Project Development and Environment Study

US 41/SR 45/South 50th St at CSX Grade Separation

Project Traffic Analysis Report Supplement

For Alternative 1F – At-Grade Intersection Option

Financial Project ID: 440749-1-22-01
Hillsborough County

Prepared for the
Florida Department of Transportation
District Seven

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The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated May 26,2022 and executed by the Federal Highway Administration and FDOT.

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1.0 INTRODUCTION

In 2019, a US 41/SR 45/South 50th Street at CSX Grade Separation Project Traffic Analysis Report (PTAR) documented the grade-separation roadway improvement alternatives developed for the US 41/ SR 45/South 50th Street ("US 41") corridor from south of Causeway Boulevard to north of Causeway Boulevard in Hillsborough County. The corridor experiences traffic delays and queuing as a result of train traffic at the CSX Railroad crossing (M.P. 23.271) south of Causeway Boulevard and is a major route for trucks traveling to and from Port Tampa Bay.

The 2019 PTAR (provided in **Appendix A**) developed and documented grade-separated roadway improvement alternatives that addressed the traffic delays and queuing on US 41/SR 45/South 50th Street ("US 41") associated with the CSX Railroad crossing south of Causeway Boulevard and that adequately supported the safe movement of truck traffic through the project corridor. Improvements carried over to the intersection of US 41 and Causeway Boulevard, which experiences traffic delays and queuing separate from the CSX Railroad crossing as a result of heavy traffic and low capacity. Alternative operations for AM and PM peak periods were evaluated for existing (2018), opening (2026), interim (2036), and design (2046) year traffic volumes.

Since the writing of the PTAR an additional alternative (Alternative 1F – At-Grade Intersection Option) has been proposed for the US 41 corridor with an expanded study area from south of Denver Street to north of 23rd Avenue. Alternative 1F includes the grade separated crossing for the CSX railroad but keeps the intersection at US 41 and Causeway Boulevard at-grade. It adds an access road west of the overpass to allow truck traffic and other vehicles into the businesses along US 41 and adds signals at the US 41 and Hartford Street intersection and at the 47th Street and Causeway Boulevard intersection. A ramp from northbound US 41 to 36th Avenue will also provide entrance to the access road and businesses.

This supplemental report evaluates operations (delays and queues) for Alternative 1F at the US 41 and Causeway Boulevard signalized intersection and the new signalized intersections at Hartford Street and 47th Street for an opening year (2026), interim year (2036), and design year (2046), in both the AM and PM peak hour. To support the analysis, traffic volumes were developed for the Hartford Street and 47th Street intersections. The study area is shown in **Figure** 1.1.

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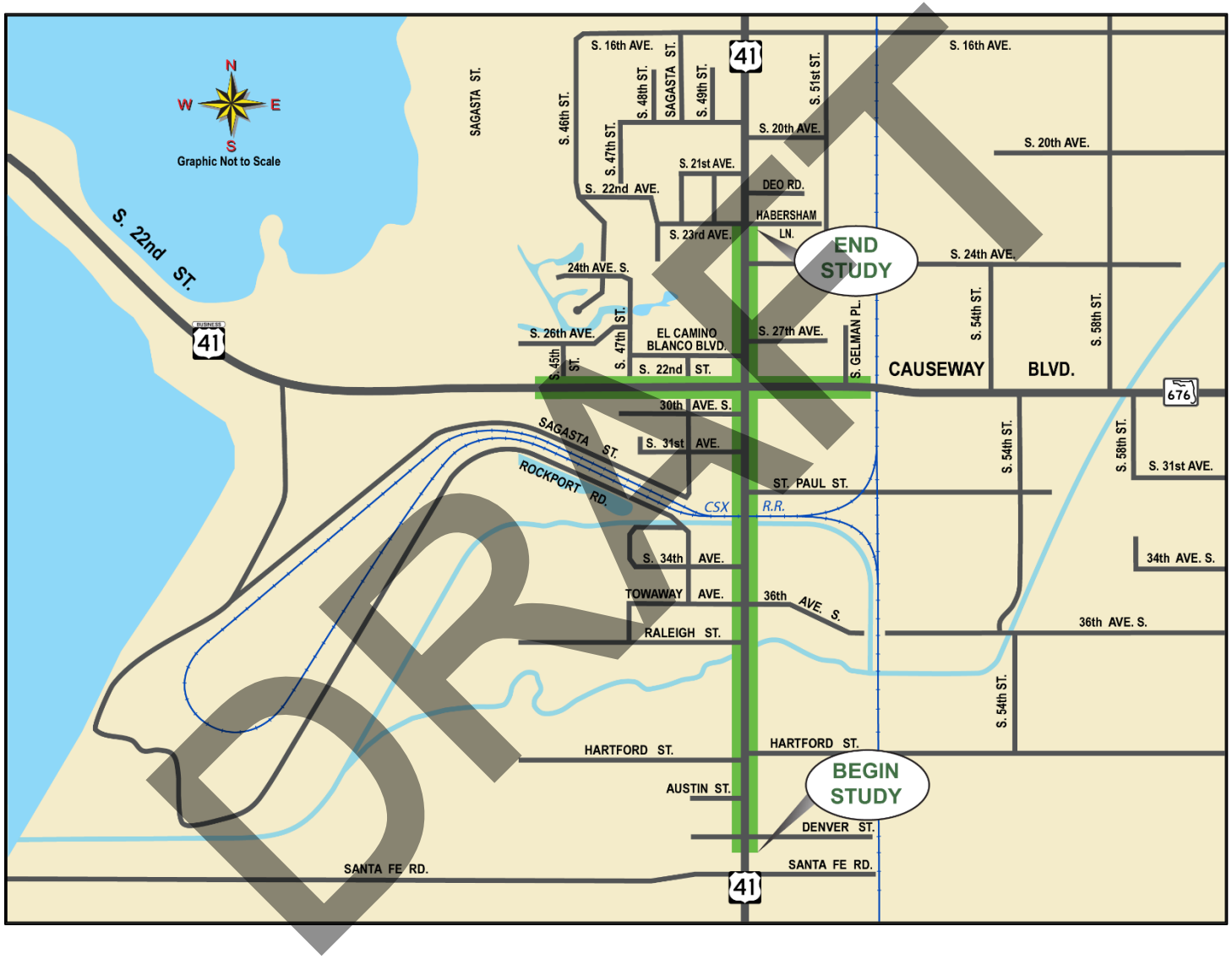
Figure 1.1. Study Area



1.1 ALTERNATIVE 1F – AT-GRADE INTERSECTION OPTION DESCRIPTION

Alternative 1F allows for grade-separation of US 41 over the CSX Railroad crossing south of Causeway Boulevard, safe movement of truck traffic through the area, and potential ability to reduce delay at the intersection of US 41 and Causeway Boulevard which are specified as goals in the 2019 PTAR. With grade-separation of US 41 over the CSX Railroad crossing, this alternative can relieve delay and congestion associated with train traffic.

The alternative includes:

- Grade-separation of US 41 in each direction over the CSX Railroad crossing, 36th Avenue/Towaway Avenue, and St. Paul Street.
- Additional left and right turn lanes at US 41 and Causeway Boulevard intersection.
- Signalization of US 41 at Hartford Street.
- Signalization of Causeway Boulevard at 47th Street.
- Six-lane typical sections on US 41.
- Four-lane typical sections on Causeway Boulevard.
- At-grade frontage roads along the west side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners.
    - Frontage road access from US 41 provided at Hartford Street, 36th Avenue/Towaway Avenue, and at the intersection of US 41 and Causeway Boulevard.
    - Frontage Road access from Causeway Boulevard is provided at 47th Street.
    - Access to adjacent parcels in the northeast and northwest corners would be allowed via driveways on mainline US 41 and mainline Causeway Boulevard.

The conceptual plans for the alternative are shown in **Appendix B**.

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2.0 VOLUME DEVELOPMENT

The 2019 PTAR developed volumes for US 41 and Causeway Boulevard and their intersection for AM and PM peak hours for the opening year (2026), interim year (2036), and design year (2046). The AM and PM peak hours identified in the PTAR were 7:30 to 8:30 AM and 4:45 to 5:45 PM. Because Alternative 1F has the US 41 and Causeway Boulevard intersection at grade, the no-build volumes from the PTAR were used as a starting point for volume development.

No traffic counts were available for 47th Street or Hartford Street. Due to the nature of the development along the access roads from Hartford Street to 47th Street, it was determined that trip generation would provide a reasonable estimate of the volumes using the access roads. Additionally, at Hartford Street, the volume for the east leg of the intersection with US 41 was estimated using volume from a similar roadway in the area because trip generation alone would not capture the volume flowing through the area. These methods are explained in more detail below.

For Hartford Street volumes, Florida Traffic Online was used to identify a roadway similar to Hartford Street that could provide an estimate of AADT. Palm River Road north of Causeway Boulevard (cosite 109047) was chosen because it also travels east west and does not directly connect to the Selmon Expressway or I-75. Growth rates from the 2019 PTAR were applied to the 2018 AADT to estimate AADTs for the analysis years. Approach volumes were calculated from the AADTs using K and D factors from the 2019 PTAR.

Trip Generation 9th edition worksheets from the Institute of Transportation Engineers (ITE) were consulted to develop incoming and outgoing volumes from all businesses on both sides of US 41 from Hartford Street to Causeway Boulevard and from 47th Street to US 41. K and D factors were applied to the AM and PM in and out volumes to determine how many vehicles would be travelling north, south, east or west to or from the business. These directional volumes were used to estimate turning movements onto and from the access roads and ramp and ultimately back to the signalized intersections on US 41 and Causeway Boulevard. The resulting turn volumes were balanced through the network and used for operational analysis. It was assumed in the volume development that the access roads would be used only for vehicles going to and from the local businesses and not used as an alternate route for vehicles to maneuver around the US 41 and Causeway Boulevard intersection. The volume development memo is provided in **Appendix C.**

The final balanced volumes used in the analysis are provided in **Figure** 2.1, **Figure** 2.2, and **Figure** 2.3.

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Figure 2.1 Balanced Volumes (2026 Opening Year)

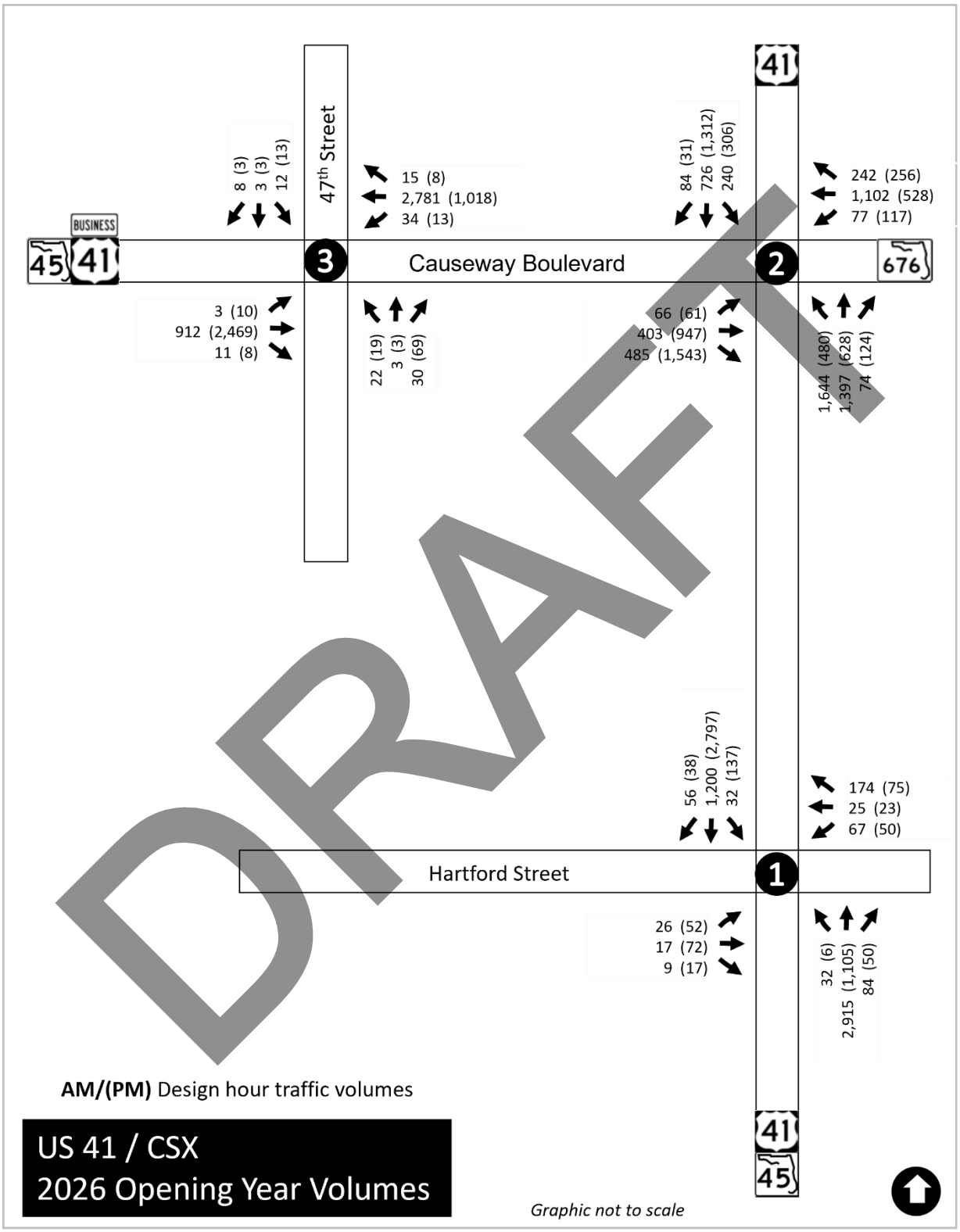


Figure 2.2 Balanced Volumes (2036 Interim Year)

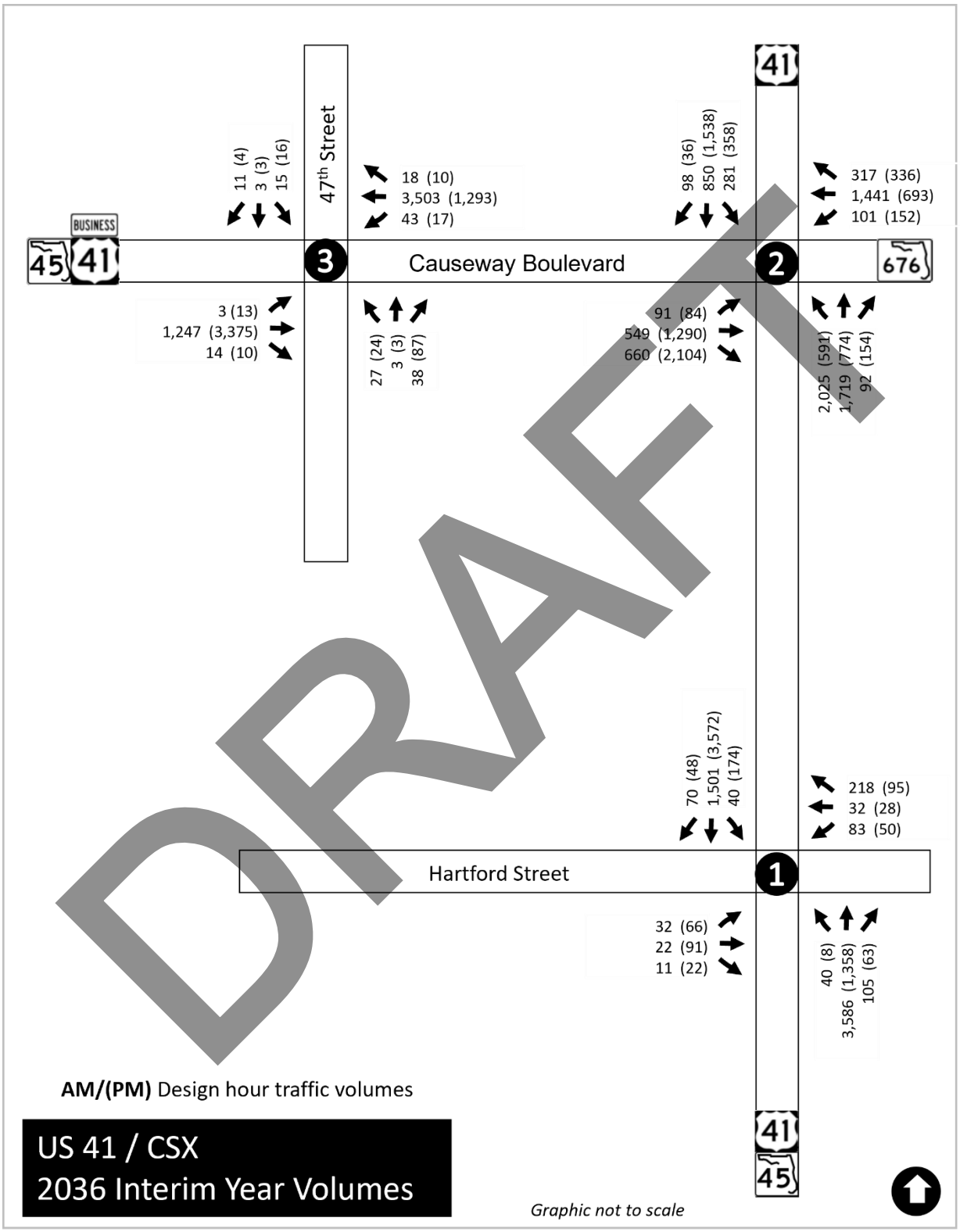
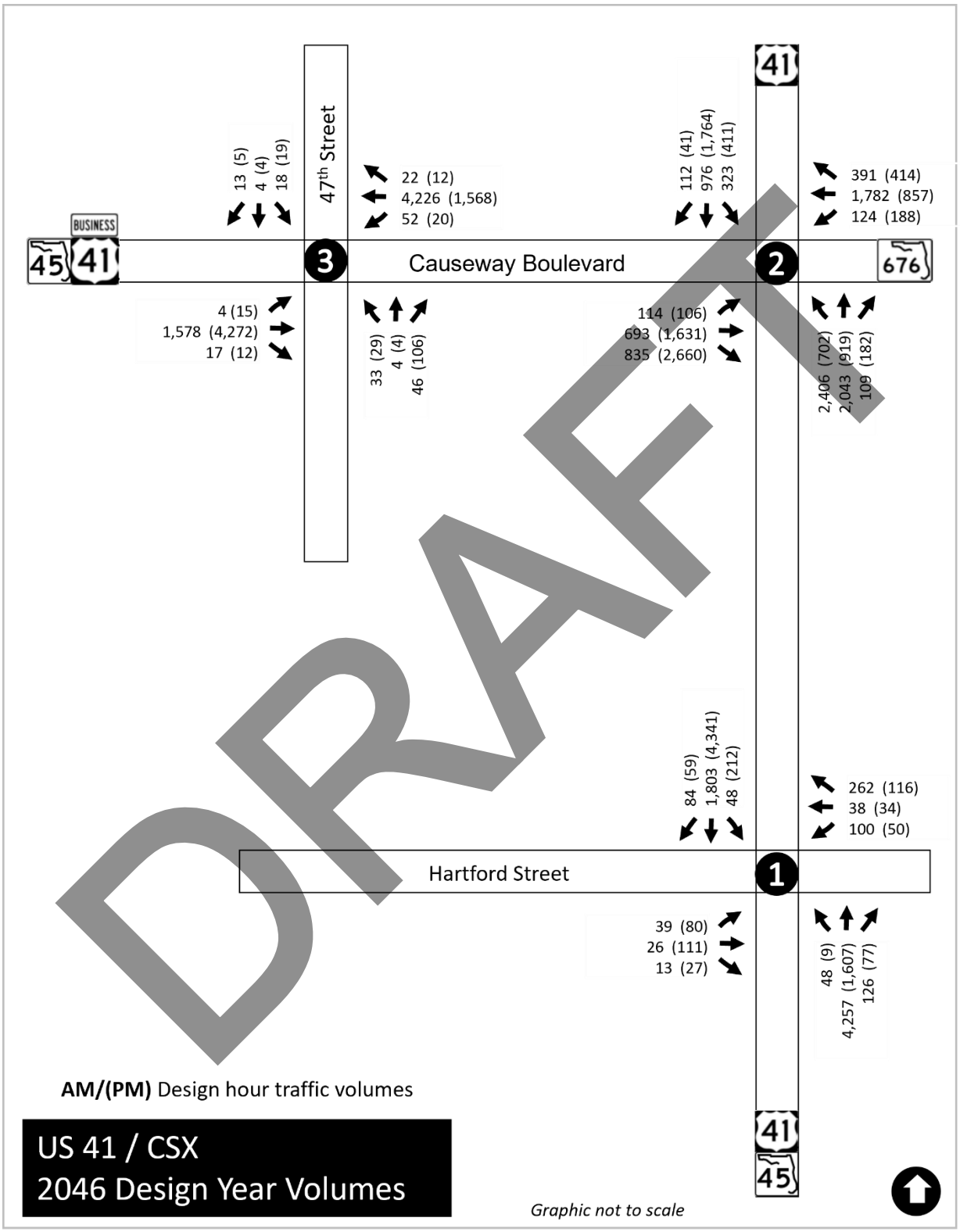


Figure 2.3 Balanced Volumes (2046 Design Year)



3.0 ALTERNATIVE 1F ANALYSIS

*Synchro (*version 11) was used for operational analysis of the study intersections. The purpose of the project is to reduce traffic delays associated with the CSX Railroad crossing and the intersection of US 41 at Causeway Boulevard, adequately support the safe movement of truck traffic, and enhance connectivity among bicyclists and pedestrians. This is achieved through grade-separation of US 41 over the CSX Railroad crossing, St. Paul Street, and 36th Avenue/Towaway Avenue with related improvements provided at the intersections of US 41 at Causeway Boulevard and Hartford Street, and 47th Street at Causeway Boulevard, as well as an access road west of US 41 with connections to US 41 and Causeway Boulevard at Hartford Street, 36th Avenue, the intersection of US 41 and Causeway Boulevard and 47th Street.

3.1 GEOMETRY

Alternative 1F includes six-lane typical sections (three lanes per direction) for US 41, with each direction grade-separated at the CSX Railroad crossing south of Causeway Boulevard. Causeway Boulevard has four-lane typical sections (two lanes per direction) with an additional westbound lane to accommodate three northbound left turn lanes from US 41 to Causeway Boulevard to 47th Street. The added westbound lane becomes a right turn only lane at 47th Street, and Causeway Boulevard returns to two westbound through lanes west of 47th Street. The design speeds for US 41 and Causeway Boulevard are assumed to be 50 mph and 45 mph respectively.

The intersection of US 41 at Causeway Boulevard has added turn lanes for all turning movements to accommodate future traffic volumes and added signals at the US 41 and Hartford Street intersection and at the Causeway Boulevard and 47th Street intersection. The lane configurations for Alternative 1F are included in **Figure** 3.1.

3.2 SIGNAL TIMING

The intersection at US 41 at Causeway Boulevard was analyzed with lead-lag phasing for the northbound and southbound left-turns. Right-turn-on-red (RTOR) was disallowed for the eastbound triple right turns. The signals at 47th Street and at Hartford Street were analyzed with *Synchro's* HCM 6th signalized reporting options. The three signals were set to Actuated-uncoordinated, and *Synchro*'s "Optimize Cycle Length" tool was used to develop the cycle length, split times, and phase order for each analysis year, with a minimum cycle length of 120 seconds defined for this alternative. Manual adjustments to the timing were made in some cases to further reduce the delay.

3.3 ACCESS MANAGEMENT

Under this alternative access to and from parcels south of Causeway Boulevard would be provided with a frontage road along the west side of US 41 with an underpass provided at 36th Street. Design speeds for the frontage roads are assumed to be 30 mph. Access to western parcels from northbound US 41 is provided with frontage road access at Hartford Street and a ramp to 36th Street. Dedicated movements to the frontage road at the intersection of US 41 and Causeway Boulevard are available for vehicles travelling eastbound, westbound, and southbound. Access to the parcels south of Causeway Boulevard

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from westbound Causeway Boulevard are provided from the 47th Street intersection. Eastbound vehicles on Causeway Boulevard may use existing driveways.

3.4 Roadway Segment Analysis

The roadway segment analysis for Alternative 1F was conducted by utilizing the methodology described in FDOT's *Quality/Level of Service Handbook* and the Generalized Volumes tables to develop LOS based on AADT and DDHVs for each segment. Results are presented in **Table** 3:1. The results for Alternative 1F indicate that for the opening year, two segments along Causeway Boulevard are expected to operate at LOS F based on AADT. For the interim year, five segments along US 41 and five segments along Causeway Boulevard are expected to operate at LOS F based on AADT. For the design year, six segments along US 41 and seven segments along Causeway Boulevard are expected to fail based on AADT.

3.5 Intersection Operational Analysis

The operational results of the *Synchro* analysis, including delay (seconds per vehicle) and LOS for Alternative 1F for opening, interim, and design years are presented in **Table 3:2**. The signalized intersections of US 41 at Hartford Street, US 41 at Causeway Boulevard, and Causeway Boulevard at 47th Street were evaluated. *Synchro* reports are included in **Appendix D**. The results indicate:

- The intersection of US 41 at Hartford Street is expected to operate at overall LOS C for the opening year, LOS F/E during the AM/PM peak hours for the interim year, and LOS F for the design year.
- The intersection of US 41 at Causeway Boulevard is expected to operate at overall LOS F/E during the AM/PM peak hours for the opening year, and LOS F for the interim and design years.
- The intersection of Causeway Boulevard at 47th Street is expected to operate at overall LOS E/D during the AM/PM peak hours for the opening year, and LOS F for the interim and design years.

3.6 Design Year Queuing Analysis

Synchro was used to generate 95th percentile queues for all three analysis years. Available right-of-way and geometric limitations were taken into consideration when recommending storage lengths. **Table 3:**3 shows the 95th percentile queue lengths and recommended storage lengths in feet for Alternative 1F. Detailed *Synchro* queuing reports are provided in **Appendix E.**

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Figure 3.1. Alternative 1F Lane Configuration

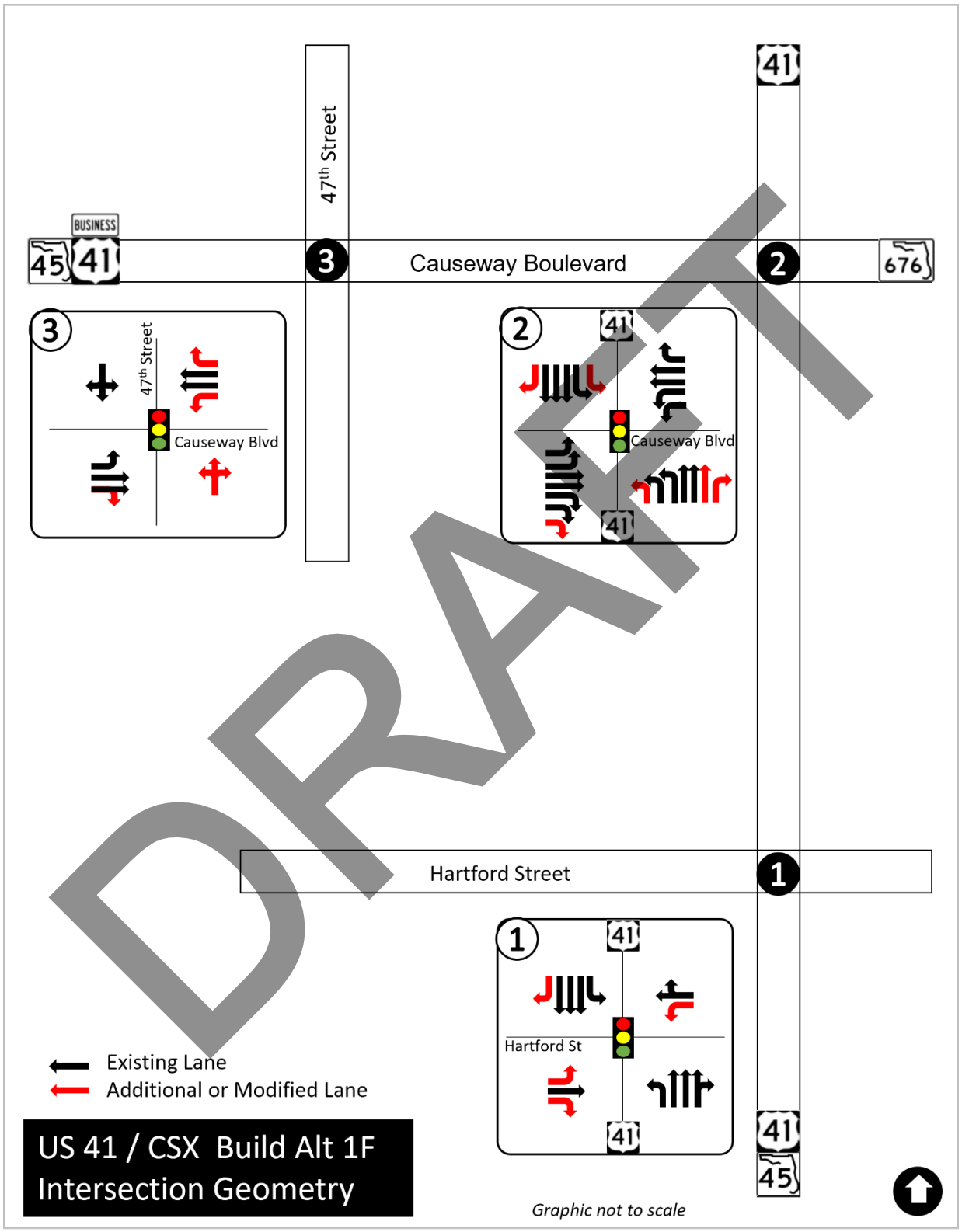

Table 3:1. Alternative 1F Opening, Interim, and Design Year Roadway Segment Analysis

2026						
Roadway / Segment	Total Lanes	Posted Speed (mph)	AM Peak Hour		PM Peak Hour	
			Volume (vph)	LOS	Volume (vph)	LOS
US 41						
Southbound, North of Causeway Boulevard	3	50	1,050	C	1,649	C
Northbound, North of Causeway Boulevard	3	50	1,705	C	945	C
Southbound, South of Causeway Boulevard	3	50	1,288	C	2,972	D
Northbound, South of Causeway Boulevard	3	50	3,115	F	1,232	C
Southbound, North of Hartford Street	3	50	1,288	C	2,972	D
Northbound, North of Hartford Street	3	50	3,115	F	1,232	C
Southbound, South of Hartford Street	3	50	1,276	C	2,864	C
Northbound, South of Hartford Street	3	50	3,031	F	1,161	C
Causeway Boulevard						
Westbound, West of US 41	3	45	2,830	C	1,039	C
Eastbound, West of US 41	2	45	954	C	2,551	F
Westbound, East of US 41	2	45	1,421	C	901	C
Eastbound, East of US 41	2	45	717	C	1,377	C
Westbound, West of 47th Street	2	45	2,811	F	1,040	C
Eastbound, West of 47th Street	2	45	926	C	2,487	F
Westbound, East of 47th Street	2	45	2,830	F	1,039	C
Eastbound, East of 47th Street	2	45	954	C	2,551	F
2036						
Roadway / Segment	Total Lanes	Posted Speed (mph)	AM Peak Hour		PM Peak Hour	
			Volume (vph)	LOS	Volume (vph)	LOS
US 41						
Southbound, North of Causeway Boulevard	3	50	1,229	C	1,932	C
Northbound, North of Causeway Boulevard	3	50	2,127	C	1,194	C
Southbound, South of Causeway Boulevard	3	50	1,611	C	3,794	F
Northbound, South of Causeway Boulevard	3	50	3,836	F	1,519	C
Southbound, North of Hartford Street	3	50	1,611	C	3,794	F
Northbound, North of Hartford Street	3	50	3,836	F	1,519	C
Southbound, South of Hartford Street	3	50	1,595	C	3,644	F
Northbound, South of Hartford Street	3	50	3,731	F	1,429	C
Causeway Boulevard						
Westbound, West of US 41	3	45	3,564	F	1,320	C
Eastbound, West of US 41	2	45	1,300	C	3,478	F
Westbound, East of US 41	2	45	1,859	C	1,181	C
Eastbound, East of US 41	2	45	922	C	1,802	C
Westbound, West of 47th Street	2	45	3,541	F	1,321	C
Eastbound, West of 47th Street	2	45	1,264	C	3,398	F
Westbound, East of 47th Street	2	45	3,564	F	1,320	C
Eastbound, East of 47th Street	2	45	1,300	C	3,478	F

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Table 3.1 Alternative 1F Opening, Interim, and Design Year Roadway Segment Analysis (Continued)

2046						
Roadway / Segment	Total Lanes	Posted Speed (mph)	AM Peak Hour		PM Peak Hour	
			Volume (vph)	LOS	Volume (vph)	LOS
US 41						
Southbound, North of Causeway Boulevard	3	50	1,411	C	2,216	C
Northbound, North of Causeway Boulevard	3	50	2,548	C	1,439	C
Southbound, South of Causeway Boulevard	3	50	1,935	C	4,612	F
Northbound, South of Causeway Boulevard	3	50	4,558	F	1,803	C
Southbound, North of Hartford Street	3	50	1,935	C	4,612	F
Northbound, North of Hartford Street	3	50	4,558	F	1,803	C
Southbound, South of Hartford Street	3	50	1,916	C	4,418	F
Northbound, South of Hartford Street	3	50	4,431	F	1,693	C
Causeway Boulevard						
Westbound, West of US 41	3	45	4,300	F	1,600	C
Eastbound, West of US 41	2	45	1,642	C	4,397	F
Westbound, East of US 41	2	45	2,297	F	1,459	C
Eastbound, East of US 41	2	45	1,125	C	2,224	F
Westbound, West of 47th Street	2	45	4,272	F	1,602	C
Eastbound, West of 47th Street	2	45	1,599	C	4,299	F
Westbound, East of 47th Street	2	45	4,300	F	1,600	C
Eastbound, East of 47th Street	2	45	1,642	C	4,397	F

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Table 3:2. Alternative 1F Opening, Interim, and Design Year Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour	
		AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
US 41 at Hartford St (Signalized)	EBL	26	52	65.5	E	47.5	D	32	66	69.2	E	58	E	39	80	75.5	E	59.7	E
	EBT	17	72	47.3	D	41.1	D	22	91	45.5	D	47.7	D	26	111	44.5	D	46.7	D
	EBR	9	17	47.1	D	39.2	D	11	22	45.3	D	45.3	D	13	27	44.2	D	44.0	D
	EB Approach	52	141	56.3	E	43.2	D	65	179	57.1	E	51.2	D	78	218	59.9	E	51.1	D
	WBL	67	50	50.9	D	44.8	D	83	50	49.8	D	52.7	D	100	50	49.5	D	52.1	D
	WBT	25	23	59.9	A	43.2	A	32	28	64.8	A	50.3	A	38	34	73.3	A	49.4	A
	WBR	174	75		E		D	218	95		E		D	262	116		E		D
	WB Approach	266	148	57.6	E	43.7	D	333	173	61.1	E	51	D	400	200	67.4	E	50.1	D
	NBL	32	6	86.4	F	73.1	E	40	8	90.5	F	81.1	F	48	9	90.0	F	82.3	F
	NBT	2,915	1,105	36.5	D	14.2	B	3,586	1,358	149.9	F	19.3	B	4,257	1,607	290.4	F	27.2	C
	NBR	84	50	46.3	D	14.9	B	105	63	161.1	F	20.3	C	126	77	302.8	F	29.4	C
	NB Approach	3,031	1,161	40.5	D	14.7	B	3,731	1,429	153.2	F	20	B	4,431	1,693	292.6	F	28.2	C
	SBL	32	137	86.4	F	53.9	D	40	174	102.6	F	64.2	E	48	212	115.5	F	76.2	E
	SBT	1,200	2,797	12.0	B	21.9	C	1,501	3,572	16.9	B	97.1	F	1,803	4,341	22.8	C	233.7	F
	SBR	56	38	9.1	A	6.6	A	70	48	11.7	B	7.5	A	84	59	14.2	B	9	A
	SB Approach	1,288	2,972	13.7	B	23.1	C	1,611	3,794	18.8	B	94.5	F	1,935	4,612	24.7	C	223.6	F
	OVERALL	**4,637**	**4,422**	**34.2**	C	**22.3**	C	**5,740**	**5,575**	**109.0**	F	**72.7**	E	**6,844**	**6,723**	**201**	F	**163.6**	F
US 41 at Causeway Blvd (Signalized)	EBL	66	61	130.1	F	111.9	F	91	84	197.0	F	119.4	F	114	106	285.6	F	161.1	F
	EBT	403	947	61.5	E	145.0	F	549	1,290	66.6	E	323.3	F	693	1,631	75	E	502.8	F
	EBR	485	1,543	20.6	C	79.3	E	660	2,104	22.1	C	234.1	F	835	2,660	23.9	C	397.9	F
	EB Approach	954	2,551	45.4	D	104.5	F	1,300	3,478	53.2	D	264.4	F	1,642	4,397	63.6	E	431.1	F
	WBL	77	117	149.7	F	115.7	F	101	152	223.1	F	167.1	F	124	188	320.8	F	252.5	F
	WBT	1,102	528	219.0	F	59.7	E	1,441	693	397.4	F	68.9	E	1,782	857	579.1	F	92.4	F
	WBR	242	256	50.5	D	42.7	D	317	336	53.2	D	45.5	D	391	414	57	E	48	D
	WB Approach	1,421	901	186.5	F	62.1	E	1,859	1,181	329.2	F	74.9	E	2,297	1,459	476.2	F	100.4	F
	NBL	1,644	480	136.7	F	66.5	E	2,025	591	251.0	F	69.6	E	2,406	702	368.8	F	74.2	E
	NBT	1,397	628	42.9	D	37.9	D	1,719	774	52.4	D	41.8	D	2,043	919	85.6	F	46.3	D
	NBR	74	124	27.7	C	30.8	C	92	154	29.6	C	33.7	C	109	182	31.6	C	36.8	D
	NB Approach	3,115	1,232	92.0	F	48.3	D	3,836	1,519	156.7	F	51.8	D	4,558	1,803	233.8	F	56.2	E
	SBL	240	306	99.2	F	89.8	F	281	358	97.8	F	88.7	F	323	411	97.2	F	88.5	F
	SBT	726	1,312	69.7	E	64.4	E	850	1,538	74.2	E	89.5	F	976	1,764	82.7	F	146.9	F
	SBR	84	31	56.7	E	38.9	D	98	36	57.5	E	38.3	D	112	41	58.5	E	38.6	D
	SB Approach	1,050	1,649	75.4	E	68.6	E	1,229	1,932	78.3	E	88.4	F	1,411	2,216	84.1	F	134.1	F
	OVERALL	**6,540**	**6,333**	**103.1**	F	**78.2**	E	**8,224**	**8,110**	**167.6**	F	**155.1**	F	**9,908**	**9,875**	**240.5**	F	**247.1**	F

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Table 3.2 Alternative 1F Opening, Interim, and Design Year Intersection Operations (continued)

Intersection	Movement/Approach	2026						2036						2046					
		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour	
		AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Causeway Blvd at 47th St (Signalized)	EBL	3	10	60.7	E	66.4	E	3	13	61.4	E	69.6	E	4	15	62.7	E	72.6	E
	EBT	912	2,469	6.3	A	47.8	D	1,247	3,375	8.5	A	211.6	F	1,578	4,272	12.3	B	397.2	F
	EBR	11	8	6.2	A	47.5	D	14	10	8.4	A	212.0	F	17	12	12.2	B	397.9	F
	EB Approach	926	2,487	6.4	A	47.7	D	1,264	3,398	8.6	A	211.3	F	1,599	4,299	12.4	B	396.4	F
	WBL	34	13	83.8	F	68.1	E	43	17	89.1	F	72.1	E	52	20	90.7	F	76.3	E
	WBT	2,781	1,018	83.6	F	7.5	A	3,503	1,293	221.0	F	9.9	A	4,226	1,568	365.3	F	13.4	B
	WBR	15	8	4.0	A	4.8	A	18	10	4.3	A	5.4	A	22	12	4.7	A	6.1	A
	WB Approach	2,830	1,039	83.2	F	8.3	A	3,564	1,320	218.3	F	10.6	B	4,300	1,600	360.1	F	14.1	B
	NBL	22	19	63.5	E	64.3	E	27	24	63.5	E	64.5	E	33	29	63.6	E	64.7	E
	NBT	3	3		A		A	3	3		A		A	4	4		A		A
	NBR	30	69		A		A	38	87		A		A	46	106		A		A
	NB Approach	55	91	63.5	E	64.3	E	68	114	63.5	E	64.5	E	83	139	63.6	E	64.7	E
	SBL	12	13	59.6	E	57.5	E	15	16	59.3	E	56.8	E	18	19	58.9	E	56.0	E
	SBT	3	3		A		A	3	3		A		A	4	4		A		A
	SBR	8	3		A		A	11	4		A		A	13	5		A		A
	SB Approach	23	19	59.6	E	57.5	E	29	23	59.3	E	56.8	E	35	28	58.9	E	56.0	E
	OVERALL	**3,834**	**3,636**	**64.2**	**E**	**36.9**	**D**	**4,925**	**4,855**	**161.4**	**F**	**152.5**	**F**	**6,017**	**6,066**	**261.9**	**F**	**286.4**	**F**

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Table 3:3. Alternative 1F Design Year (2046) 95th Percentile Queues

Intersection	Movement/ Approach	Synchro 95th Percentile Queue (ft.)						Recommended Storage (ft)
		2026		2036		2046		
		AM	PM	AM	PM	AM	PM	
US 41 at Hartford St (Signalized)	EBL	53	77	65	104	82	127	200
	EBT	37	95	44	129	49	152	
	EBR	0	0	0	0	0	0	200
	EB Approach	-	-	-	-	-	-	-
	WBL	106	74	123	81	146	82	200
	WBT	206	65	271	82	346	102	
	WBR							
	WB Approach	-	-	-	-	-	-	-
	NBL	68	18	83	25	97	27	290
	NBT	#1239	247	#1897	381	#2429	509	
	NBR							
	NB Approach	-	-	-	-	-	-	-
	SBL	#74	156	#105	218	#132	#293	360
	SBT	252	#883	408	#1468	540	#2054	
	SBR	9	0	19	4	27	9	595
	SB Approach	-	-	-	-	-	-	-
	OVERALL	-	-	-	-	-	-	-
US 41 at Causeway Blvd (Signalized)	EBL	#92	69	#137	#105	#176	#143	580
	EBT	298	#868	416	#1331	543	#1787	
	EBR	150	#899	211	#1550	280	#2156	715
	EB Approach	-	-	-	-	-	-	-
	WBL	#112	#137	#153	#191	#193	#246	520
	WBT	#1123	374	#1602	510	#2080	#718	
	WBR	182	209	269	297	372	402	330
	WB Approach	-	-	-	-	-	-	-
	NBL	#986	234	#1344	290	#1698	349	940
	NBT	638	259	#927	332	#1243	404	
	NBR	33	83	53	116	71	149	600
	NB Approach	-	-	-	-	-	-	-
	SBL	205	237	232	272	266	313	680
	SBT	375	633	447	#843	#527	#1052	
	SBR	15	0	32	0	48	1	395
	SB Approach	-	-	-	-	-	-	-
	OVERALL	-	-	-	-	-	-	-

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

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Table 3.3. -Alternative 1F Design Year (2046) 95th Percentile Queues (Continued)

Intersection	Movement/ Approach	Synchro 95th Percentile Queue (ft.)						Recommended Storage (ft)
		2026		2036		2046		
		AM	PM	AM	PM	AM	PM	
Causeway Blvd at 47th St (Signalized)	EBL	14	31	14	38	17	42	335
	EBT	246	#1564	410	#2559	675	#3585	0
	EBR							
	EB Approach	-	-	-	-	-	-	-
	WBL	65	35	78	42	91	48	335
	WBT	#1754	233	#2491	367	#3277	568	0
	WBR	0	0	0	0	0	0	0
	WB Approach	-	-	-	-	-	-	-
	NBL	68	85	78	116	101	150	0
	NBT							
	NBR							
	NB Approach	-	-	-	-	-	-	-
	SBL	43	41	49	47	55	53	0
	SBT							
	SBR							
	SB Approach	-	-	-	-	-	-	-
	OVERALL	-	-	-	-	-	-	-

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

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4.0 SAFETY ANALYSIS

A safety analysis was conducted for the study area. The analysis utilized techniques as described by the FDOT State Safety Office (SSO), and crash data obtained from Signal Four Analytics (University of Florida Geoplan Center). The safety analysis will be used to help identify problem areas and crash trends.

4.1 DATA COLLECTION

4.1.1 Reports and Crash Records

Crash records were collected from Signal Four Analytics to conduct the safety analysis. Crash data for the period of 1/1/2015 to 12/31/2019 was downloaded on 10/26/2022. The download date for Signal Four Analytics data is important to note as this site is continually updated and may contain unreported data that was not available or uploaded at the time the data was collected such that subsequent inquiries may vary slightly. The Signal Four Analytics database was used instead of the FDOT Crash Analysis Reporting System (CARS) for the ability to geo-reference the data. Crash data is available in **Appendix F**.

