPASS		VEHICLE 2 TRAFFIC	2 DOSTED		SURFACE	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1	CIRCUMS TANCE 1	WA STATE PLANE	WA STATE PLANE
VEHICLE 2 ACTION	FROM	NTO	CONTROL	SPEED	VEHICLE 2 ROADWAY TYPE	TYPE	(UNIT 1)	(UNIT 2)	SOUTH - X	SOUTH - Y
Going Straight Ahead		South	No Traffic Control	35	Other		Disregard Stop Sign - Flashing Red	None	2384506.39	
Going Straight Ahead	West	East	No Traffic Control	35	Two Way - Divided, with Barrier		Did Not Grant RW to Vehicle	None	2384506.18	
Ooling Strangift Arread	WEST	Last	No Trainic Control	33	Two way - Divided, with Damer	ыаскюр	Exceeding Reas. Safe Speed	None	2384289.72	
Going Straight Ahead	North	East	No Traffic Control		Two Way - Divided, with Barrier	Rlackton	Did Not Grant RW to Vehicle	None	2384507.55	-
	West	East	No Traffic Control	35	Other	·	Improper Turn/Merge	None	2384506.33	
Going Straight Ahead	Northwest	East	No Traffic Control	35	Two Way - Divided, with Barrier		Did Not Grant RW to Vehicle	None	2384507.62	
Going Straight Ahead	Northwest	East	No Traffic Control	30	Two Way - Divided, with Barrier		Did Not Grant RW to Vehicle	None	2384509.04	
Making Left Turn	North	East	No Traffic Control	50	Two Way - Divided, with Barrier	Blacktop	Did Not Grant RW to Vehicle	None	2384495.59	
Going Straight Ahead	North	East	No Traffic Control	30	One Way	·	Did Not Grant RW to Vehicle	None	2384506.44	-
Going Straight Ahead	North	East	No Traffic Control		Two Way - Divided, with Barrier		Disregard Traffic Sign and Signals	None	2384504.01	882958.36
Going Straight Ahead	West	East	No Traffic Control		Two Way - Divided, with Barrier		Unknown Distraction	None	2384506.44	
	West	East	No Traffic Control	25	Other		Unknown Distraction	None	2384500.36	
	*****	2401	Tto Trainio Control		0.1161	Биотор	Operating Other Electronic Devices (comp	110110	2384505.35	
Going Straight Ahead	Northwest	Southeast	No Traffic Control		Two Way - Divided, no Barrier	Blacktop	Did Not Grant RW to Vehicle	None	2384504.59	
	West	East	No Traffic Control	30	Two Way - Divided, with Barrier	Blacktop		None	2384508.69	
Negotiating a Curve		South	No Traffic Control	30	Two Way - Divided, with Barrier		Disregard Traffic Sign and Signals	None	2384507.28	
Going Straight Ahead		East	No Traffic Control	35	Two Way - Divided, with Barrier		Did Not Grant RW to Vehicle	None	2384506.44	
	West	East	No Traffic Control	30	Two Way - Divided, no Barrier		Did Not Grant RW to Vehicle	None	2384506.44	
Going Straight Ahead	Northwest		No Traffic Control				Did Not Grant RW to Vehicle	None	2384506.44	
Going Straight Ahead			No Traffic Control	35	Two Way - Divided, with Barrier		Inattention	None		882937.73
	Southwest	Northeast	No Traffic Control		Two Way - Divided, with Barrier	Blacktop	Other Contributing Circ Not Listed	None	2384761.94	882699.56
		East	No Traffic Control	35	Two Way - Divided, with Barrier	Blacktop		None	2384507.55	882956.83
Going Straight Ahead	Northwest	Southeast	No Traffic Control	35	Two Way - Divided, no Barrier		Disregard Traffic Sign and Signals	None	2384507.31	882977.43
							Other Contributing Circ Not Listed		2384372.47	883024.38
Going Straight Ahead	South	North	No Traffic Control		Two Way - Undivided	Blacktop	Disregard Traffic Sign and Signals	None	2384744.99	882677.16
							Improper Turn/Merge		2384500.58	882961.49