The data shows 372 crashes occurring within the study area during the 5-year period. The majority of crashes in the study area were rear ends (149), followed by sideswipe (75) and angle (71) crashes. Pedestrians were involved in three crashes and bicyclists in eight crashes. There were five fatal crashes, 19 incapacitating injury crashes, 51 non-incapacitating injury crashes, 93 possible injury crashes, and 204 crashes with property damage only. **Table 4:1** lists the comprehensive crash costs by crash severity for the study area.

The data shows that 275 crashes occurred along US 41, 26 crashes occurred along Causeway Boulevard, and 71 crashes occurred within the intersection (i.e., past the stop bar prior to entering another leg) of US 41 and Causeway Boulevard. This gives an approximate crash frequency of 55 crashes per year along US 41, 5 per year along Causeway Boulevard, and 14 per year in the intersection. Crash rates for select roadway segments and intersections are shown in **Table 4:**2. **Table 4:**3 shows the US 41 and Causeway Boulevard segment crash summaries and the US 41 at Causeway Boulevard intersection crash summaries. **Table 4:**4 shows crash summaries for the intersections of US 41 at Hartford Street and Causeway Boulevard at 47th Street.

Most crashes in the study area occurred during daylight hours, peaking between 8:00 and 9:00 AM. Of the five fatal crashes, four of them occurred at night. Two of the fatal crashes were angle type crashes, one was a left turn collision, one was a rear end collision, and one involved a pedestrian. Of the 11 total crashes involving pedestrians or bicyclists, four occurred at night. All eight bicyclist crashes resulted in injuries: one possible injury, four non-incapacitating injuries, and three incapacitating injuries. One of the three pedestrian collisions resulted in a fatality, one resulted in an incapacitating injury, and one had no injuries. The crash data indicated that the fatal collisions and the bicyclist and pedestrian collisions were spread throughout the study area and not localized to a particular problem spot.

Figure 4.1 shows the crashes by time of day. A heat map of the crashes is shown in **Figure** 4.2. **Figure** 4.3 provides a map of all crash locations. **Figure** 4.4 shows the locations of fatal crashes by crash type while

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Figure 4.5 shows the locations of pedestrian and bicyclist crashes in the study area. The diurnal distribution of crashes is shown in **Figure** 4.6.

4.1.2 Train Related Crashes

The number of crashes involving a train was obtained from the Federal Railroad Administration Office of Safety Analysis for the railroad crossing (crossing #624802A) south of the study intersection. The data showed that there were 10 train crashes at this railroad crossing between the year 1976 and 2000. **Appendix G** presents historical train-related crash data. No collisions involving trains have been identified after April 2000.

Table 4:1. FDOT KABCO Crash Costs for the Study Area

Crash Severity	Unit Cost	Number of Crashes	Total
Fatal (K)	$10,230,000	5	$51,150,000
Severe Injury (A)	$580,320	19	$11,026,080
Moderate Injury (B)	$157,170	51	$8,015,670
Minor Injury (C)	$97,650	93	$9,081,450
Property Damage Only (O)	$7,600	204	$1,550,400
Total Cost	-	-	**$80,823,600**

From FDOT Plans Preparation Manual (2017) Vol. 1, Chapter 23, Table 23.6.2.

Table 4:2. Crash Rate Comparisons for Select Segments and Intersections

Location	Total Crashes (2015-2019)*	2019 AADT	Number of Years	Segment Length (mi)	Study Crash Rate	Statewide Crash Rate (2012-2016)	Districtwide Crash Rate (2012-2016)	Hillsborough Countywide Crash Rate (2012-2016)
US 41 from Denver Street to Hartford Street	42	30000	5	0.16	4.7945	4.4315	3.7203	4.1054
US 41 from Hartford Street to Causeway Boulevard	201	33000	5	0.78	4.2788	4.4315	3.7203	4.1054
US 41 from Causeway Boulevard to 23rd Avenue	54	25000	5	0.33	3.5866	4.4315	3.7203	4.1054
Causeway Boulevard west of US 41	22	29000	5	0.44	0.9447	3.4124	3.8293	4.3548
Causeway Boulevard east of US 41	12	21000	5	0.25	1.2524	3.4124	3.8293	4.3548
Intersection of US 41 and Causeway Boulevard	71	54000	5	n/a	0.7204	0.6676	0.6112	0.6429
Intersection of US 41 and Hartford Street*	30	35050	5	n/a	0.4690	0.6676	0.6112	0.6429
Intersection of Causeway Boulevard and 47th Street*	7	30850	5	n/a	0.1243	0.5867	0.5442	0.6279

**AADT for Hartford and 47th are calculated from this report's directional hourly volumes for 2026. Other values are from Florida Traffic Online.*

**Statewide, District, and County crash rates are for 6-lane urban and 4-lane urban divided roadways for US 41 and Causeway Blvd, respectively.*

**Crash totals for segments are from selecting mapped crashes and may include some intersection or intersection related crashes.*

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Table 4:3. US 41, Causeway Boulevard, and Intersection Crash Summaries

US 41		Total Crashes	Average/ Year	% Of Total
Crash Type	Angle	51	10.2	18.5%
	Bicycle	6	1.2	2.2%
	Left Turn	22	4.4	8.0%
	Off Road	2	0.4	0.7%
	Other	24	4.8	8.7%
	Pedestrian	2	0.4	0.7%
	Rear End	102	20.4	37.1%
	Right Turn	1	0.2	0.4%
	Rollover	0	0.0	0.0%
	Sideswipe	61	12.2	22.2%
	Unknown	4	0.8	1.5%
	Total	*275*	*55*	*100.0%*
Injury Severity	Fatal	5	1.0	1.8%
	Incapacitating	12	2.4	4.4%
	Non-Incapacitating	42	8.4	15.3%
	Possible Injury	65	13.0	23.6%
	Property Damage	151	30.2	54.9%
	Total	*275*	*55*	*100.0%*
Lighting Condition	Dawn	8	1.6	2.9%
	Daylight	221	44.2	80.4%
	Dusk	7	1.4	2.5%
	Dark - Lighted	25	5.0	9.1%
	Dark - Not Lighted	12	2.4	4.4%
	Unknown	2	0.4	0.7%
	Total	*275*	*55*	*100.0%*
Surface Condition	Dry	246	49.2	89.5%
	Wet	29	5.8	10.5%
	Unknown	0	0	0.0%
	Total	*275*	*55*	*100.0%*

Causeway Boulevard		Total Crashes	Average/ Year	% Of Total
Crash Type	Angle	3	0.6	11.5%
	Bicycle	2	0.4	7.7%
	Left Turn	1	0.2	3.8%
	Off Road	1	0.2	3.8%
	Other	2	0.4	7.7%
	Pedestrian	0	0.0	0.0%
	Rear End	12	2.4	46.2%
	Right Turn	0	0.0	0.0%
	Rollover	0	0.0	0.0%
	Sideswipe	5	1.0	19.2%
	Unknown	0	0.0	0.0%
	Total	*26*	*5.2*	*100.0%*
Injury Severity	Fatal	0	0.0	0.0%
	Incapacitating	3	0.6	11.5%
	Non-Incapacitating	1	0.2	3.8%
	Possible Injury	8	1.6	30.8%
	Property Damage	14	2.8	53.8%
	Total	*26*	*5.2*	*100.0%*
Lighting Condition	Dawn	0	0.0	0.0%
	Daylight	23	4.6	88.5%
	Dusk	0	0.0	0.0%
	Dark - Lighted	3	0.6	11.5%
	Dark - Not Lighted	0	0.0	0.0%
	Unknown	0	0.0	0.0%
	Total	*26*	*5.2*	*100.0%*
Surface Condition	Dry	23	4.6	88.5%
	Wet	3	0.6	11.5%
	Unknown	0	0	0.0%
	Total	*26*	*5.2*	*100.0%*

Within Intersection of US 41 and Causeway Boulevard		Total Crashes	Average/ Year	% Of Total
Crash Type	Angle	17	3.4	23.9%
	Bicycle	0	0.0	0.0%
	Left Turn	3	0.6	4.2%
	Off Road	0	0.0	0.0%
	Other	3	0.6	4.2%
	Pedestrian	1	0.2	1.4%
	Rear End	35	7.0	49.3%
	Right Turn	3	0.6	4.2%
	Rollover	0	0.0	0.0%
	Sideswipe	9	1.8	12.7%
	Unknown	0	0.0	0.0%
	Total	*71*	*14.2*	*100.0%*
Injury Severity	Fatal	0	0.0	0.0%
	Incapacitating	4	0.8	5.6%
	Non-Incapacitating	8	1.6	11.3%
	Possible Injury	20	4.0	28.2%
	Property Damage	39	7.8	54.9%
	Total	*71*	*14.2*	*100.0%*
Lighting Condition	Dawn	4	0.8	5.6%
	Daylight	45	9.0	63.4%
	Dusk	3	0.6	4.2%
	Dark - Lighted	19	3.8	26.8%
	Dark - Not Lighted	0	0.0	0.0%
	Unknown	0	0.0	0.0%
	Total	*71*	*14.2*	*100.0%*
Surface Condition	Dry	64	12.8	90.1%
	Wet	7	1.4	9.9%
	Unknown	0	0	0.0%
	Total	*71*	*14.2*	*100.0%*

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Table 4:4. US 41 at Harford Street and Causeway Boulevard at 47th Street Intersection Crash Summaries

Intersection of US 41 and Hartford Street		Total Crashes	Average/ Year	% Of Total
Crash Type	Angle	12	2.4	16.9%
	Bicycle	0	0.0	0.0%
	Left Turn	4	0.8	5.6%
	Off Road	0	0.0	0.0%
	Other	1	0.2	1.4%
	Pedestrian	0	0.0	0.0%
	Rear End	5	1.0	7.0%
	Right Turn	0	0.0	0.0%
	Rollover	0	0.0	0.0%
	Sideswipe	7	1.4	9.9%
	Unknown	1	0.2	1.4%
	Total	*30*	*6*	*42.3%*
Injury Severity	Fatal	0	0.0	0.0%
	Incapacitating	1	0.2	1.4%
	Non-Incapacitating	5	1.0	7.0%
	Possible Injury	6	1.2	8.5%
	Property Damage	18	3.6	25.4%
	Total	*30*	*6*	*42.3%*
Lighting Condition	Dawn	1	0.2	1.4%
	Daylight	26	5.2	36.6%
	Dusk	1	0.2	1.4%
	Dark - Lighted	0	0.0	0.0%
	Dark - Not Lighted	1	0.2	1.4%
	Unknown	1	0.2	1.4%
	Total	*30*	*6*	*100.0%*
Surface Condition	Dry	27	5.4	38.0%
	Wet	3	0.6	4.2%
	Unknown	0	0	0.0%
	Total	*30*	*6*	*42.3%*

Intersection of Causeway Boulevard and 47th Street		Total Crashes	Average/ Year	% Of Total
Crash Type	Angle	1	0.2	1.4%
	Bicycle	2	0.4	2.8%
	Left Turn	1	0.2	1.4%
	Off Road	0	0.0	0.0%
	Other	1	0.2	1.4%
	Pedestrian	0	0.0	0.0%
	Rear End	2	0.4	2.8%
	Right Turn	0	0.0	0.0%
	Rollover	0	0.0	0.0%
	Sideswipe	0	0.0	0.0%
	Unknown	0	0.0	0.0%
	Total	*7*	*1.4*	*9.9%*
Injury Severity	Fatal	0	0.0	0.0%
	Incapacitating	3	0.6	4.2%
	Non-Incapacitating	1	0.2	1.4%
	Possible Injury	2	0.4	2.8%
	Property Damage	1	0.2	1.4%
	Total	*7*	*1.4*	*9.9%*
Lighting Condition	Dawn	0	0.0	0.0%
	Daylight	7	1.4	9.9%
	Dusk	0	0.0	0.0%
	Dark - Lighted	0	0.0	0.0%
	Dark - Not Lighted	0	0.0	0.0%
	Unknown	0	0.0	0.0%
	Total	*7*	*1.4*	*100.0%*
Surface Condition	Dry	6	1.2	8.5%
	Wet	1	0.2	1.4%
	Unknown	0	0	0.0%
	Total	*7*	*1.4*	*9.9%*

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Figure 4.1. Five-year Crashes by Time of Day by Year

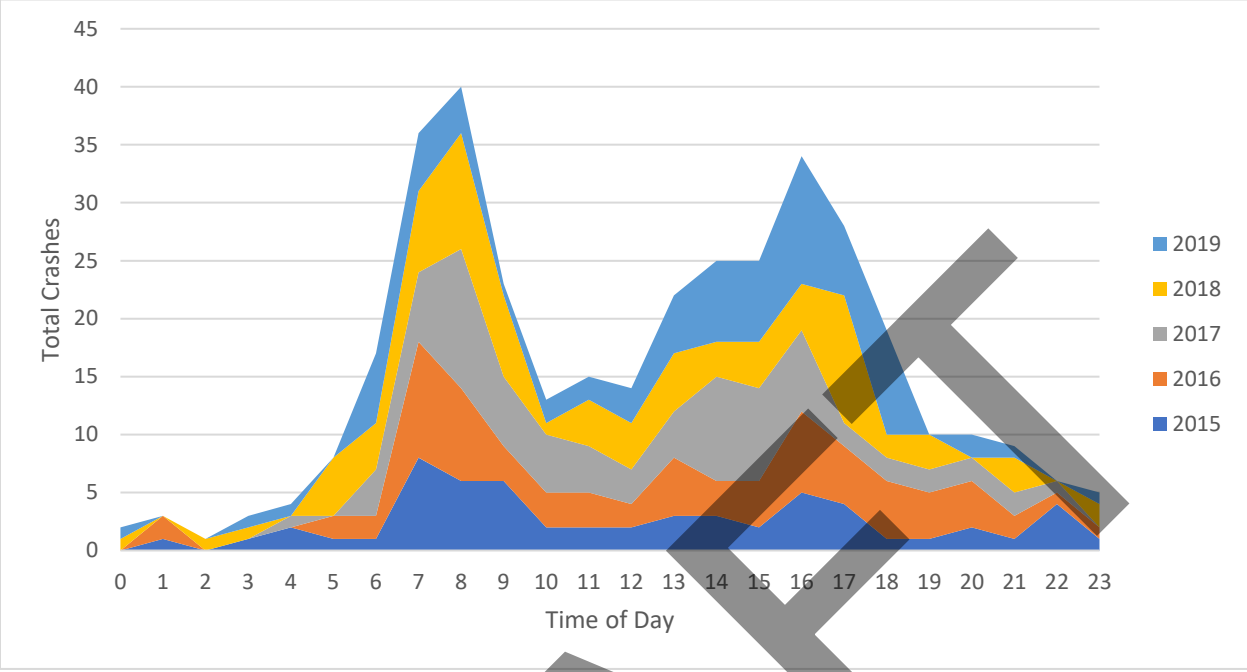

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Figure 4.2. Heat Map of Crashes (2015-2019)

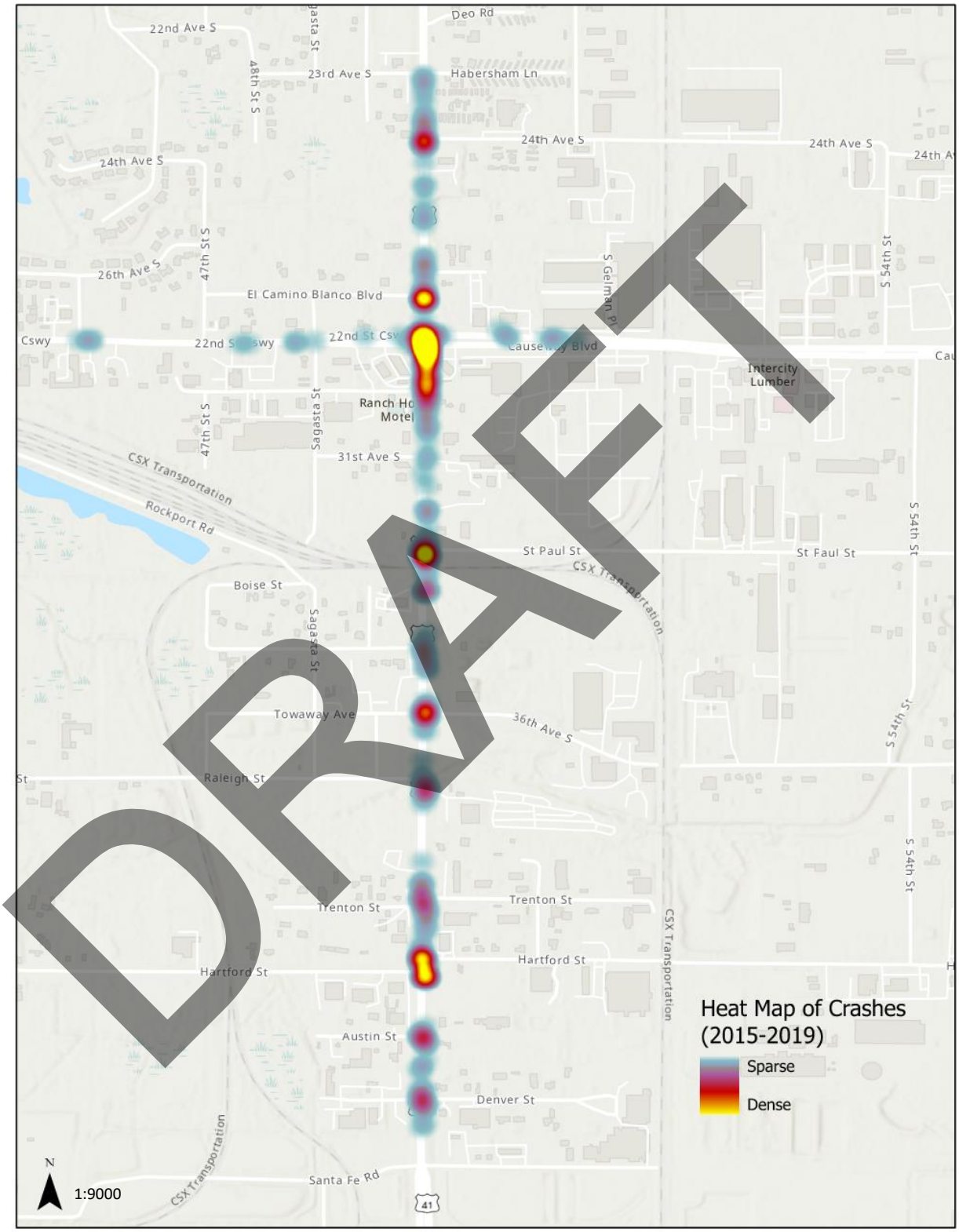

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Figure 4.3. Crashes by Crash Type

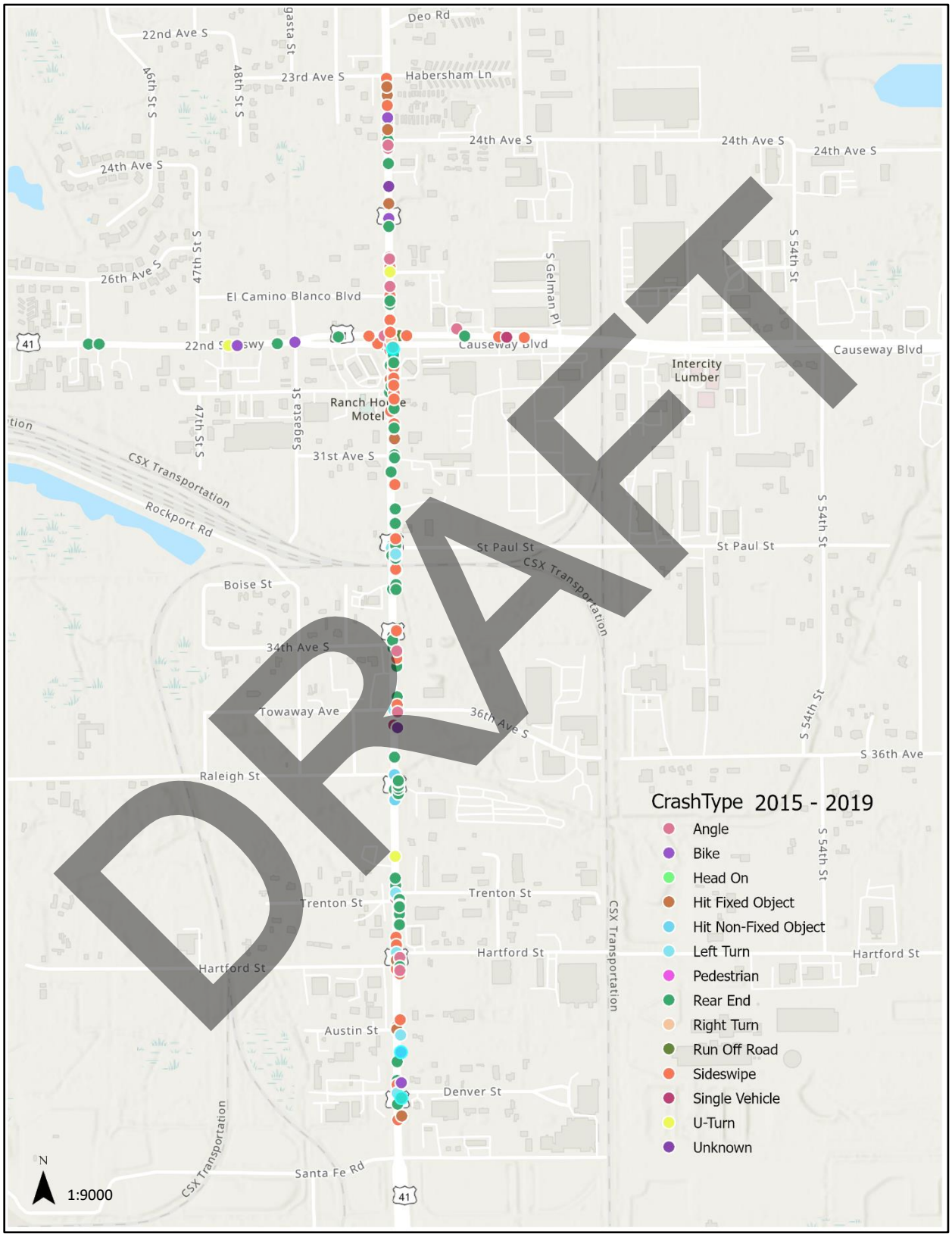

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Figure 4.4. Fatal Crashes

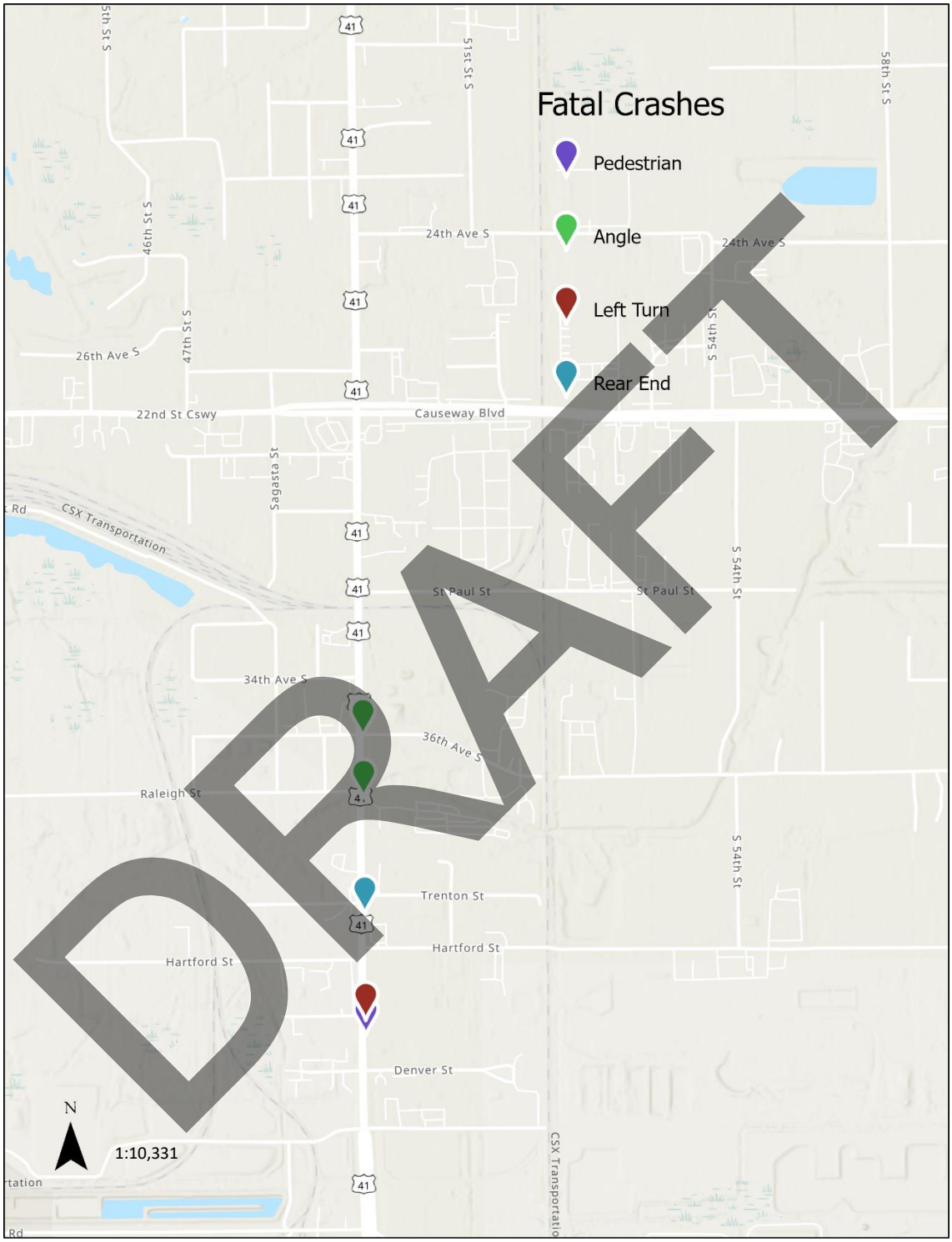


Figure 4.5. Bicycle and Pedestrian Crashes

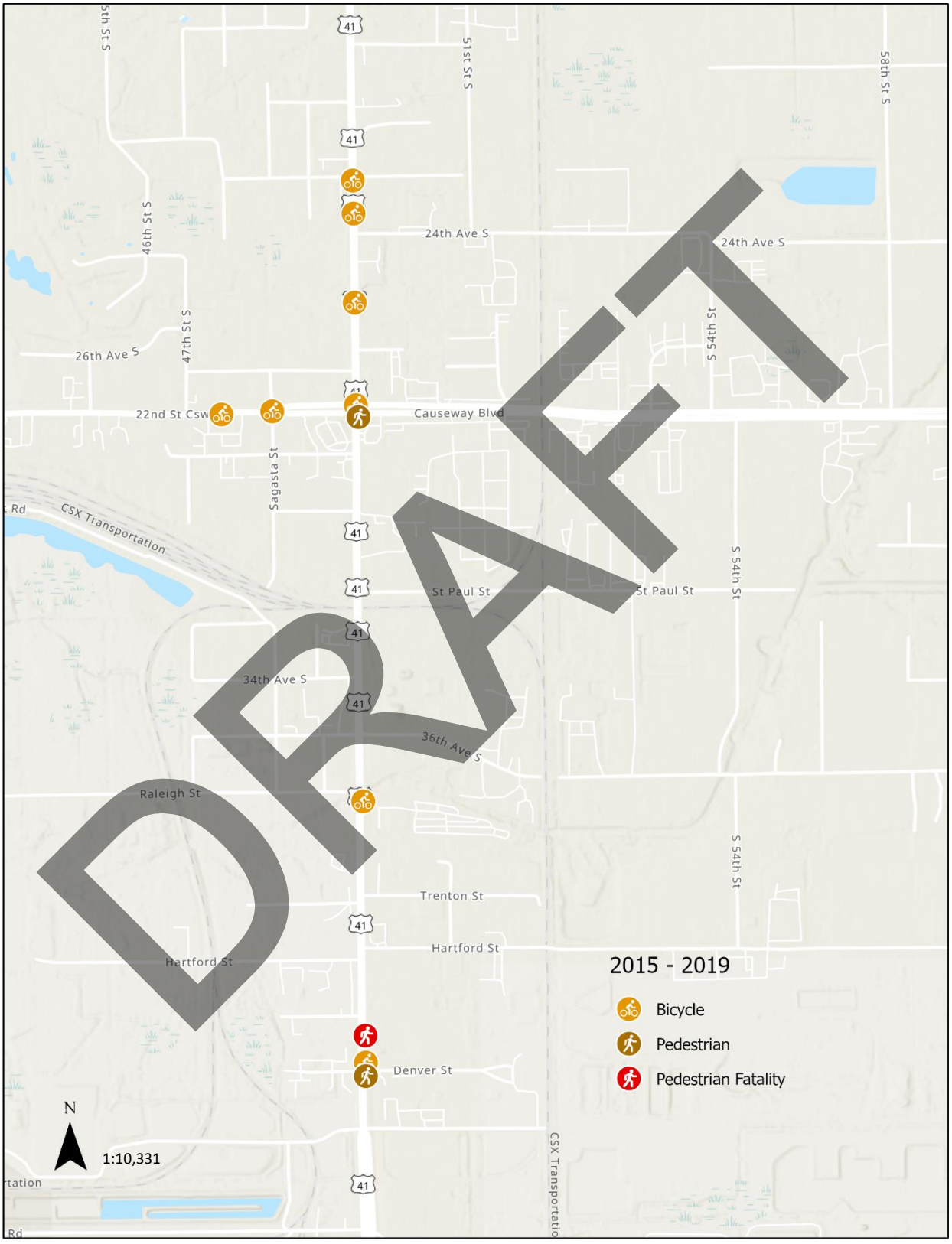
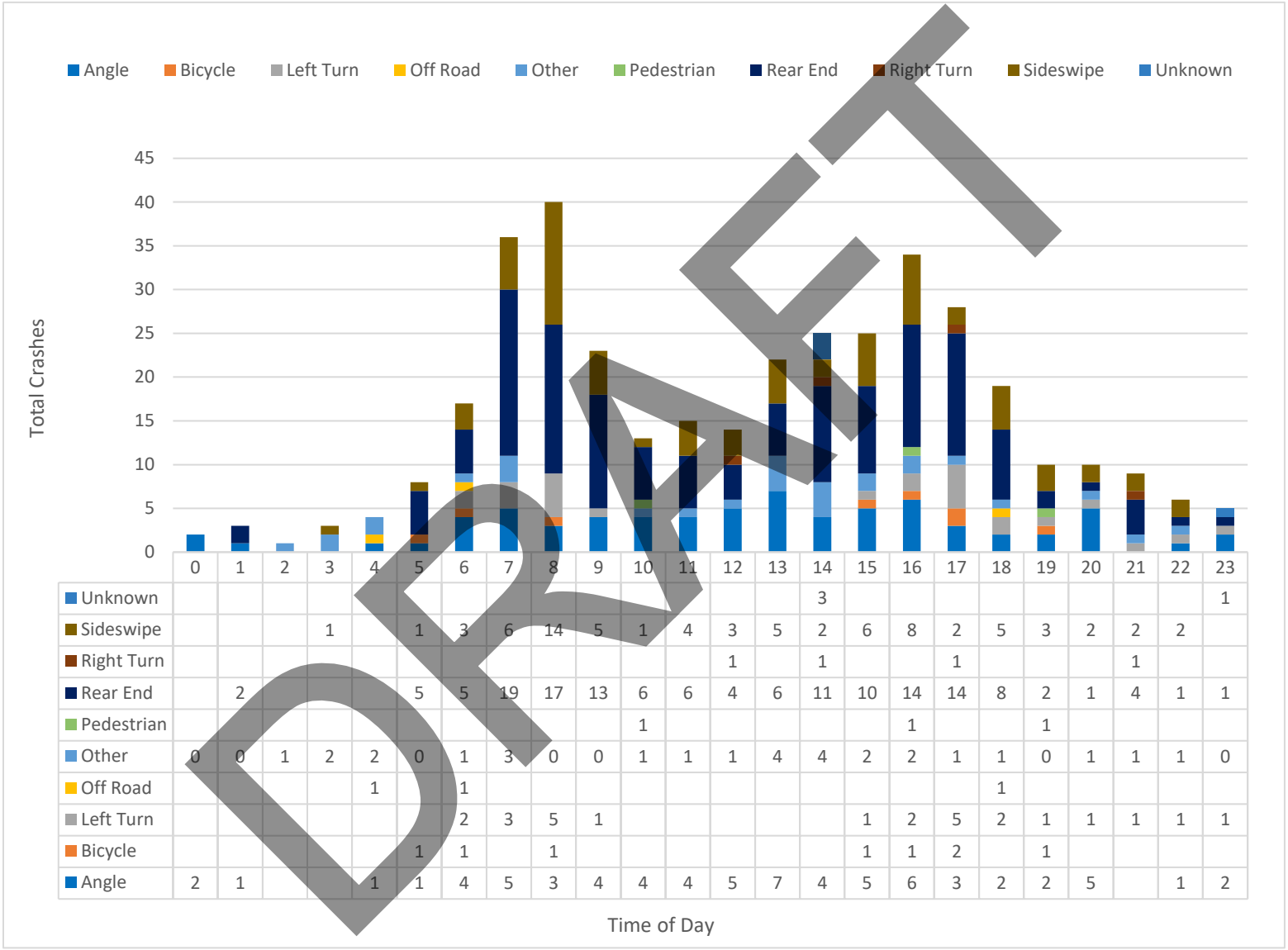


Figure 4.6. Diurnal Crash Overview of Study Area



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Unknown															3									1
Sideswipe				1		1	3	6	14	5	1	4	3	5	2	6	8	2	5	3	2	2	2	
Right Turn													1		1			1				1		
Rear End		2				5	5	19	17	13	6	6	4	6	11	10	14	14	8	2	1	4	1	1
Pedestrian											1						1			1				
Other	0	0	1	2	2	0	1	3	0	0	1	1	1	4	4	2	2	1	1	0	1	1	1	0
Off Road					1		1												1					
Left Turn							2	3	5	1						1	2	5	2	1	1	1	1	1
Bicycle						1	1		1							1	1	2		1				
Angle	2	1			1	1	4	5	3	4	4	4	5	7	4	5	6	3	2	2	5		1	2

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4.2 Crash Mitigation Strategies

The crash mitigation strategies offered in this section focus on the intersections of US 41 at Hartford Street, US 41 at Causeway Boulevard, and Causeway Boulevard at 47th Street. For the planned grade-separation of US 41 from Hartford Street to Causeway Boulevard, crashes along that segment involving left and right turns into driveways and side streets will be reduced by design. Rear-ends and sideswipes may continue as vehicles stop for the traffic signals at the intersections and change lanes to make turns at the intersections. The other segments in the study area are not being significantly changed from the existing condition.

FDOT countermeasures applicable to the study area are listed by intersection in **Table 4:5**. These countermeasures are found in the FDOT Crash Reduction Factors Table (2/14/2014) and were developed using five or more projects.

The additions of signals and turn lanes at Hartford Street and 47th Street have the potential to reduce total crashes by as much as 35% although a new signal has the potential to increase rear end crashes due to driver unfamiliarity with the new signal. New signals should be installed with proper sight distance and reflective backplates.

At US 41 and Causeway Boulevard, modifying the signals and channelization may reduce total crashes by as much as 24%; however, adding turn lanes, while reducing turning related crashes, has the potential to increase pedestrian crashes due to turning vehicles not looking for pedestrians before turning. Based on the information presented in FHWA's Crash Modification Clearinghouse, installing advanced yield or stop markings and signs for pedestrians, like the R10-15 sign, has a CMF of 0.8 or CRF of up to 20% for rear end, sideswipe, and vehicle/pedestrian crashes. At all signalized intersections, signs instructing drivers to yield to pedestrians should be installed according to MUTCD standards.

Table 4:5. Crash Reduction Factors for Roadway Design Features

Location	Improvement	Total CRF (%)	Crash Severity CRFs		Vehicle Movement CRFs				Pedestrian CRF
			Fatal	Injury	Left Turn	Sideswipe	Right Turn	Rear End	
US 41 at Hartford Street / Causeway Boulevard at 47th Street	New signal at channelized intersection	12%	15%	20%	16%	10%	70%	-51%	-90%
	New LT channelization w/ LT phase (signalized)	17%	59%	36%	50%	12%	-42%	5%	29%
	Increase storage lanes	11%	-76%	15%	15%	7%	-36%	0%	17%
	Add turn lanes and pavement resurfacing	35%	3%	47%	53%	-15%	51%	49%	3%
	Add turn bay	10%	52%	16%	21%	20%	36%	5%	-
	Add right turn	9%	67%	9%	37%	-20%	1%	11%	-49%
US 41 at Causeway Boulevard	Modify both signal and channelization	24%	50%	30%	66%	4%	-4%	6%	34%
	Increase storage lanes	11%	-76%	15%	15%	7%	-36%	0%	17%
	Add turn lanes and pavement resurfacing	35%	3%	47%	53%	-15%	51%	49%	3%
	Add right turn	9%	67%	9%	37%	-20%	1%	11%	-49%
	Add 2nd LT lane in same direction as existing	4%	0%	13%	30%	-33%	42%	1%	-25%

*Source FDOT Crash Reduction Factors Spreadsheet 2/14/2014

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5.0 SUMMARY OF ANALYSIS RESULTS

The *Synchro* operational results show that the intersection improvements and additional signals in the study area under Build Alternative 1F improved the intersection delay and LOS when compared to the No-Build conditions (provided in the 2019 PTAR in Appendix A) given the additional capacity in the form of turn lanes and signalization**.** The intersection of US 41 at Causeway Boulevard is expected to operate at overall LOS F through design year 2046; however, overall intersection delay (seconds/vehicle) is expected to be better than No-Build conditions which show LOS F and significantly higher delays (as indicated in the 2019 PTAR). The signalized intersection of US 41 at Hartford Street is expected to operate at overall LOS C for the opening year, LOS F/E during the AM/PM peak hours for the interim year, and LOS F for the design year. Lastly, the intersection of Causeway Boulevard at 47th Street is expected to operate at overall LOS E/D during the AM/PM peak hours for the opening year, and LOS F for the interim and design years.

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6.0 APPENDICES

Appendix A: 2019 PTAR

Appendix B: Conceptual Plans for Build Alternative 1F – At-Grade Intersection Option

Appendix C: Volume Development Memo

Appendix D: Synchro Signalized Intersection Reports

Appendix E: Synchro Queue Reports

Appendix F: Signal Four Analytics Crash Data

Appendix G: Train Related Crash Data

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Appendix A: 2019 PTAR

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Project Development and Environment Study

US 41/SR 45/South 50th St at CSX Grade Separation

Project Traffic Analysis Report

Financial Project ID: 440749-1-22-01
Hillsborough County

Prepared for the
Florida Department of Transportation
District Seven

Prepared by:
Rummel, Klepper & Kahl, LLP
101 West Main Street, Suite 240
Lakeland, FL ▪ 33815

August 2019

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The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

1.0 EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) is conducting a reevaluation of a previous Environmental Assessment (EA) with a Finding of No Significant Impact (FONSI) approved by the Federal Highway Administration on May 24, 1994. The previous PD&E study was completed for 22nd Street Causeway/Causeway Boulevard (SR 676) from SR 60 to US 301, in Hillsborough County, Florida. The previous study evaluated anticipated conditions for a 2015 Design Year. The FONSI documented the construction of a six-lane roadway to replace the existing 2- to 4-lane roadway beginning at SR 60 and extending approximately 7 miles east at U.S. 301. The project included a new interchange at US 41/Causeway Boulevard intersection for which the approved concept was a "compressed diamond" interchange with US 41 elevated over Causeway Boulevard. This interchange is commonly referred to now as a Single Point Urban Interchange (SPUI). The study identified the US 41 interchange bridge would carry three lanes of traffic in each direction with a barrier wall separating opposing traffic. The study recommended an additional grade separation of US 41 over the CSX railroad crossing south of Causeway Boulevard while the CSX railroad crossing east of US 41 would remain at grade with Causeway Boulevard. The concept illustrated the SPUI ramps were oriented along US 41 and one-way, one-lane frontage roads were provided in the southeast and northeast quadrants to provide local property access. Five-foot sidewalks and 4-foot bicycle lanes were proposed along both sides of Causeway Boulevard.

This Project Development & Environment (PD&E) study, with a 2046 Design Year, will evaluate the capacity and operational improvements along US 41/State Road (SR) 45/SR 599/South 50th Street (US 41) from south of the SR 676/Causeway Boulevard (Causeway Boulevard) intersection to north of the Causeway Boulevard intersection. These improvements include the construction of a grade separation of US 41 at the CSX railroad crossing located approximately 1,400' south of the US 41/Causeway Boulevard intersection. Intersection and operational improvements along US 41 and Causeway Boulevard are also planned. The project limits identified along US 41 are from Austin Street (MP 22.695) to South 21st Avenue (MP 23.982) and along Causeway Boulevard from west of the Rockport East Terminal Entrance (MP 4.038) to Causeway Center Drive (MP 2.766), for a total project length of 2.559 miles. US 41 is currently a six-lane facility throughout the project limits and Causeway Boulevard is currently a four-lane facility. US 41 and Causeway Boulevard are functionally classified by the FDOT as urban principal arterials. US 41 south of Causeway Boulevard and Causeway Boulevard west of US 41 are part of FDOT's Strategic Intermodal System (SIS) designated as a SIS Connector. The CSX railroad crossing east of US 41 is a designated SIS Railway Corridor and the CSX railroad crossing south of Causeway Boulevard is designated as an SIS Railway Connector. There is one bridge culvert south of Causeway Boulevard for US 41 over Delaney Creek at MP 23.003.

Currently, the corridor experiences traffic delays and queuing as a result of train traffic at the CSX Railroad crossing (M.P. 23.271) south of US 41 Business/SR 45/SR 676/Causeway Boulevard ("Causeway Boulevard") and is a major route for trucks traveling to and from Port Tampa Bay. Therefore, alternatives were developed to address the train-related delays and queuing and to allow for the safe movement of truck traffic through the project corridor. Additionally, the alternatives include improvements to the signalized intersection of US 41 and Causeway Boulevard, which experiences traffic delays and queuing separately from the CSX Railroad crossing as a result of volumes exceeding capacity, leading to extensive delays.

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In addition to analyzing the existing (2018) condition, this study evaluated the operations of the No-Build condition, assuming no changes to the existing condition other than routine maintenance, and four Build alternatives for opening (2026), interim (2036), and design (2046) years during the AM and PM peak hours. A safety analysis for the study area was also carried out. Following are brief descriptions of the Build alternatives.

Build Alternative 1: Northbound Flyover

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- A two-lane, grade-separated flyover for northbound US 41 to westbound Causeway Boulevard, originating south of the CSX Railroad crossing and ending with a one-lane merge to the inside of westbound Causeway Boulevard.
- A two-lane, grade-separated, northbound overpass or "queue jump" over the primary intersection, to remove most northbound traffic from the intersection.
- Signalization of US 41 at Causeway Boulevard.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to adjacent parcels in the northeast and northwest corners would be allowed via driveways on mainline US 41 and mainline Causeway Boulevard.

Build Alternative 2: Southwestern Quadrant

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- A southwestern quadrant roadway intersecting Causeway Boulevard west of US 41 to create a new T-intersection. The quadrant roadway provides northbound-to-westbound and eastbound-to-southbound connections, removing these movements from US 41 at Causeway Boulevard, and is connected to US 41 by grade-separated ramps. Left or U-turns from Causeway Boulevard would be disallowed at the new intersection; these can be accommodated by other access points.
- Signalization of US 41 at Causeway Boulevard, however, northbound left turns and eastbound right turns would be disallowed. These can be accommodated by the quadrant roadway and other access points.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to adjacent parcels in the northeast and northwest corners would be provided via driveways on mainline US 41 and mainline Causeway Boulevard.

Build Alternative 3: Diverging Diamond Interchange (DDI)

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- An east-west oriented DDI at the location of the US 41 and Causeway Boulevard intersection including grade-separation of US 41 over the interchange.

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- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to northeast and northwest parcels is allowed from the DDI ramps north of Causeway Boulevard, and additional driveways can be accessed via mainline Causeway Boulevard on the east and west.

Build Alternative 4: Single Point Urban Interchange (SPUI)

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- A SPUI at the location of the US 41 and Causeway Boulevard intersection including grade-separation of US 41 over the interchange. Through movements are allowed from the off-ramps to allow access to adjacent parcels.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to northeast and northwest parcels is allowed from the SPUI ramps north of Causeway Boulevard, and additional driveways can be accessed via mainline Causeway Boulevard on the east and west.