								SR ONLY HISTORY/						MOST SEVERE INJURY	
JURISDICT			INVESTIGATIVE	REPORT	INDEXED PRIMARY	PRIMARY	BLOCK	SUSPENS						TYPE	MOST SEVERE
ION	COUNTY	CITY	AGENCY	NUMBER	TRAFFICWAY	TRAFFICWAY	NUMBER	Е	INTERSECTING TRAFFICWAY	DATE	DAY NAME	TIME 24	TIME	CODE	INJURY TYPE
City Street	Spokane	Spokane	Municipal/City Po	EC29584	N ASSEMBLY ST	N ASSEMBLY ST	6087	No	W NINE MILE RD	03/18/2022	Friday	22:27	10:27 PM	7	Possible Injury
City Street	Spokane	Spokane	Municipal/City Po	EA08188	N ASSEMBLY ST	N ASSEMBLY ST	6200	No	ACCESS RD TO W NINE MILE RD	01/09/2020	Thursday	00:22	12:22 AM	7	Possible Injury
City Street	Spokane	Spokane	Municipal/City Po	ED84533	N ASSEMBLY ST	N ASSEMBLY ST		No	W NINE MILE RD	07/29/2023	Saturday	23:19	11:19 PM	7	Possible Injury
City Street	Spokane	Spokane	Municipal/City Po	EB32005	N ASSEMBLY ST	N ASSEMBLY ST		No	W NINE MILE RD	05/20/2021	Thursday	13:02	1:02 PM	7	Possible Injury

													FIRST		FIRST		SECOND		JUNCTION	
		SUSP											COLLISIO	FIRST	OBJECT	FIRST				JUNCTION
FATAL	SUSP SER	MINOR INJ	POSS INJ	TOTAL INJ		# SUSP	# SUSP		TOTAL#				N TYPE	COLLISIO	STRUCK	OBJECT	N TYPE	COLLISIO	SHIP	RELATION
COLS	INJ COLS	COLS	COLS	COLS	# FAT	SER INJ	MINOR INJ	# POS INJ	INJ	# VEH	# PEDS	# PEDAL	CODE	N TYPE	CODE	STRUCK	CODE	N TYPE	CODE	SHIP
0	0	0	1	1	0	0	0	1	1	2	0	0	28	From oppos	site directior	n - one left tu	ırn - one str	aight	1	At Intersect
0	0	0	1	1	0	0	0	1	1	2	0	0	28	From oppos	site directior	n - one left ti	ırn - one str	aight	1	At Intersect
0	0	0	1	1	0	0	0	2	2	2	0	0	10	Entering at	angle				1	At Intersect
0	0	0	1	1	0	0	0	1	1	2	0	0	28	From oppos	site direction	n - one left tı	ırn - one str	aight	1	At Intersect

										FIRST										
										IMPACT										
										LOCATION										
										(City,										
										County &										
		ROADWAY	ROADWAY	ROADWAY				MISCELLA	FIRST	Misc	SR ONLY	SR ONLY			VEHICLE 1	VEHICLE 1				VEHICLE 1
		SURFACE	SURFACE	CHARACT	ROADWAY	LIGHTING	LIGHTING	NEOUS	IMPACT	Trafficway	VEH 1	VEH 2			COMPASS	COMPASS	VEHICLE 1	VEHICLE 1	VEHICLE 1	ROADWAY
WEATHER		CONDITIO	CONDITIO	ERICTIC	CHARACT	CONDITIO	CONDITIO	TRAFFICW	LOCATION	s - 2010	MOVEMEN	MOVEMEN	VEHICLE 1	VEHICLE 1	DIRECTIO	DIRECTIO	TRAFFIC	POSTED	ROADWAY	SURFACE
CODE	WEATHER	N CODE	N	CODE	ERISTIC	N CODE	N	AY TYPE	CODE	forward)	T	T	TYPE	ACTION	N FROM	N TO	CONTROL	SPEED	TYPE	TYPE
1	Clear	1	Dry	6	Curve & Gra	4	Dark-Street	Lights On	C1	Lane of Prir	mary Trafficv	vay	Passenger	Going Strai	North	South	Stop Sign		Two Way - I	Blacktop
2	Overcast	1	Dry	1	Straight & L	6	Dark-No St	reet Lights	C1	Lane of Prir	mary Trafficv	vay	Pickup,Pan	Going Strai	South	North	No Traffic C	30	Two Way - I	Blacktop
1	Clear	1	Dry	5	Curve & Lev	6	Dark-No St	reet Lights	C1	Lane of Prir	nary Trafficv	vay	Passenger	Making Left	North	South	Stop Sign	30	Two Way -	Blacktop
1	Clear	1	Dry			1	Daylight		C1	Lane of Prir	mary Trafficv	vay	Pickup,Pan	Going Strai	North	South	Stop Sign		Two Way - I	Blacktop
						·														

		VEHICLE 2	VEHICLE 2				VEHICLE 2				
		COMPASS	COMPASS	VEHICLE 2	VEHICLE 2	VEHICLE 2	ROADWAY			WA STATE	WA STATE
VEHICLE 2	VEHICLE 2	DIRECTIO	DIRECTIO	TRAFFIC	POSTED	ROADWAY	SURFACE	MV DRIVER CONTRIBUTING	MV DRIVER CONTRIBUTING	PLANE	PLANE
TYPE	ACTION	N FROM	N TO	CONTROL	SPEED	TYPE	TYPE	CIRCUMSTANCE 1 (UNIT 1)	CIRCUMSTANCE 1 (UNIT 2)	SOUTH - X	SOUTH - Y
Passenger	Going Strai	South	North	No Traffic C	Control	Two Way - l	Blacktop	Other Distractions	None	2384881.07	882430.57
Passenger	Making Left	Southeast	West	No Traffic C	30	Two Way - [Blacktop	None	Under Influence of Alcohol	2384879.57	882707.35
Pickup,Pan	Going Strai	South	Northwest	No Traffic C	Control	One Way	Blacktop	Under Influence of Alcohol	None	2384884.29	882548.98
Pickup,Pan	Making Left	South	North	No Traffic C	Control	Two Way - [Blacktop	Other Contributing Circ Not Listed	None	2384884.29	882548.98

Nine Mile & Francis

Intersection Crash rates

Daily Entering Vehicles Number of Crashes Number of Years Intersection Crash rate

20600 8 6 1 0.177328545 crashes per million entering vehicles

Average rate 92.46 per 100,000,000 miles

avg(am/0.08, PM/0.1)

Nine Mile Rd/Francis Ave & Driscoll

Intersection Crash rates

Daily Entering Vehicles Number of Crashes Number of Years Intersection Crash rate

30955 26 6 1 0.383529191 crashes per million entering vehicles

Assembly St & Driscoll

Intersection Crash rates

Daily Entering Vehicles Number of Crashes Number of Years Intersection Crash rate

7088 4 5 1 0.309224157 crashes per million entering vehicles

Date Prepared: 4/3/2025 Prepared by: J. BALL
Date Updated: 8/12/2025 Updated by: J. BALL
Project Name: Francis - Assembly & Assembly- Driscoll Roundabouts & Street only \$8,978,173 Proj ID: 2021079
Description: Construct 2 lane roundabouts at Francis & Assembly & Driscoll. Full depth rebuild (SR 291 8" over 8", Discroll & Assembly 5" over 6"). Includes stormwater upgrades Param Meter & Fiber Conduit to Fire Station.