A traffic analysis was performed consistent with the Florida DOT *Traffic Analysis Handbook* and the PD&E Manual, Part 2, Chapter 2 using *Synchro* Version 10.1, Build 2. The traffic analysis for the existing (2018) conditions showed that the intersection of US 41 at Causeway Boulevard operates at LOS F during the AM peak hour and LOS E during the PM peak hour. FDOT's *2012 Generalized Service Volume Tables* ("Generalized Tables") were used to determine that all but one roadway segment in the analysis area operate at LOS C based on peak hour volumes. Westbound Causeway Boulevard west of US 41 operates at LOS F during the AM peak hour.

The Tampa Bay Regional Planning Model (TBRPM) Version 8.2 was utilized in the development of future year annual average daily traffic (AADT). The National Cooperative Highway Research Program (NCHRP) Report 765 ratio and difference methods were used to process the model results. Linear growth rates developed from the NCHRP procedure were applied to the 2018 AADT to develop opening (2026), interim (2036), and design (2046) year AADT. Directional design hour volumes (DDHV) and design hour turning movement volumes (DHTMV) for future years were developed using existing traffic design characteristics and turning movement percentages.

For each analysis year, the *Synchro* analysis indicates that the intersection of US 41 and Causeway Boulevard would operate at LOS F during each peak hour under the No-Build condition. The Generalized Tables indicate that based on peak hour directional volumes during the design year:

- The following segments would operate at LOS F during the AM peak hour:
    - Northbound US 41, south of Causeway Boulevard
    - Westbound Causeway Boulevard, west of US 41
    - Westbound Causeway Boulevard, east of US 41
- The following segments would operate at LOS F during the PM peak hour:

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    - Southbound US 41, south of Causeway Boulevard
    - Eastbound Causeway Boulevard, west of US 41
    - Eastbound Causeway Boulevard, east of US 41

The *Synchro* analysis indicates the following overall intersection levels of service for each Build alternative during the design year:

- Build Alternative 1
    - US 41 at Causeway Boulevard: LOS D during the AM peak hour and LOS F during the PM peak hour
- Build Alternative 2:
    - US 41 at Causeway Boulevard: LOS F during the AM peak hour and LOS E during the PM peak hour
    - Quadrant Roadway at Causeway Boulevard: LOS D during the AM peak hour and LOS B during the PM peak hour
- Build Alternative 3:
    - Western Crossover: LOS F during the AM peak hour and LOS C during the PM peak hour
    - Causeway Boulevard at Southbound Left Ramp: LOS A during the AM peak hour and LOS A during the PM peak hour
    - Causeway Boulevard at Northbound Left Ramp: LOS D during the AM peak hour and LOS A during the PM peak hour
    - Eastern Crossover: LOS E during the AM peak hour and LOS B during the PM peak hour
- Build Alternative 4
    - US 41 at Causeway Boulevard: LOS F during the AM peak hour and LOS E during the PM peak hour

Since the typical sections (for the external intersection or interchange legs) of US 41 and Causeway Boulevard are the same for each Build alternative, the roadway segment analysis results are the same for each Build alternative. The results indicate that based on peak hour directional volumes during the design year:

- The following segments would operate at LOS F during the AM peak hour:
    - Northbound US 41, south of Causeway Boulevard
    - Westbound Causeway Boulevard, west of US 41
    - Westbound Causeway Boulevard, east of US 41
- The following segments would operate at LOS F during the PM peak hour:
    - Southbound US 41, south of Causeway Boulevard
    - Eastbound Causeway Boulevard, west of US 41
    - Eastbound Causeway Boulevard, east of US 41

Based on the results of the evaluation, Build Alternative 3 provides lower delays and queuing than the other Build alternatives.

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LIST OF ABBREVIATIONS

AADT	Average Annual Daily Traffic
BEBR	Bureau of Business and Economics
CAP-X	Capacity Analysis for the Planning of Junctions
CARS	Crash Analysis Reporting System
DDHV	Directional Design Hour Volume
DDI	Diverging Diamond Interchange
DHTMV	Design Hour Turning Movement Volume
FDOT	Florida Department of Transportation
FSUTMS	Florida Standard Urban Transportation Model Structure
FTI	Florida Traffic Information
HART	Hillsborough Area Regional Transit
HCM	Highway Capacity Manual
LOS	Level of Service
MP	Mile Post
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
PD&E	Project Development and Environment
PHF	Peak Hour Factor
PTAR	Project Traffic Analysis Report
RTOR	Right-Turn-on-Red
SIS	Strategic Intermodal System
SPUI	Single Point Urban Interchange
SSO	State Safety Office
TBRPM	Tampa Bay Regional Planning Model
TDP	Transit Development Plan
V/C	Volume-to-Capacity

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2.0 PROJECT TRAFFIC ASSUMPTION SUMMARY

Traffic forecast for the project was developed using:	
☑ Travel Demand Model	☐ Growth Rates
Type of Travel Demand Model Used: ☑ Metropolitan Planning Model ☐ Other Model Tampa Bay RPM 8.2	*Refer to appropriate section of Project Traffic Analysis Report that discusses growth rates*
Is the travel demand model based on the latest adopted Long Range Transportation Plan?	
☑ YES	☐ NO
9/5/2018 Date when MPO adopted the latest Long Range Transportation Plan Administrative modification 9/2018; Amended 2/2018; Adopted 11/2014	Explain why?
2010 Base Year of Travel Demand Model	
2040 Horizon Year of Travel Demand Model	
Long Range Transportation Plan documentation is available at (provide web address): http://www.planhillsborough.org/2040-lrtp/	
Traffic Data and Factors	
Standard K: 9.0 D Factor: 61.1 / 72.4 T_{Daily} 13.0	Traffic Counts Collection Year 2018 Opening Year 2026 Interim Year 2036 Design Year 2046
Discuss any changes in land use, economics, population, and employment data since the model was built.	
None	
Traffic Analysis Assumptions	
The study area covers an urban area in unincorporated Hillsborough County. The study will utilize filed measurements and collected data to calibrate factors. Traffic projections will be developed for the opening year 2026, the interim year 2036, and the design year 2046. The traffic analysis will follow the FDOT Traffic Analysis Handbook and HCM Version 6.	

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3.0 INTRODUCTION

The US 41/SR 45/South 50th Street at CSX Grade Separation Project Traffic Analysis Report (PTAR) documents the grade-separation roadway improvement alternatives developed for the US 41/ SR 45/South 50th Street ("US 41") corridor from south of Causeway Boulevard to north of Causeway Boulevard in Hillsborough County. The corridor experiences traffic delays and queuing as a result of train traffic at the CSX Railroad crossing (M.P. 23.271) south of Causeway Boulevard and is a major route for trucks traveling to and from Port Tampa Bay.

The purpose of this study is to develop and document grade-separation roadway improvement alternatives that address the traffic delays and queuing on US 41/SR 45/South 50th Street ("US 41") associated with the CSX Railroad crossing south of Causeway Boulevard and that adequately support the safe movement of truck traffic through the project corridor. Improvements also carry over to the intersection of US 41 and Causeway Boulevard, which experiences traffic delays and queuing separately from the CSX Railroad crossing as a result of heavy traffic and low capacity. To support the development of alternatives, the existing (2018), opening (2026), interim (2036), and design (2046) year operations of the corridor were evaluated.

3.1 PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT) is conducting a reevaluation of a previous Environmental Assessment (EA) with a Finding of No Significant Impact (FONSI) approved by the Federal Highway Administration on May 24, 1994. The previous PD&E study was completed for 22nd Street Causeway/Causeway Boulevard (SR 676) from SR 60 to US 301, in Hillsborough County, Florida. The previous study evaluated anticipated conditions for a 2015 Design Year. The FONSI documented the construction of a six-lane roadway to replace the existing 2- to 4-lane roadway beginning at SR 60 and extending approximately 7 miles east at U.S. 301. The project included a new interchange at US 41/Causeway Boulevard intersection for which the approved concept was a "compressed diamond" interchange with US 41 elevated over Causeway Boulevard. This interchange is commonly referred to now as a Single Point Urban Interchange (SPUI). The study identified the US 41 interchange bridge would carry three lanes of traffic in each direction with a barrier wall separating opposing traffic. The study recommended an additional grade separation of US 41 over the CSX railroad crossing south of Causeway Boulevard while the CSX railroad crossing east of US 41 would remain at grade with Causeway Boulevard. The concept illustrated the SPUI ramps were oriented along US 41 and one-way, one-lane frontage roads were provided in the southeast and northeast quadrants to provide local property access. Five-foot sidewalks and 4-foot bicycle lanes were proposed along both sides of Causeway Boulevard.

This Project Development & Environment (PD&E) study, with a 2046 Design Year, will evaluate the capacity and operational improvements along US 41/State Road (SR) 45/SR 599/South 50th Street (US 41) from south of the SR 676/Causeway Boulevard (Causeway Boulevard) intersection to north of the Causeway Boulevard intersection. These improvements include the construction of a grade separation of US 41 at the CSX railroad crossing located approximately 1,400' south of the US 41/Causeway Boulevard intersection. Intersection and operational improvements along US 41 and Causeway Boulevard are also planned. The project limits identified along US 41 are from Austin Street (MP 22.695) to South 21st Avenue (MP 23.982) and along Causeway Boulevard from west of the Rockport East Terminal Entrance (MP 4.038)

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to Causeway Center Drive (MP 2.766), for a total project length of 2.559 miles. US 41 is currently a six-lane facility throughout the project limits and Causeway Boulevard is currently a four-lane facility. US 41 and Causeway Boulevard are functionally classified by the FDOT as urban principal arterials. US 41 south of Causeway Boulevard and Causeway Boulevard west of US 41 are part of FDOT's Strategic Intermodal System (SIS) designated as a SIS Connector. The CSX railroad crossing east of US 41 is a designated SIS Railway Corridor and the CSX railroad crossing south of Causeway Boulevard is designated as an SIS Railway Connector. There is one bridge culvert south of Causeway Boulevard for US 41 over Delaney Creek at MP 23.003. The study area is shown in **Figure 3.1**.

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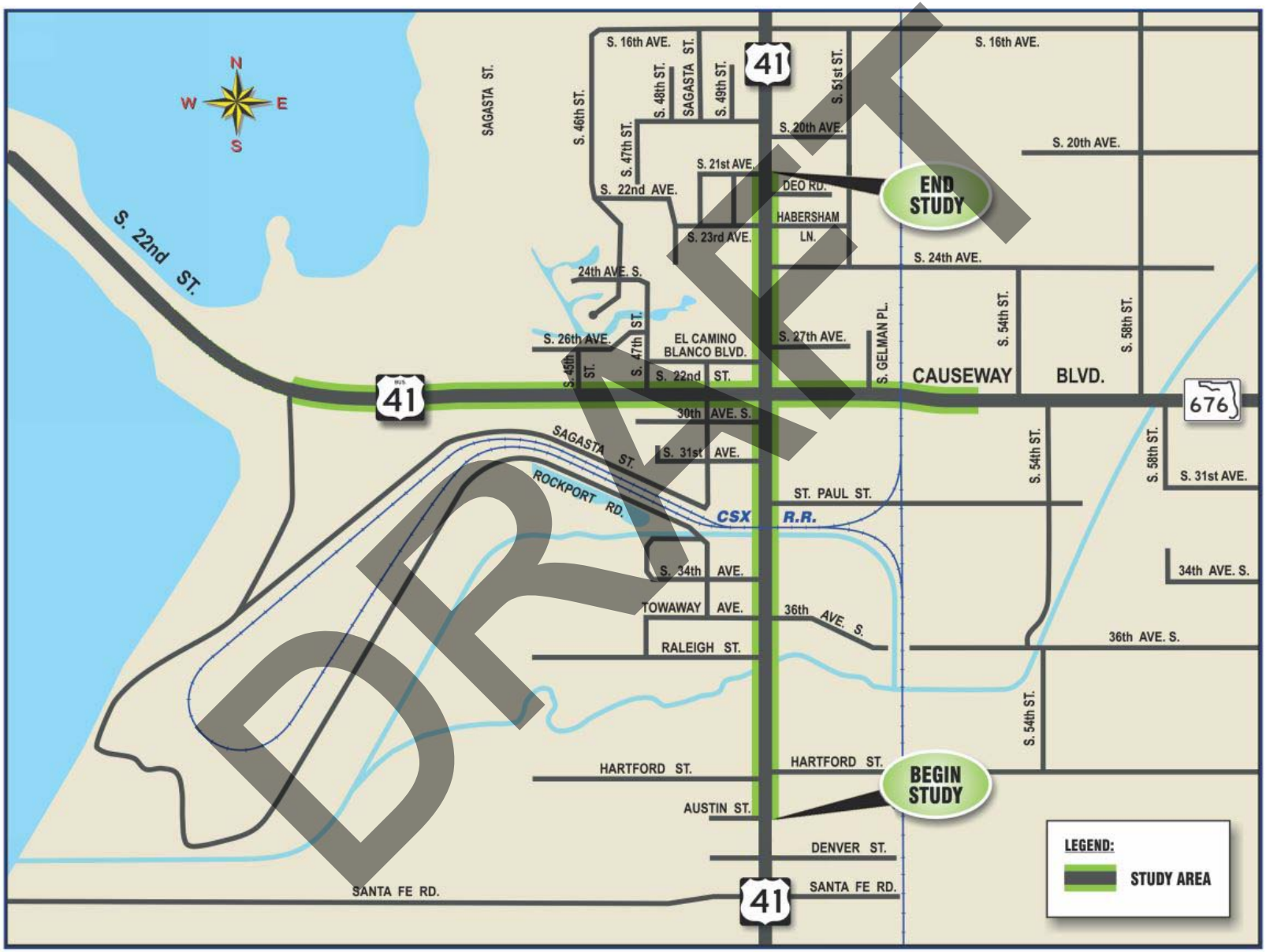
Figure 3.1. Study Area



3.2 ALTERNATIVES

Concepts and reports developed for prior planning and PD&E studies were reviewed to determine whether any alternatives identified in previous efforts were suitable to carry forward for analysis. Additionally, the FDOT-modified Capacity Analysis for Planning of Junctions (CAP-X) tool was utilized to identify alternatives using design year (2046) AM and PM peak hour turning movement volumes. CAP-X worksheets can be found in **Appendix A**. The selection of alternatives focused on those that would allow for grade-separation of US 41 over the CSX Railroad crossing south of Causeway Boulevard, safe movement of truck traffic through the area, and ability to reduce delay at the intersection of US 41 and Causeway Boulevard. With grade-separation of US 41 over the CSX Railroad crossing, each Build alternative has the ability to relieve delay and congestion associated with train traffic.

The *US 41 (SR 45) at SR 676 (Causeway Boulevard) Intersection Study* identified two concepts, Option 1C (Northbound Flyover) and Option 2B (Southwestern Quadrant), that were carried forward for analysis. These were deemed viable for their ability to accommodate truck traffic and delay reduction as a result of eliminating heavy turning movements from the intersection of US 41 and Causeway Boulevard. The southwestern quadrant was also evaluated using the CAP-X tool, where it was noted to have an overall v/c ratio of 1.15 during the AM peak hour and an overall v/c ratio of 2.59 during the PM peak hour of the design year. However, the quadrant design represented in the CAP-X tool varies from the quadrant alternative identified in this report, in that "Zone 2" within the tool is signalized, whereas the concept identified in this report uses free-flowing movements at this location. Therefore, the v/c ratios calculated by the tool may not be valid for the analyzed design.

The CAP-X tool identified the diverging diamond interchange (DDI) as having volume-to-capacity (v/c) ratios less than 1.0, and although not the top-ranked result of the tool, DDIs provide good pedestrian, bicycle, and transit accommodations, and more easily accommodate trucks than higher-ranked junction types, which included partial clover leaf and displaced left turn interchanges.

The single point urban interchange (SPUI) was analyzed in several prior studies, including *US 41 (SR 45) at SR 676 (Causeway Boulevard) Intersection Study* and the *22nd Street-Causeway Boulevard Preliminary Engineering Report*, where it was first brought forth as a possible alternative. The CAP-X tool also identified the SPUI as having v/c ratios less than 1.0 with fair bicycle and pedestrian accommodations and good transit accommodations. The SPUI would operate similarly to a traditional traffic signal and its wide turn geometry makes it acceptable for truck traffic.

Brief descriptions of the alternative concepts are included in the following sections. More information about the alternatives, including detailed lane configurations, signal timing, and access management can be found in Section 7.0.

3.2.1 No-Build Alternative

The No-Build alternative assumes that the geometry of the existing transportation network is maintained throughout all analysis years. Only routine maintenance would be provided, and this is assumed to include

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maintaining the existing peak hour cycle lengths but optimizing the signal split times and phasing for each analysis year.

3.2.2 Build Alternative 1: Northbound Flyover

Build Alternative 1 includes:

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- A two-lane, grade-separated flyover for northbound US 41 to westbound Causeway Boulevard, originating south of the CSX Railroad crossing and ending with a one-lane merge to the inside of westbound Causeway Boulevard.
- A two-lane, grade-separated, northbound overpass or "queue jump" over the primary intersection, to remove most northbound traffic from the intersection.
- Signalization of US 41 at Causeway Boulevard.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to adjacent parcels in the northeast and northwest corners would be allowed via driveways on mainline US 41 and mainline Causeway Boulevard.

3.2.3 Build Alternative 2: Southwestern Quadrant

Build Alternative 2 includes:

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- A southwestern quadrant roadway intersecting Causeway Boulevard west of US 41 to create a new T-intersection. The quadrant roadway provides northbound-to-westbound and eastbound-to-southbound connections, removing these movements from US 41 at Causeway Boulevard, and is connected to US 41 by grade-separated ramps. Left or U-turns from Causeway Boulevard would be disallowed at the new intersection; these can be accommodated by other access points.
- Signalization of US 41 at Causeway Boulevard, however, northbound left turns and eastbound right turns would be disallowed. These can be accommodated by the quadrant roadway and other access points.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to adjacent parcels in the northeast and northwest corners would be provided via driveways on mainline US 41 and mainline Causeway Boulevard.

3.2.4 Build Alternative 3: Diverging Diamond Interchange (DDI)

Build Alternative 3 includes:

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.

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- An east-west oriented DDI at the location of the US 41 and Causeway Boulevard intersection including grade-separation of US 41 over the interchange.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to northeast and northwest parcels is allowed from the DDI ramps north of Causeway Boulevard, and additional driveways can be accessed via mainline Causeway Boulevard on the east and west.

3.2.5 Build Alternative 4: Single Point Urban Interchange (SPUI)

Build Alternative 4 includes:

- Grade-separation of US 41 in each direction over the CSX Railroad crossing.
- A SPUI at the location of the US 41 and Causeway Boulevard intersection including grade-separation of US 41 over the interchange. Through movements are allowed from the off-ramps to allow access to adjacent parcels.
- Six-lane typical sections on US 41 and Causeway Boulevard.
- At-grade frontage roads along each side of US 41 south of Causeway Boulevard to maintain access to adjacent parcels in the southwest and southeast corners. Access to northeast and northwest parcels is allowed from the SPUI ramps north of Causeway Boulevard, and additional driveways can be accessed via mainline Causeway Boulevard on the east and west.

The conceptual plans for the Build alternatives are included in **Appendix B**.

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4.0 TRAFFIC ANALYSIS METHODOLOGY

The following sections describe the traffic analysis methodology. **Appendix C** includes the *Traffic Analysis Methodology Report* previously submitted for the project.

4.1 ANALYSIS YEARS

In addition to analyzing the existing conditions for the year 2018, the No-Build and Build alternatives were analyzed for the following analysis years:

- Opening Year (2026)
- Interim Year (2036)
- Design Year (2046)

The AM and PM peak hours were analyzed for each analysis scenario. A review of the collected intersection and bi-directional data showed the AM peak hour was from 7:30 to 8:30 AM and the PM peak hour was from 4:45 to 5:45 PM.

4.2 DATA SOURCES

4.2.1 Florida Traffic Information Database

FDOT's 2017 Florida Traffic Information (FTI) database was used as a data source for existing year and historical:

- Average Annual Daily Traffic (AADT),
- K-Factors,
- Directional (D) Factors,
- Daily Truck Factor,
- Peak Season Factor,
- Model Output Conversion Factor, and
- Weekly Axle Factor.

FDOT's FTI database showed four Portable Traffic Monitoring Sites (PTMS) and one Telemetered Traffic Monitoring Site (TTMS) within the study area. AADT information collected from the FTI database for locations within the study area are presented in **Table 4.1**.

Table 4.1. FDOT FTI Study Area CoSites by Type

CoSite	Description	Type	AADT				
			2013	2014	2015	2016	2017
100003	SR 599/US 41/S 50TH ST, N OF SR 676/CAUSEWAY BLVD	PTMS	21,500	23,000	18,100	24,500	25,500
100004	SR 45/US 41/S 50TH ST, S OF SR 676/CAUSEWAY BLVD	PTMS	35,500	36,500	29,000	30,000	31,000
100022	SR 676/CAUSEWAY BLVD, E OF US 41/SR 45/50TH ST	PTMS	23,500	22,000	22,000	18,300	18,900
100033	SR 45/USB 41/22ND ST CAUSEWAY, W OF US 41/SR 45	PTMS	32,500	29,500	29,500	26,500	27,500
100373	US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD	TTMS	27,551	27,200	24,063	27,391	30,711

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4.2.2 Hillsborough Area Regional Transit Authority

The Hillsborough Area Regional Transit Authority's (HART) website was used to find that there are no transit routes within the study corridor. The HART Transit Development Plan (TDP) does not indicate any funded plans for future expansion of transit service through the study area.

4.2.3 Traffic Counts

Traffic counts were collected during August 21-23 and August 28-30, 2018 to account for schools being in session, and the end of the summer tourist season. The counts consisted of one 4-hour turning movement count (TMC) (taking place from 7:00 to 9:00 AM and 4:00 to 6:00 PM), two 72-hour bi-directional volume counts, and two 72-hour vehicle classification counts. **Figure 4.1** shows the location of the traffic counts. The turning movement counts and vehicle classification data are provided in **Appendix D**.

A 4-hour TMC was collected at the following intersection:

- US 41 / Tamiami Trail at SR 676 / Causeway Boulevard

72-hour bi-directional volume counts were collected at the following locations:

- US 41 / Tamiami Trail south of SR 676 / Causeway Boulevard
- US 41 / Tamiami Trail north of SR 676 / Causeway Boulevard

72-hour vehicle classification counts were collected at the following locations:

- SR 676 / Causeway Boulevard west of US 41 / Tamiami Trail
- SR 676 / Causeway Boulevard east of US 41 / Tamiami Trail

4.3 ANALYSIS TOOLS

Intersection analyses were performed using Trafficware's *Synchro/SimTraffic* software package (Version 10, Build 1), with reports and outputs primarily generated with *Highway Capacity Manual* (*HCM*) *6th Edition* methodology. The *HCM 6th Edition* methodology is not applicable to clustered intersections; therefore, *HCM 2000* reports were generated for alternatives with clustered intersections. *Synchro's* Queue report was used to gather design year 95th percentile queues for signalized intersections and its HCM Unsignalized Intersection Capacity Analysis report was used to gather design year 95th percentile queues for unsignalized locations where available. At some unsignalized locations, queues could not be obtained from *Synchro* either due to the signing settings or number of lanes. As a result of this limitation, *SimTraffic* was used to generate design year 95th percentile queue lengths averaged over 10 one-hour simulation runs with 15-minute seeding periods at locations where *Synchro* queues could not be obtained. FDOT's *2012 Generalized Service Volume Tables* ("Generalized Tables") were used to analyze roadway segments.

4.4 FORECASTING TOOLS

The Florida Standard Urban Transportation Model Structure (FSUTMS) compliant Tampa Bay Regional Planning Model (TBRPM Version 8.2) was used to develop future year traffic projections. The TBRPM is

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recognized by FDOT and the Hillsborough County Metropolitan Planning Organization (MPO), as the accepted travel demand forecasting model for the Tampa Bay region.

The National Cooperative Highway Research Program's (NCHRP) Report 765's model output refinement procedure (Chapter 6) was used to process the TBRPM model output.

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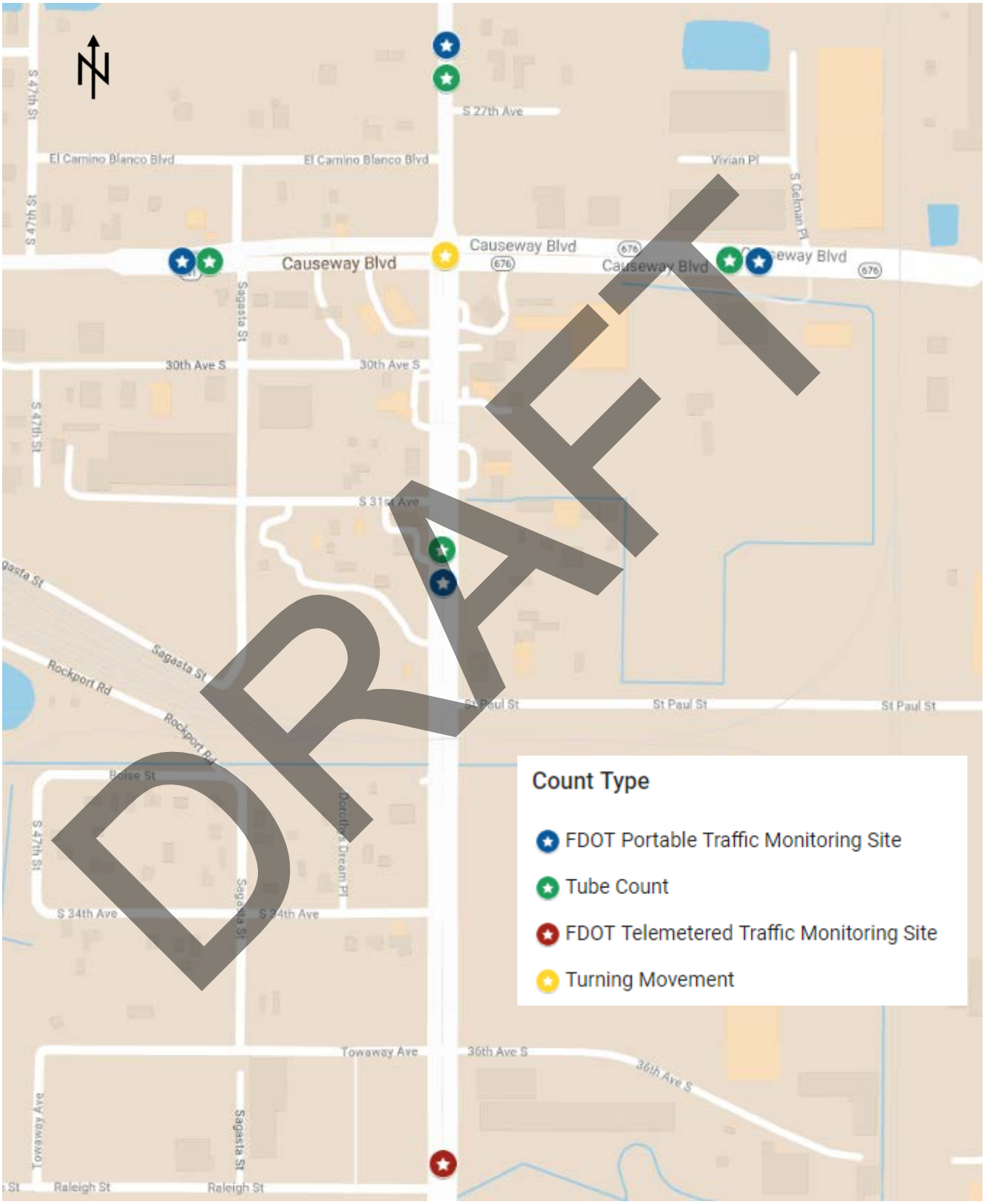
Figure 4.1. Study Area Count Collection Locations



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4.5 MEASURES OF EFFECTIVENESS

4.5.1 Intersection

The *HCM 6th Edition*'s level of service (LOS) criteria for signalized intersections, presented in **Table 4.2**, was used to evaluate the intersections. The volume-to-capacity (v/c) ratio was used to determine the significance of a failing intersection.

Table 4.2. HCM 6th Edition Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10 sec	Free Flow
B	>10–20 sec	Stable Flow (slight delays)
C	>20–35 sec	Stable flow (acceptable delays)
D	>35–55 sec	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55–80 sec	Unstable flow (intolerable delay)
F[1]	>80 sec	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 6th Edition*, Transportation Research Board, 2016.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0, LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

4.5.2 Segment

The Generalized Tables were used to determine roadway segment LOS based on AADT and directional design hour volume (DDHV). The Generalized Tables are included in **Appendix E**. The study area is considered an urbanized area per the *2013 FDOT Quality/Level of Service Handbook*'s definition; therefore, the following tables were used:

- Table 1: Daily Service Volume for Urbanized Areas
- Table 7: Peak Hour Directional Service Volume

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5.0 EXISTING CONDITIONS ANALYSIS

5.1 ROADWAY CHARACTERISTICS

US 41 is a six-lane divided roadway with a posted speed limit of 50 mph and is classified as an Urban Principal Arterial – Other. Causeway Boulevard is a four-lane divided roadway with a posted speed limit of 45 mph and is also classified as an Urban Principal Arterial – Other. West of US 41, Causeway Boulevard is a Strategic Intermodal System (SIS) connector.

The intersection of US 41 at Causeway Boulevard within the study area is a four-leg signalized intersection with crosswalks present at all approaches. Daily truck percentages through the intersection corridors range from 12 to 15 percent. Train crossings at the CSX Railroad south of Causeway Boulevard cause heavy queuing and long times to queue clearance, especially for the northbound approach during the AM peak hour.

Many driveways for commercial businesses are also within the study area. The existing year (2018) intersection lane geometry is shown in **Figure 5.1**.

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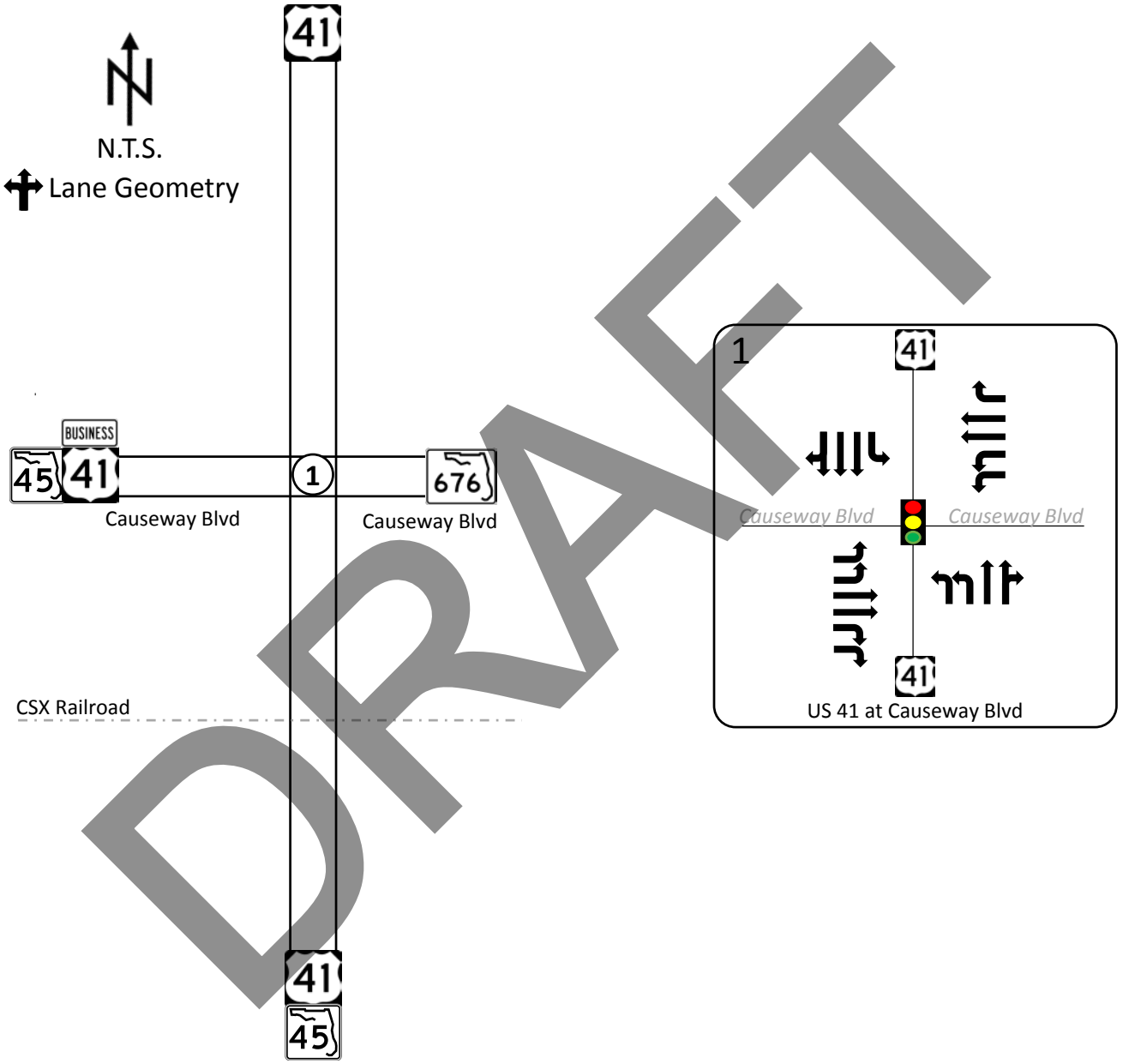
Figure 5.1. Existing Lane Configurations



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5.2 DATA

5.2.1 2018 Existing Traffic AADT

The 2018 AADT volumes were calculated using the seasonal and axle adjustment factors from the FDOT's 2017 FTI database category 1000 for Hillsborough County and are provided in **Appendix D**. For the period collected, the seasonal correction factor varied from 1.02 to 1.05 with application being identified for the week collected, and the axle adjustment factor for the corridor ranged between 0.96 and 0.93. The 2017 factors from the FTI database were applied to the 2018 volumes to render a comparable 2018 existing traffic AADT. An overview of the counts collected, the collection date, the seasonal correction factor, seasonal adjustment, and calculated AADT is presented in **Table 5.1**.

AM and PM peak periods were determined by analyzing the 15-minute hourly totals of the turning movement counts obtained by traffic counts. Directionality was determined by examining the hourly movement of traffic through the intersections. The highest volumes of traffic travel north on US 41 and west on Causeway Boulevard in the AM. These directions reverse in the evening. The peak times were determined to be 7:30-8:30 AM and 4:45-5:45 PM.

Table 5.1. Existing Year 2018 Traffic Volumes

Roadway / Segment	Collection Date	ADT	Seasonal Factor[1]	Axle Factor[1]	AADT
US 41					
North of SR 676/Causeway Blvd	8/28/2018	26,146	1.05	0.96	26,000
South of SR 676/Causeway Blvd	8/28/2018	40,083	1.05	0.93	39,000
SR 676/Causeway Blvd[2]					
East of US 41	8/21/2018	18,586	1.02	1.00	19,000
West of US 41	8/21/2018	27,046	1.02	1.00	28,000

Notes:

1. Most Recent Seasonal and Axle Adjustment factors were obtained from FDOT 2017 Florida Traffic Online website
2. Vehicle classification counts were collected on Causeway Boulevard and thus no Axle CF

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5.2.2 Traffic Design Characteristics

Recommended design hour traffic factors recommended for the *US 41 at CSX Grade Separation Study* include a standard K-factor of 9.0% per the *2014 Project Traffic Forecasting Handbook* along US 41 and all side streets. The recommended D-Factor had two values as the segments exhibited different characteristics. A D-factor of 61.1% is recommended for the north and east legs, and a D-factor of 72.4% is recommended for the south and west legs of the US 41 and SR 676/Causeway Boulevard intersection.

The daily truck percentage (T_{24}) along the study corridor is 13.0% with a recommended design hour truck factor of 7.0%. These recommended K and D-factors and daily truck percentage were used for the development of existing and future traffic volumes.

The peak hour factor (PHF) was calculated from the intersection and provided observed values of 0.95 and 0.96 during the AM and PM peak hours, respectively. The FDOT's *Traffic Analysis Handbook*'s recommendation of 0.95 for an urban arterial was consulted and the PHF of 0.95 was utilized.

A summary of the recommended design traffic characteristics is shown in **Table 5.2**.

Table 5.2. Recommended Design Traffic Characteristics

Roadway / Segment	K-Factor	D-Factor	T-Factor	DHT	PHF
US 41 & SR 676/Causeway Boulevard	9.0%		13.0%	7.0%	0.95
US 41, N. of SR 676/Causeway Boulevard and SR 676/Causeway Boulevard, E. of US 41	-	61.1%	-	-	-
US 41, S. of SR 676/Causeway Boulevard and SR 676/Causeway Boulevard, W. of US 41	-	72.4%	-	-	-

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5.3 EXISTING ROADWAY MODEL DEVELOPMENT AND VERIFICATION

Operational analyses were performed using *Synchro*, Version 10.1, Build 2, with companion software *SimTraffic*. The base model was developed for existing conditions over the 7:30 to 8:30 AM peak hour and the 4:45 to 5:45 PM peak hour.

5.3.1 Geometry

The *Synchro* network was constructed based on aerial imagery. Aerial and street-level imagery from field visits were used to identify and verify lane geometry, medians, signal types, pedestrian crossings, and speed limits.

5.3.2 Volumes

Existing (2018) directional design hour volumes were produced using the developed AADT and recommended traffic design factors. Design hour turning movement volumes (DHTMV) were produced from the DDHVs using turning movement percentages from the raw turning movement counts collected for the study.

5.3.3 Signal Timing

Existing (2018) signal timing data was provided by Hillsborough County and entered into the *Synchro* analysis. Timing sheets provided by the County are in **Appendix F**.

5.4 EXISTING CONDITIONS TRAFFIC OPERATIONS

Generalized Tables from FDOT's *Quality/Level of Service Handbook* were used, as appropriate, to identify the level of service (LOS) for the roadway segments within the study area.

The AADT and directional design hour volumes (DDHV) were compared to the Generalized Tables for Urbanized Areas, Table 1 and Table 7, respectively and the results are shown in **Table 5.3**. Under the existing conditions, each of the study segments operates at LOS C based on AADT. Based on peak hour directional volumes, the segments operate at LOS C except for westbound Causeway Boulevard west of US 41 which operates at LOS F.

Intersection capacity analyses were conducted utilizing the *HCM 6th Edition* methodologies incorporated within *Synchro* software to assess the existing LOS at the intersection in the study area using the existing design hour turning movement volumes (DHTMV), shown in **Figure 5.2,** and existing geometry. **Table 5.4** shows the results of the existing intersection analysis. The study intersection was found to operate at LOS F and LOS E during AM and PM peak hour conditions, respectively. The *US 41 at CSX Grade Separation Existing Conditions Report* (which includes the *Synchro* reports for existing conditions) is provided in **Appendix G**.

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Table 5.3. Existing Year (2018) Segment Analysis Results

Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					DDHV	LOS	DDHV	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	26,000	C	909	C	1,430	C
Northbound, North of Causeway Boulevard	6	50	26,000	C	1,360	C	713	C
Southbound, South of Causeway Boulevard	6	50	39,000	C	1,043	C	2,358	C
Northbound, South of Causeway Boulevard	6	50	39,000	C	2,540	C	968	C
Causeway Boulevard								
Eastbound, West of US 41	4	45	28,000	C	696	C	1,824	C
Westbound, West of US 41	4	45	28,000	C	2,226	F	800	C
Eastbound, East of US 41	4	45	19,000	C	561	C	1,016	C
Westbound, East of US 41	4	45	19,000	C	1,045	C	665	C

Table 5.4. Existing Year (2018) Intersection Delay, LOS, and V/C

Intersection	Movement/ Approach	AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	122.8	F	0.64	85.5	F	0.49
	EBT	60.1	E	0.34	65.0	E	0.84
	EBR	12.4	B	0.21	124.2	F	1.15
	EB Approach	*40.2*	*D*	*0.26*	*102.2*	*F*	*0.99*
	WBL	121.6	F	0.66	88.8	F	0.67
	WBT	85.4	F	0.91	49.4	D	0.47
	WBR	65.3	E	0.48	29.9	C	0.32
	WB Approach	*83.9*	*F*	*0.77*	*48.9*	*D*	*0.43*
	NBL	97.2	F	1.05	76.1	E	0.84
	NBT	69.1	E	0.88	43.3	D	0.52
	NBR	68.9	E	0.88	43.4	D	0.53
	NB Approach	*84.1*	*F*	*0.96*	*56.7*	*E*	*0.62*
	SBL	207.7	F	1.17	96.9	F	0.93
	SBT	263.7	F	1.35	43.0	D	0.67
	SBR	284.2	F	1.37	45.4	D	0.67
	SB Approach	*256.3*	*F*	*1.31*	*53.7*	*D*	*0.70*
	Overall	**108.3**	**F**	**0.71**	**71.7**	**E**	**0.70**

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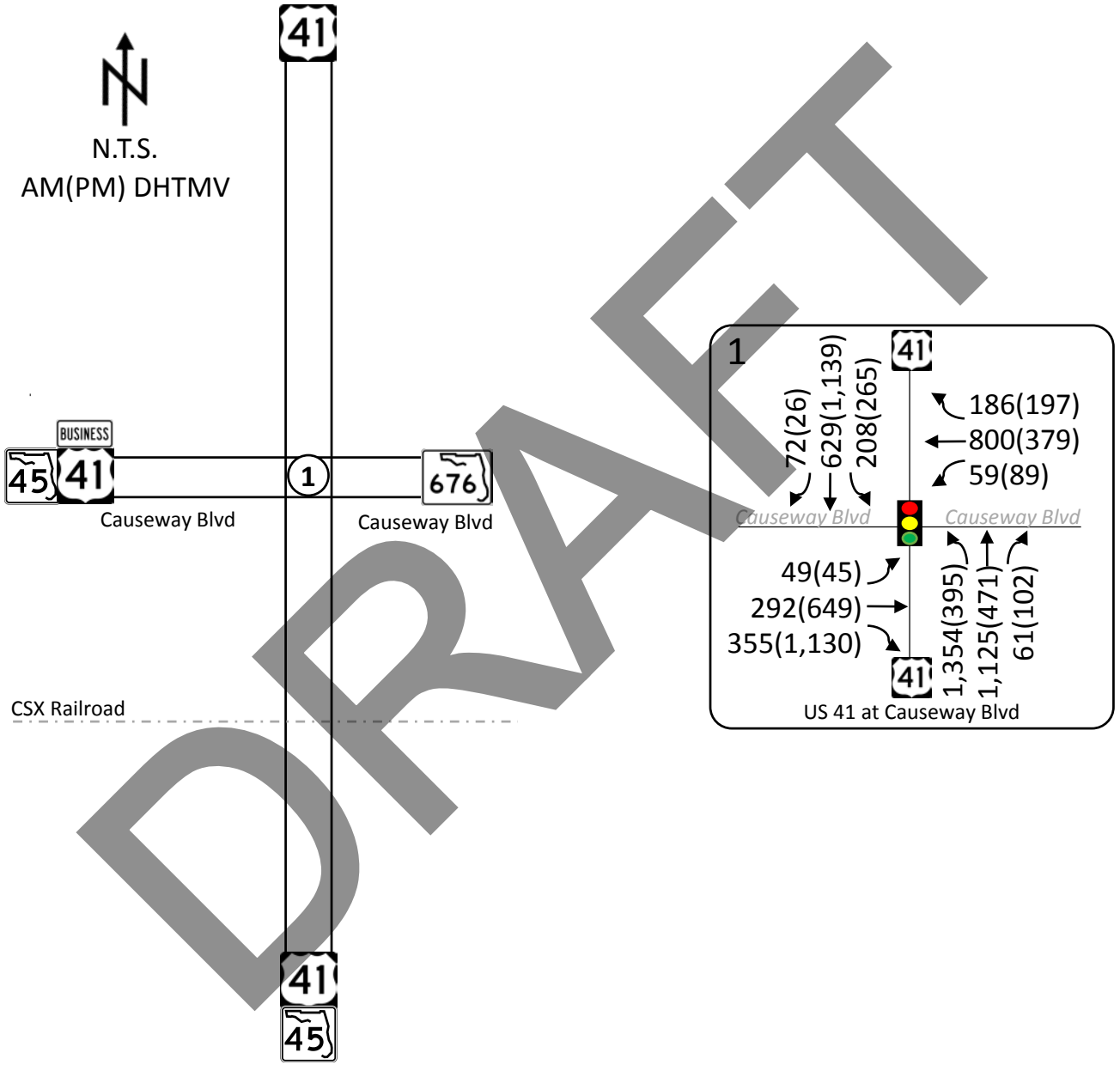
Figure 5.2. Existing DHTMV



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5.5 SAFETY ANALYSIS

A safety analysis was conducted for the study area. The analysis utilized techniques as described by the FDOT State Safety Office (SSO), and crash data obtained from Signal Four Analytics (University of Florida GIS). The safety analysis will be used to help identify problem areas and crash trends.