Item Description	Qty	<u>Unit</u>	Unit Cost	<u>Extension</u>
Division 1 - Genera			00.000	00.00
SPCC Plan Public Liaison Representative	1.0 1.0	LS LS	\$2,000 \$5,000	\$2,00 \$5,00
Reference and Reestablish Survey Monument	6	EA	\$1,000	\$6,00
Mobilization	1.0	LS	\$393,000	\$393,00
Project Tremporary Traffic Control	1.0	LS	\$393,000	\$393,000
Division 2 - E	arthwork		subtotal:	\$799,000
Clearing & Grubbing	1	LS	\$15,000	\$15,000
Remove Existing Curb and/or Gutter	7,900	LF	\$12	\$94,80
Remove Cement Concrete Sidewalk & Driveway	3,106 14	SY EA	\$20 \$1,200	\$62,12
Remove Manhole, Catch Basin, or Drywell Sawcutting Curb	14	EA	\$1,200 \$45	\$16,80 \$63
Sawcutting Rigid and Flexible Pavement	14,210	LFI	\$1.50	\$21,31
Roadway Excavation Including Haul	7,758	CY	\$30	\$232,74
Common Borrow Incl. Haul	2,000	CY	\$30	\$60,00
Preparation of Untreated Roadway	17,767	SY	\$3 subtotal:	\$53,30 \$556,7 0
Division 4	- Bases		Subiolai.	ψ550,71
Crushed Surfacing Base Course	3,546	CY	\$75 \$450	\$265,95
CSTC for Sidewalk and Driveways	141	CY	\$150 subtotal:	\$21,15 \$287,1 0
Division 5 - Surface Trea	tments & Paver	nents		,
HMA CL 1/2 IN. Heavy Traffic, 8 INCH THICK - SR291	10,667	SY	\$58	\$618,68
HMA CL 1/2 IN. Heavy Traffic, 5 INCH THICK - Driscoll & Assembly	7,100	SY	\$37	\$262,70
HMA for Pavement Repair, CL 1/2 IN. Heavy Traffic, 5 In. Thick	556 19 297	SY	\$45 \$1	\$25,02
Soil Residual Herbicide Pavement Repair Excavaton Including Haul	18,287 556	SY SY	\$1 \$40	\$18,28 \$22,24
Furnishing Concrete for Cement Concrete Pavement-Truck Apron	116	CY	\$350	\$22,24 \$40,60
Portland Cement Concrete Pavement, 8 Depth - Truck Apron	520	SY	\$75	\$39,00
			subtotal:	\$1,026,53
Division 6 - S Reinforced Concrete Retaining Wall	Structures 800	SF	\$100	\$80,000
Cement Concrete Curb Wall	185	LF	\$85	\$15,72
			subtotal:	\$95,72
Division 7 - Drainage Structures, Storm Sewers	s, Sanitary Sewe	ers, Wat EA	er mains & Conduits \$3,500	¢cc En
Catch basin Type 1 MH or DW Frame & Cover	20	EA	\$3,500 \$1,300	\$66,50 \$26,00
Connect In. Dia. Pipe to Existing CB, DW or MH	13	EA	\$850	\$11,05
Trench Safety	1	LS	\$5,000	\$5,00
Catch Basin Ductile Iron Sewer Pipe 8 In. Diam.	775	LF	\$85	\$65,87
Division 8 - Miscelland	eous Constructi	ion	subtotal:	\$174,42
Landscaping	1	LS	\$15,000	\$15,000
Topsoil Type A, 2 Inch Thick	8,617	SY	\$6	\$51,70
Hydroseeding	6,667	SY	\$5	\$33,33
Sod Installation	1,950	SY	\$25	\$48,75
Irrigation System - new and modify Cement Concrete Curb and/or Gutter	1 4,400	LS LF	\$15,000 \$45	\$15,00 \$198,00
Roundabout Central Island Cement Concrete Curb	625	LF	\$50	\$31,25
Roundabout Cement Concrete Curb & Gutter	4,525	LF	\$50	\$226,25
Cement Concrete Driveway	261	SY	\$95	\$24,79
Cement Concrete Sidewalk	2,000	SY	\$110	\$220,00
Ramp Detectable Warning	112	SF	\$35	\$3,92
Traffic Signal System - Ramp Meter	1	LS	\$300,000	\$300,00
Illumination System (Street Lights) Communication Conduit System - Ramp Meter	10 3,675	EA LF	\$10,000 \$50	\$100,00 \$183,75
Communication Conduit System - Namp Meter Communication Cables and Interfaces - Ramp Meter	3,675	LF	\$15	\$55,12
Signing, Permanent - City Manufactured Signs	1	LS	\$30,000	\$30,00
Pavement Marking (Durable Heat Applied, Inlay Tape, Durable, Paint)	1	LS	\$45,000	\$45,00
Reinforced Doweled Curb	550	LF	\$50	\$27,50
Traffic Island Concrete - 4 Inch Thick	1,475	SY	\$70	\$103,25
Traffic Island Fill - CSTC	165	CY	\$150 subtotal:	\$24,75 \$1,737,37
Legacy ICI	VI Items		- Cubictuii	\$1,101,01
Utility Relocate - power pole	9	EA	\$5,000 subtotal:	\$45,000 \$45,00 0
			Construction Subtotal	\$4,721,86
Scope Contingency	20.0%			\$944,37
po domingondy	20.070		Construction Subtotal	\$5,666,23
Construction Contingency	15.0%			\$849,930
Construction total			Construction Total	\$6,516,17
Property Purchase - 125 SF +/-				\$5,000
Geotech	1.0%			\$65,16
Surveying	3.0%			\$195,48
	7.0%			\$456,13
	1.5%			\$97,74
Admin, Legal, & Permits				\$977,42
Admin, Legal, & Permits	15.0%		Project Total	
Admin, Legal, & Permits Construction Mgmt	15.0%		Project Total for construction in	
Admin, Legal, & Permits Construction Mgmt Unit co			Project Total for construction in 2027	
Admin, Legal, & Permits Construction Mgmt Unit co <u>For Program</u>	15.0% sts from year 2025		for construction in 2027	
Admin, Legal, & Permits Construction Mgmt Unit co For Program Preconstruction	15.0% sts from year 2025 815		for construction in 2027 \$879,684	
For Program Preconstruction Property Purchase	15.0% sts from year 2025 815 5		for construction in 2027 \$879,684 \$5,400	
Admin, Legal, & Permits Construction Mgmt Unit co For Program Preconstruction	15.0% sts from year 2025 815		for construction in 2027 \$879,684	\$8,313,12

Date Prepared: 4/3/2025 Prepared by: J. BALL Date Updated: 7/17/2025 Updated by: J. BALL

Description Construct Signate at Francision Bittimus Bitti		Date Updated:	7/17/202	5	Updated by: J.	
Name Description			(SP 201 - 9" ox	or 9" F		oj ID: 2021079
Division 1 - Seneral Requirements 1	Description: Construct Signals at Francis/Driscoil & Assembly/Dris	scoii. Fuii deptii rebuiid	(SK 291 = 0 U	rero, L	ons & Assem = 5 Over 6).	
SPOC Piem 1071000 10 1.5 2.000 5.5				<u>Unit</u>	Unit Cost	<u>Extension</u>
Proble Liston Representative Celebration Representative Celebratics and Processing Survey Monument (107000) 10 S \$5,000 \$5 \$5,000 \$5 \$6 \$1,000 \$5 \$6 \$1,000 \$5 \$5 \$1,000 \$5 \$5 \$5 \$1,000 \$5 \$5 \$5 \$1,000 \$5 \$5 \$5 \$5 \$5 \$5 \$5				1.0	¢2.000	¢2.000
Reference and Recetabilith Survey Mornament - Month Childration - 1000000						\$2,000 \$5,000
Project Tremporary Traffic Control 100000 10 LS \$331,000 333						\$6,000
Common C						\$391,000
Clearing & Grubberg	Project Tremporary Traffic Control	1100000	1.0	LS		\$391,000 \$795,000
Remove Cement Corrierate Sidewak & Driveway 2000-0 6,625 EF \$12 \$75 \$25 \$35		Division 2 - Earthwo	rk		- Cubician	4.00,000
Remove Center Concrete Giosewik & Driverse 2000-10 3.00 5 5 5 5 5 5 5 5 5						\$10,000
Remove Machole, Calcht Basin, or Dywell 2000605 11 EA \$1,200 \$1						\$79,500 \$64,120
Securiting Rigid and Flexibile Perwament 202015						\$13,200
Readway Excivation Including Halal 2030000 7,866 CV \$30 \$22 \$30 \$25 \$30						\$810
Preparation of Untreated Roadway 2030000 16,577 SY S3 Statutotatic						\$20,925 \$235,980
Construction Bases Course Corner Corne						\$55,731
Strained Surfacing Base Course 4040020 3,794 CY \$75 \$28		Di iti u A Bussa			subtotal:	\$480,26
CSTC for Sidewak and Driveways	Crushed Surfacing Base Course		3.794	CY	\$75	\$284,550
MAN ACL 12 N. Heavy Traffic, 8 INCH THICK - SR291 50400					\$150	\$21,600
HMA CL 12 N. Heavy Traffic, 8 INCH THICK - R8291 \$0400_ 10.33 \$Y\$ \$58 \$59 \$50 \$140 \$	Division	E Curface Treatments	9 Dayramanta		subtotal:	\$306,150
HMA CL Z. N. Heavy Traffic, 5 INCH THICK - Discoil & Assembly 50400				SY	\$58	\$599,314
Soli Residual Herbicide	HMA CL 1/2 IN. Heavy Traffic, 5 INCH THICK - Driscoll & Assembly	50400	8,244	SY	\$37	\$305,028
Pavement Repair Excavation Including Haul Sol 40320 534 SY Sol 52 Subtotal: Subtotal: Sol 50000 Sol 500000 Sol 5000000 Sol 5000000000000000000000000000000000000						\$45,390
Common Concrete Curb Wall						\$18,577 \$21,360
Comment Concrete Curb Wall	r avernent repair Excavatori including riadi	3040320	334	01		\$989,669
Subtolaries	10 10 1 W II				005	407.00 5