5.5.1 Data Collection

5.5.1.1 Reports and Crash Records

Crash records were collected from Signal Four Analytics to conduct the safety analysis. Crash data for the period of 1/1/2014 to 12/31/2018 was downloaded on 5/2/2019. The download date for Signal Four Analytics data is important to note as this site is continually updated and may contain unreported data that was not available or uploaded at the time the data was collected such that subsequent inquiries may vary slightly. The Signal Four Analytics database was used instead of the FDOT Crash Analysis Reporting System (CARS) for the ability to gather more recent data and ability to geo-reference the data.

The data shows 292 crashes occurring within a 0.75-mile radius of the center of the US 41 / Causeway Boulevard intersection during the 5-year period. The majority of crashes in the study area were rear ends (128), followed by sideswipe (47) and other (37) crashes. Pedestrians were involved in two crashes and bicycles in seven crashes. There were 6 fatal crashes, 11 incapacitating injury crashes, 34 non-incapacitating injury crashes, 59 possible injury crashes, and 183 crashes with property damage only. **Table 5.5** lists the comprehensive crash costs by crash severity for the study area.

The data shows that 165 crashes occurred along US 41, 63 crashes occurred along Causeway Boulevard, and 64 crashes occurred within the intersection (i.e. past the stop bar prior to entering another leg) of US 41 and Causeway Boulevard. This gives an approximate crash frequency of 33 crashes per year along US 41, 13 per year along Causeway Boulevard, and 13 per year in the intersection. **Table 5.6** shows the US 41 and Causeway Boulevard segment crash summaries and the US 41 at Causeway Boulevard intersection crash summaries.

Most crashes in the study area occurred during daylight hours, peaking between 8:00 and 9:00 AM. Of the six fatal crashes, four of them occurred at night. Four of the fatal crashes were left turn collisions, one was a rear end collision, and one involved a pedestrian. Of the nine total crashes involving pedestrians or bicycles, five occurred at night. Six of the seven bicycle crashes resulted in injuries: one possible injury, three non-incapacitating injuries, and two incapacitating injuries. One of the pedestrian collisions resulted in a fatality and one of them resulted in an incapacitating injury. The crash data indicated that the fatal collisions and the bicycle and pedestrian collisions were spread throughout the study area and not localized to a particular problem spot.

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Figure 5.3 shows the crashes by time of day. A map of all crash locations is provided in **Figure 5.4**. **Figure 5.5** shows the locations of fatal crashes by crash type while **Figure 5.6** shows the locations of pedestrian and bicycle crashes in the study area. The diurnal distribution of crashes is shown in **Figure 5.7**.

5.5.1.2 Train Related Crashes

The number of crashes involving a train was obtained from the Federal Railroad Administration Office of Safety Analysis for the railroad crossing (crossing #624802A) south of the study intersection. The data showed that there were 10 train crashes at this railroad crossing between the year 1976 and 2000. **Appendix H** presents historical train-related crash data. No collisions involving trains have been identified after April 2000.

Table 5.5. FDOT KABCO Crash Costs for the Study Area

Crash Severity	Unit Cost	Number of Crashes	Total
Fatal (K)	$10,230,000	6	$61,380,000
Severe Injury (A)	$580,320	11	$6,383,520
Moderate Injury (B)	$157,170	34	$5,343,780
Minor Injury (C)	$97,650	59	$5,761,350
Property Damage Only (O)	$7,600	182	$1,383,200
Total Cost	-	-	**$80,251,850**

From FDOT Plans Preparation Manual (2017) Vol. 1, Chapter 23, Table 23.6.2.

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Table 5.6. US 41, Causeway Boulevard, and Intersection Crash Summaries

US 41		Total Crashes	Average/ Year	% of Total
Crash Type	Angle	7	1.4	4.2%
	Bicycle	5	1.0	3.0%
	Left Turn	25	5.0	15.2%
	Off Road	6	1.2	3.6%
	Other	20	4.0	12.1%
	Pedestrian	1	0.2	0.6%
	Rear End	64	12.8	38.8%
	Right Turn	1	0.2	0.6%
	Rollover	2	0.4	1.2%
	Sideswipe	28	5.6	17.0%
	Unknown	6	1.2	3.6%
	Total	*165*	*33*	*100.0%*
Injury Severity	Fatal	5	1.0	3.0%
	Incapacitating	7	1.4	4.2%
	Non-Incapacitating	23	4.6	13.9%
	Possible Injury	26	5.2	15.8%
	Property Damage	104	20.8	63.0%
	Total	*165*	*33*	*100.0%*
Lighting Condition	Dawn	4	0.8	2.4%
	Daylight	129	25.8	78.2%
	Dusk	1	0.2	0.6%
	Dark - Lighted	15	3.0	9.1%
	Dark - Not Lighted	15	3.0	9.1%
	Unknown	1	0.2	0.6%
	Total	*165*	*33*	*100.0%*
Surface Condition	Dry	147	29.4	89.1%
	Wet	17	3.4	10.3%
	Unknown	1	0.2	0.6%
	Total	*165*	*33*	*100.0%*

Causeway Boulevard		Total Crashes	Average/ Year	% of Total
Crash Type	Angle	0	0.0	0.0%
	Bicycle	2	0.4	3.2%
	Left Turn	4	0.8	6.3%
	Off Road	6	1.2	9.5%
	Other	10	2.0	15.9%
	Pedestrian	1	0.2	1.6%
	Rear End	28	5.6	44.4%
	Right Turn	3	0.6	4.8%
	Rollover	0	0.0	0.0%
	Sideswipe	7	1.4	11.1%
	Unknown	2	0.4	3.2%
	Total	*63*	*12.6*	*100.0%*
Injury Severity	Fatal	1	0.2	1.6%
	Incapacitating	2	0.4	3.2%
	Non-Incapacitating	6	1.2	9.5%
	Possible Injury	17	3.4	27.0%
	Property Damage	37	7.4	58.7%
	Total	*63*	*12.6*	*100.0%*
Lighting Condition	Dawn	3	0.6	4.8%
	Daylight	51	10.2	81.0%
	Dusk	0	0.0	0.0%
	Dark - Lighted	9	1.8	14.3%
	Dark - Not Lighted	0	0.0	0.0%
	Unknown	0	0.0	0.0%
	Total	*63*	*12.6*	*100.0%*
Surface Condition	Dry	56	11.2	88.9%
	Wet	7	1.4	11.1%
	Unknown	0	0	0.0%
	Total	*63*	*12.6*	*100.0%*

Within Intersection of US 41 and Causeway Boulevard		Total Crashes	Average/ Year	% of Total
Crash Type	Angle	3	0.6	4.7%
	Bicycle	0	0.0	0.0%
	Left Turn	4	0.8	6.3%
	Off Road	2	0.4	3.1%
	Other	7	1.4	10.9%
	Pedestrian	0	0.0	0.0%
	Rear End	36	7.2	56.3%
	Right Turn	0	0.0	0.0%
	Rollover	0	0.0	0.0%
	Sideswipe	12	2.4	18.8%
	Unknown	0	0.0	0.0%
	Total	*64*	*12.8*	*100.0%*
Injury Severity	Fatal	0	0.0	0.0%
	Incapacitating	2	0.4	3.1%
	Non-Incapacitating	5	1.0	7.8%
	Possible Injury	16	3.2	25.0%
	Property Damage	41	8.2	64.1%
	Total	*64*	*12.8*	*100.0%*
Lighting Condition	Dawn	2	0.4	3.2%
	Daylight	40	8.0	63.5%
	Dusk	2	0.4	3.2%
	Dark - Lighted	19	3.8	30.2%
	Dark - Not Lighted	0	0.0	0.0%
	Unknown	0	0.0	0.0%
	Total	*63*	*12.6*	*100.0%*
Surface Condition	Dry	56	11.2	87.5%
	Wet	8	1.6	12.5%
	Unknown	0	0	0.0%
	Total	*64*	*12.8*	*100.0%*

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Figure 5.3. Five-year Crashes by Time of Day by Year

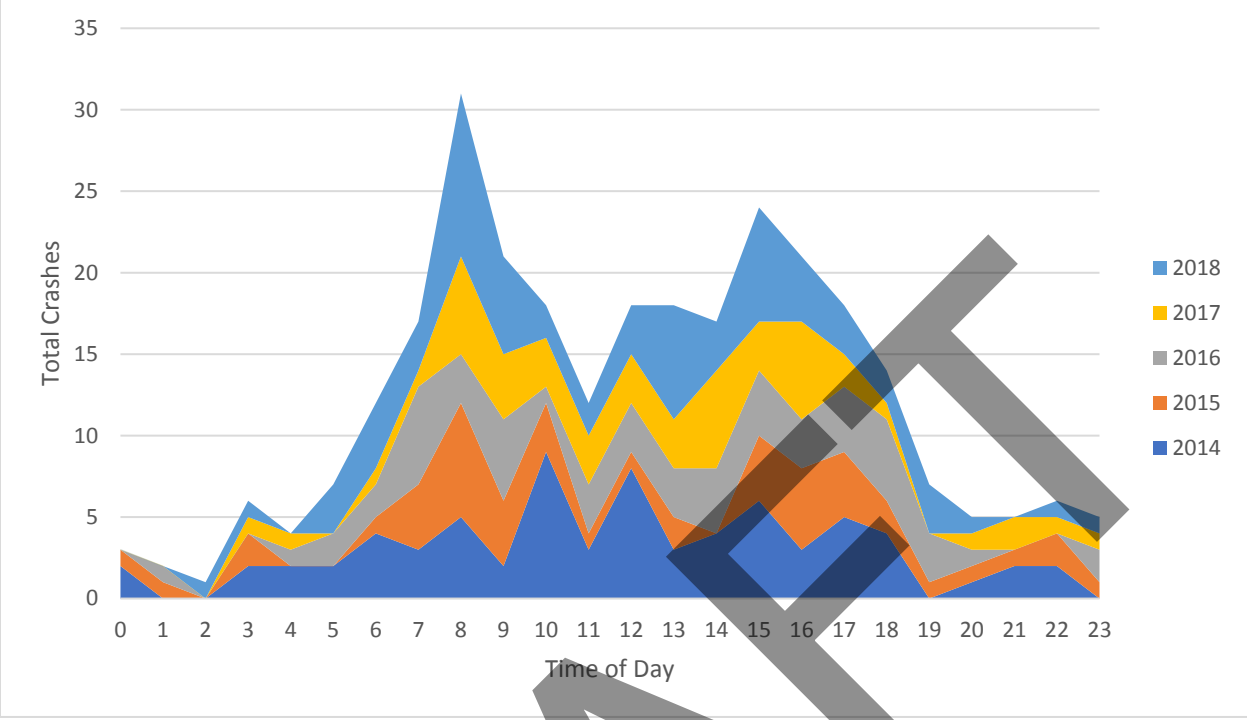

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Figure 5.4. Crashes by Crash Type (2014-2018)

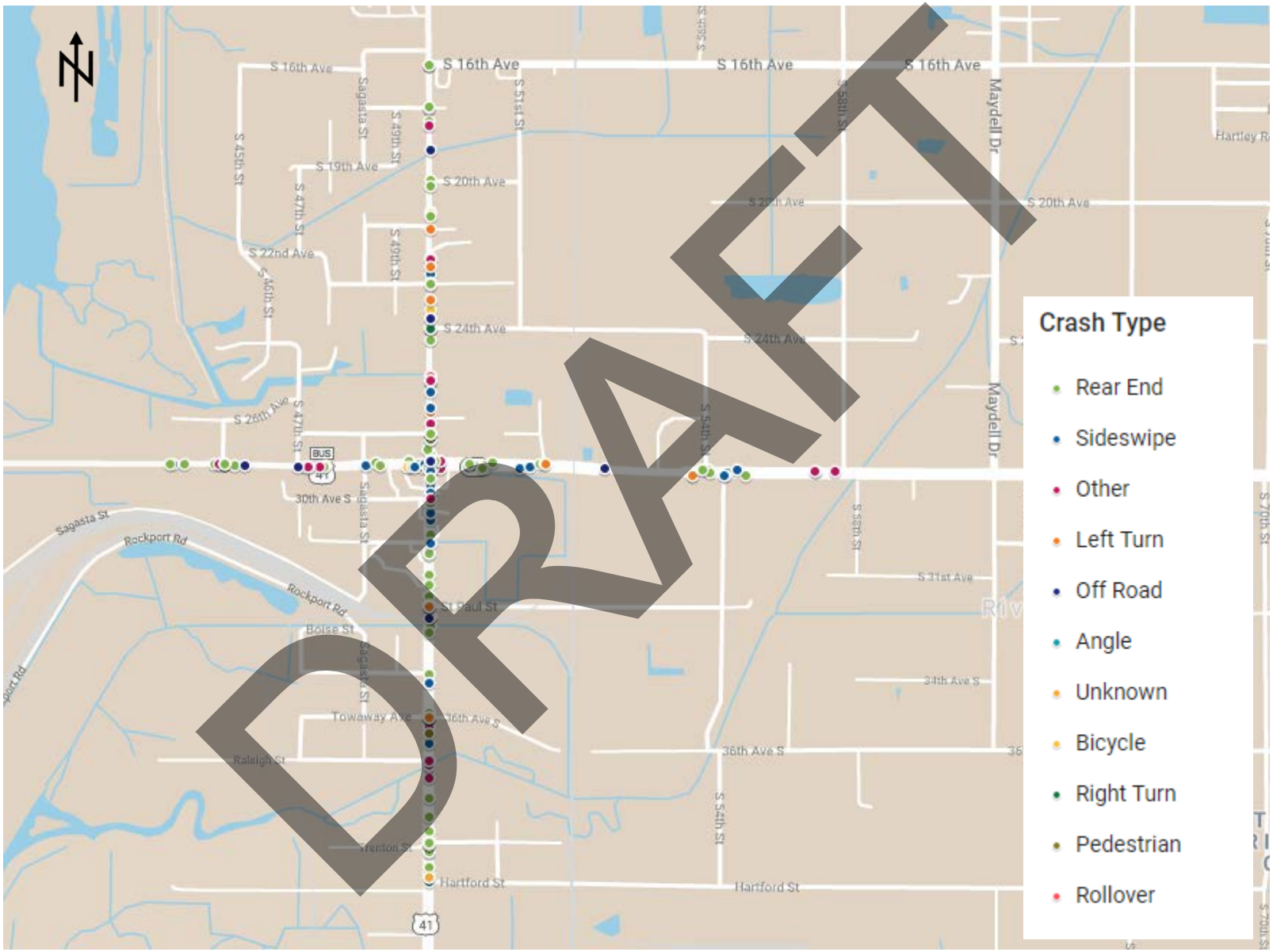

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Figure 5.5. Fatal Crashes

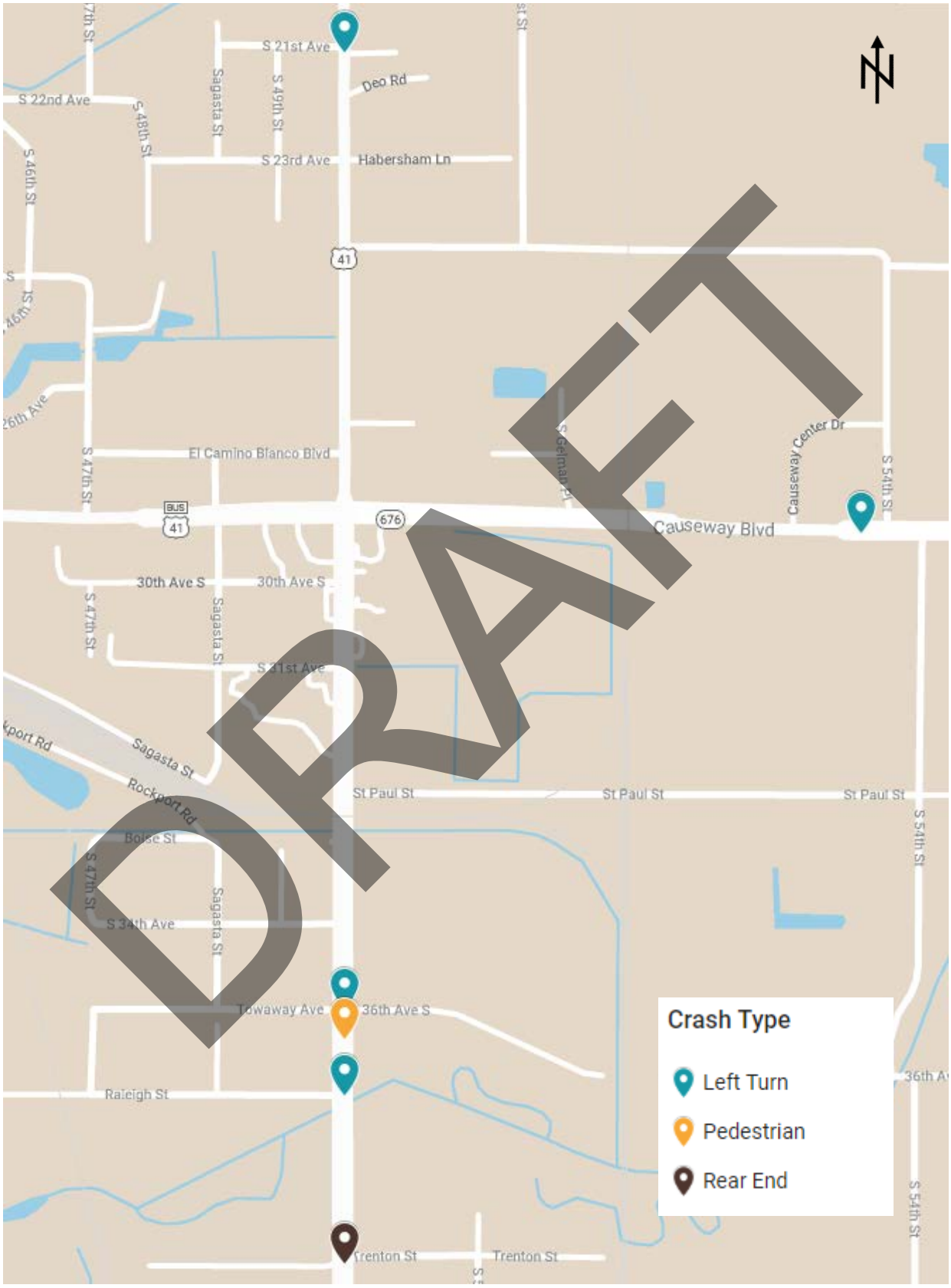

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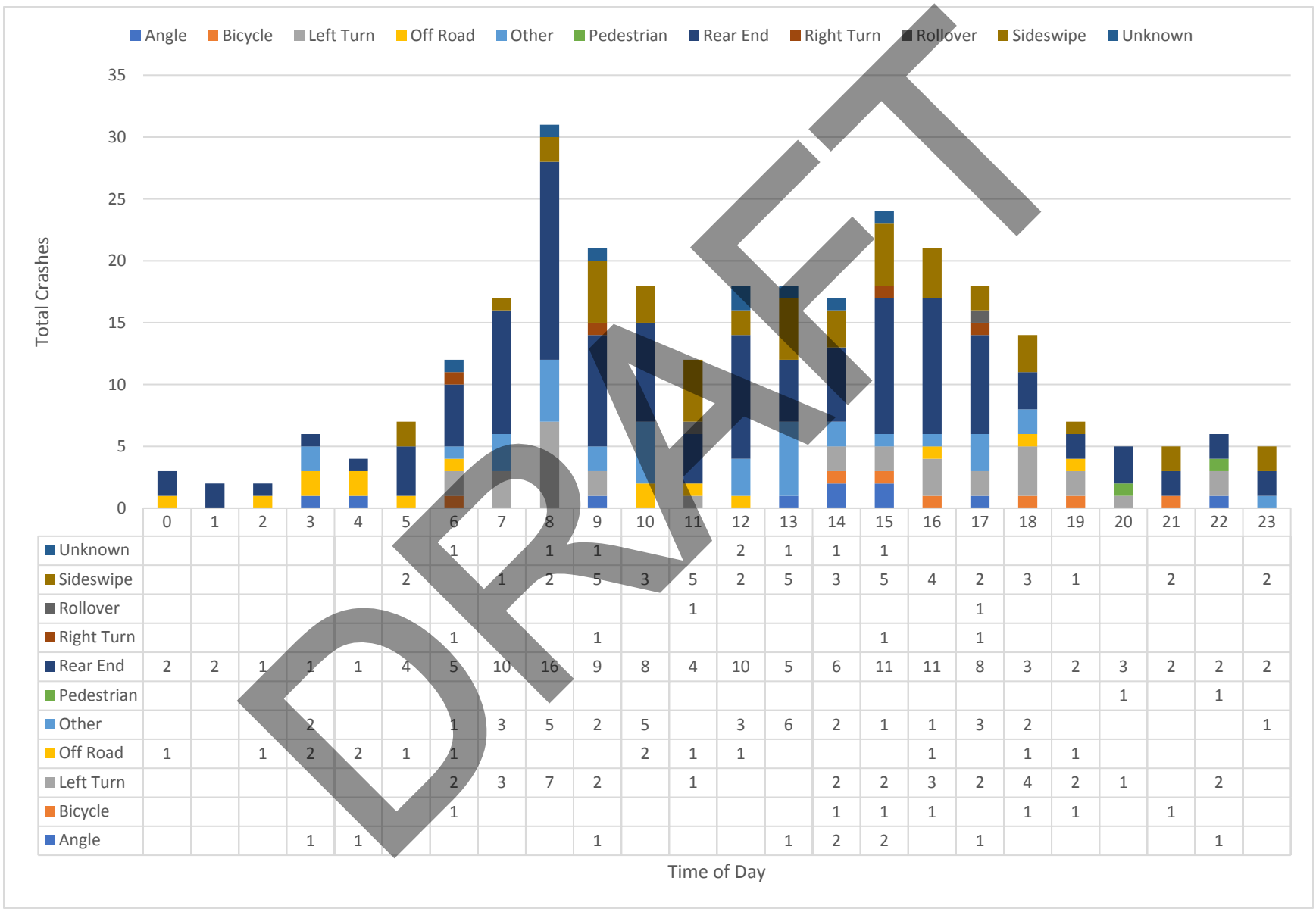
Figure 5.6. Bicycle and Pedestrian Crashes

Figure 5.7. Diurnal Crash Overview of Study Area



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Unknown							1		1	1			2	1	1	1								
Sideswipe						2		1	2	5	3	5	2	5	3	5	4	2	3	1		2		2
Rollover												1						1						
Right Turn							1			1						1		1						
Rear End	2	2	1	1	1	4	5	10	16	9	8	4	10	5	6	11	11	8	3	2	3	2	2	2
Pedestrian																					1		1	
Other				2			1	3	5	2	5		3	6	2	1	1	3	2					1
Off Road	1		1	2	2	1	1				2	1	1				1		1	1				
Left Turn							2	3	7	2		1			2	2	3	2	4	2	1		2	
Bicycle							1								1	1	1		1	1		1		
Angle				1	1					1				1	2	2		1					1	

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5.5.2 Crash Mitigation Strategies

The crash mitigation strategies offered in this section are focused on preventing the most common crash type in the study area: rear ends. As rear ends are primarily a result of congestion, the most effective countermeasure is likely to be the added roadway capacity implemented as part of the recommended Build alternative. The increased capacity would be expected to result in less congestion and therefore a lower accident probability. The second most common crash type in the study area, sideswipe collisions, is more likely to be corrected by changes in driver behavior rather than roadway improvements.

Countermeasures applicable to the study area that may reduce the frequency of rear end collisions include:

- Modify/close median openings
- Signing and pavement markings
- Add turn lane(s) and pavement resurfacing

These countermeasures are found in the FDOT Crash Reduction Factors Table (2/14/2014) and were developed using five or more projects. The countermeasures above are also likely to be incorporated with the construction of the recommended Build alternative. **Table 5.7** shows the rear end crash reduction factors for the mitigating strategies suggested for this study.

Table 5.7. Rear End Crash Reduction Factors for Crash Mitigation Strategies

Improvement	Total CRF (%)
Modify/close median openings*	6%
Signing and pavement markings*	10%
Add turn lane(s) and pavement resurfacing*	49%

*Source FDOT Crash Reduction Factors CRF.xlsm (2/14/2014)

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6.0 DEVELOPMENT OF FUTURE YEAR TRAFFIC FORECAST

Future year traffic volumes were projected using the Florida Standard Urban Transportation Model Structure (FSUTMS) compliant Tampa Bay Regional Planning Model (TBRPM), version 8.2. The future year AADT's were developed using existing year AADT, linear interpolation of model results, and the NCHRP Report 765 ratio and difference methodologies.

6.1 MODEL USED

The TBRPM Model, version 8.2, published in August of 2017 was used in the development of the future traffic volumes. The model has a base year of 2010 and a future year of 2040.

6.2 POPULATION PROJECTIONS

The University of Florida's Bureau of Business and Economic Research (BEBR's) most recent population projections were obtained from the University's website. The 2017 estimate is the most current and provides projections for 2020, 2025, 2030, 2035, 2040, and 2045 at low, medium, and high estimates; these are summarized in **Table 6.1**. Growth rates range from 0.46 to 2.02 percent. The BEBR data is provided in **Appendix I**.

Table 6.1. BEBR Hillsborough County Population Projections

2017 Estimate	Projection	2045 Projection	Annual Growth Rate
1,379,302	Low	1,569,300	0.46%
	Medium	1,983,200	1.31%
	High	2,415,100	2.02%

6.3 FUTURE YEAR AADT AND DDHV

The volumes were extracted and, utilizing NCHRP's 765 ratio and difference methodologies, future year smoothed AADTs were developed for the study area. The forecasted AADTs are presented in **Table 6.2**.

DDHVs were calculated by applying the traffic design factors presented in Section 5.2.2 to the forecasted AADT. Future year design hour turning movement volumes (DHTMV) used in the intersection analyses were calculated by applying the existing turning movement percentages to the DDHVs.

The DHTMVs for the No-Build and Build alternatives are presented in **Figure 6.1** through **Figure 6.13**.

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Table 6.2. NCHRP 765 & AADT Forecast for Existing, Opening, Interim, and Design Years

Roadway / Segment	Smoothing Procedure							Linear Trend Growth Rate	AADT by Forecast Year			
	AADT	Model Volumes		Interpolate	2040 NCHRP 765							
	2018	2010	2040	2018	Ratio	Difference	Average		2018	2026	2036	2046
US 41												
North of Causeway Blvd	26,000	21,700	39,000	26,300	37,200	37,100	37,200	1.96%	26,000	30,100	35,200	40,300
South of Causeway Blvd	39,000	31,400	64,200	40,100	62,400	63,100	62,800	2.77%	39,000	47,700	58,500	69,300
Causeway Blvd												
East of US 41	19,000	14,000	37,000	20,100	35,000	35,900	35,500	3.95%	19,000	25,000	32,500	40,000
West of US 41	28,000	19,100	61,400	30,400	56,600	59,000	57,800	4.84%	28,000	38,800	52,400	65,900

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Figure 6.1. No-Build: 2026 Opening Year, 2036 Interim Year, and 2046 Design Year DHTMV

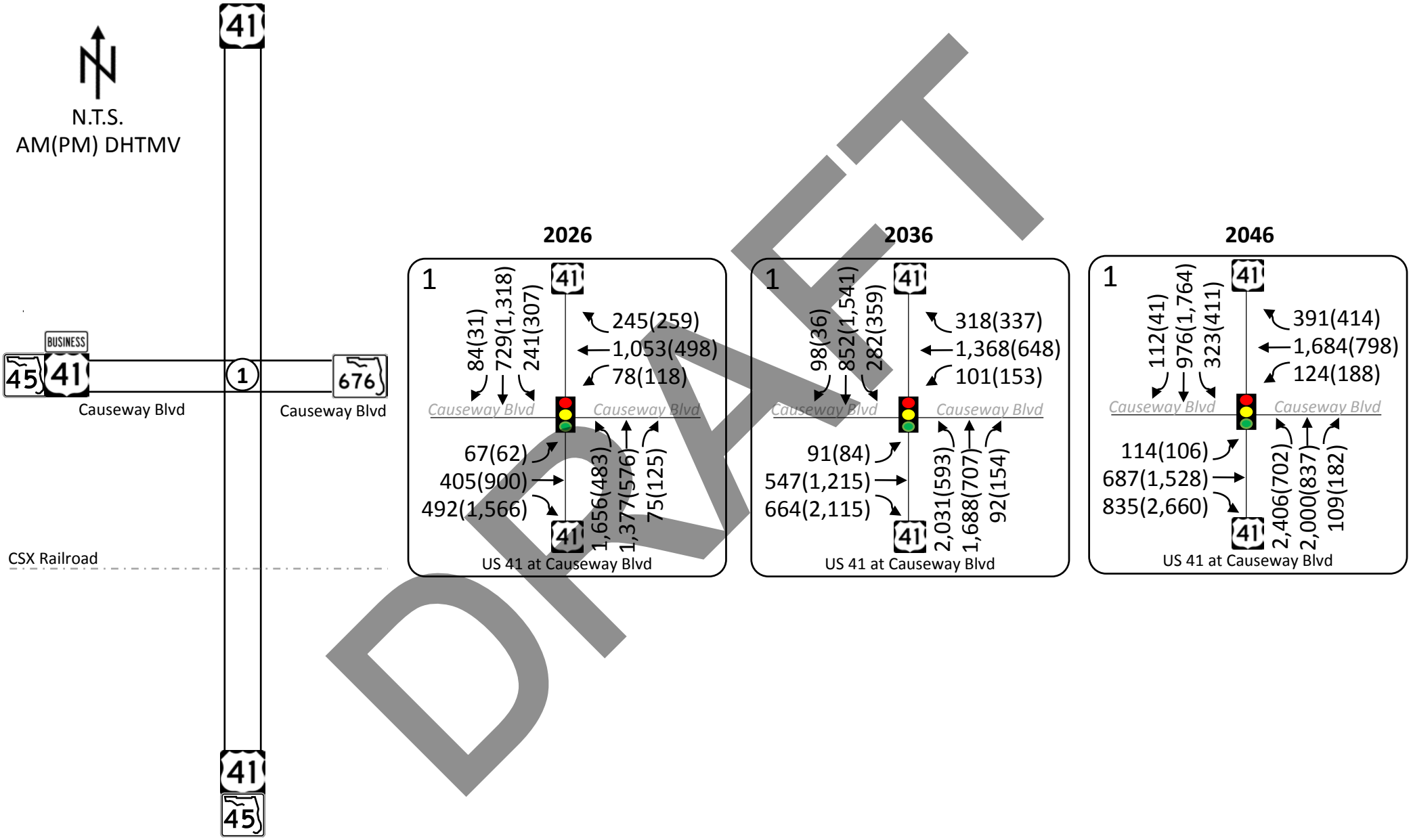

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Figure 6.2. Build Alternative 1: 2026 Opening Year DHTMV

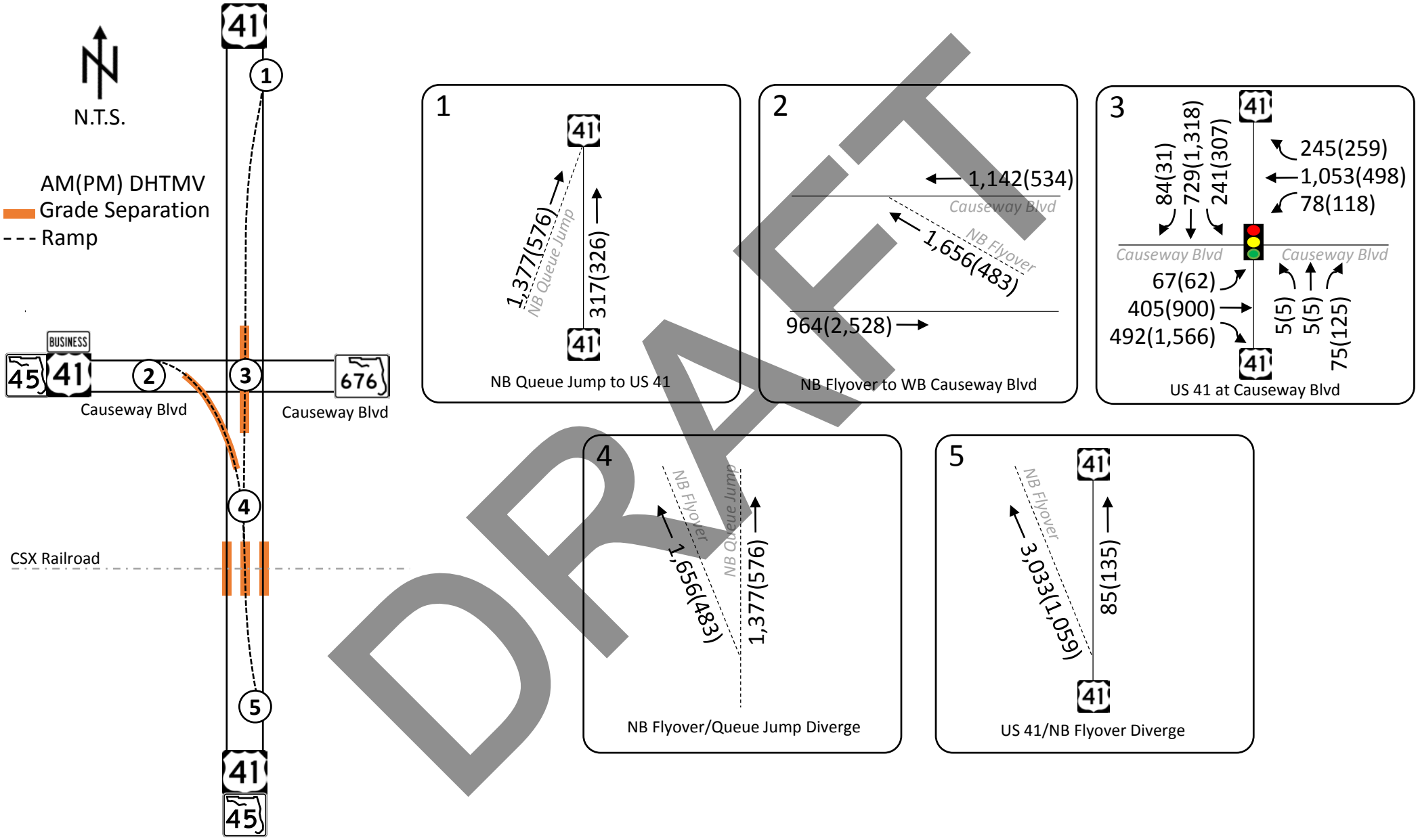

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Figure 6.3. Build Alternative 1: 2036 Opening Year DHTMV

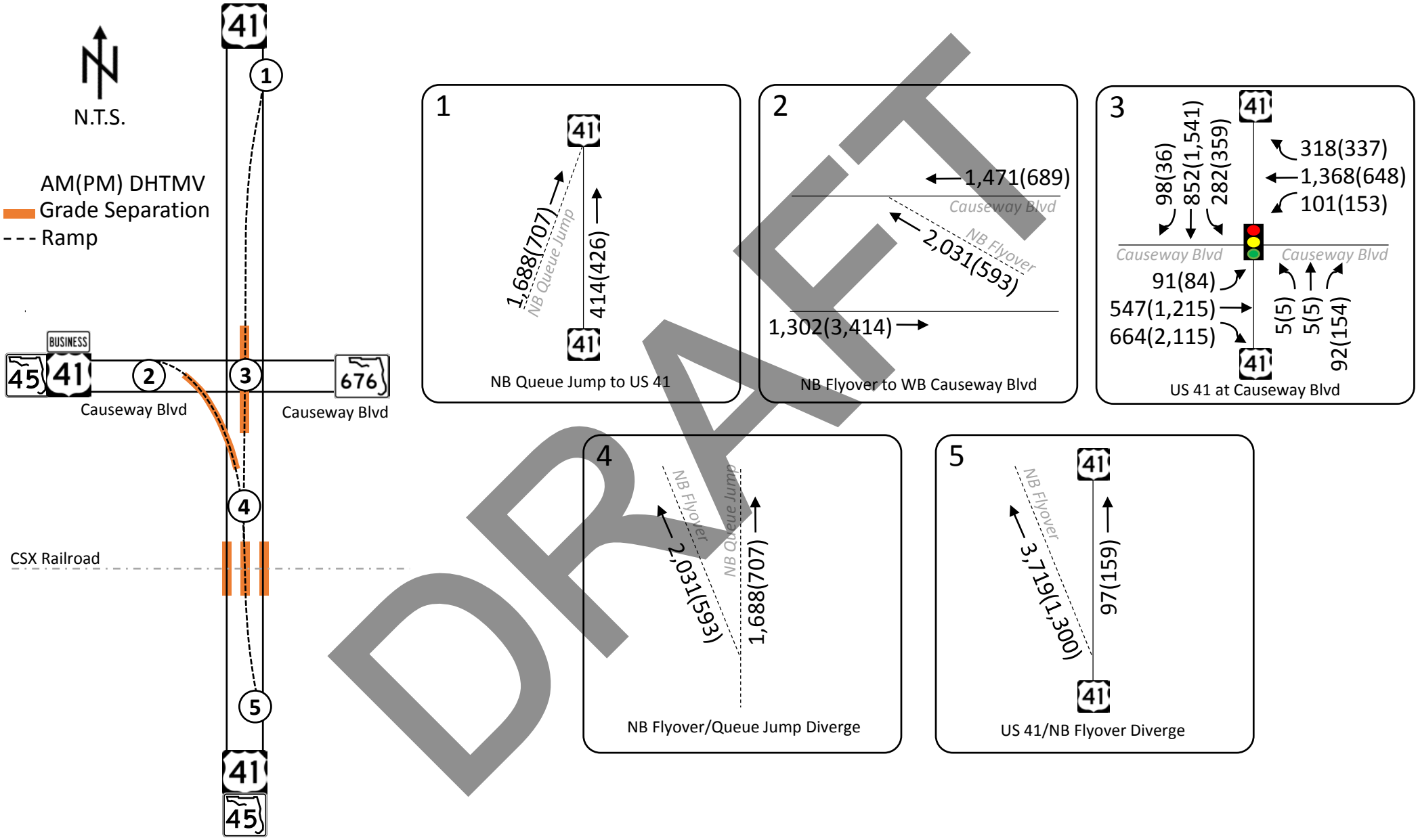

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Figure 6.4. Build Alternative 1: 2046 Opening Year DHTMV

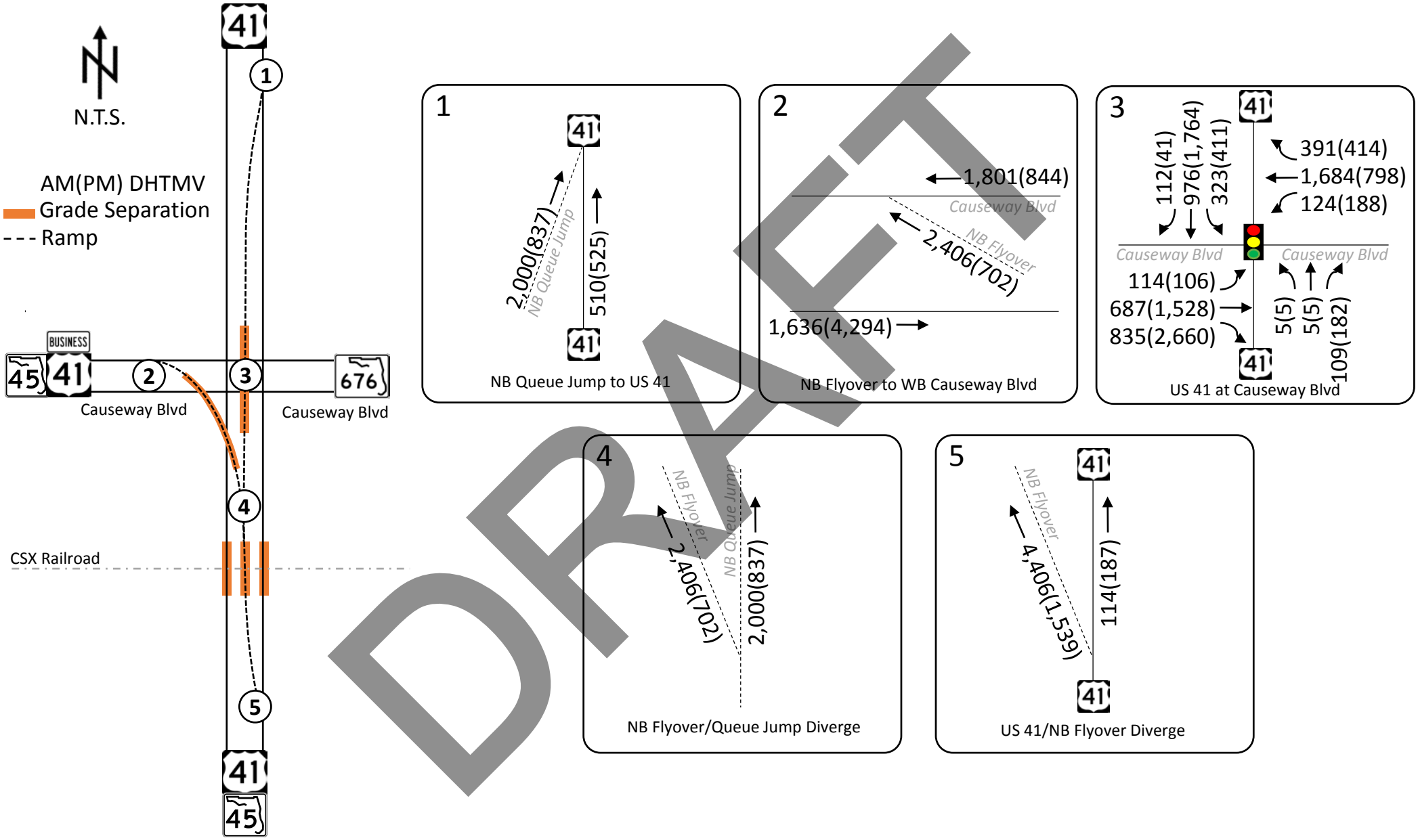

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Figure 6.5. Build Alternative 2: 2026 Opening Year DHTMV

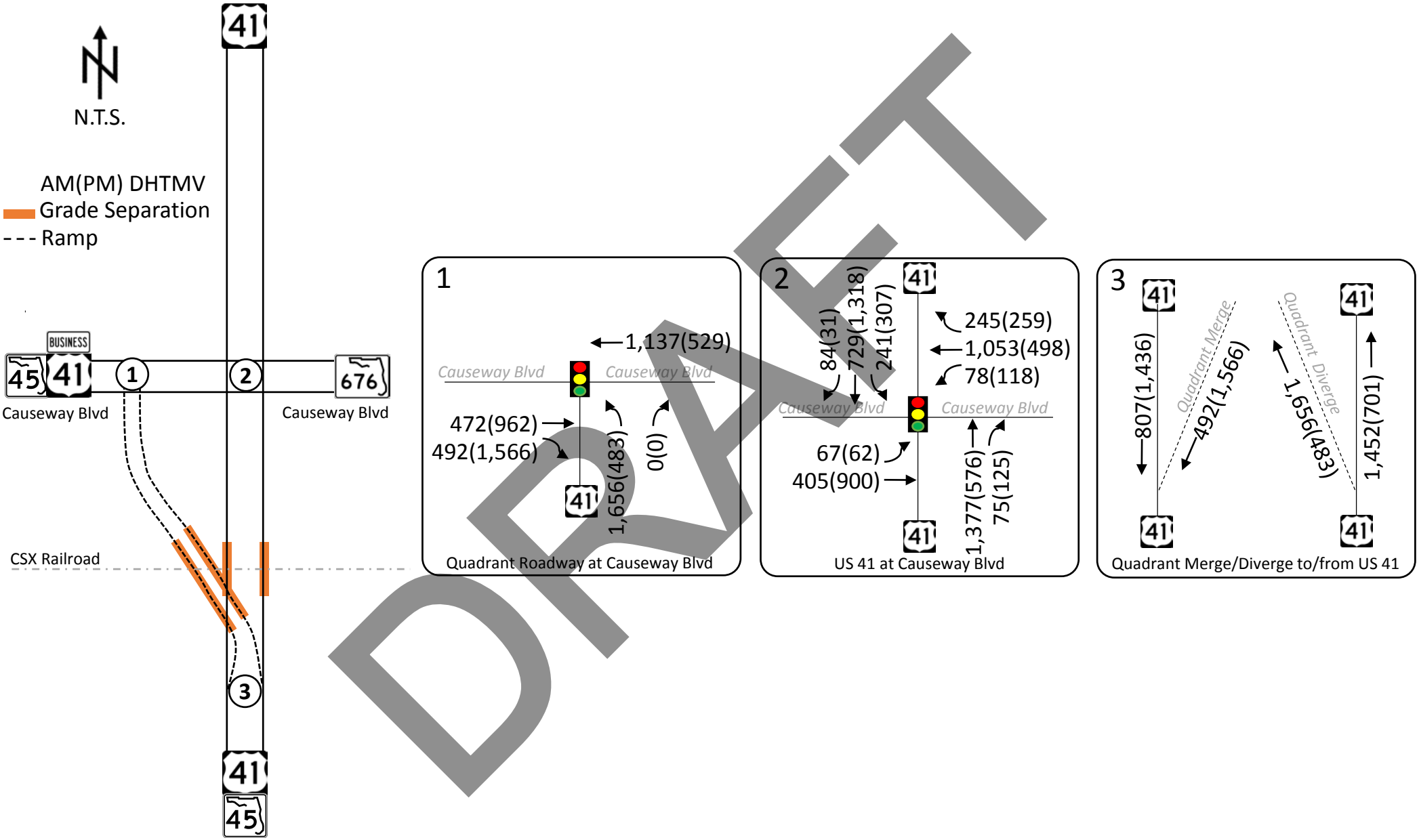

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Figure 6.6. Build Alternative 2: 2036 Opening Year DHTMV