Adjust Existing MH, CB, DW or Grate Intel in Asphalt or Concrete 750c2 6	Cement Concrete Curb wall	6020080	325	LF		\$27,625 \$27,62 5
Catch basin Type 1 7050221 14 EA \$3,500 \$4 Mill or DW Frame & Cover 7050282 20 EA \$1,300 \$2 Valve Box and Cover 7050283 12 EA \$550 \$ ConnedIn. Dia. Pipe to Existing CB, DW or MH 7050292 7 FA \$550 \$ ConnedIn. Dia. Sewer Pipe & In. Dian. 705032 3 EA \$750 \$ Catch Basin Ducile fron Sewer Pipe & In. Dian. 7080082 40 LF \$5500 \$ Catch Basin Ducile fron Sewer Pipe & In. Dian. 7080082 400 LF \$5500 \$ Catch Basin Ducile fron Sewer Pipe & In. Dian. 8020000 1 LS \$55000 \$ Catch Basin Ducile fron Sewer Pipe & In. Dian. 80202000 40 LF \$515000 \$ Catch Basin Ducile fron Sewer Pipe & In. Dian. 80202000 1 LS \$150000 \$ Catch Basin Ducile fron Sewer Pipe & In. Dian. 80202000 1 LS \$150000 \$ \$ \$2	Division 7 - Drainage Structure	es, Storm Sewers, Sanita	ry Sewers, Wat	er main		* ,*
Mil of DW Fraime & Cover 705028						\$4,800
Valve Box and Cover						\$49,000 \$26,000
Connect In. Dia. Sewer Pipe to Existing Sewer Pipe 705032						\$7,800
Trench Safety						\$5,950
Catch Basin Ductile Iron Sewer Pipe 8 In. Diam. 7080082 400 LF Subtotal: Sub						\$2,250
Division 8 - Miscellaneous Construction S12 S12 S15,000 S1 Copsol Type A, 2 Inch Thick 8020000 1 LS S15,000 S1 Copsol Type A, 2 Inch Thick 8020010 3,889 SY S8 S2 S5 S8 S5 S8 S2 S5 S8 S8 S2 S5 S8 S8 S2 S8 S8 S2 S8 S8						\$5,000 \$34,000
Landscaping						\$134,800
Topsoil Type A, 2 Inch Thick					Φ4F 000	¢45,000
Hydroseeling						\$15,000 \$21,534
Irrigation System - new and modify 8030000 1 LS \$15,000 \$1 Cement Concrete Curb and/or Gutter 80400 3,425 LF \$45 \$15 \$						\$7,280
Cement Concrete Curb and/or Gutter 80400_ 3.425						\$53,325
Cement Concrete Driveway 80600000						\$15,000 \$154,125
Cement Concrete Driveway Transition						\$18,430
Ramp Detectable Warring 1140040 152 SF \$35		8060020	50	SY	\$90	\$4,500
Summarian Summ						\$197,730
Illumination System (Street Lights)						\$5,320
Communication Conduit System S200060 3,100 LF \$50 \$15 \$15 \$34 \$15 \$35 \$34 \$350070 \$3,100 LF \$350 \$15 \$35 \$35 \$350070 \$3,100 LF \$350 \$350070 \$						\$800,000 \$50,000
Communication Cables and Interfaces \$200070 3,100 LF \$15 \$4						\$155,000
Pawement Marking (Durable Heat Applied, Inlay Tape, Durable, Paint) 82200_0 1	Communication Cables and Interfaces		3,100		\$15	\$46,500
Reinforced Doweled Curb Reinforced Doweled Reinforced Doweled Curb Reinforced Doweled Cu						\$20,000
Traffic Island Concrete - 4 Inch Thick 8910050 1,525 SY \$70 \$10 Traffic Island Fill - CSTC \$2 \$150 \$2 Legacy ICM Items Utility Relocate - power pole 6 EA \$5,000 \$3 Scope Contingency 20.0% Construction Subtotal \$4,69 Scope Contingency 20.0% Construction Subtotal \$5,60 Construction Contingency 15.0% Construction Subtotal \$5,60 Construction total Construction total Construction Total \$6,48 Property Purchase Geotech 0.5% \$3 Surveying 1.0% \$3 Design & Bid Docs 7.0% \$45 Admin, Legal, & Permits 1.5% Project Total \$8,10 Construction Mgmt Unit costs from year For Program Project Total \$8,10						\$74,000 \$162,500
Traffic Island Fill - CSTC						\$106,750
Utility Relocate - power pole	Traffic Island Fill - CSTC		170	CY		\$25,500
Utility Relocate - power pole 6 EA subtotal: \$3 subtotal: \$3 \$5,000 \$3 \$3 \$4,69 \$6,69 \$6,69 \$6,69 \$93 \$6,69 \$6,69 \$6,69 \$6,69 \$6,69 \$6,48 \$6,45 \$6,48 \$6,48 \$6,45 <		Legacy ICM Items			Subtotal:	\$1,932,494
Scope Contingency 20.0% \$93 \$93 \$5,60 \$60 \$5,60 \$6	Utility Relocate - power pole		6	EA		\$30,000
Scope Contingency 20.0% \$93 \$93 \$20.0% \$5,60 \$84 \$6,48 \$60 \$6,48						\$30,000 \$4,696,004
Construction Subtotal \$5,63						* 1,000,000
Construction Subtotal \$5,63	Scope Contingency		20.00/			¢020.204
Construction Contingency	Scope Condingency		20.0%		Construction Subtotal	\$939,201 \$5,635,20 5
Property Purchase Geotech 0.5% \$3 Surveying 1.0% \$6 Design & Bid Docs 7.0% \$45 Admin, Legal, & Permits 1.5% \$97 Construction Mgmt 15.0% Project Total \$8,10 Unit costs from year for construction in 2025 2027			15.0%		Į.	\$845,281
September Sept	Construction total				Construction Total	\$6,480,486
Surveying 1.0% \$6 Design & Bid Docs 7.0% \$45 Admin, Legal, & Permits 1.5% \$9 Construction Mgmt 15.0% Project Total \$8,10 Propert Total \$8,10 For Program Preconstruction 648 \$699,892 Property Purchase 0 \$0						\$0
Design & Bid Docs 7.0% \$45						\$32,402 \$64,805
Admin, Legal, & Permits 1.5% \$9 Construction Mgmt 15.0% Project Total \$8.10 Unit costs from year for construction in 2025 2027 Preconstruction 648 \$699,892 Property Purchase 0 \$0						\$64,805 \$453,634
Visit Costs from year For Construction in For Program	Admin, Legal, & Permits		1.5%			\$97,207
Unit costs from year for construction in 2025 2027 For Program Preconstruction 648 \$699,892 Property Purchase 0 \$0	Construction Mgmt		15.0%		Project Total	\$972,073 \$8,100,607
For Program 2025 2027 Preconstruction 648 \$699,892 Property Purchase 0 \$0		Unit co	sts from year		•	ψυ, ι υυ, υυ /
Preconstruction 648 \$699,892 Property Purchase 0 \$0					2027	
Property Purchase 0 \$0			040		#coo oco	
Const mgmt 972 \$1,049,839			972		\$1,049,839	
8,101 \$8,748,655 Project Cost			8,101		\$8,748,655 Pr	oject Cost