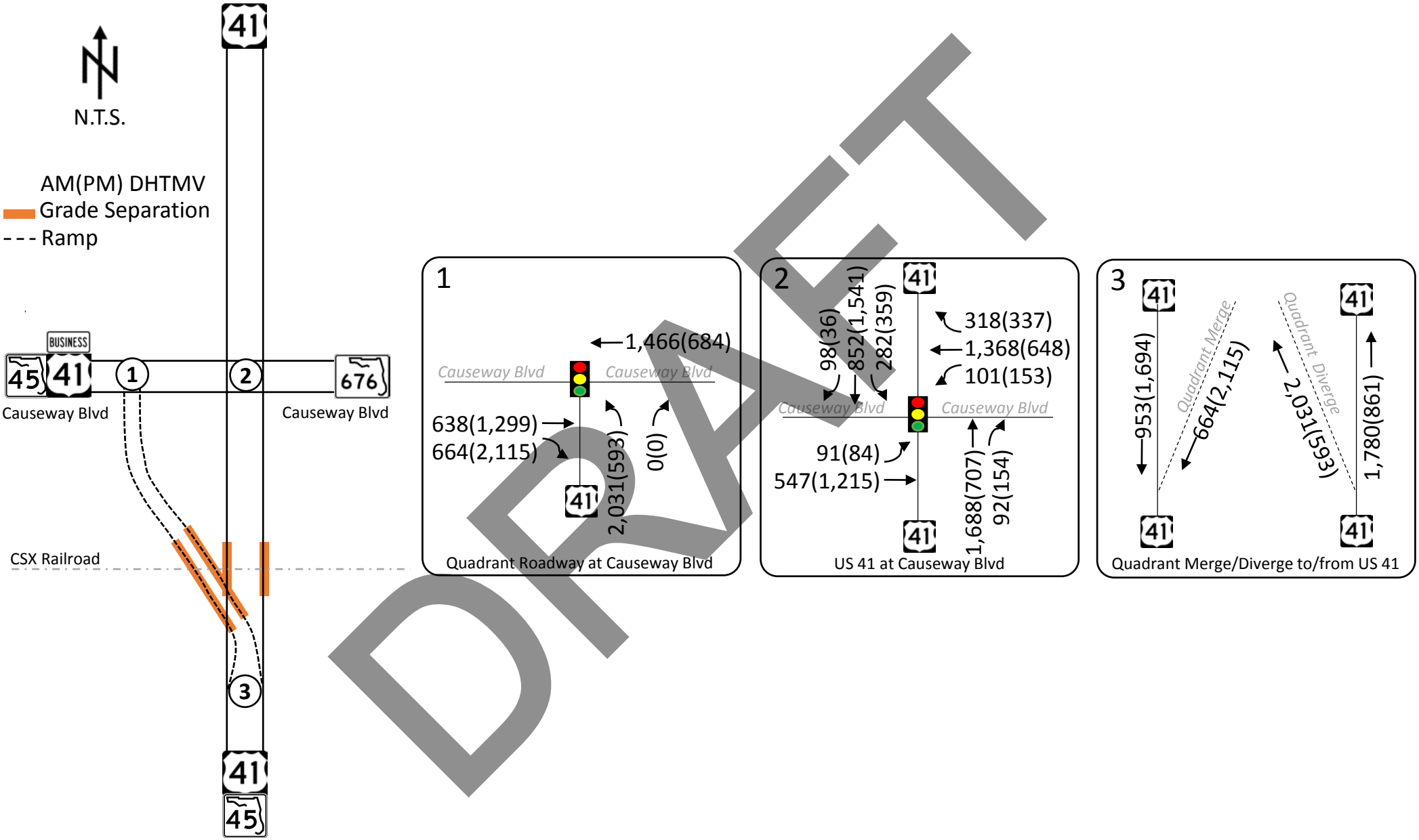

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Figure 6.7. Build Alternative 2: 2046 Opening Year DHTMV

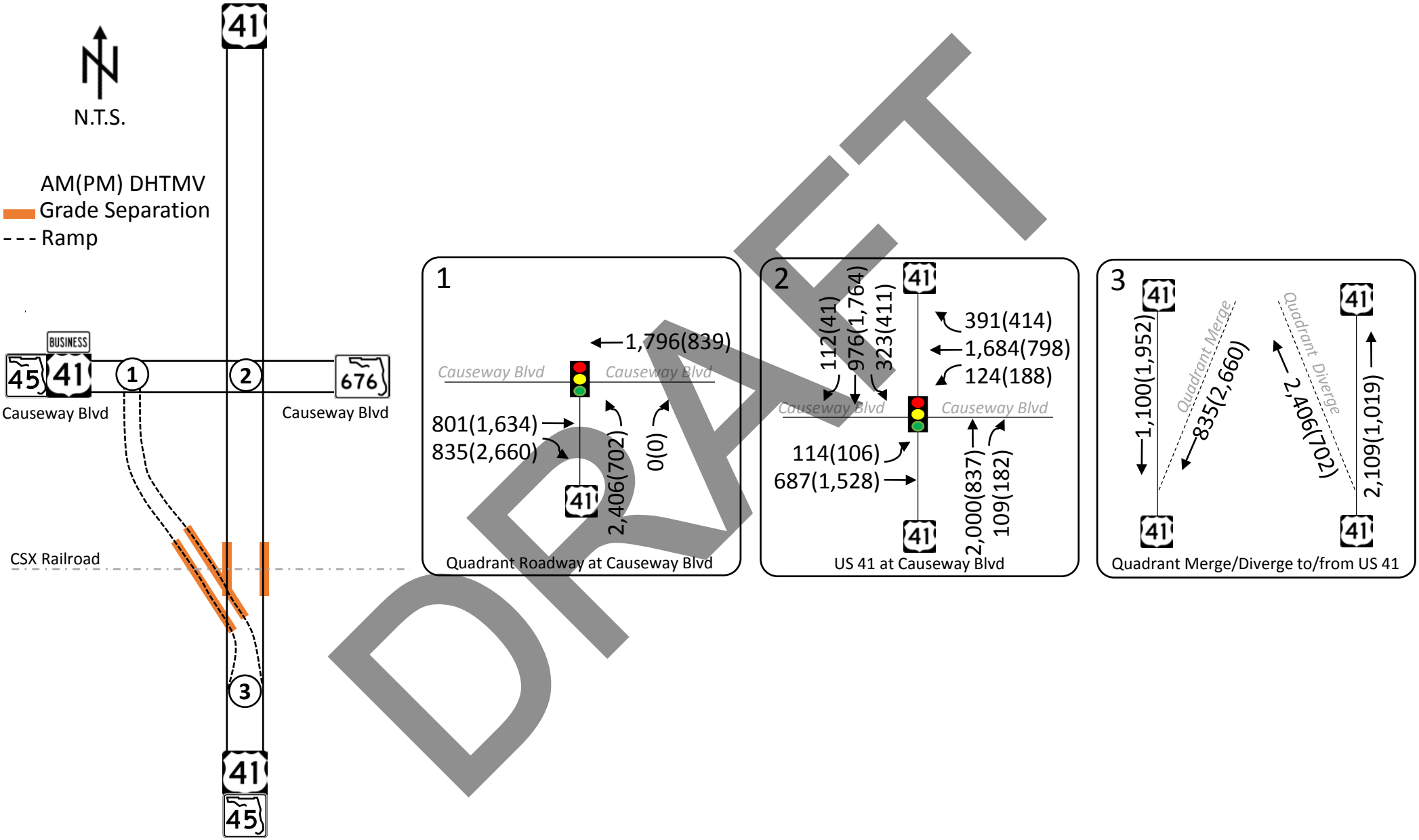

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Figure 6.8. Build Alternative 3: 2026 Opening Year DHTMV

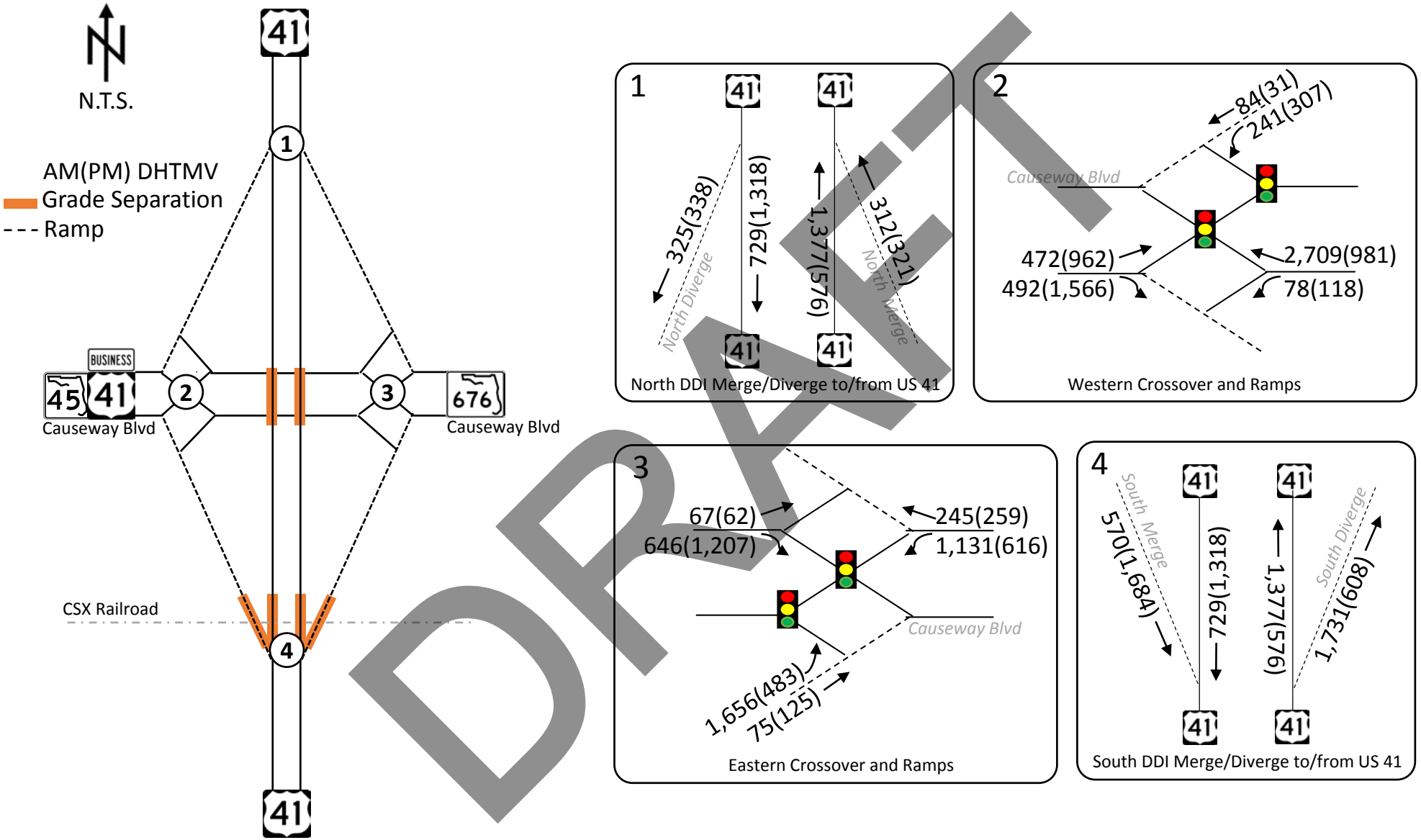

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Figure 6.9. Build Alternative 3: 2036 Opening Year DHTMV

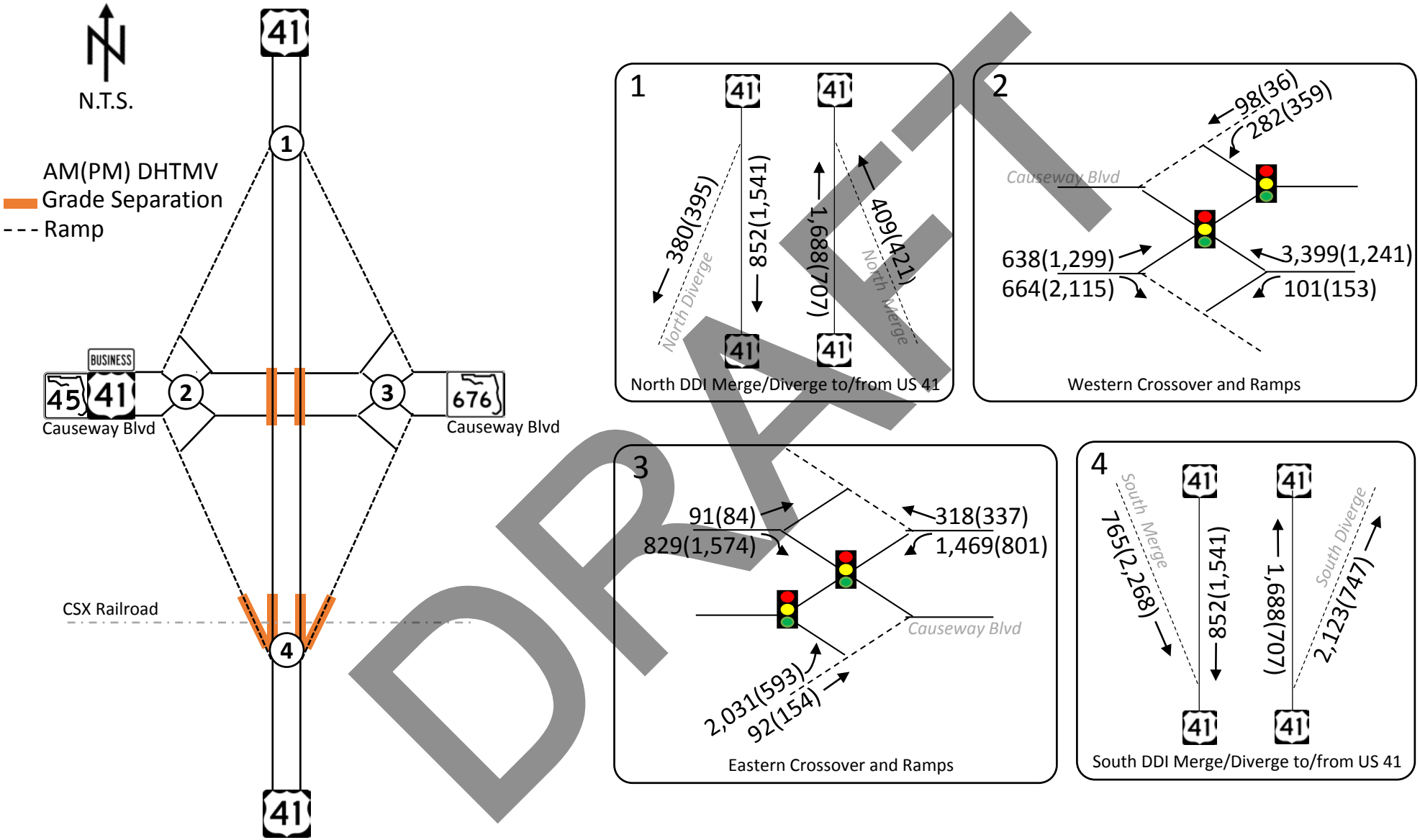

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Figure 6.10. Build Alternative 3: 2046 Opening Year DHTMV

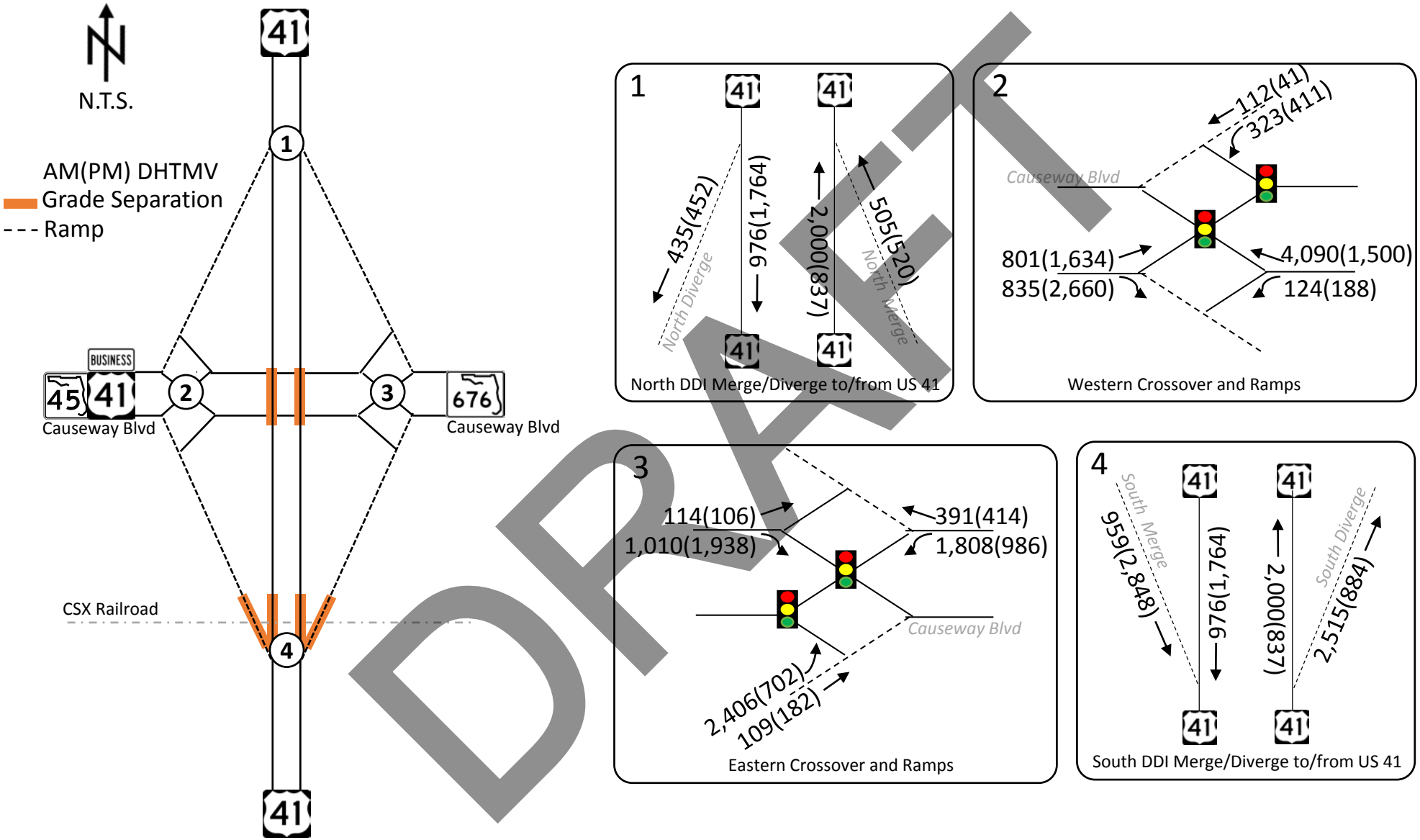

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Figure 6.11. Build Alternative 4: 2026 Opening Year DHTMV

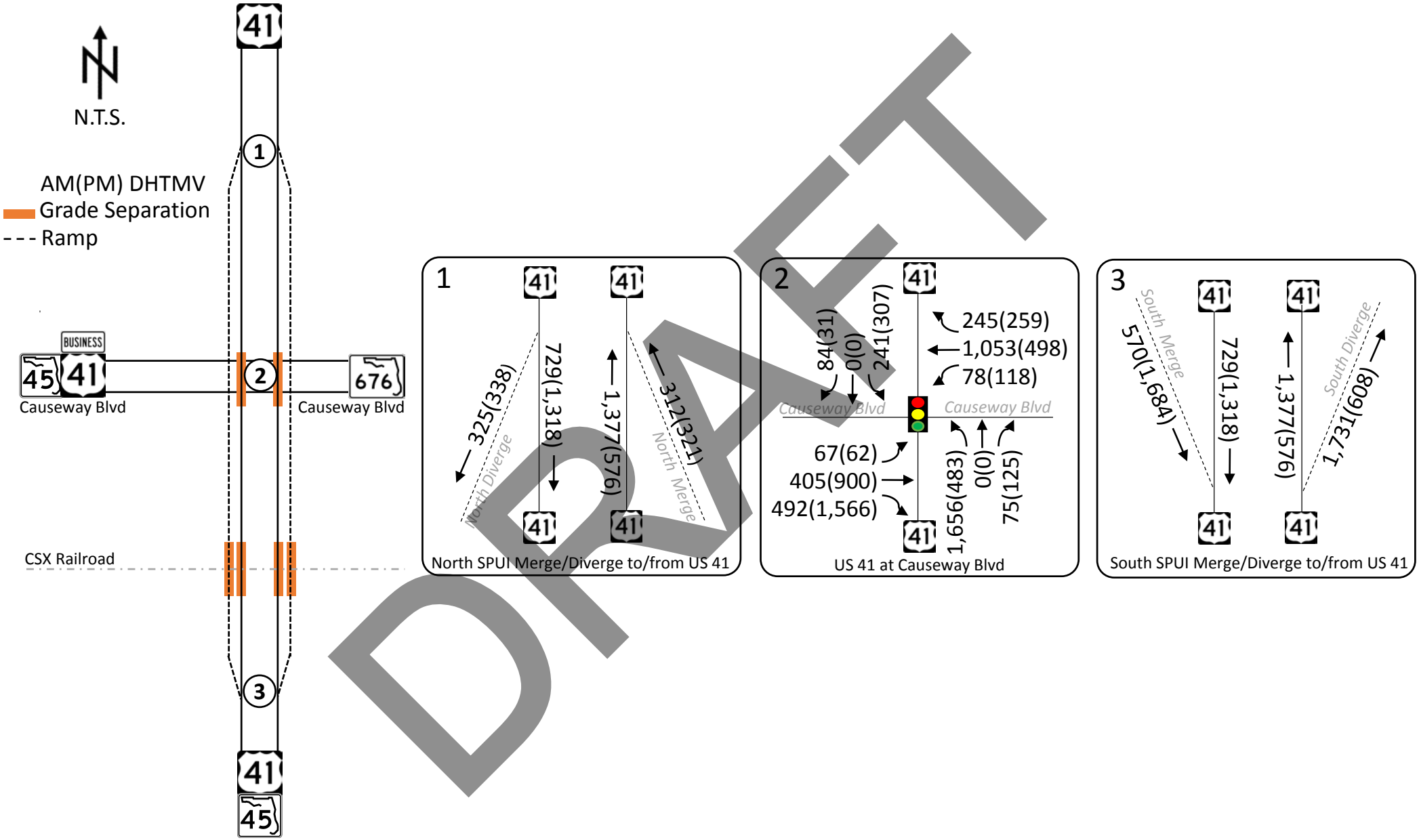

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Figure 6.12. Build Alternative 4: 2036 Opening Year DHTMV

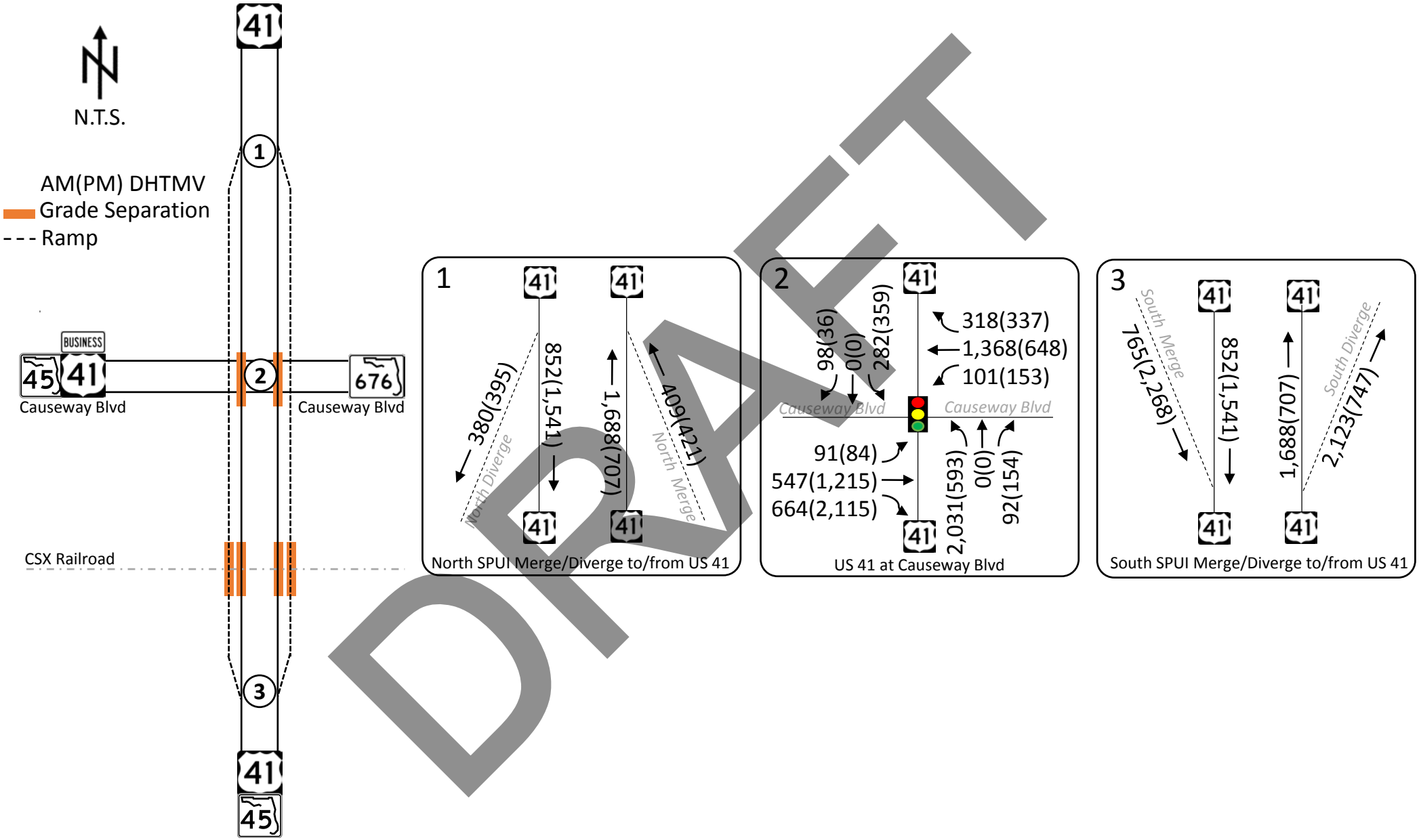

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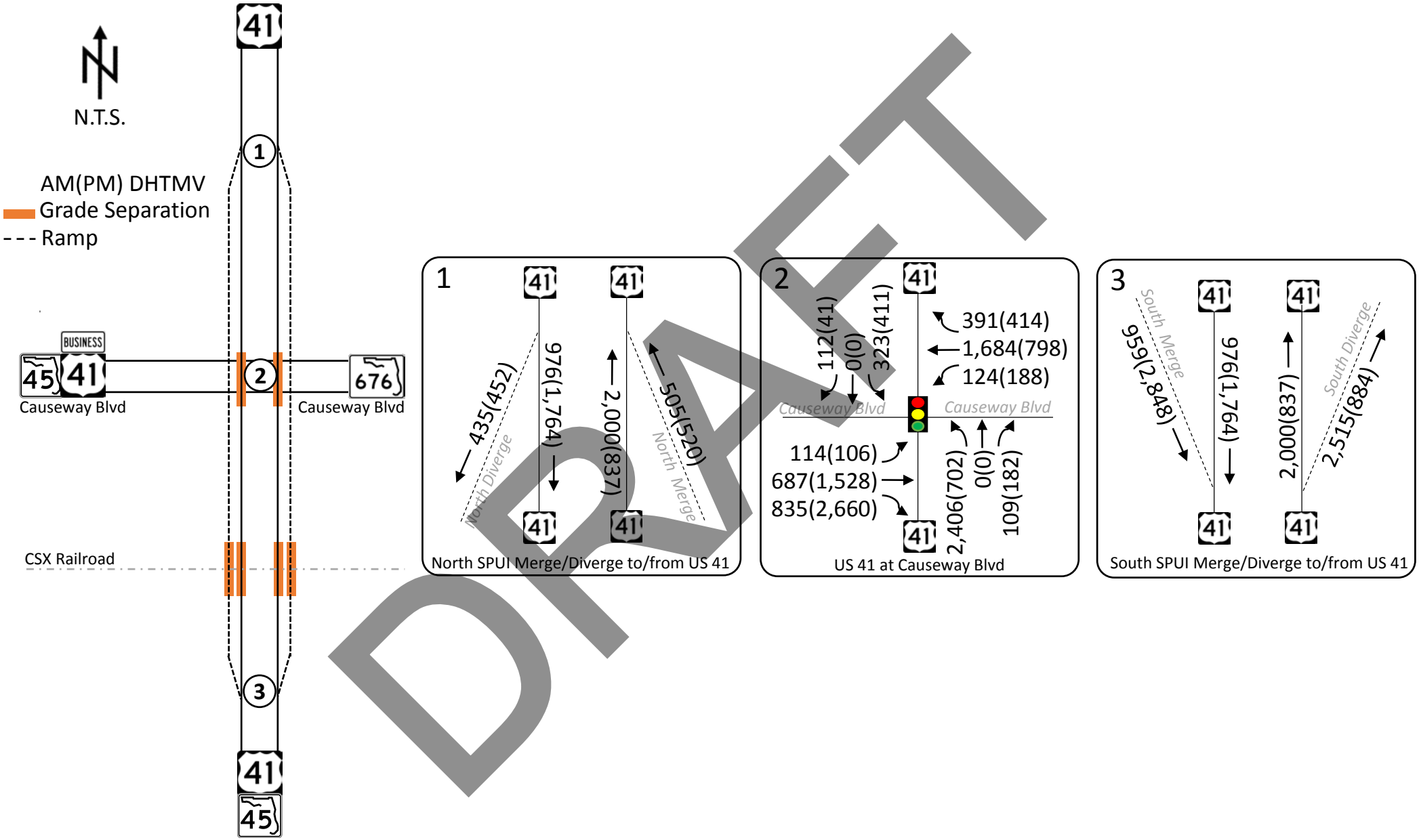
Figure 6.13. Build Alternative 4: 2046 Opening Year DHTMV



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7.0 ALTERNATIVES ANALYSIS

The purpose of this project is to reduce traffic delays associated with the CSX Railroad crossing and the intersection of US 41 and Causeway Boulevard, adequately support the safe movement of truck traffic, and enhance connectivity among bicyclists and pedestrians. This is achieved through grade-separation of US 41 over the CSX Railroad crossing with related improvements provided at the intersection of US 41 at Causeway Boulevard. FDOT's policy states that the target LOS for automobile modes in urbanized area is "D". The concepts were developed with this target in mind, however, in an effort to minimize right-of-way constraints as well as provide a consistent comparison among the alternatives, each was analyzed with a six-lane typical section on Causeway Boulevard. During the analysis, it was found that for some alternatives, eight-lane typical sections may be required for either or both US 41 and Causeway Boulevard to achieve segment or intersection operations of LOS D. *Synchro* reports for each of the alternatives are included in **Appendix J.**

7.1 NO-BUILD ALTERNATIVE

7.1.1 Geometry

The No-Build Alternative assumes that the geometry of the existing transportation network is maintained throughout all analysis years. The lane configurations presented for the existing condition in **Figure 5.1** can be used for the No-Build Alternative.

7.1.2 Signal Timing

For the No-Build Alternative, the existing (2018) AM and PM peak hour cycle lengths were maintained for each analysis year. Other signal timing parameters, such as the minimum green time, passage time, clearance intervals, and minimum gap were kept consistent with the existing conditions. *Synchro*'s "Optimize Splits" tool was used to optimize the split times and phase order for each analysis year, and this is assumed to be consistent with routine maintenance that would be provided under a No-Build scenario.

7.1.3 *Access Management*

Existing access would be maintained in the No-Build Alternative.

7.1.4 Roadway Segment Analysis

The roadway segment analysis for the No-Build alternative was completed using FDOT's Generalized Tables (Tables 1 and 7) to develop LOS based on AADT and DDHVs for each segment. The results of the roadway segment analysis for the No-Build alternative are presented in **Table 7.1**.

The results indicate:

- For the opening year:
    - All segments operate at LOS C or D based on AADT.
    - The following segments operate at LOS F based on DDHV:
        - Northbound US 41, south of Causeway Boulevard (AM peak hour)

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        - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
        - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
- For the interim year:
    - The Causeway Boulevard segment west of US 41 operates at LOS F based on AADT.
    - The following segments operate at LOS F based on DDHV:
        - Southbound US 41, south of Causeway Boulevard (PM peak hour)
        - Northbound US 41, south of Causeway Boulevard (AM peak hour)
        - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
        - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
- For the design year:
    - The following segments operate at LOS F based on AADT:
        - US 41 south of Causeway Boulevard
        - Causeway Boulevard west of US 41
        - Causeway Boulevard east of US 41
    - The following segments operate at LOS F based on DDHV:
        - Southbound US 41, south of Causeway Boulevard (PM peak hour)
        - Northbound US 41, south of Causeway Boulevard (AM peak hour)
        - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
        - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
        - Westbound Causeway Boulevard, east of US 41 (AM peak hour)
        - Eastbound Causeway Boulevard, east of US 41 (PM peak hour)

7.1.5 Intersection Operational Analysis

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for the No-Build Alternative for opening, interim, and design years are presented in **Table 7.2**.

The results indicate failing operations at the intersection of US 41 and Causeway Boulevard in each of the analysis years during both the AM and PM peak hours. During the PM peak hour of 2046, none of the movements are expected to operate at target LOS D. The v/c ratios show that the intersection nears capacity by 2026 and exceeds capacity by 2036. The results show that the most problematic approaches under the No-Build scenario are northbound during the AM peak hour and eastbound during the PM peak hour.

7.1.6 Design Year Queuing Analysis

Synchro was used to generate 95th percentile queues for the design year as described in Section 4.3. **Figure 7.1** shows the queue lengths for the No-Build scenario. The results indicate that queues in the northbound direction would be expected to extend to nearly 3,000 feet during the AM peak hour and eastbound queues would extend to 2,700 feet during the PM peak hour. The "#" notation for several of the queues indicates that the 95th percentile volume exceeds the capacity. Queuing reports generated by *Synchro* can be found in **Appendix J**.

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Table 7.1. No-Build Alternative Opening, Interim, and Design Year Roadway Segment Analysis

2026								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	30,100	C	1,054	C	1,656	C
Northbound, North of Causeway Boulevard	6	50	30,100	C	1,689	C	897	C
Southbound, South of Causeway Boulevard	6	50	47,700	C	1,299	C	3,002	D
Northbound, South of Causeway Boulevard	6	50	47,700	C	3,108	F	1,184	C
Causeway Boulevard								
Westbound, West of US 41	4	45	38,800	D	2,793	F	1,012	C
Eastbound, West of US 41	4	45	38,800	D	964	C	2,528	F
Westbound, East of US 41	4	45	25,000	C	1,376	C	875	C
Eastbound, East of US 41	4	45	25,000	C	721	C	1,332	C
2036								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	35,200	C	1,232	C	1,936	C
Northbound, North of Causeway Boulevard	6	50	35,200	C	2,097	C	1,128	C
Southbound, South of Causeway Boulevard	6	50	58,500	D	1,617	C	3,809	F
Northbound, South of Causeway Boulevard	6	50	58,500	D	3,811	F	1,454	C
Causeway Boulevard								
Westbound, West of US 41	4	45	52,400	F	3,497	F	1,277	C
Eastbound, West of US 41	4	45	52,400	F	1,302	C	3,414	F
Westbound, East of US 41	4	45	32,500	C	1,787	C	1,138	C
Eastbound, East of US 41	4	45	32,500	C	921	C	1,728	C
2046								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	40,300	C	1,411	C	2,216	C
Northbound, North of Causeway Boulevard	6	50	40,300	C	2,505	C	1,357	C
Southbound, South of Causeway Boulevard	6	50	69,300	F	1,935	C	4,612	F
Northbound, South of Causeway Boulevard	6	50	69,300	F	4,515	F	1,721	C
Causeway Boulevard								
Westbound, West of US 41	4	45	65,900	F	4,202	F	1,541	C
Eastbound, West of US 41	4	45	65,900	F	1,636	C	4,294	F
Westbound, East of US 41	4	45	40,000	F	2,199	F	1,400	C
Eastbound, East of US 41	4	45	40,000	F	1,119	C	2,121	F

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Table 7.2. No-Build Opening, Interim, and Design Year Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	137.3	F	0.76	92.5	F	0.63	199.8	F	1.03	79.0	E	0.53	287.5	F	1.29	86.4	F	0.67
	EBT	65.1	E	0.49	132.9	F	1.14	67.6	E	0.63	204.8	F	1.32	72.3	E	0.77	320.5	F	1.58
	EBR	9.2	A	0.32	245.2	F	1.48	10.9	B	0.45	471.4	F	1.99	12.7	B	0.57	740.5	F	2.59
	EB Approach	*41.7*	*D*	*0.40*	*201.5*	*F*	*1.30*	*48.0*	*D*	*0.53*	*366.9*	*F*	*1.60*	*56.9*	*E*	*0.67*	*574.8*	*F*	*2.00*
	WBL	121.3	F	0.71	153.3	F	1.00	120.2	F	0.75	253.7	F	1.30	123.5	F	0.80	375.7	F	1.60
	WBT	188.9	F	1.23	53.1	D	0.61	298.1	F	1.49	55.0	D	0.74	408.8	F	1.74	61.3	E	0.87
	WBR	73.2	E	0.64	30.9	C	0.72	78.9	E	0.78	72.1	E	0.86	92.2	F	0.91	99.1	F	1.01
	WB Approach	*164.4*	*F*	*1.02*	*60.0*	*E*	*0.68*	*249.1*	*F*	*1.22*	*86.7*	*F*	*0.82*	*336.3*	*F*	*1.42*	*114.7*	*F*	*0.97*
	NBL	316.6	F	1.55	79.8	E	0.90	543.7	F	2.05	265.8	F	1.42	769.8	F	2.55	571.9	F	2.10
	NBT	81.3	F	0.98	48.4	D	0.65	166.5	F	1.22	51.5	D	0.76	270.4	F	1.46	64.5	E	0.90
	NBR	82.2	F	0.98	48.6	D	0.65	174.1	F	1.24	51.6	D	0.76	281.9	F	1.49	64.7	E	0.90
	NB Approach	*206.9*	*F*	*1.22*	*61.2*	*E*	*0.74*	*369.3*	*F*	*1.56*	*138.9*	*F*	*0.93*	*539.3*	*F*	*1.90*	*271.5*	*F*	*1.17*
	SBL	308.3	F	1.42	127.5	F	1.05	490.3	F	1.84	467.6	F	1.85	720.9	F	2.35	708.2	F	2.39
	SBT	83.7	F	0.80	52.2	D	0.82	94.4	F	0.91	69.4	E	0.97	124.9	F	1.05	95.1	F	1.07
	SBR	91.7	F	0.81	57.3	E	0.82	106.3	F	0.92	78.8	E	0.97	138.9	F	1.05	104.2	F	1.07
	SB Approach	*137.3*	*F*	*0.89*	*67.6*	*E*	*0.86*	*188.2*	*F*	*1.03*	*146.0*	*F*	*1.06*	*264.9*	*F*	*1.20*	*211.5*	*F*	*1.19*
	Overall	**162.1**	**F**	**0.87**	**119.5**	**F**	**0.92**	**264.0**	**F**	**1.08**	**231.1**	**F**	**1.15**	**373.0**	**F**	**1.29**	**370.1**	**F**	**1.39**

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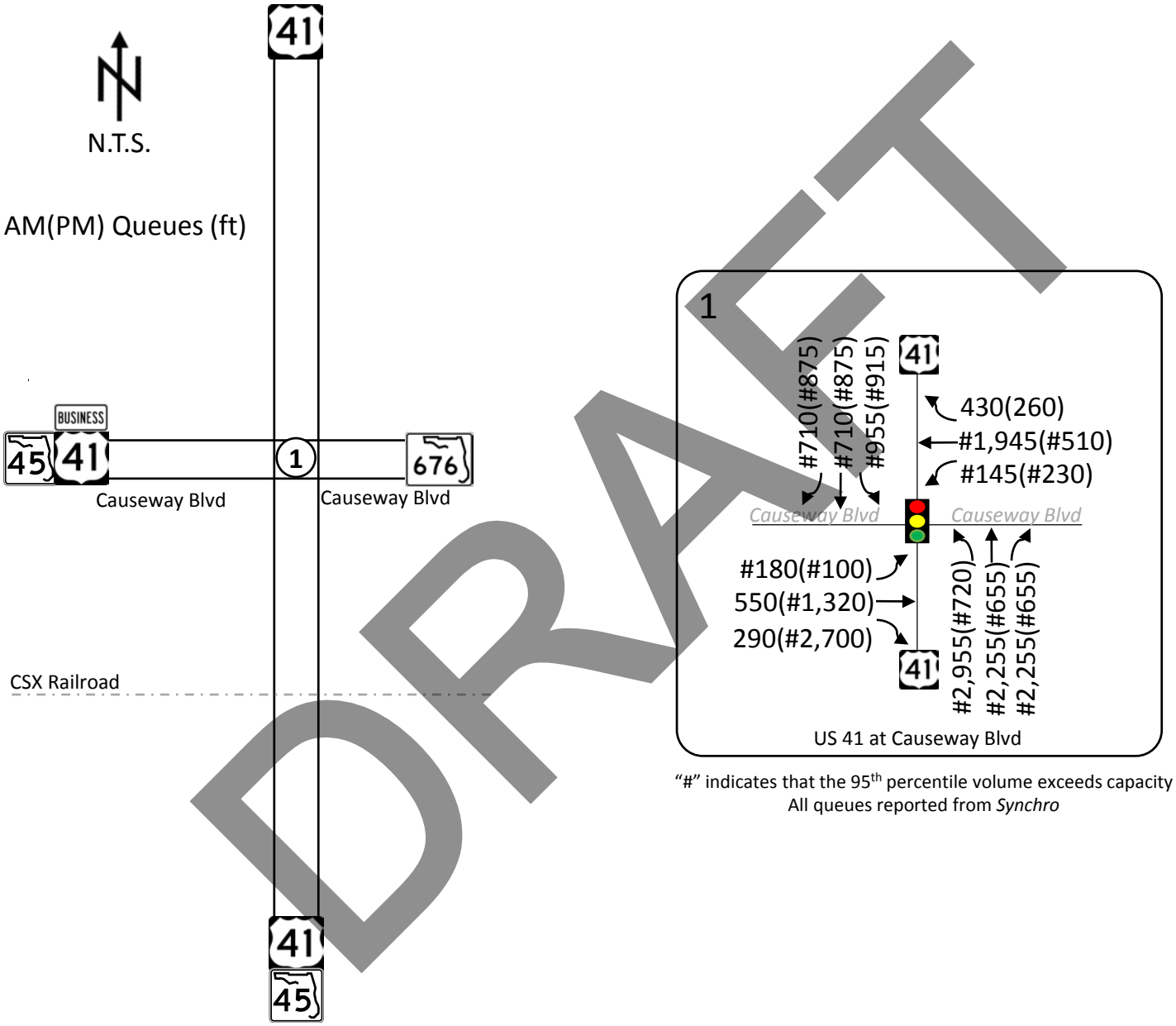
Figure 7.1. No-Build Alternative Design Year 95th Percentile Queues



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7.2 BUILD ALTERNATIVE 1: NORTHBOUND FLYOVER

7.2.1 Geometry

Build Alternative 1 includes the construction of a grade-separated, northbound-to-westbound (US 41 NB to Causeway Boulevard WB), two-lane flyover originating south of the CSX Railroad crossing south of Causeway Boulevard. The flyover ends with a one-lane merge to the inside of westbound Causeway Boulevard. Build Alternative 1 also includes a two-lane, grade-separated northbound overpass or "queue jump" over the intersection of US 41 and Causeway Boulevard, which removes most northbound through traffic from the intersection. At US 41 and Causeway Boulevard, a triple right turn is used to service the heavy PM eastbound right turn volume.

Both US 41 and Causeway Boulevard have six-lane typical sections (three lanes per direction), and each direction of US 41 is grade-separated at the CSX Railroad crossing south of Causeway Boulevard. The design speeds for US 41, Causeway Boulevard, the flyover, and queue jump are assumed to be 50 mph. The lane configurations for Build Alternative 1 are included in **Figure 7.2**.

7.2.2 Signal Timing

Build Alternative 1 was analyzed with lead-lag phasing for the northbound and southbound left-turns. Right-turn-on-red (RTOR) was disallowed for the eastbound triple right turns. *Synchro*'s "Optimize Cycle Length" tool was used to develop the cycle length, split times, and phase order for each analysis year, with a minimum cycle length of 120 seconds defined for this alternative. Manual adjustments to the timing were made in some cases to further reduce the delay. Optimizing the cycle length may not have produced cycle lengths consistent with other signals along the corridor, however, this was employed to show the best-case scenario for the alternative. In addition, this may give way to further signal timing improvements along the corridor.

7.2.3 Access Management

Under this alternative, most existing access points to adjacent parcels would remain. Access to and from parcels south of Causeway Boulevard would be provided with frontage roads along either side of US 41. Design speeds for the frontage roads are assumed to be 35 mph. Access to northwestern parcels from northbound US 41 is provided with dedicated movements at the intersection of US 41 and Causeway Boulevard.

7.2.4 Roadway Segment Analysis

The roadway segment analysis for Build Alternative 1 was completed using FDOT's generalized tables to develop LOS based on AADT and DDHVs for each segment. Since the typical sections (for the external intersection or interchange legs), design speeds, and volumes for each Build alternative are the same, the results presented in **Table 7.3** for Build Alternative 1 can be used for Build Alternatives 2, 3, and 4.

The results indicate:

- For the opening year:
    - All segments operate at LOS C or D based on AADT.

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- The northbound US 41 segment south of Causeway Boulevard operates at LOS F based on DDHV.

- For the interim year:
  - All segments operate at LOS C or D based on AADT.
  - The following segments operate at LOS F based on DDHV:
    - Southbound US 41, south of Causeway Boulevard (PM peak hour)
    - Northbound US 41, south of Causeway Boulevard (AM peak hour)
    - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
    - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
- For the design year:
  - The following segments operate at LOS F based on AADT:
    - US 41 south of Causeway Boulevard
    - Causeway Boulevard west of US 41
  - The following segments operate at LOS F based on DDHV:
    - Southbound US 41, south of Causeway Boulevard (PM peak hour)
    - Northbound US 41, south of Causeway Boulevard (AM peak hour)
    - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
    - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)

7.2.5 Intersection Operational Analysis

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 1 for opening, interim, and design years are presented in **Table 7.4**. The signalized intersection of US 41 at Causeway Boulevard was evaluated.

The results indicate:

- For the opening year:
  - During the AM peak hour:
    - US 41 at Causeway Boulevard operates at overall LOS D.
    - The eastbound left and southbound left movements operate at LOS F.
  - During the PM peak hour:
    - US 41 at Causeway Boulevard operates at overall LOS E, though the v/c ratio indicates that the intersection is under capacity.
    - The eastbound left and right movements operate at LOS F and the eastbound right is over capacity.
    - The westbound left operates at LOS F.
    - The northbound right operates at LOS F.
    - The northbound through, southbound left, and southbound through operate at LOS E.
- For the interim year:
  - During the AM peak hour:
    - US 41 at Causeway Boulevard operates at overall LOS D.

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        - The eastbound left and southbound left operate at LOS E.
    - During the PM peak hour:
        - US 41 at Causeway Boulevard operates at overall LOS F, though the v/c ratio indicates that the intersection is under capacity.
        - The eastbound left and right movements operate at LOS F and the eastbound right is over capacity.
        - The westbound left operates at LOS F and is over capacity.
        - The northbound left and right operate at LOS F.
        - The southbound through operates at LOS F and is over capacity while the southbound left also operates at LOS F.
- For the design year:
    - During the AM peak hour:
        - US 41 at Causeway Boulevard operates at overall LOS D.
        - The eastbound left operates at LOS F.
        - The westbound left, northbound left, southbound left, and southbound through movements operate at LOS E.
    - During the PM peak hour:
        - US 41 at Causeway Boulevard operates at overall LOS F, though the v/c ratio indicates that the intersection is under capacity.
        - The eastbound left and right movements operate at LOS F and the eastbound right is over capacity.
        - The westbound left operates at LOS F and is over capacity.
        - The northbound left and right operate at LOS F, while the northbound through operates at LOS E.
        - The southbound through operates at LOS F and is over capacity while the southbound left operates at LOS F.

These results also indicate that removing the eastbound to southbound right turn movement from the US 41 at Causeway Boulevard intersection, potentially through a flyover from eastbound Causeway Boulevard to southbound US 41, would likely result in improvement to the LOS especially during the PM peak hour when this movement shows LOS F during each analysis year. With signalized control, no RTOR, and no overlap phase between the northbound left and eastbound right as is used in the existing conditions, this movement operates worse during the PM peak hour in 2046 than the PM existing condition.

7.2.6 Design Year Queuing Analysis

Synchro and *SimTraffic* were used to generate 95th percentile queues for the design year as described in Section 4.3. Queues reported from *Synchro* are indicated for the signalized intersection node at US 41 and Causeway Boulevard, while queues reported from *SimTraffic* are noted in addition to *Synchro* reported queues for merge/diverge areas or at areas where *Synchro* queues are not available. **Figure 7.3** shows the 95th percentile queue lengths in feet for Build Alternative 1. The results indicate that at the signalized intersection, queues may be expected to reach to over 2,300 feet in the eastbound direction during the

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AM peak hour. Both *Synchro* and *SimTraffic* indicated queueing of over 5,000 feet during the AM peak hour at the flyover diverge south of the intersection. Since this represents a ramp junction, the *SimTraffic* analysis may not be sensitive to the interaction that occurs at this location. Also, since the capacity analysis indicates oversaturated conditions, the queuing indicated by *Synchro* may not be representative of actual conditions. As noted in the FDOT *Traffic Analysis Handbook*, *Synchro* may not accurately model oversaturated conditions and *SimTraffic* does not have the ability to simulate ramp junctions or weaving segments. Queuing reports can be found in **Appendix J.**

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Figure 7.2. Build Alternative 1 Lane Configurations

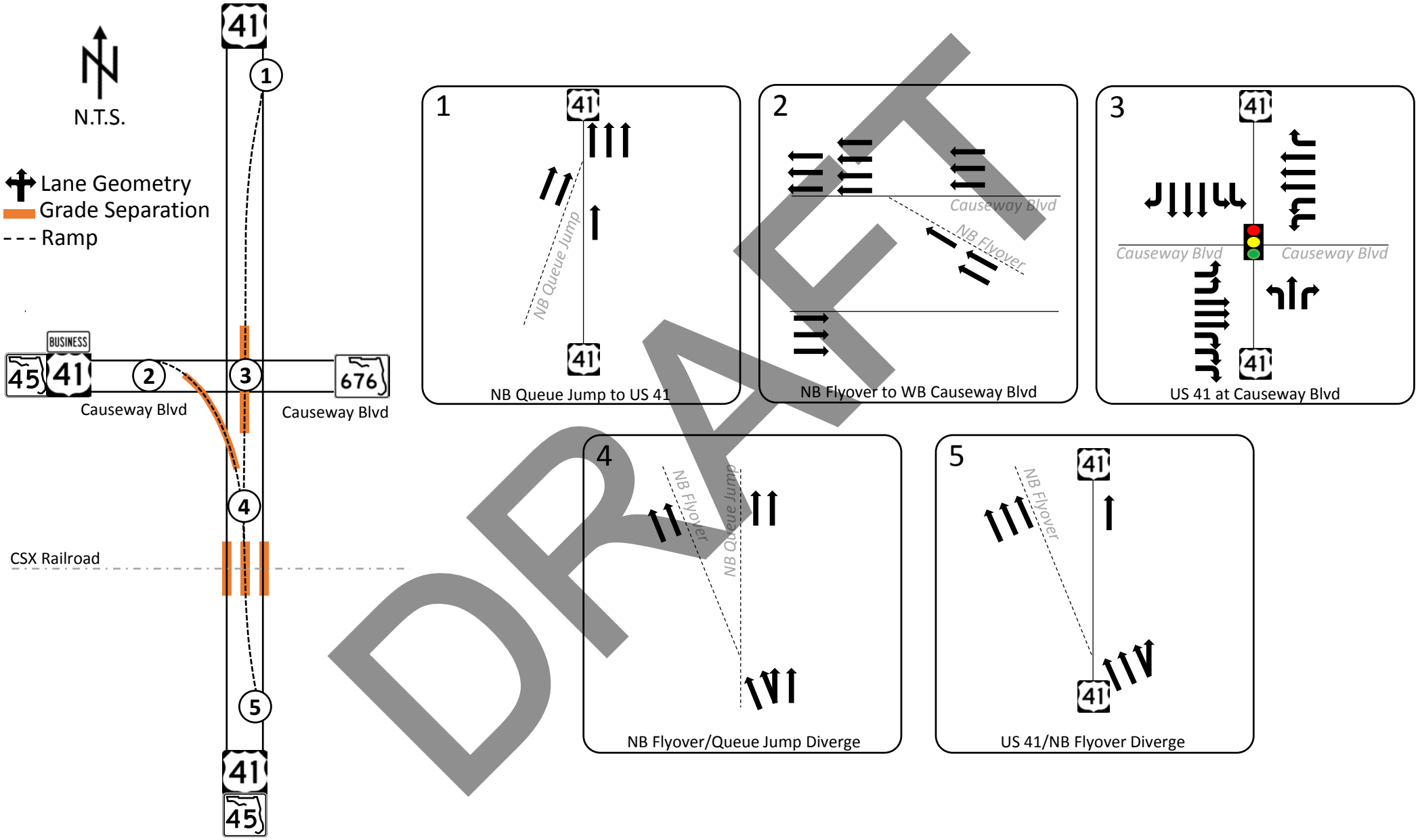

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Table 7.3. Build Alternative 1 Opening, Interim, and Design Year Roadway Segment Analysis

2026								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	30,100	C	1,054	C	1,656	C
Northbound, North of Causeway Boulevard	6	50	30,100	C	1,689	C	897	C
Southbound, South of Causeway Boulevard	6	50	47,700	C	1,299	C	3,002	D
Northbound, South of Causeway Boulevard	6	50	47,700	C	3,108	F	1,184	C
Causeway Boulevard								
Westbound, West of US 41	6	50	38,800	C	2,793	C	1,012	C
Eastbound, West of US 41	6	50	38,800	C	964	C	2,528	C
Westbound, East of US 41	6	50	25,000	C	1,376	C	875	C
Eastbound, East of US 41	6	50	25,000	C	721	C	1,332	C
2036								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	35,200	C	1,232	C	1,936	C
Northbound, North of Causeway Boulevard	6	50	35,200	C	2,097	C	1,128	C
Southbound, South of Causeway Boulevard	6	50	58,500	D	1,617	C	3,809	F
Northbound, South of Causeway Boulevard	6	50	58,500	D	3,811	F	1,454	C
Causeway Boulevard								
Westbound, West of US 41	6	50	52,400	C	3,497	F	1,277	C
Eastbound, West of US 41	6	50	52,400	C	1,302	C	3,414	F
Westbound, East of US 41	6	50	32,500	C	1,787	C	1,138	C
Eastbound, East of US 41	6	50	32,500	C	921	C	1,728	C
2046								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	40,300	C	1,411	C	2,216	C
Northbound, North of Causeway Boulevard	6	50	40,300	C	2,505	C	1,357	C
Southbound, South of Causeway Boulevard	6	50	69,300	F	1,935	C	4,612	F
Northbound, South of Causeway Boulevard	6	50	69,300	F	4,515	F	1,721	C
Causeway Boulevard								
Westbound, West of US 41	6	50	65,900	F	4,202	F	1,541	C
Eastbound, West of US 41	6	50	65,900	F	1,636	C	4,294	F
Westbound, East of US 41	6	50	40,000	C	2,199	C	1,400	C
Eastbound, East of US 41	6	50	40,000	C	1,119	C	2,121	C

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Table 7.4. Build Alternative 1 Opening, Interim, and Design Year Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	70.6	E	0.57	111.1	F	0.66	73.4	E	0.66	121.3	F	0.73	96.1	F	0.85	120.2	F	0.76
	EBT	35.1	D	0.31	35.8	D	0.44	31.2	C	0.36	35.4	D	0.53	28.8	C	0.40	37.9	D	0.65
	EBR	39.2	D	0.54	99.7	F	1.08	36.3	D	0.61	169.1	F	1.30	35.2	D	0.69	302.4	F	1.60
	EB Approach	*39.6*	*D*	*0.42*	*77.3*	*E*	*0.71*	*36.8*	*D*	*0.47*	*120.3*	*F*	*0.84*	*36.7*	*D*	*0.53*	*203.8*	*F*	*1.03*
	WBL	51.7	D	0.26	126.5	F	0.85	54.6	D	0.37	195.8	F	1.09	55.6	E	0.44	287.2	F	1.34
	WBT	36.5	D	0.67	30.4	C	0.24	37.2	D	0.79	29.0	C	0.28	51.2	D	0.97	30.0	C	0.34
	WBR	17.4	B	0.51	6.8	A	0.40	16.2	B	0.59	34.3	C	0.46	40.0	D	0.72	37.4	D	0.57
	WB Approach	*34.0*	*C*	*0.59*	*36.4*	*D*	*0.30*	*34.4*	*C*	*0.70*	*53.0*	*D*	*0.35*	*49.5*	*D*	*0.86*	*66.7*	*E*	*0.43*
	NBL	46.6	D	0.02	84.6	F	0.09	51.5	D	0.04	94.8	F	0.10	55.3	E	0.07	94.7	F	0.10
	NBT	32.5	C	0.01	73.9	E	0.03	37.6	D	0.01	68.1	E	0.02	43.0	D	0.02	72.6	E	0.02
	NBR	17.1	B	0.20	130.5	F	0.89	23.2	C	0.30	85.7	F	0.60	31.9	C	0.49	112.3	F	0.84
	NB Approach	*19.6*	*B*	*0.08*	*126.9*	*F*	*0.37*	*25.2*	*C*	*0.13*	*85.4*	*F*	*0.27*	*33.3*	*C*	*0.21*	*110.9*	*F*	*0.37*
	SBL	56.5	E	0.83	57.6	E	0.40	60.0	E	0.85	104.1	F	0.93	61.0	E	0.87	108.0	F	0.94
	SBT	44.3	D	0.66	72.4	E	0.93	47.2	D	0.76	182.2	F	1.23	57.0	E	0.91	285.1	F	1.46
	SBR	38.6	D	0.24	30.8	C	0.07	39.1	D	0.28	39.0	D	0.09	22.4	C	0.34	39.5	D	0.11
	SB Approach	*46.6*	*D*	*0.61*	*68.9*	*E*	*0.63*	*49.5*	*D*	*0.69*	*165.1*	*F*	*0.95*	*55.1*	*E*	*0.79*	*247.7*	*F*	*1.10*
	Overall	**39.0**	**D**	**0.47**	**69.0**	**E**	**0.55**	**39.1**	**D**	**0.56**	**121.0**	**F**	**0.67**	**46.7**	**D**	**0.67**	**189.9**	**F**	**0.82**

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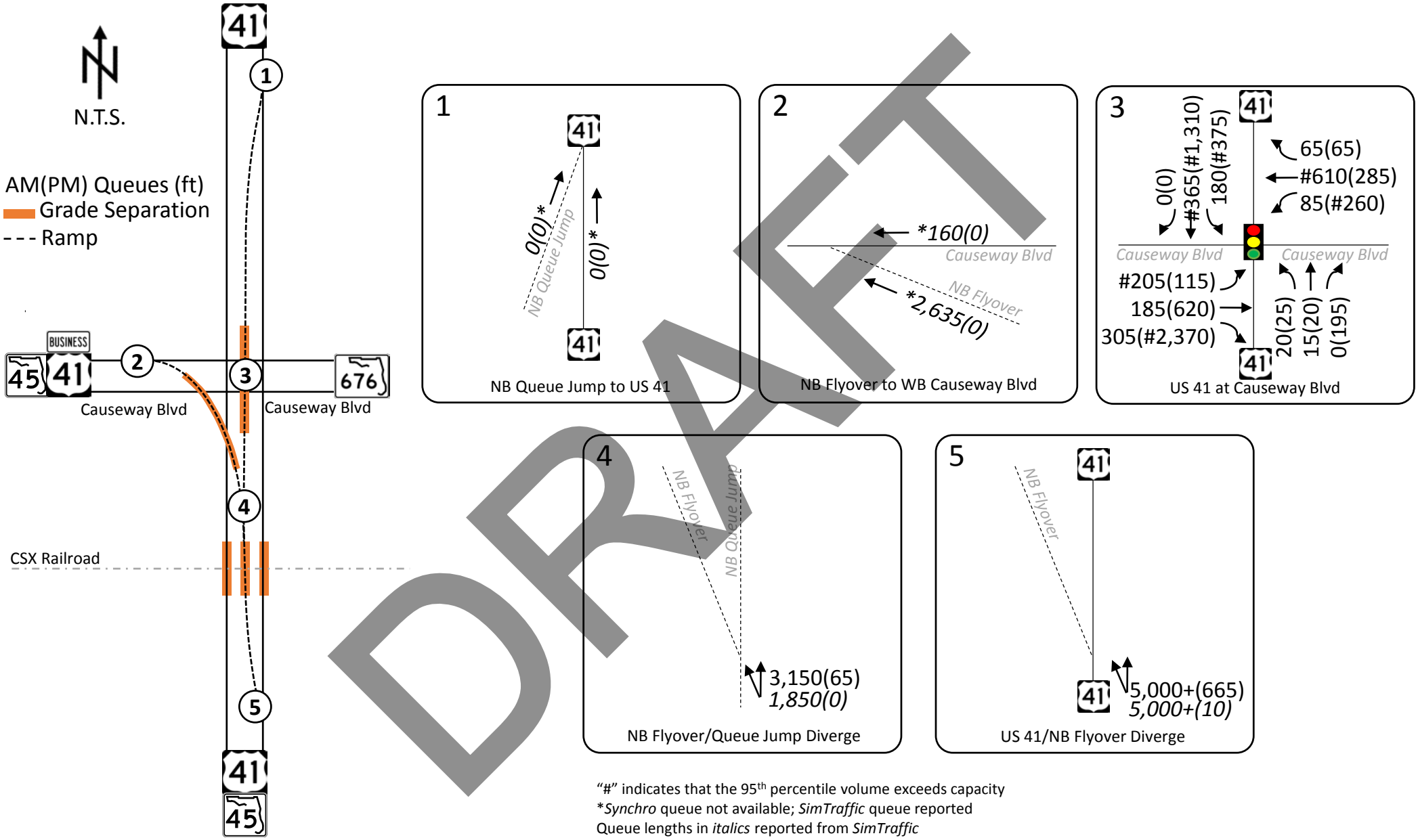
Figure 7.3. Build Alternative 1 Design Year 95th Percentile Queues



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"#" indicates that the 95th percentile volume exceeds capacity
**Synchro* queue not available; *SimTraffic* queue reported
Queue lengths in *italics* reported from *SimTraffic*

7.3 BUILD ALTERNATIVE 2: SOUTHWESTERN QUADRANT

7.3.1 Geometry

Build Alternative 2 includes grade-separation of US 41 in each direction at the CSX Railroad crossing south of Causeway Boulevard. A southwestern quadrant roadway originates with free-flowing ramp connections to US 41 south of the CSX Railroad crossing and is grade-separated over US 41 and the railroad. The roadway meets at-grade west of US 41 to intersect Causeway Boulevard, forming a new signalized T-intersection. Eastbound right turns (heaviest during the PM peak hour) and northbound left turns (heaviest during the AM peak hour) are removed from the intersection of US 41 at Causeway Boulevard and utilize the new quadrant intersection. Free-flowing dual eastbound right turns are provided at the quadrant intersection to further improve LOS. Additionally, eastbound and westbound U-turns and left turns are disallowed at the quadrant intersection. Removal of turns from either the US 41 and Causeway Boulevard intersection or the quadrant intersection may require vehicles to use alternate access points, which is discussed in Section 7.3.4.

Both US 41 and Causeway Boulevard have six-lane typical sections (three lanes per direction), and each direction of US 41 is grade-separated at the CSX Railroad crossing south of Causeway Boulevard. The design speeds for US 41, Causeway Boulevard, and quadrant roadway are assumed to be 50 mph. The lane configurations for Build Alternative 1 are included in **Figure 7.4**.

7.3.2 Signal Timing

Under Build Alternative 2, the quadrant intersection and US 41 at Causeway Boulevard are coordinated. US 41 at Causeway Boulevard would likely be dual-coordinated along US 41 and along Causeway Boulevard. The northbound left turn phase at US 41 and Causeway Boulevard would no longer be required with this turn movement prohibited. The quadrant intersection operates with permissive movements in each direction. *Synchro*'s "Optimize Cycle Length" tool was used to develop the cycle length, split times, and phase order for each analysis year, with a minimum cycle length of 120 seconds defined for this alternative. Manual adjustments to the timing were made in some cases to further reduce the delay. Optimizing the cycle length in this manner may not have produced cycle lengths consistent with other signals along the corridor, however, this was employed to show the best-case scenario for the alternative. In addition, this may give way to further signal timing improvements along the corridors.

7.3.3 Access Management

By removing eastbound right turns and northbound left turns from the intersection of US 41 and Causeway Boulevard, and by removing eastbound and westbound left or U-turns from the quadrant intersection, LOS can be improved, however, this will require the use of alternate access points to reach a given destination. For example, those who would use a northbound left at US 41 and Causeway Boulevard to access the northwestern quadrant may instead proceed straight through the intersection and turn left at S 23rd Avenue, utilizing local streets to reach their final destination. Or, they may use the quadrant roadway, turn left at the quadrant intersection, and turn right on S 45th Street, again utilizing local streets to reach their final destination. Access to and from parcels south of Causeway Boulevard

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would be provided with frontage roads along either side of US 41. Design speeds for the frontage roads are assumed to be 35 mph.

7.3.4 Roadway Segment Analysis

Refer to Section 7.2.4 for the results of the roadway segment analysis.

7.3.5 Intersection Operational Analysis

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 2 for opening, interim, and design years are presented in **Table 7.5**. The signalized intersections of US 41 at Causeway Boulevard and the Quadrant Roadway at Causeway Boulevard were evaluated.

The results indicate:

- For the opening year:
  - During the AM peak hour:
    - Each intersection operates at LOS D or better.
    - At US 41 and Causeway Boulevard, the eastbound left, westbound left, and southbound left movements operate at LOS E.
  - During the PM peak hour:
    - Each intersection operates at LOS D or better.
    - At US 41 and Causeway Boulevard, the westbound left and southbound left movements operate at LOS E.
- For the interim year:
  - During the AM peak hour:
    - US 41 at Causeway Boulevard operates at LOS E.
    - At US 41 and Causeway Boulevard, several movements operate at LOS F, including the eastbound left, westbound left northbound through (over capacity), and southbound left. The westbound through and right operate at LOS E.
    - Quadrant Roadway at Causeway Boulevard operates at LOS C with all movements at LOS D or better.
  - During the PM peak hour:
    - Each intersection operates at LOS D or better.
    - At US 41 and Causeway Boulevard, the westbound left operates at LOS F, and the eastbound through, northbound through, northbound right, and southbound left operate at LOS E.
- For the design year:
  - During the AM peak hour:
    - US 41 at Causeway Boulevard operates at LOS F, though the v/c ratio indicates that the intersection is under capacity.
    - At US 41 and Causeway Boulevard, several movements operate at LOS F, including the eastbound left, westbound left, westbound through (over capacity),

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northbound through (over capacity), and southbound left. The westbound right operates at LOS E.

- At Quadrant Roadway and Causeway Boulevard, the westbound through and northbound left operate at LOS E.

- During the PM peak hour:
  - US 41 at Causeway Boulevard operates at LOS E.
  - At US 41 and Causeway Boulevard, the westbound left and southbound left operate at LOS F, and the eastbound left, eastbound through, northbound through, and northbound right operate at LOS E.
  - At Quadrant Roadway and Causeway Boulevard, the northbound left operates at LOS E.

7.3.6 Design Year Queuing Analysis

Synchro and *SimTraffic* were used to generate 95th percentile queues for the design year as described in Section 4.3. Queues reported from *Synchro* are indicated for the signalized intersection nodes, while queues reported from *SimTraffic* are noted in addition to *Synchro* reported queues for merge/diverge areas or at areas where *Synchro* queues are not available. **Figure 7.5** shows the 95th percentile queue lengths in feet for Build Alternative 2. The results indicate that at the signalized intersection of US 41 and Causeway Boulevard, queues of over 1,000 feet are shown at the northbound and westbound approaches during the AM peak hour. During the PM peak hour, queues at this intersection are less than 800 feet. The longest queue at the Quadrant Roadway and Causeway Boulevard is shown for the northbound left turn at 1,240 feet. Although *Synchro* indicated no queues at the quadrant diverge, *SimTraffic* indicated queueing of over 5,000 feet during the AM peak hour. Since this represents a ramp junction, the *SimTraffic* analysis may not be sensitive to the interaction that occurs at this location. As noted in the FDOT *Traffic Analysis Handbook*, *SimTraffic* does not have the ability to simulate ramp junctions or weaving segments. Queuing reports can be found in **Appendix J.**

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Figure 7.4. Build Alternative 2 Lane Configurations

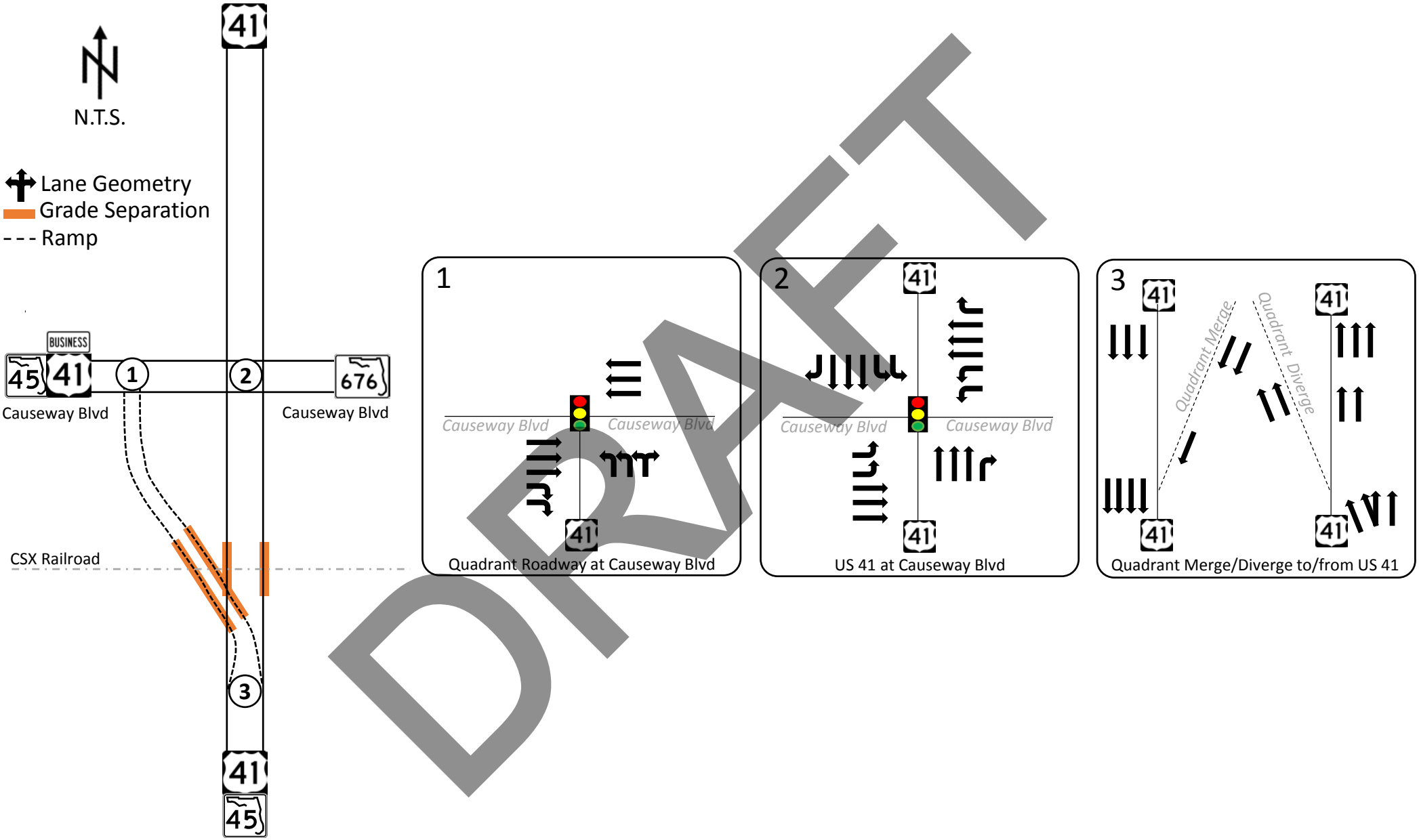

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Table 7.5. Build Alternative 2 Opening, Interim, and Design Year Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	55.5	E	0.37	50.3	D	0.13	107.1	F	0.78	53.1	D	0.22	164.2	F	1.00	69.4	E	0.33
	EBT	20.5	C	0.31	46.7	D	0.58	25.5	C	0.39	55.4	E	0.83	36.8	D	0.54	71.2	E	0.91
	EB Approach	*25.5*	*C*	*0.32*	*46.9*	*D*	*0.48*	*37.1*	*D*	*0.42*	*55.3*	*E*	*0.70*	*54.9*	*D*	*0.58*	*71.0*	*E*	*0.82*
	WBL	74.0	E	0.63	71.0	E	0.68	96.2	F	0.71	87.5	F	0.86	123.1	F	0.86	93.6	F	0.83
	WBT	49.4	D	0.86	39.6	D	0.44	70.3	E	0.96	34.8	C	0.46	123.0	F	1.11	41.6	D	0.52
	WBR	46.8	D	0.64	30.4	C	0.74	58.7	E	0.72	26.1	C	0.77	74.1	E	0.83	35.9	D	0.86
	WB Approach	*50.3*	*D*	*0.79*	*41.1*	*D*	*0.53*	*69.7*	*E*	*0.89*	*39.3*	*D*	*0.56*	*114.3*	*F*	*1.03*	*46.9*	*D*	*0.62*
	NBT	52.0	D	0.94	44.2	D	0.57	72.7	F[1]	1.00	59.2	E	0.86	134.0	F	1.15	66.9	E	0.86
	NBR	17.2	B	0.16	43.9	D	0.40	21.4	C	0.18	55.4	E	0.61	21.9	C	0.20	62.1	E	0.61
	NB Approach	*50.2*	*D*	*0.75*	*44.2*	*D*	*0.53*	*70.1*	*E*	*0.81*	*58.6*	*E*	*0.80*	*128.2*	*F*	*0.93*	*66.1*	*E*	*0.80*
	SBL	72.7	E	0.82	62.9	E	0.79	114.0	F	0.96	71.7	E	0.88	162.3	F	1.09	86.4	F	0.91
	SBT	19.9	B	0.33	31.3	C	0.69	24.3	C	0.36	42.0	D	0.89	29.4	C	0.41	52.2	D	0.93
	SBR	17.8	B	0.12	21.7	C	0.05	21.3	C	0.13	24.4	C	0.07	25.1	C	0.15	27.5	C	0.07
	SB Approach	*31.8*	*C*	*0.33*	*37.0*	*D*	*0.57*	*44.6*	*D*	*0.36*	*47.2*	*D*	*0.72*	*59.5*	*E*	*0.41*	*58.1*	*E*	*0.76*
	Overall	**43.1**	**D**	**0.52**	**41.3**	**D**	**0.53**	**60.3**	**E**	**0.60**	**49.4**	**D**	**0.69**	**99.7**	**F**	**0.71**	**60.3**	**E**	**0.74**
Quadrant Roadway at Causeway Blvd	EBT	24.3	C	0.25	5.7	A	0.28	35.0	C	0.35	7.6	A	0.40	43.6	D	0.44	10.1	B	0.49
	EBR	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00
	EB Approach	*24.3*	*C*	*0.25*	*5.7*	*A*	*0.28*	*35.0*	*C*	*0.35*	*7.6*	*A*	*0.40*	*43.6*	*D*	*0.44*	*10.1*	*B*	*0.49*
	WBT	9.1	A	0.61	10.2	B	0.16	15.1	B	0.81	1.3	A	0.21	62.3	E	0.99	7.7	A	0.25
	WB Approach	*9.1*	*A*	*0.61*	*10.2*	*B*	*0.16*	*15.1*	*B*	*0.81*	*1.3*	*A*	*0.21*	*62.3*	*E*	*0.99*	*7.7*	*A*	*0.25*
	NBL	29.3	C	0.78	52.5	D	0.79	39.1	D	0.87	50.7	D	0.81	62.5	E	1.00	62.5	E	0.85
	NBR	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00
	NB Approach	*29.3*	*C*	*0.59*	*52.5*	*D*	*0.60*	*39.1*	*D*	*0.66*	*50.7*	*D*	*0.62*	*62.5*	*E*	*0.76*	*62.5*	*E*	*0.65*
	Overall	**21.6**	**C**	**0.50**	**18.3**	**B**	**0.26**	**29.9**	**C**	**0.62**	**15.8**	**B**	**0.34**	**59.4**	**E**	**0.74**	**21.0**	**C**	**0.41**

1. Lane group LOS is F when v/c is greater than 1.00 per *HCM 6th Edition* methodology.

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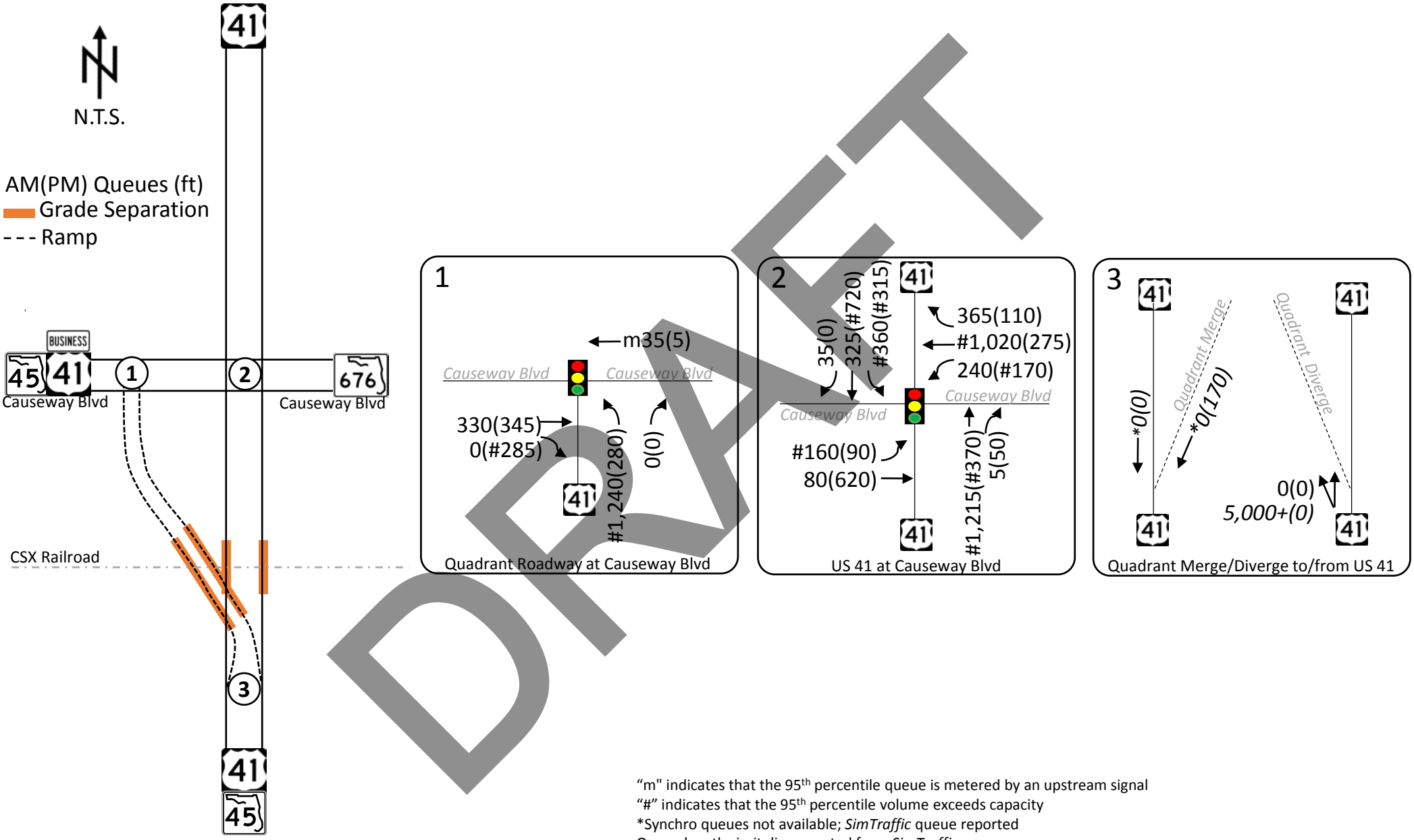
Figure 7.5. Build Alternative 2 Design Year 95th Percentile Queues



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"m" indicates that the 95th percentile queue is metered by an upstream signal
"#" indicates that the 95th percentile volume exceeds capacity
*Synchro queues not available; *SimTraffic* queue reported
Queue lengths in *italics* reported from *SimTraffic*

7.4 BUILD ALTERNATIVE 3: DIVERGING DIAMOND INTERCHANGE

7.4.1 Geometry

Build Alternative 3 is an east-west oriented diverging diamond interchange (DDI) with grade-separation of US 41 over the CSX Railroad crossing south of Causeway Boulevard and over the interchange. For the DDI and its ramps, the design speed is assumed to be 35 mph. Outside of the interchange, US 41 and Causeway Boulevard have 50 mph design speeds. The southbound off-ramp from US 41 to the DDI is assumed to have a dedicated left and a dedicated free-flowing right turn lane while the northbound off-ramp from US 41 to the DDI is assumed to have triple left turns and a dedicated free-flowing right turn lane. Left turns from the DDI to US 41 use single lanes. The eastbound-to-southbound right turn consists of two lanes. The intersection of this right turn and the westbound-to-southbound left turn was modeled as signalized to prevent unsafe weaving conditions between the two turns. The lane configurations for Build Alternative 3 are shown in **Figure 7.6**.

7.4.2 Signal Timing

Within the DDI, Causeway Boulevard at the southbound right ramp, the western crossover, Causeway Boulevard at the southbound left ramp, Causeway Boulevard at the northbound left ramp, the eastern crossover, Causeway Boulevard at the northbound right ramp, and the eastbound right ramp at the westbound left ramp are signalized. Within *Synchro*, Causeway Boulevard at the southbound right ramp, the western Crossover, and Causeway Boulevard at the southbound left ramp were modeled as clustered intersections, and Causeway Boulevard at the northbound left ramp, the eastern crossover, and Causeway Boulevard at the northbound right ramp were modeled as clustered intersections. The two sets of clustered intersections and intersection between the eastbound right ramp and the westbound left ramp were then modeled under coordination. *Synchro*'s "Optimize Cycle Length" tool was used to develop the cycle length, split times, and phase order for each analysis year with a minimum cycle length of 90 seconds defined for this alternative.

7.4.3 Access Management

Access to and from parcels south of Causeway Boulevard would be provided with frontage roads along either side of US 41. Design speeds for the frontage roads are assumed to be 35 mph. Parcels south of Causeway Boulevard can also be accessed via driveways along mainline Causeway Boulevard prior to the entering the interchange. Parcels north of Causeway Boulevard can be accessed via mainline Causeway Boulevard, the DDI ramps north of Causeway Boulevard, or mainline US 41 north of the ramps. Under this concept, no through movements can be allowed at the ramp terminals, therefore one limitation of this alternative is that there is no accommodation for at-grade access to the northeast quadrant from the south along US 41.

7.4.4 Roadway Segment Analysis

Refer to Section 7.2.4 for the results of the roadway segment analysis.

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7.4.5 Intersection Operational Analysis

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 3 opening, interim, and design years are presented in **Table 7.6**. The results for Build Alternative 3 have been reported using *HCM 2000* methodology as the use of clustered intersections is not permitted in *HCM 6th Edition* methodology. Unclustering the intersections also does not produce *HCM 6th Edition* results as the typical signal phases in a DDI do not follow strict NEMA phasing. The signalized intersections of the Causeway Boulevard at the southbound right ramp, the western crossover, Causeway Boulevard at the southbound left ramp, Causeway Boulevard at the northbound left ramp, the eastern crossover, Causeway Boulevard at the northbound right ramp, and the eastbound ramp at the westbound left ramp were evaluated.

The results indicate:

- For the opening year:
  - During the AM peak hour, all intersections and approaches operate at LOS D or better.
  - During the PM peak hour, all intersections and approaches operate at LOS D or better.
- For the interim year:
  - During the AM peak hour, all intersections and approaches operate at LOS D or better.
  - During the PM peak hour, all intersections operate at LOS D or better. The westbound left movement/westbound approach at the eastbound right ramp and westbound left ramp intersection operates at LOS F.
- For the design year:
  - During the AM peak hour, all intersections and approaches operate at LOS D or better. The eastbound through/approach at the western crossover, the northbound left/approach at Causeway Boulevard and the northbound left ramp, and the westbound through/approach at the eastern crossover operate at LOS E.
  - During the PM peak hour, all but one intersection operate at LOS D or better. The eastbound right ramp at westbound left ramp operates at LOS F with each of its approaches at LOS F.