Crash Type	Cost
Fatality (K)	\$11,295,400
Suspected Serious Injury (A)	\$655,000
Suspected Minor Injury (B)	\$198,500
Possible Injury (C)	\$125,600
Property Damage Only (O)	\$11,900
CMF ID:	7966
CMF	0.541
CRF	0.459

From 2017 FHWA guidance

Net Benefits (B = WB - C)

Benefit to Cost Ratio

Source:

Crash Costs for Highway Safety Analysis, January 2018

For WSDOT facilities only

Crash Type	2018-2023	Crash Costs	CMF	Expected Crashes	Difference	Crash Benefits
Fatality (K)	0	\$0	0.54	0.00	0.00	\$0
Suspected Serious Injury (A)	1	\$655,000	0.54	0.54	0.46	\$300,645
Suspected Minor Injury (B)	8	\$1,588,000	0.54	4.33	3.67	\$728,892
Possible Injury (C)	14	\$1,758,400	0.54	7.57	6.43	\$807,106
Property Damage Only (O)	16	\$190,400	0.54	8.66	7.34	\$87,394
Total Crash Costs	39	\$4,191,800		21.099	17.901	\$1,924,036
Project Costs (C)	\$8,748,655					
Worth of Benefits (WB)	\$23,049,954					

\$14,301,298

Crash Type	Cost
Fatality (K)	\$11,295,400
Suspected Serious Injury (A)	\$655,000
Suspected Minor Injury (B)	\$198,500
Possible Injury (C)	\$125,600
Property Damage Only (O)	\$11,900
CMF ID:	10082
CMF	0.623
CRF	0.377

From 2017 FHWA guidance

Net Benefits (B = WB - C)

Benefit to Cost Ratio

Source:

Crash Costs for Highway Safety Analysis, January 2018

For WSDOT facilities only

Crash Type	2018-2023	Crash Costs	CMF	Expected Crashes	Difference	Crash Benefits
Fatality (K)	0	\$0	0.62	0.00	0.00	\$0
Suspected Serious Injury (A)	1	\$655,000	0.62	0.62	0.38	\$246,935
Suspected Minor Injury (B)	8	\$1,588,000	0.62	4.98	3.02	\$598,676
Possible Injury (C)	14	\$1,758,400	0.62	8.72	5.28	\$662,917
Property Damage Only (O)	16	\$190,400	0.62	9.97	6.03	\$71,781
Total Crash Costs	39	\$4,191,800		24.297	14.703	¢1 F80 200
Total Crash Costs	39	\$4,191,800		24.297	14.703	\$1,580,309
Project Costs (C)	\$8,978,173					
Worth of Benefits (WB)	\$18,932,097					

\$9,953,924

Crash Type	Cost
Fatality (K)	\$11,295,400
Suspected Serious Injury (A)	\$655,000
Suspected Minor Injury (B)	\$198,500
Possible Injury (C)	\$125,600
Property Damage Only (O)	\$11,900
CMF ID:	7966
CMF	0.541
CRF	0.459

Net Benefits (B = WB - C)

Benefit to Cost Ratio

Source:

Crash Costs for Highway Safety Analysis, January 2018

For WSDOT facilities only

Crash Type	2018-2023	Crash Costs	CMF	Expected Crashes	Difference	Crash Benefits
Fatality (K)	0	\$0	0.54	0.00	0.00	\$0
Suspected Serious Injury (A)	1	\$655,000	0.54	0.54	0.46	\$300,645
Suspected Minor Injury (B)	8	\$1,588,000	0.54	4.33	3.67	\$728,892
Possible Injury (C)	10	\$1,256,000	0.54	5.41	4.59	\$576,504
Property Damage Only (O)	16	\$190,400	0.54	8.66	7.34	\$87,394
Total Crash Costs	35	\$3,689,400		18.935	16.065	\$1,693,435
Project Costs (C)	\$4,905,322					
Worth of Benefits (WB)	\$20,287,347					
From 2017 FHWA guidance						

\$15,382,025

Crash Type	Cost
Fatality (K)	\$11,295,400
Suspected Serious Injury (A)	\$655,000
Suspected Minor Injury (B)	\$198,500
Possible Injury (C)	\$125,600
Property Damage Only (O)	\$11,900
CMF ID:	10082
CMF	0.623
CRF	0.377

Net Benefits (B = WB - C)

Benefit to Cost Ratio

Source:

Crash Costs for Highway Safety Analysis, January 2018

For WSDOT facilities only

Crash Type	2018-2023	Crash Costs	CMF	Expected Crashes	Difference	Crash Benefits
Fatality (K)	0	\$0	0.62	0.00	0.00	\$0
Suspected Serious Injury (A)	1	\$655,000	0.62	0.62	0.38	\$246,935
Suspected Minor Injury (B)	8	\$1,588,000	0.62	4.98	3.02	\$598,676
Possible Injury (C)	10	\$1,256,000	0.62	6.23	3.77	\$473,512
Property Damage Only (O)	16	\$190,400	0.62	9.97	6.03	\$71,781
Total Crash Costs	35	\$3,689,400		21.805	13.195	\$1,390,904
Project Costs (C)	\$5,921,856					
Worth of Benefits (WB)	\$16,663,028					
From 2017 FHWA guidance						

\$10,741,171