7.4.6 Design Year Queuing Analysis

Synchro and *SimTraffic* were used to generate 95th percentile queues for the design year as described in Section 4.3. Queues reported from *Synchro* are indicated for the signalized intersection nodes, while queues reported from *SimTraffic* are noted in addition to *Synchro* reported queues for merge/diverge areas or at areas where *Synchro* queues are not available. **Figure 7.7** shows the 95th percentile queue lengths in feet for Build Alternative 3. The *Synchro* results indicate the longest queue of 1,965 feet is during the PM peak hour at the eastbound approach to the DDI. *SimTraffic* results indicate a queue of 2,755 feet at the northbound off-ramp diverge where *Synchro* queues are not available. Since this represents a ramp junction, the *SimTraffic* analysis may not be sensitive to the interaction that occurs at this location. As noted in the FDOT *Traffic Analysis Handbook*, *SimTraffic* does not have the ability to simulate ramp junctions or weaving segments. Also, although this is a similar diverge configuration to that of Build

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Alternative 1, the traffic volume split at this location is different between the two alternatives, and therefore, the queues are not equivalent. Queuing reports can be found in **Appendix J.**

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Figure 7.6. Build Alternative 3 Lane Configurations

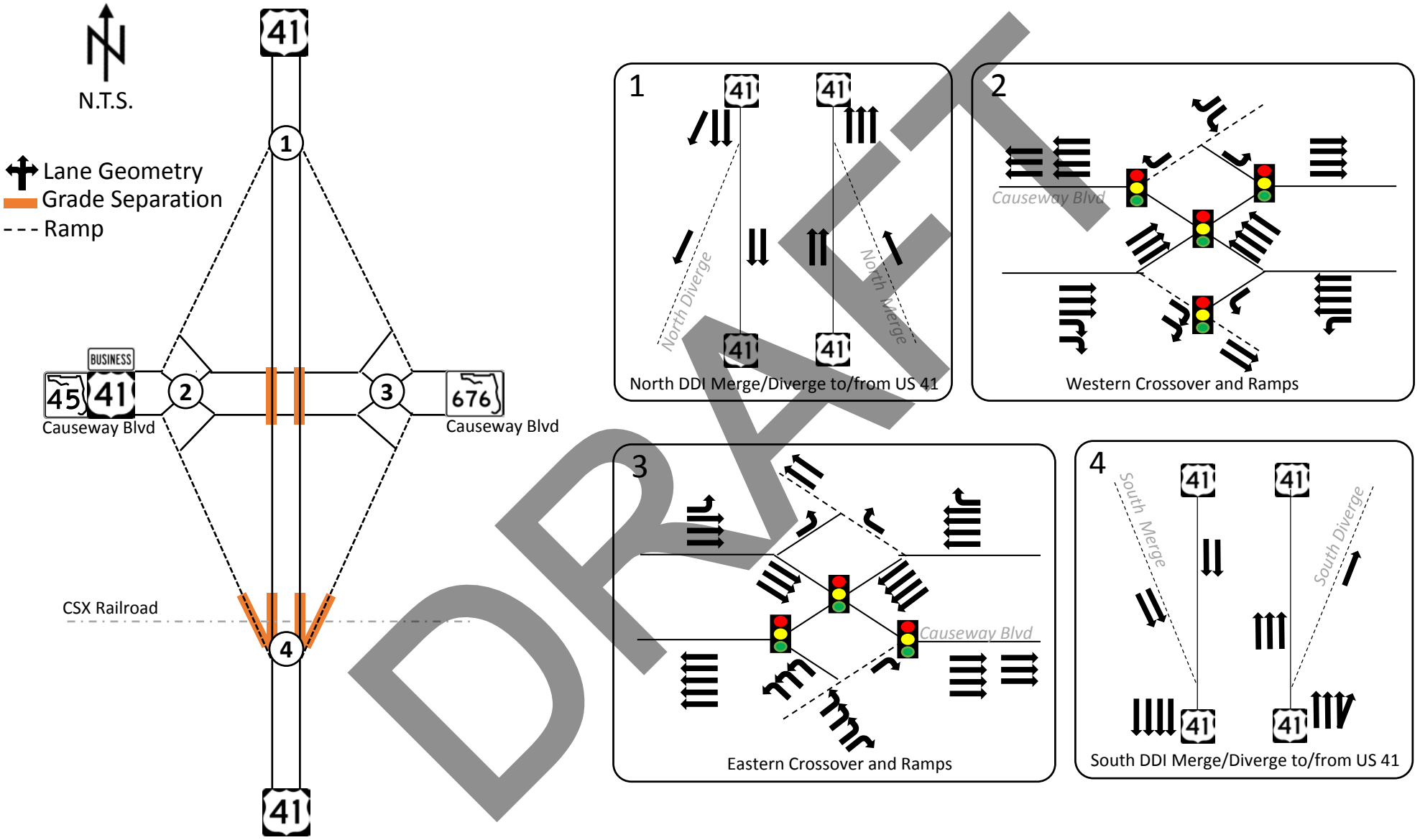

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Table 7.6. Build Alternative 3 Opening, Interim, and Design Year Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
Causeway Blvd at SBR Ramp	*WBT/WB Approach*	*0.2*	*A*	*0.45*	*0.1*	*A*	*0.16*	*0.2*	*A*	*0.57*	*0.1*	*A*	*0.21*	*0.2*	*A*	*0.69*	*0.1*	*A*	*0.25*
	SBR/SB Approach	*30.1*	*C*	*0.13*	*17.8*	*B*	*0.02*	*35.6*	*D*	*0.18*	*19.5*	*B*	*0.02*	*52.8*	*D*	*0.23*	*21.8*	*C*	*0.03*
	Overall	**1.1**	**A**	**0.44**	**0.6**	**A**	**0.15**	**1.2**	**A**	**0.55**	**0.6**	**A**	**0.19**	*1.6*	**A**	**0.67**	**0.7**	**A**	**0.23**
Western Crossover	*EBT/EB Approach*	*33.4*	*C*	*0.49*	*23.3*	*C*	*0.54*	*43.1*	*D*	*0.72*	*28.4*	*C*	*0.67*	*69.9*	*E*	*0.88*	*35.5*	*D*	*0.77*
	WBT/WB Approach	*6.0*	*A*	*0.70*	*5.8*	*A*	*0.34*	*9.3*	*A*	*0.84*	*11.9*	*B*	*0.44*	*19.5*	*B*	*0.96*	*19.3*	*B*	*0.55*
	Overall	**10.1**	**B**	**0.66**	**14.4**	**B**	**0.42**	**14.6**	**B**	**0.82**	**20.3**	**C**	**0.54**	**27.8**	**C**	**0.94**	**27.7**	**C**	**0.65**
Causeway Blvd at SBL Ramp	*EBT/EB Approach*	*0.0*	*A*	*0.10*	*0.1*	*A*	*0.20*	*0.0*	*A*	*0.14*	*0.1*	*A*	*0.27*	*0.0*	*A*	*0.17*	*0.1*	*A*	*0.35*
	SBL/SB Approach	*15.2*	*B*	*0.31*	*33.4*	*C*	*0.69*	*13.3*	*B*	*0.32*	*39.9*	*D*	*0.73*	*13.0*	*B*	*0.31*	*49.7*	*D*	*0.78*
	Overall	**5.2**	**A**	**0.13**	**8.1**	**A**	**0.25**	**4.1**	**A**	**0.16**	**8.7**	**A**	**0.32**	**3.8**	**A**	**0.20**	**10.1**	**B**	**0.39**
Causeway Blvd at NBL Ramp	*WBT/WB Approach*	*0.0*	*A*	*0.19*	*0.0*	*A*	*0.10*	*0.0*	*A*	*0.25*	*0.0*	*A*	*0.13*	*0.0*	*A*	*0.30*	*0.1*	*A*	*0.17*
	NBL/NB Approach	*24.4*	*C*	*0.81*	*30.5*	*C*	*0.46*	*34.5*	*C*	*0.94*	*31.2*	*C*	*0.43*	*55.6*	*E*	*1.01*	*29.7*	*C*	*0.38*
	Overall	**14.5**	**B**	**0.35**	**13.4**	**B**	**0.16**	**20.0**	**C**	**0.43**	**13.3**	**B**	**0.19**	**31.7**	**C**	**0.50**	**12.4**	**B**	**0.22**
Eastern Crossover	*EBT/EB Approach*	*7.3*	*A*	*0.23*	*5.1*	*A*	*0.51*	*9.1*	*A*	*0.30*	*7.6*	*A*	*0.66*	*28.4*	*C*	*0.35*	*8.7*	*A*	*0.74*
	WBT/WB Approach	*33.4*	*C*	*0.73*	*21.1*	*C*	*0.29*	*43.0*	*D*	*0.90*	*25.3*	*C*	*0.36*	*67.9*	*E*	*0.98*	*35.9*	*D*	*0.47*
	Overall	**23.9**	**C**	**0.41**	**10.5**	**B**	**0.41**	**30.8**	**C**	**0.52**	**13.6**	**B**	**0.51**	**53.7**	**D**	**0.60**	**17.9**	**B**	**0.62**
Causeway Blvd at NBR Ramp	*EBT/EB Approach*	*0.1*	*A*	*0.14*	*0.1*	*A*	*0.26*	*0.1*	*A*	*0.18*	*0.2*	*A*	*0.33*	*0.1*	*A*	*0.21*	*0.2*	*A*	*0.41*
	NBR/NB Approach	*27.0*	*C*	*0.19*	*21.3*	*C*	*0.23*	*29.3*	*C*	*0.23*	*25.1*	*C*	*0.27*	*39.7*	*D*	*0.24*	*35.1*	*D*	*0.35*
	Overall	**2.9**	**A**	**0.14**	**2.1**	**A**	**0.25**	**3.0**	**A**	**0.18**	**2.4**	**A**	**0.33**	**4.0**	**A**	**0.22**	**3.2**	**A**	**0.40**
EBR Ramp at WBL Ramp	EBR/EB Approach	*3.1*	*A*	*0.20*	*8.9*	*A*	*0.77*	*3.8*	*A*	*0.26*	*45.0*	*D*	*1.05*	*4.1*	*A*	*0.33*	*148.0*	*F*	*1.29*
	WBL/WB Approach	*8.8*	*A*	*0.50*	*22.7*	*C*	*0.62*	*10.2*	*B*	*0.53*	*82.7*	*F*	*0.96*	*24.5*	*C*	*0.68*	*150.3*	*F*	*1.17*
	Overall	**3.8**	**A**	**0.22**	**9.9**	**A**	**0.75**	**4.7**	**A**	**0.29**	**47.6**	**D**	**1.04**	**6.7**	**A**	**0.36**	**148.1**	**F**	**1.28**

Note: *HCM 2000* methodology used to report results.

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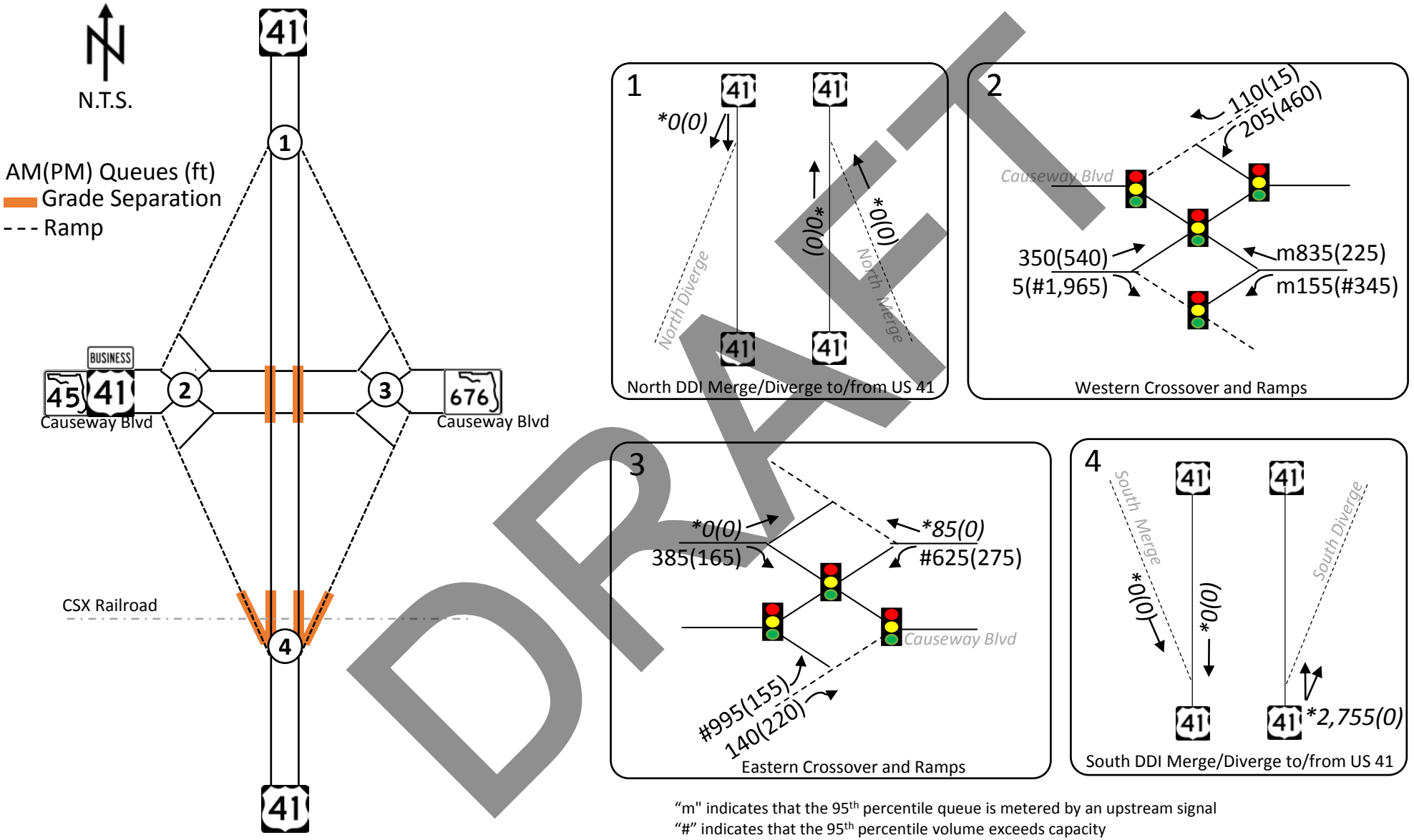
Figure 7.7. Build Alternative 3 Design Year 95th Percentile Queues



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"m" indicates that the 95th percentile queue is metered by an upstream signal
"#" indicates that the 95th percentile volume exceeds capacity
*Synchro queues not available; *SimTraffic* queue reported
Queue lengths in *italics* reported from *SimTraffic*

7.5 BUILD ALTERNATIVE 4: SINGLE POINT URBAN INTERCHANGE

7.5.1 Geometry

Build Alternative 4 is a single point urban interchange (SPUI) at the location of US 41 and Causeway Boulevard with grade-separation of US 41 over the CSX Railroad crossing south of Causeway Boulevard and over the interchange. The SPUI includes through movements from the northbound and southbound ramps to allow access to adjacent parcels via frontage roads or ramps. The design speed along US 41 and Causeway Boulevard is 50 mph and the design speed for the ramps is 35 mph. The SPUI assumes double left turns from the eastbound and westbound approaches, a single left turn from the southbound approach, and triple left turns from the northbound approach. The lane configurations for Build Alternative 4 are shown in **Figure 7.8**.

7.5.2 Signal Timing

Since the SPUI operates similarly to a traditional intersection, an overlap phase between the eastbound right turns and northbound left turns was used for the analysis. The phasing is similar to the existing conditions; however, coordinated phases are assumed for the eastbound and westbound approaches rather than the northbound and southbound approaches. *Synchro*'s "Optimize Cycle Length" tool was used to develop the cycle length, split times, and phase order for each analysis year with a minimum cycle length of 120 seconds defined for this alternative. Manual adjustments to the timing were made in some cases to further reduce the delay. Optimizing the cycle length may not have produced cycle lengths consistent with other signals along the corridor, however, this was employed to show the best-case scenario for the alternative. In addition, this may give way to further signal timing improvements along the corridor.

7.5.3 Access Management

Access to and from parcels south of Causeway Boulevard would be provided with frontage roads along either side of US 41. Design speeds for the frontage roads are assumed to be 35 mph. Parcels south of Causeway Boulevard can also be accessed via driveways along mainline Causeway Boulevard prior to the entering the interchange. Parcels north of Causeway Boulevard can be accessed via mainline Causeway Boulevard, the DDI ramps north of Causeway Boulevard, or mainline US 41 north of the ramps.

7.5.4 Roadway Segment Analysis

Refer to Section 7.2.4 for the results of the roadway segment analysis.

7.5.5 Intersection Operational Analysis

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 3 opening, interim, and design years are presented in **Table 7.7**. The signalized intersection US 41 at Causeway Boulevard was evaluated.

The results indicate:

- For the opening year:

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    - During the AM peak hour:
        - The intersection operates at LOS D.
        - The eastbound left, westbound left, and southbound left movements operate at LOS E.
        - The southbound right operates at LOS F.
    - During the PM peak hour:
        - The intersection operates at LOS C.
        - The eastbound left, westbound left, southbound left, and southbound right movements operate at LOS E.
        - The northbound right operates at LOS F.
- For the interim year:
    - During the AM peak hour:
        - The intersection operates at LOS E.
        - The eastbound left, westbound left, westbound through, northbound left, and southbound right operate at LOS F.
        - The westbound right and southbound left operate at LOS E.
    - During the PM peak hour:
        - The intersection operates at LOS E.
        - The eastbound left and southbound right operate at LOS E.
        - The eastbound right, westbound left, and northbound right operates at LOS F.
- For the design year:
    - During the AM peak hour:
        - The intersection operates at LOS F.
        - The eastbound left, westbound left, westbound through, northbound left, and southbound right operate at LOS F.
        - The westbound right and southbound left operate at LOS E.
    - During the PM peak hour:
        - The intersection operates at LOS F.
        - The eastbound right, westbound left, and northbound right operate at LOS F.
        - The eastbound left, southbound left, and southbound right operate at LOS E.

7.5.6 Design Year Queuing Analysis

Synchro was used to generate 95th percentile queues for the design year. **Figure 7.9** shows the 95th percentile queue lengths in feet for Build Alternative 4. The results indicate a queue length of 1,200 feet at the northbound approach during the AM peak hour and a queue length of 1,330 feet at the eastbound approach during the PM peak hour, with remaining queue lengths less than 1,000 feet. Ramp junctions were not modeled in this alternative, however, the *Synchro* analysis indicates that queues would not spill back to the northbound ramp diverge on US 41 and, as noted in the FDOT *Traffic Analysis Handbook*, *SimTraffic* does not have the ability to simulate ramp junctions. Queuing reports can be found in **Appendix J.**

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Figure 7.8. Build Alternative 4 Lane Configurations

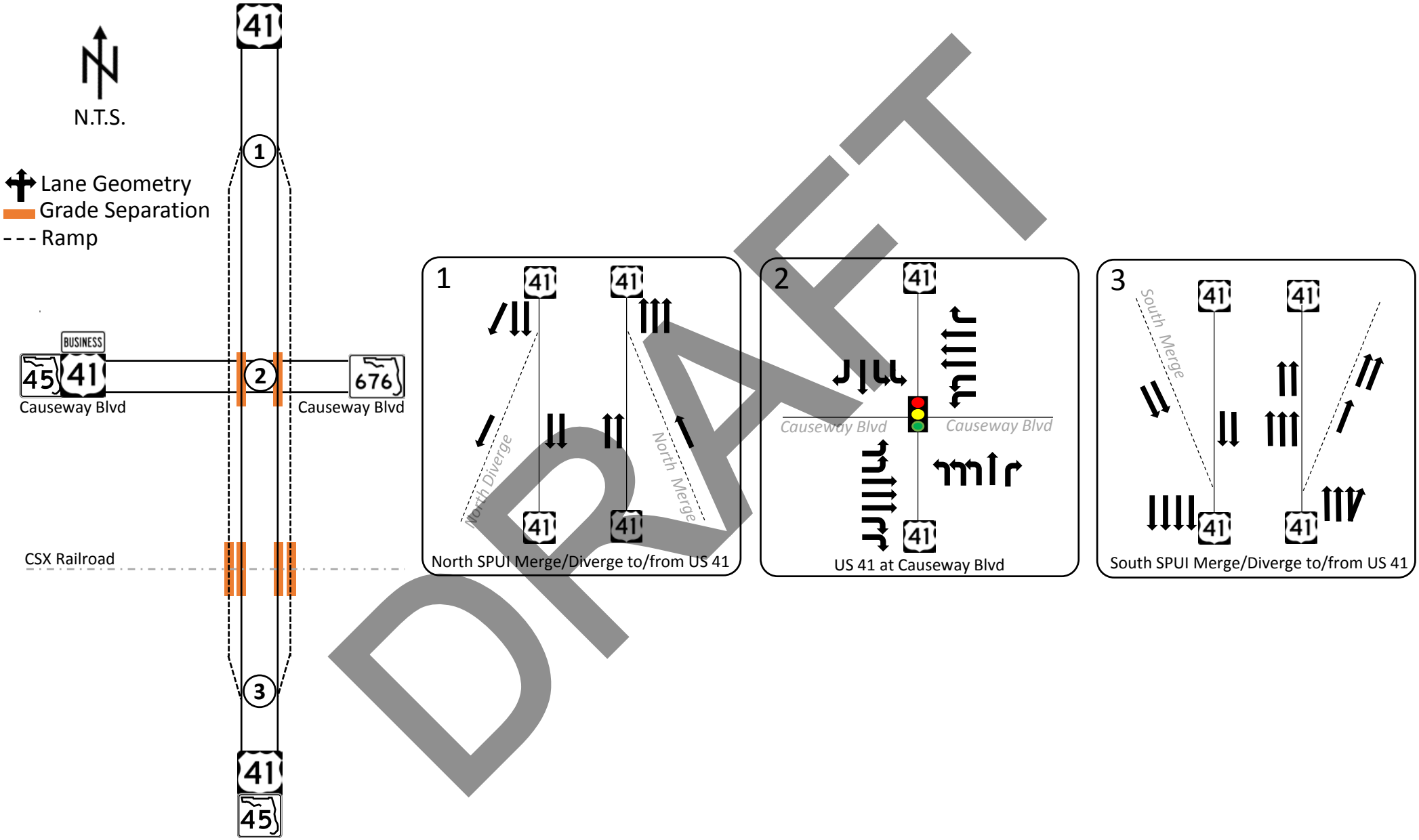

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Table 7.7. Build Alternative 4 Opening, Interim, and Design Year Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	70.6	E	0.57	69.1	E	0.53	98.9	F	0.74	73.6	E	0.64	130.0	F	0.92	78.0	E	0.69
	EBT	35.8	D	0.32	19.4	B	0.39	44.2	D	0.41	24.6	C	0.57	43.5	D	0.48	30.9	C	0.72
	EBR	9.0	A	0.26	19.1	B	0.82	8.6	A	0.32	80.0	F[1]	1.11	9.1	A	0.40	185.0	F	1.36
	EB Approach	*24.5*	*C*	*0.30*	*20.4*	*C*	*0.58*	*29.9*	*C*	*0.37*	*60.1*	*E*	*0.82*	*32.0*	*C*	*0.45*	*127.5*	*F*	*1.02*
	WBL	74.0	E	0.63	71.6	E	0.69	89.9	F	0.70	88.5	F	0.84	151.8	F	1.00	166.6	F	1.12
	WBT	47.6	D	0.84	16.1	B	0.21	77.6	F[1]	1.00	19.3	B	0.29	140.9	F	1.18	23.5	C	0.37
	WBR	45.5	D	0.63	18.6	B	0.35	59.2	E	0.75	23.7	C	0.49	70.6	E	0.88	31.0	C	0.63
	WB Approach	*48.8*	*D*	*0.78*	*24.3*	*C*	*0.26*	*75.0*	*E*	*0.93*	*29.9*	*C*	*0.37*	*129.0*	*F*	*1.10*	*44.9*	*D*	*0.47*
	NBL	45.9	D	0.94	50.1	D	0.64	77.4	F[1]	1.05	47.7	D	0.67	175.5	F	1.28	49.0	D	0.68
	NBT	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00
	NBR	28.2	C	0.16	247.9	F	1.31	34.1	C	0.18	269.7	F	1.38	37.7	D	0.24	279.8	F	1.41
	NB Approach	*45.1*	*D*	*0.62*	*90.9*	*F*	*0.63*	*75.5*	*E*	*0.70*	*93.4*	*F*	*0.66*	*169.5*	*F*	*0.87*	*96.6*	*F*	*0.68*
	SBL	58.2	E	0.67	56.2	E	0.70	71.7	E	0.72	54.4	D	0.72	69.8	E	0.73	57.0	E	0.74
	SBT	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00
	SBR	127.8	F	0.94	58.8	E	0.52	302.5	F	1.37	59.8	E	0.60	382.8	F	1.57	65.3	E	0.65
	SB Approach	*76.1*	*E*	*0.59*	*56.4*	*E*	*0.60*	*131.1*	*F*	*0.70*	*54.9*	*D*	*0.63*	*150.4*	*F*	*0.73*	*57.7*	*E*	*0.65*
	Overall	**44.0**	**D**	**0.52**	**33.9**	**C**	**0.47**	**68.5**	**E**	**0.62**	**58.1**	**E**	**0.63**	**122.0**	**F**	**0.75**	**102.7**	**F**	**0.76**

1. Lane group LOS is F when v/c is greater than 1.00 per *HCM 6th Edition* methodology.

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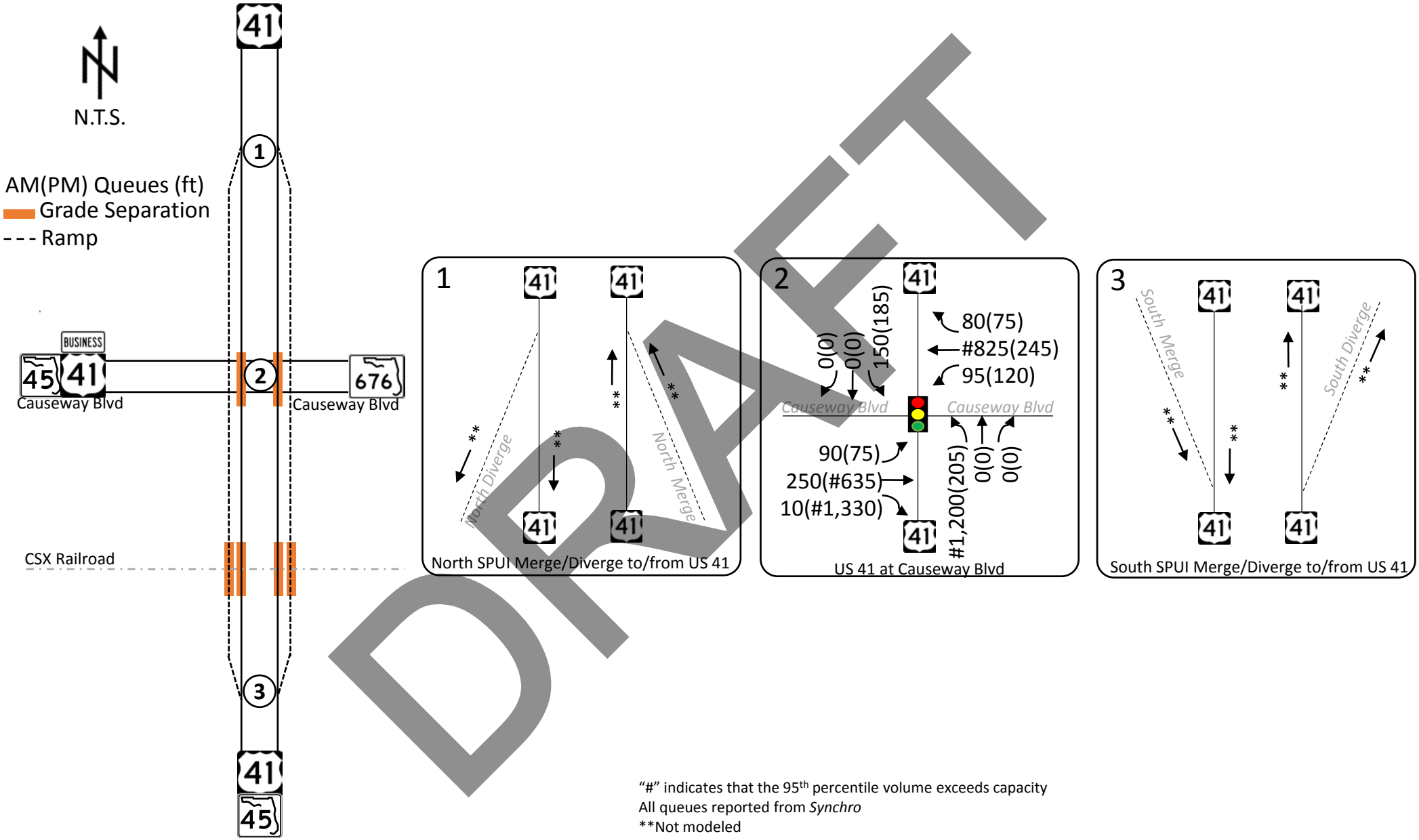
Figure 7.9. Build Alternative 4 Design Year 95th Percentile Queues



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"#" indicates that the 95th percentile volume exceeds capacity
All queues reported from *Synchro*
**Not modeled

8.0 SUMMARY OF ANALYSIS RESULTS

The *Synchro* operational results showed that each of the Build alternatives would provide improvement in delay and LOS to the study area when compared to the No-Build Alternative. For each alternative, design year 95th percentile queues were reported using *Synchro* and/or *SimTraffic*. As noted in the FDOT *Traffic Analysis Handbook*, there are limitations to using either of these software for queuing analyses, including using them for oversaturated conditions or at locations such as ramp junctions or weaving areas.

Although the US 41 at Causeway Boulevard intersection under Build Alternative 1 achieves the target LOS of D or better during the AM peak hour of each analysis year, the heavy eastbound right turn volume during the PM peak hour contributes to the overall LOS F for each analysis year. Removing the northbound left turns from the intersection resulted in adequate LOS during the AM peak hour for each analysis year, but both *Synchro* and *SimTraffic* show significant queueing at the flyover diverge point, which may indicate an increased flyover capacity would be needed to accommodate the heavy volume.

Build Alternative 2 shows the LOS at US 41 and Causeway Boulevard degrading to E during the AM peak hour by 2036. By 2046, the LOS degrades to F during the AM peak hour and to E during the PM peak hour, and most of the movements and approaches also show inadequate LOS. The results show that the Quadrant Roadway intersection with Causeway Boulevard would operate at the target LOS of D or better for all but the 2046 AM peak hour. The results indicate that additional capacity would be needed to bring US 41 and Causeway Boulevard to LOS D or better by the design year.

Build Alternative 3 most closely approaches the target LOS of D by 2046. One of the signalized intersections are below the target LOS during the PM peak hour of the design year. As indicated by *Synchro*, queueing is longest at the eastbound approach to the western crossover during the PM peak hour.

Build Alternative 4 achieves the target LOS or better during AM and PM peak hours of the opening year but degrades to LOS E and F during each peak hour of the interim and design years, respectively. The major sources of delay for this alternative are the left turns; three of the four left turn movements show LOS F during the AM peak hour of the design year while other movements operate at or better than LOS D. *Synchro* indicates that queuing is also an issue at the northbound approach during the AM peak hour due to the volume of left turns as well as at the eastbound approach during the PM peak hour.

User delay costs for each alternative were also calculated and summarized. The 2018 cost per vehicle per hour delay was obtained from the Texas Transportation Institute. The total cost of delay for personal vehicles was found to be $29.35 per hour, and the total cost of delay for commercial vehicles was found to be $39.47. These values were used to calculate the total cost of delay for each alternative, using the weighted signalized intersection delay, processed vehicular volume in vehicles per hour (obtained from *Synchro*), and percentage of heavy vehicles (assumed to be commercial vehicles). **Table 8.1** summarizes the user costs by year and peak hour for each alternative. These costs were used to develop a total peak hour project user delay cost from 2026 to 2046 for each alternative. The total project costs are

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summarized in **Table 8.2**. The calculations show that Build Alternative 3 provides the lowest user delay cost.

Table 8.1. User Delay Costs by Year and Peak Hour

Alternative	User Cost Metrics	2026 AM	2026 PM	2036 AM	2036 PM	2046 AM	2046 PM
No Build	Intersection Delay (s/veh)	162.1	119.5	264.0	231.1	373.0	370.1
	Vehicles per hour	6,843	6,570	8,561	8,359	10,276	10,139
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	**$9,262**	**$6,555**	**$18,871**	**$16,129**	**$32,003**	**$31,331**
Build Alternative 1	Intersection Delay (s/veh)	39.0	69.0	39.1	121.0	46.7	189.9
	Vehicles per hour	3,661	5,466	4,656	7,001	5,648	8,529
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	**$1,192**	**$3,149**	**$1,520**	**$7,073**	**$2,202**	**$13,523**
Build Alternative 2	Intersection Delay (s/veh)	33.9	33.9	47.2	38.3	82.2	47.1
	Vehicles per hour	8,019	6,492	10,077	8,220	12,131	9,942
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	**$2,269**	**$1,840**	**$3,969**	**$2,630**	**$8,326**	**$3,909**
Build Alternative 3	Intersection Delay (s/veh)	6.8	6.9	9.3	10.7	16.0	20.9
	Vehicles per hour	13,032	10,538	16,558	13,870	20,123	17,114
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	**$743**	**$610**	**$1,290**	**$1,244**	**$2,688**	**$2,984**
Build Alternative 4	Intersection Delay (s/veh)	44.0	33.9	68.5	58.1	122.0	102.7
	Vehicles per hour	4,627	4,577	5,887	5,993	7,144	7,401
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	**$1,700**	**$1,296**	**$3,367**	**$2,907**	**$7,277**	**$6,346**

Table 8.2. Total Project User Delay Cost (2026 to 2046)

Alternative	AM Peak Hour	PM Peak Hour	Total
No Build	$102,708,953	$91,188,964	**$193,897,917**
Build Alternative 1	$8,364,850	$40,064,249	**$48,429,099**
Build Alternative 2	$24,091,909	$14,310,952	**$38,402,861**
Build Alternative 3	$7,813,304	$7,905,272	**$15,718,576**
Build Alternative 4	$20,424,495	$17,493,308	**$37,917,803**

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9.0 APPENDICES

Appendix A: CAP-X Worksheets
Appendix B: Conceptual Plans for Build Alternatives
Appendix C: Traffic Methodology Report
Appendix D*:* Data Collection
Appendix E: FDOT Generalized Tables
Appendix F: Existing Signal Timing
Appendix G: Existing Conditions Report
Appendix H: Historical Crash Data (Trains Only)
Appendix I: BEBR Data
Appendix J: Synchro Reports

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Appendix A: CAP-X Worksheets

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Capacity Analysis for Planning of Junctions

Project Name:	US 41 at Causeway Boulevard
Project Number:	440749-1-22-01
Location:	Tampa, FL
Date:	2046 AM
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	114	687	835	13.00%	0.00%
Westbound	0	138	1753	415	13.00%	0.00%
Southbound	0	323	976	112	13.00%	0.00%
Northbound	0	2459	2052	111	13.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
FDOT Context Zone		**C3C-Suburban Commercial**	
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

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Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		3	3	1		1	3	1		2	3	3		2	3	1
Quadrant Roadway	S-W		0	0	0			0	0		0	0	0		0	0	0
	N-E			0	0		0	0	0		0	0	0		0	0	0
	S-E		0	0	0		0	0	0			0	0		0	0	0
	N-W		0	0	0		0	0	0		0	0	0			0	0
Partial Displaced Left Turn	N-S		3	3	1		1	3	1		2	3	2		2	3	1
Displaced Left Turn	FULL		3	3	1		1	3	1		1	3	3		1	3	1
Signalized Restricted Crossing U-Turn	N-S	2	2	3	2	2	2	3	3				2				3
Unsignalized Restricted Crossing U-Turn	N-S	2	2	3	1	2	1	3	1				2				2
Median U-Turn	N-S	2		3	1	2		3	1			2	2			2	1
Partial Median U-Turn	N-S	3		3	1	2		3	1		2	2	2		2	2	1

Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Diamond	E-W		0	2	0		0	2	0		1	0	1		1	0	1
Partial Cloverleaf A	E-W		3		2		1		1			3				3	
Partial Cloverleaf B	E-W		1		1		1		1		2	2	2		2	2	1
Displaced Left Turn	E-W		3	2	1		2	2	2		2	3	1		2	3	1
Diverging Diamond Interchange	E-W		3		1		1		1		1	3	1		1	3	1
Single Point	E-W		3	2	1		2	2	1		1	3	2		1	3	1

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Capacity Analysis for Planning of Junctions

Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	FULL									2122	1.39	1.39	Fair	Fair	Good
Quadrant Roadway	S-W			3613	2.06			3979	2.27	2228	1.24	2.27	Fair	Fair	Fair
	N-E	3808	2.18			4260	2.43			4929	2.74	2.74	Fair	Fair	Fair
	S-E			3800	2.17	4150	2.37			3540	1.97	2.37	Fair	Fair	Fair
	N-W	6344	3.63					4409	2.52	3660	2.03	3.63	Fair	Fair	Fair
Partial Displaced Left Turn	N-S	1200	*0.67*	1395	0.77					1703	0.97	0.97	Fair	Fair	Good
Displaced Left Turn	FULL	1200	*0.67*	1395	0.77	545	*0.30*	1722	0.96	1635	0.91	0.96	Fair	Fair	Good
Signalized Restricted Crossing U-Turn	N-S	1867	1.04	2307	1.28	1838	1.02	2289	1.27			1.28	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	N-S	1595	7.41	5223	146.75	2448	148.51	3367	142.34			148.51	Fair	Fair	Fair
Median U-Turn	N-S	2366	1.31	2050	1.14					4409	2.45	2.45	Good	Good	Fair
Partial Median U-Turn	N-S	1690	0.94	1969	1.09					2758	1.58	1.58	Good	Good	Fair

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Capacity Analysis for Planning of Junctions

Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				

Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Diamond	E-W					3994	2.28	2849	1.63					2.28	Fair	Fair	Good
Partial Cloverleaf A	E-W					686	0.38	1687	0.94					0.94	Poor	Poor	Good
Partial Cloverleaf B	E-W					599	0.33	1136	0.63					0.63	Poor	Poor	Good
Displaced Left Turn	E-W	1655	0.92			1779	0.99	2408	1.34			512	0.28	1.34	Fair	Fair	Good
Diverging Diamond Interchange	E-W	1736	0.96	1888	1.05	686	0.38	1687	0.94	1093	0.61	527	0.29	1.05	Good	Good	Good
Single Point	E-W	1736	0.96			1800	1.06					527	0.29	1.06	Fair	Fair	Good

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Capacity Analysis for Planning of Junctions

Project Name:	US 41 at Causeway Boulevard
Project Number:	440749-1-22-01
Location:	Tampa, FL
Date:	2046 PM
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	113	1619	2803	13.00%	0.00%
Westbound	0	188	798	414	13.00%	0.00%
Southbound	0	424	1885	47	13.00%	0.00%
Northbound	0	805	942	216	13.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
FDOT Context Zone		**C3C-Suburban Commercial**	
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

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Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		3	3	1		1	3	1		2	3	3		2	3	1
Quadrant Roadway	S-W		0	0	0			0	0		0	0	0		0	0	0
	N-E			0	0		0	0	0		0	0	0		0	0	0
	S-E		0	0	0		0	0	0			0	0		0	0	0
	N-W		0	0	0		0	0	0		0	0	0			0	0
Partial Displaced Left Turn	N-S		3	3	1		1	3	1		2	3	2		2	3	1
Displaced Left Turn	FULL		3	3	1		1	3	1		1	3	3		1	3	1
Signalized Restricted Crossing U-Turn	N-S	2	2	3	2	2	2	3	3				2				3
Unsignalized Restricted Crossing U-Turn	N-S	2	2	3	1	2	1	3	1				2				2
Median U-Turn	N-S	2		3	1	2		3	1			2	2			2	1
Partial Median U-Turn	N-S	3		3	1	2		3	1		2	2	2		2	2	1

Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Diamond	E-W		0	2	0		0	2	0		1	0	1		1	0	1
Partial Cloverleaf A	E-W		3		2		1		1			3				3	
Partial Cloverleaf B	E-W		1		1		1		1		2	2	2		2	2	1
Displaced Left Turn	E-W		3	2	1		2	2	2		2	3	1		2	3	1
Diverging Diamond Interchange	E-W		3		1		1		1		1	3	1		1	3	1
Single Point	E-W		3	2	1		2	2	1		1	3	2		1	3	1

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Capacity Analysis for Planning of Junctions

Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	FULL									2081	1.36	1.36	Fair	Fair	Good
Quadrant Roadway	S-W			5040	2.88			4100	2.34	2459	1.37	2.88	Fair	Fair	Fair
	N-E	1574	0.90			1973	1.13			4791	2.66	2.66	Fair	Fair	Fair
	S-E			2872	1.64	2096	1.20			5030	2.79	2.79	Fair	Fair	Fair
	N-W	2158	1.23					3496	2.00	4897	2.72	2.72	Fair	Fair	Fair
Partial Displaced Left Turn	N-S	902	*0.50*	1100	*0.61*					2366	1.35	1.35	Fair	Fair	Good
Displaced Left Turn	FULL	902	*0.50*	1100	*0.61*	992	*0.55*	739	*0.41*	1633	0.91	0.91	Fair	Fair	Good
Signalized Restricted Crossing U-Turn	N-S	1584	0.88	1962	1.09	1840	1.02	3795	2.11			2.11	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	N-S	2662	11.38	2218	12.68	3265	21.51	2342	243.61			243.61	Fair	Fair	Fair
Median U-Turn	N-S	1589	0.88	1119	*0.62*					3071	1.71	1.71	Good	Good	Fair
Partial Median U-Turn	N-S	1267	*0.70*	1039	*0.58*					2844	1.63	1.63	Good	Good	Fair

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Capacity Analysis for Planning of Junctions

Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				

Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Diamond	E-W					2112	1.21	1837	1.05					1.21	Fair	Fair	Good
Partial Cloverleaf A	E-W					1157	0.64	691	0.38					0.64	Poor	Poor	Good
Partial Cloverleaf B	E-W					1154	0.64	624	0.35					0.64	Poor	Poor	Good
Displaced Left Turn	E-W	671	0.37			862	0.48	1443	0.80			1026	0.57	0.80	Fair	Fair	Good
Diverging Diamond Interchange	E-W	666	0.37	1256	0.70	1157	0.64	691	0.38	1141	0.63	1056	0.59	0.70	Good	Good	Good
Single Point	E-W	666	0.37			1152	0.68					1056	0.59	0.68	Fair	Fair	Good

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Appendix B: Conceptual Plans for Build Alternatives

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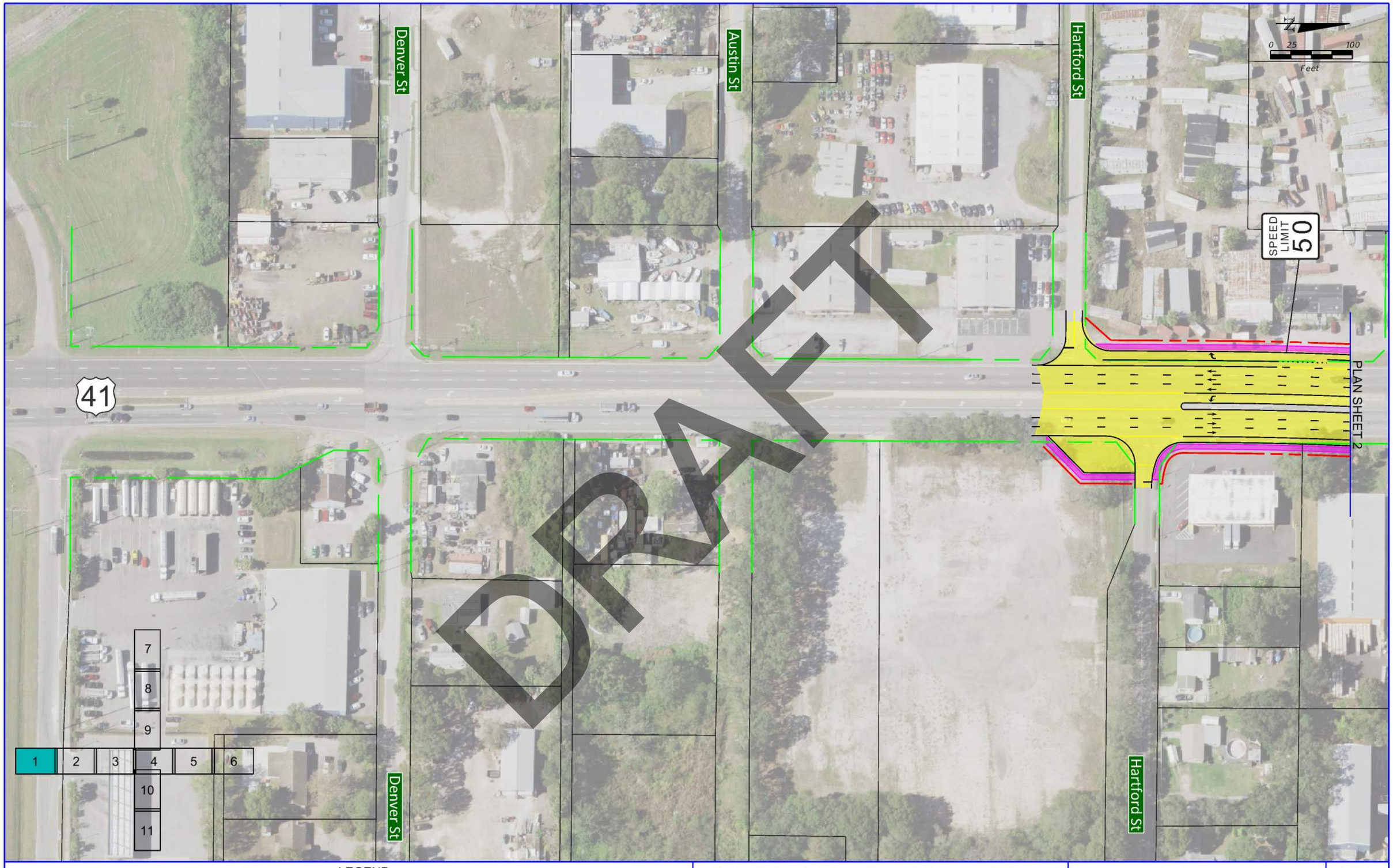


LEGEND

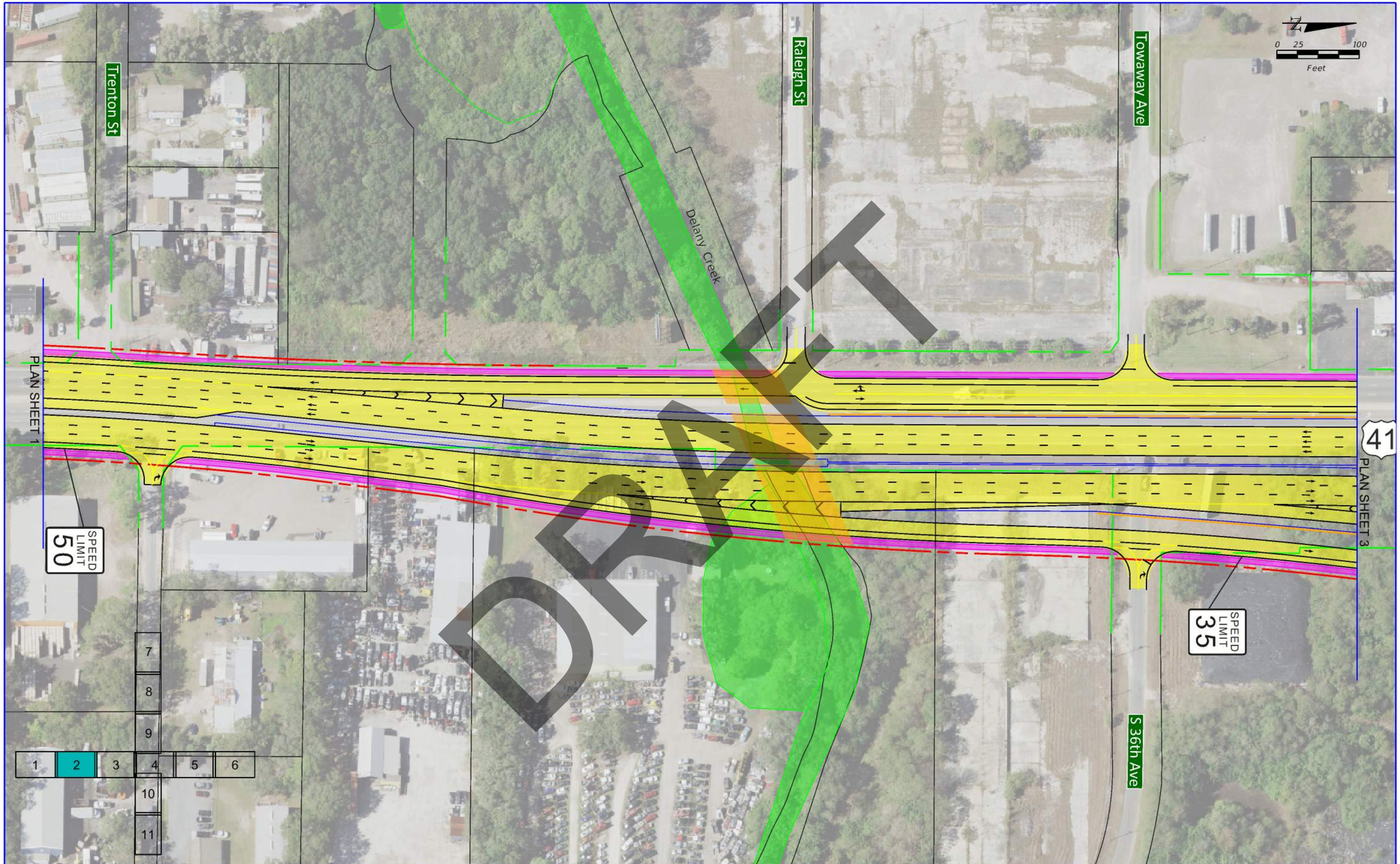
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1 PLAN SHEET 1

SHEET NO. 1



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LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 2

SHEET NO. 2

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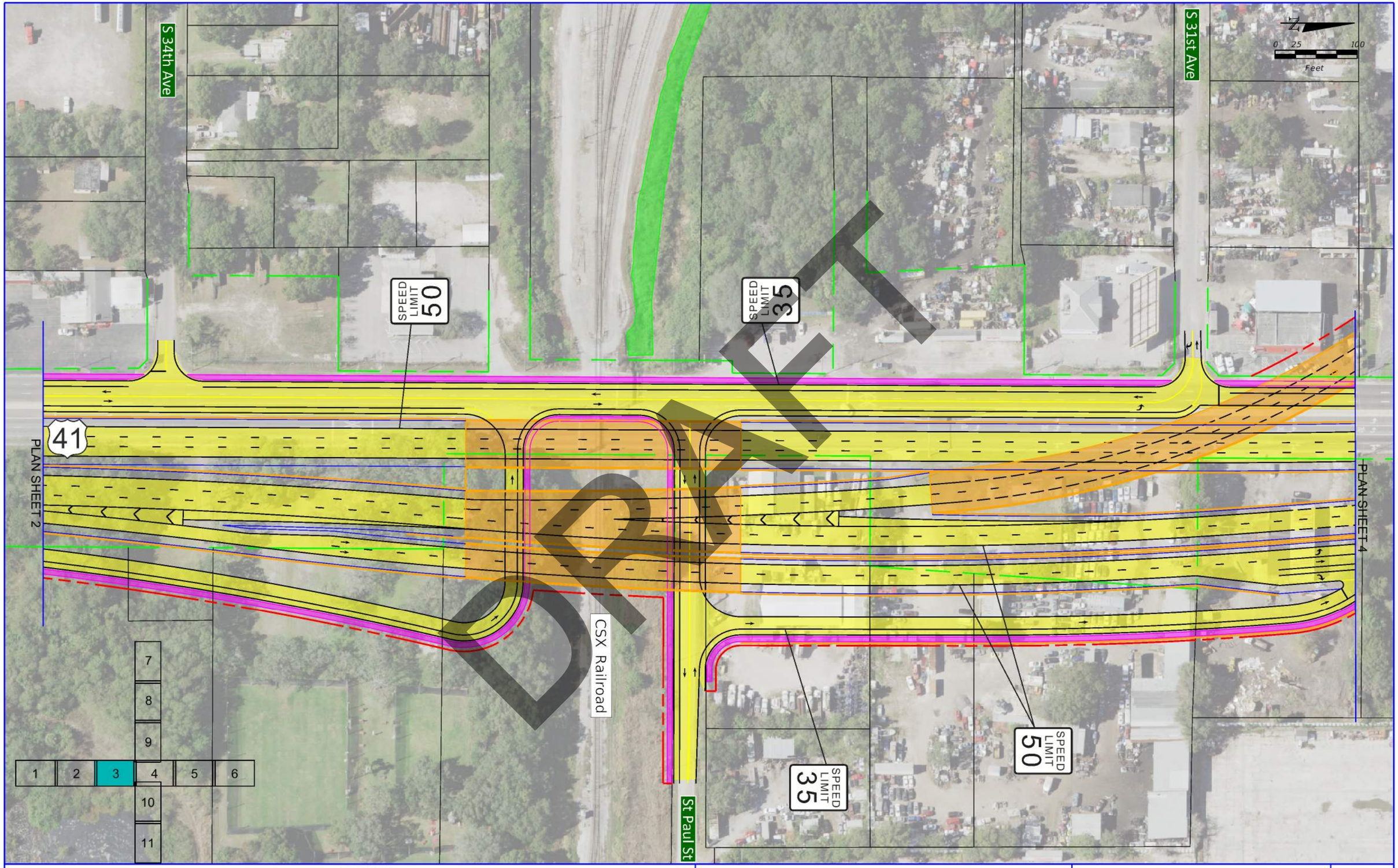

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 3

SHEET NO. 3

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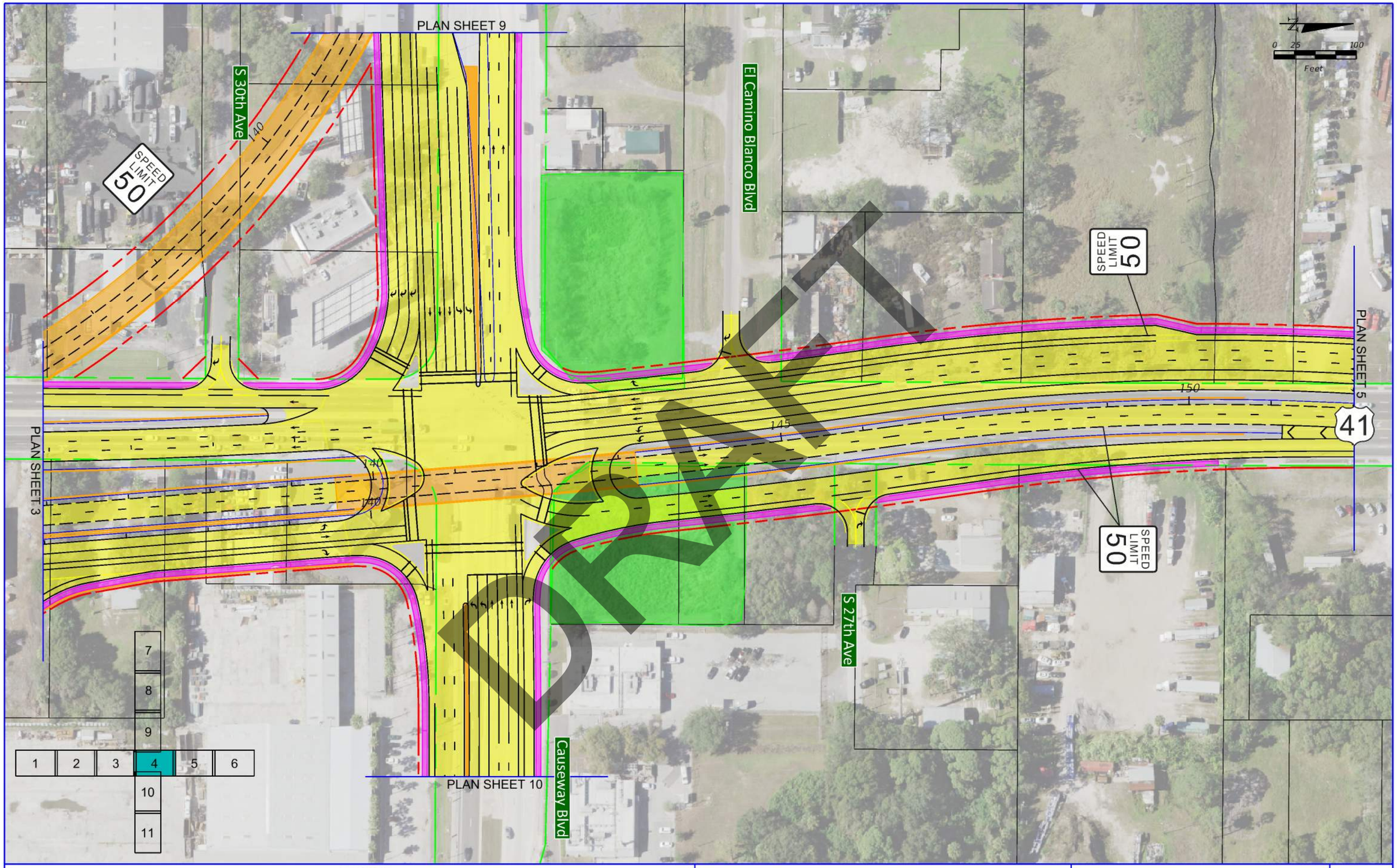


DRAFT

LEGEND

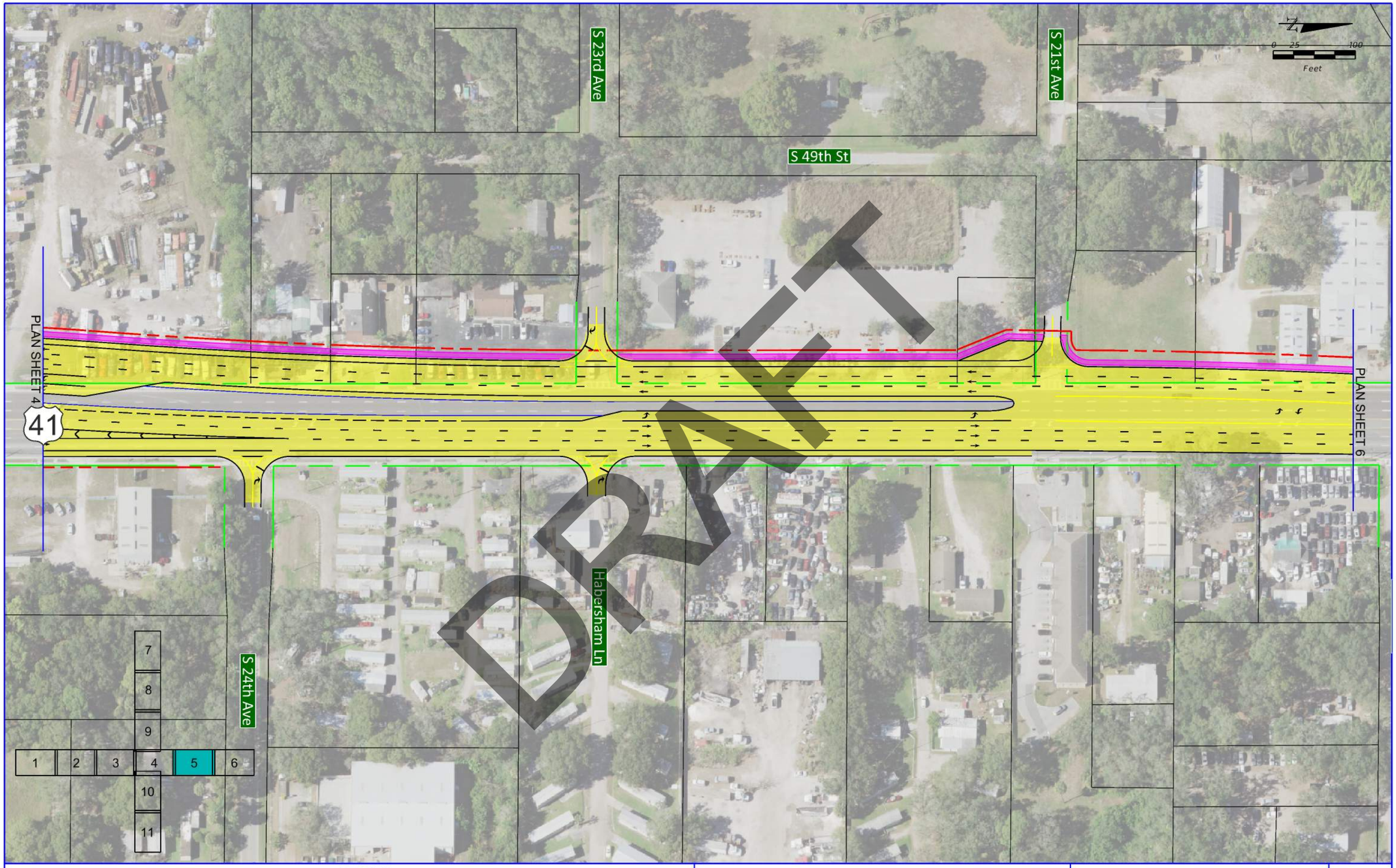
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 4

SHEET NO. 4



DRAFT

LEGEND

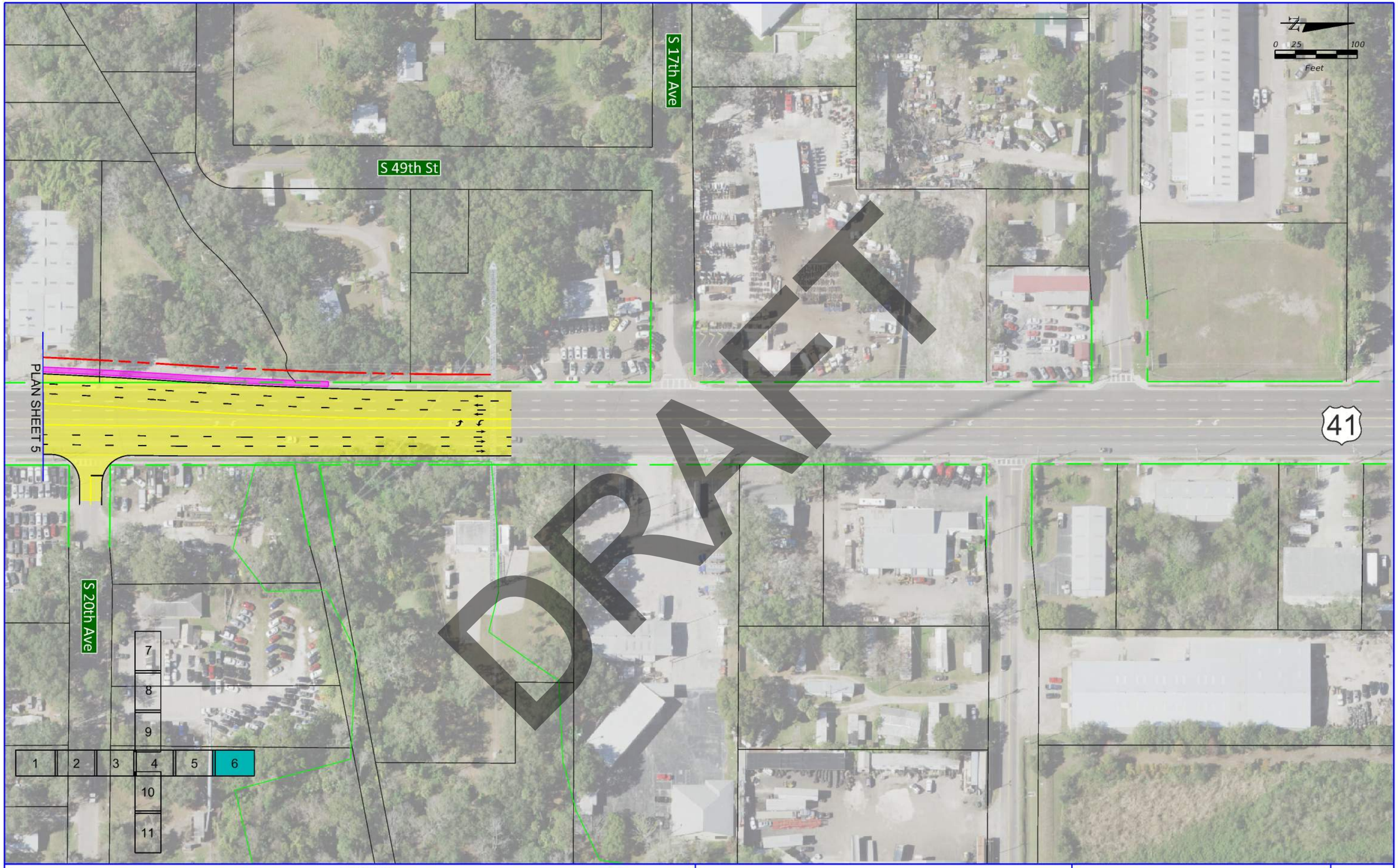
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1 PLAN SHEET 5

SHEET NO. 5



DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 6

SHEET NO. 6

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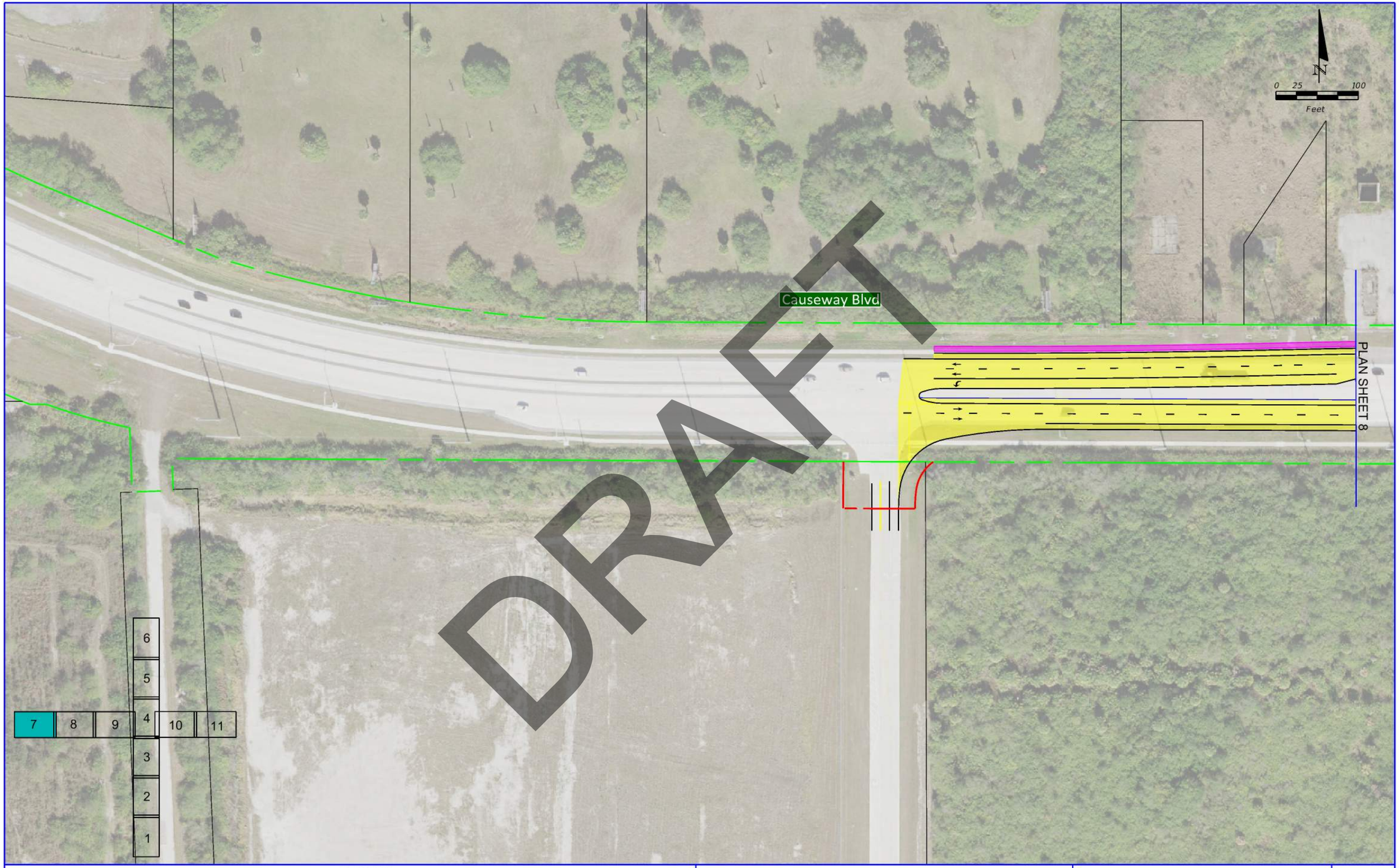

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 7

SHEET NO. 7

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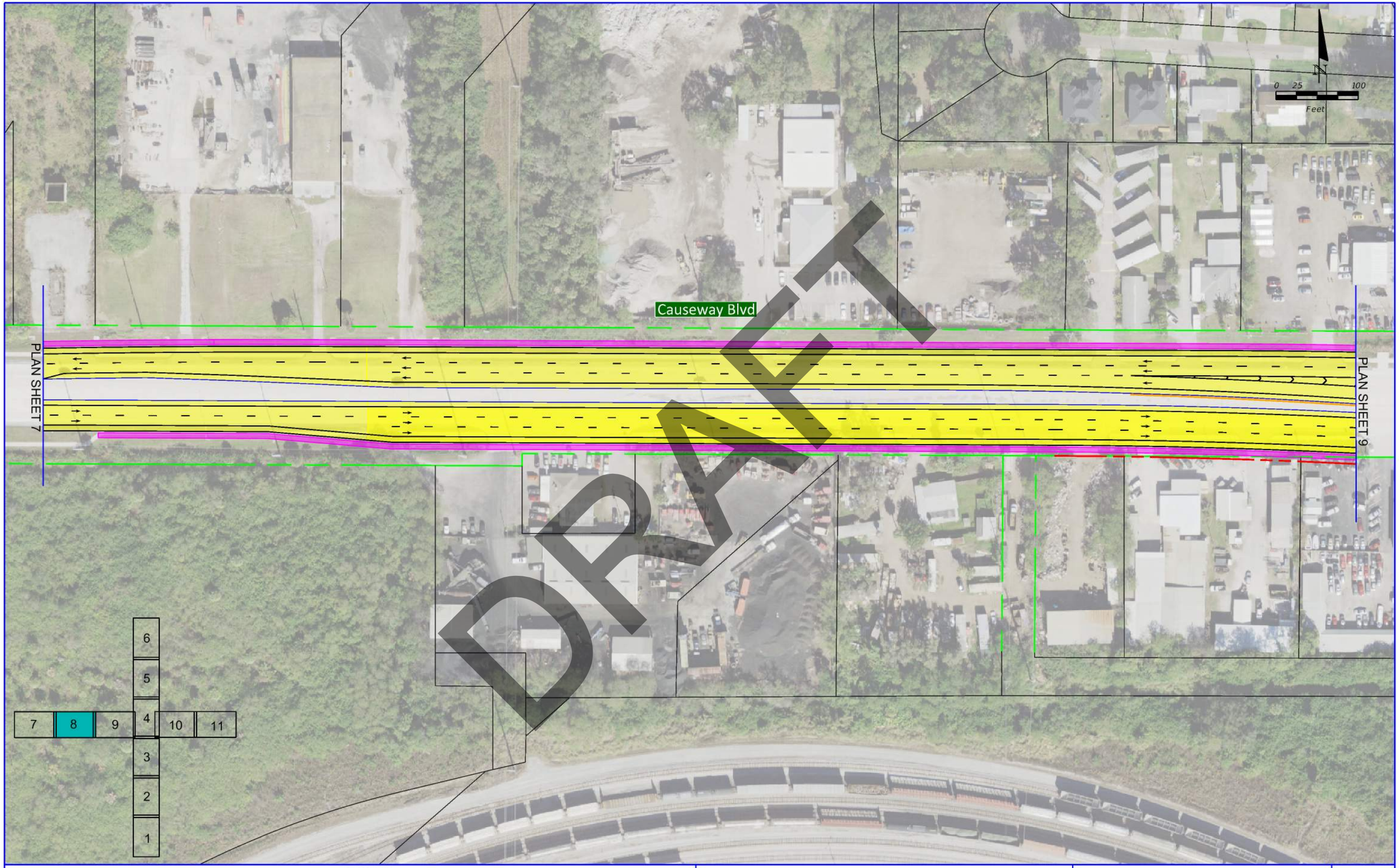

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 8

SHEET NO. 8

vperez 8/5/2019 8:46:18 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\41

S 45th St

S 47th St

El Camino Blanco Blvd

Causeway Blvd

SPEED LIMIT 50

SPEED LIMIT 50

PLAN SHEET 8

PLAN SHEET 4

S 30th Ave

S 47th St

6
5
7 8 9 4 10 11
3
2
1

0 25 100
Feet

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 9

SHEET NO. 9

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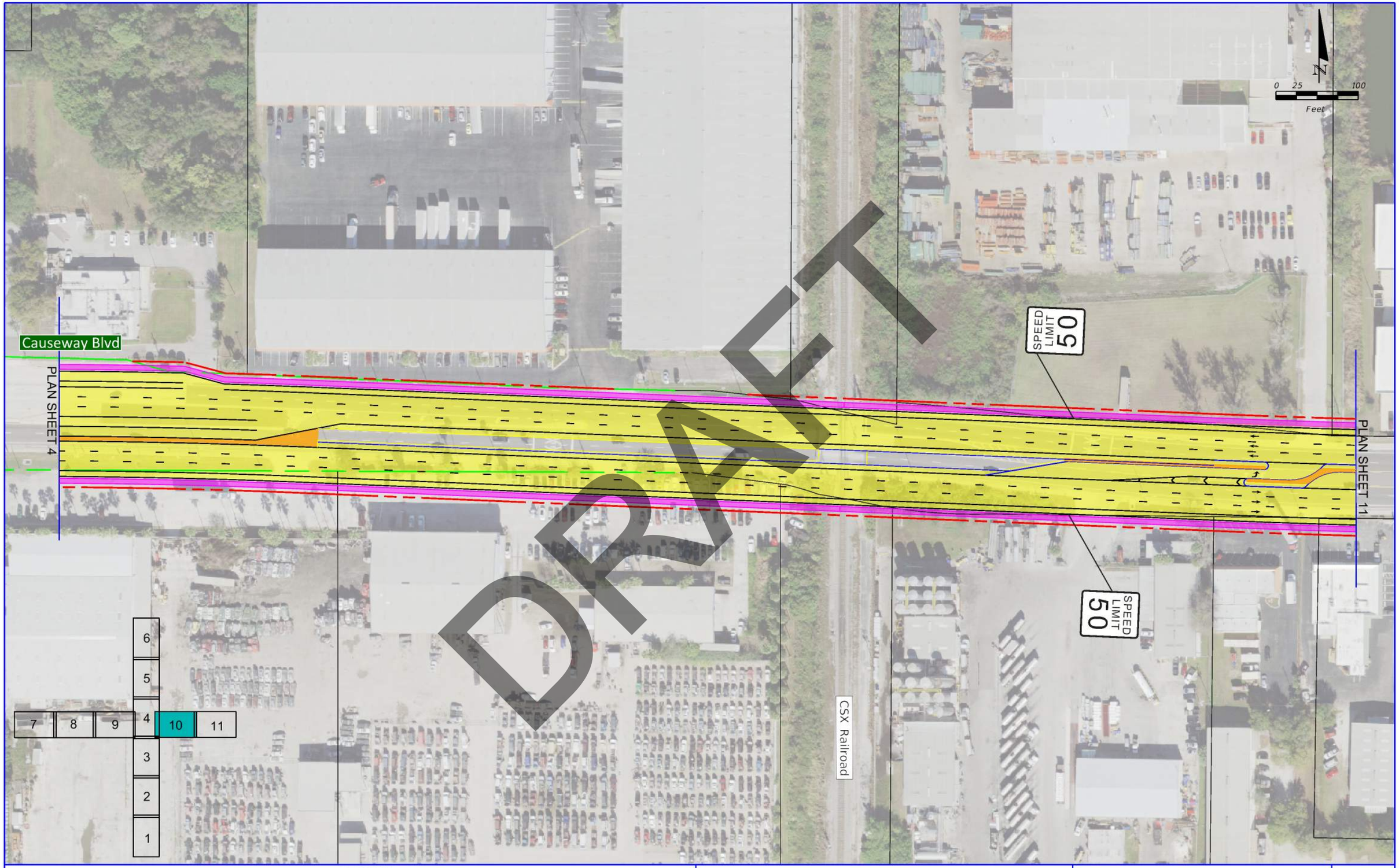


DRAFT

LEGEND

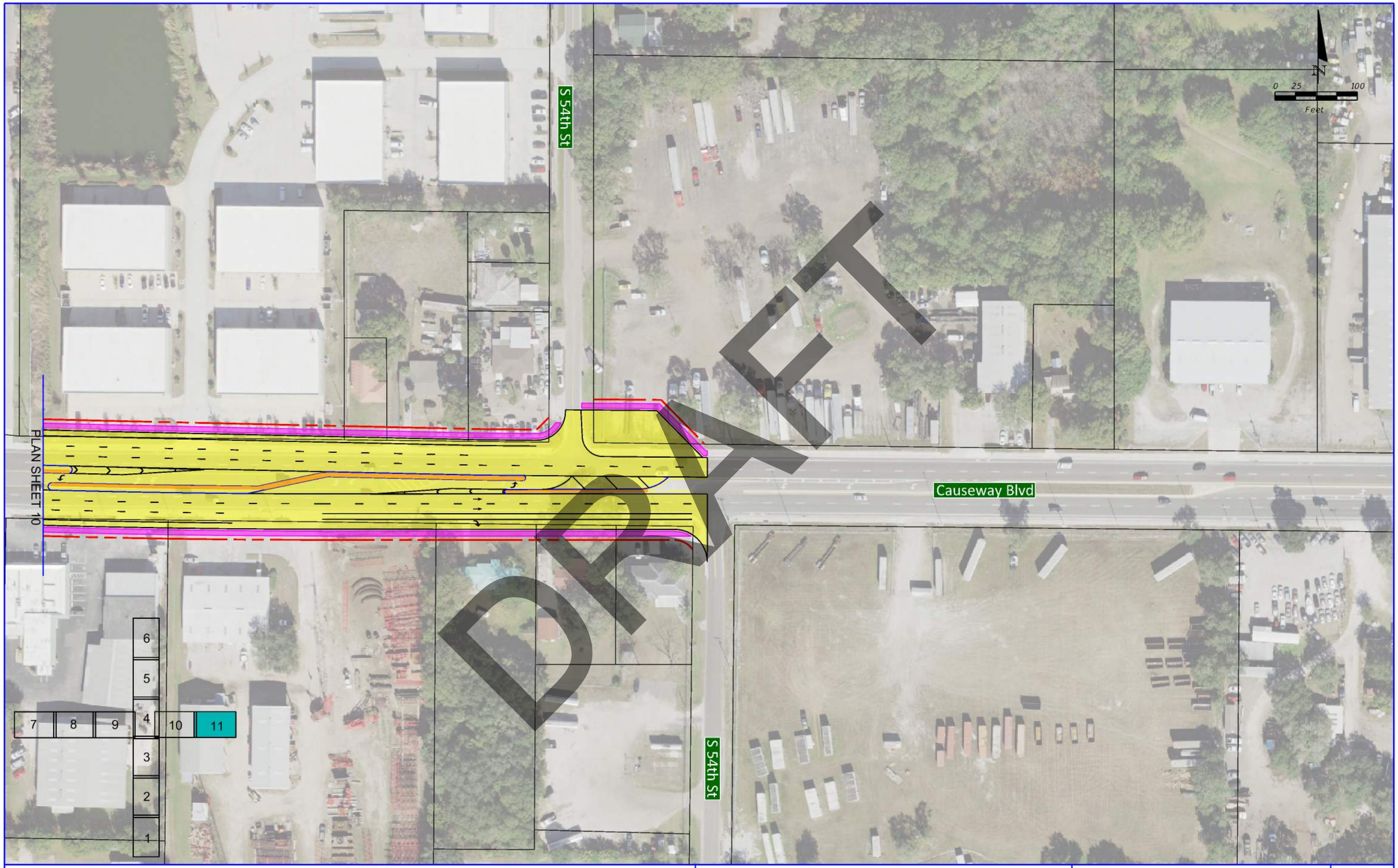
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1
PLAN SHEET 10

SHEET NO. 10



LEGEND

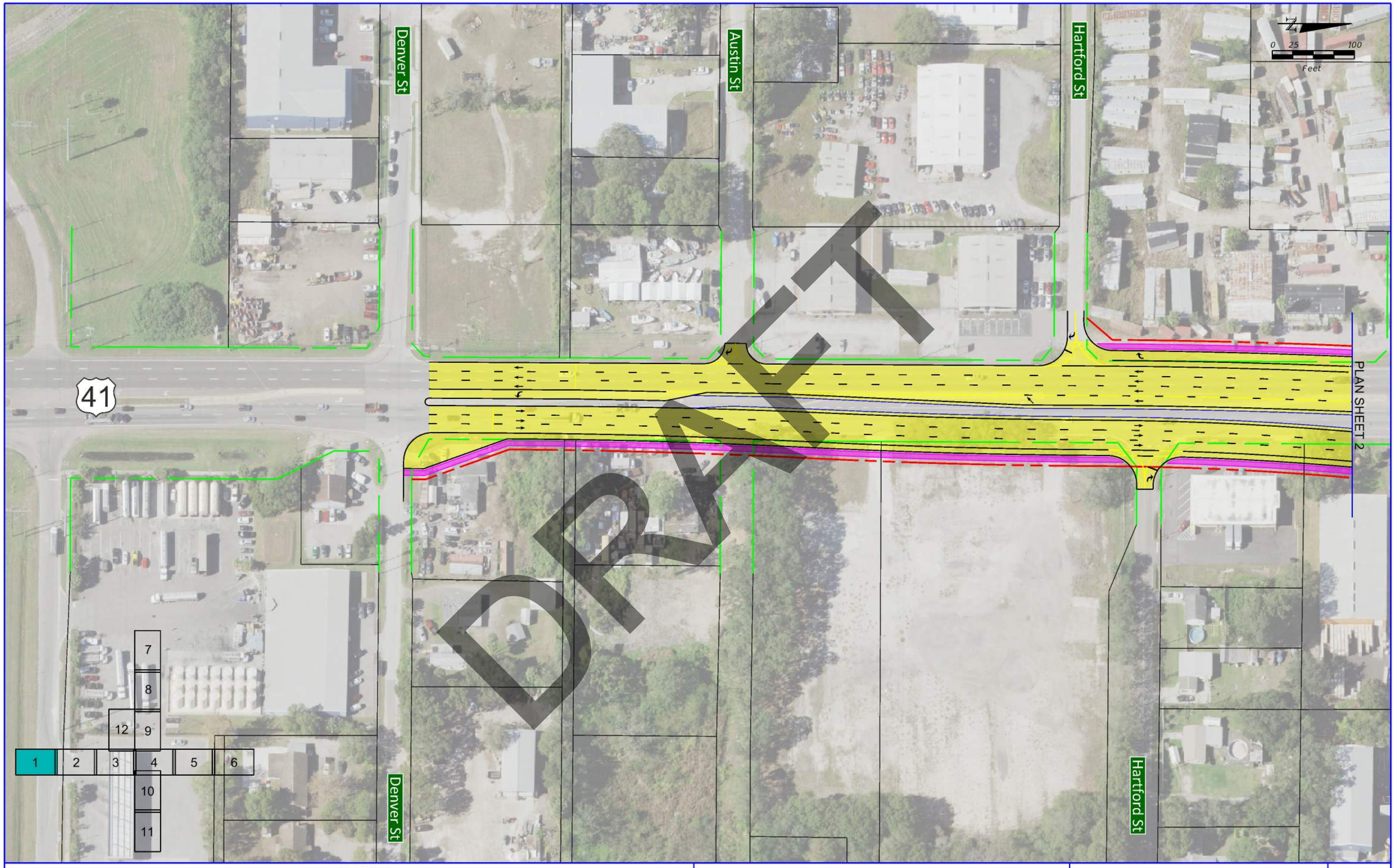
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 1 PLAN SHEET 11

SHEET NO. 11



DRAFT

LEGEND

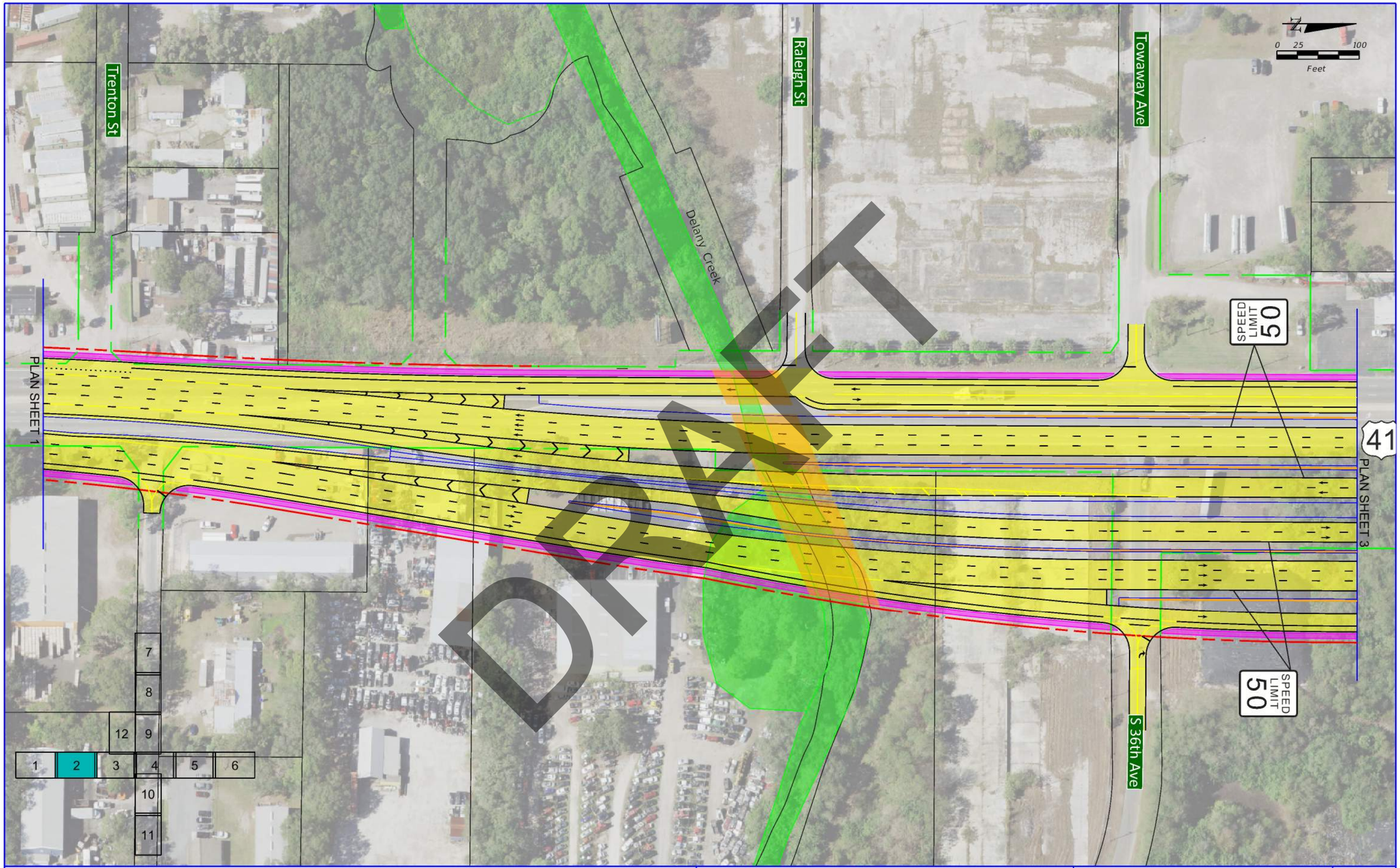
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segmen

ALTERNATIVE 2
PLAN SHEET 1

SHEET NO.
1



LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2 PLAN SHEET 2

SHEET NO. 2

vperez 8/5/2019 8:52:01 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\41

S 34th Ave

S 31st Ave

PLAN SHEET 12

0 25 100
Feet

SPEED LIMIT 35

SPEED LIMIT 35

SPEED LIMIT 50

41

PLAN SHEET 2

PLAN SHEET 4

CSX Railroad

SPEED LIMIT 35

SPEED LIMIT 35

SPEED LIMIT 50

St Paul St

7
8
12
9
1
2
3
4
5
6
10
11

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 3

SHEET NO.
3

vperez 8/5/2019 8:52:09 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\410

PLAN SHEET 9

S 30th Ave

El Camino Blanco Blvd

0 25 100
Feet

SPEED LIMIT 50

PLAN SHEET 5

41

PLAN SHEET 3

SPEED LIMIT 50

S 27th Ave

7
8
12 9
1 2 3 4 5 6
10
11

PLAN SHEET 10

Causeway Blvd

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 4

SHEET NO. 4

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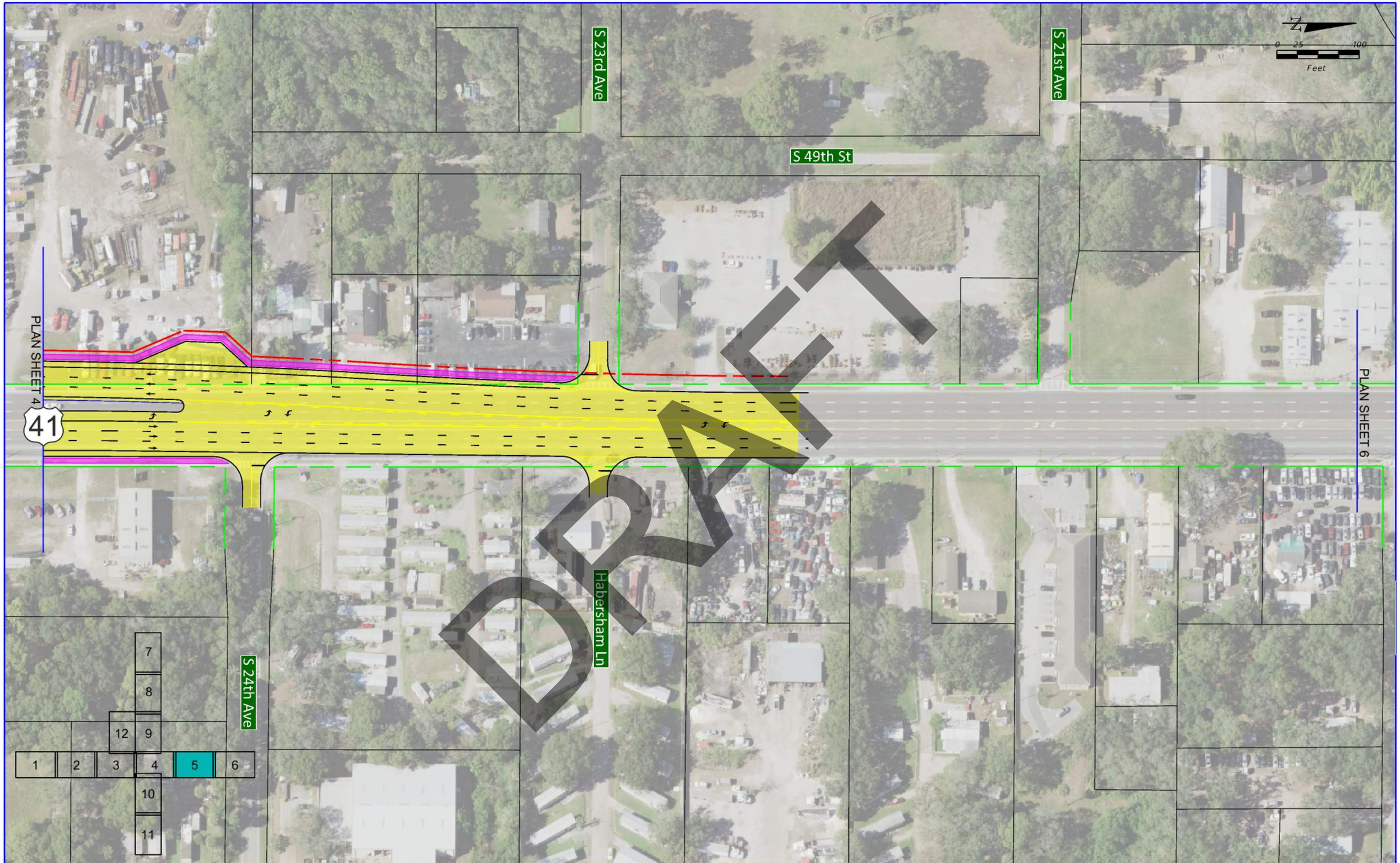

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2 PLAN SHEET 5

SHEET NO. 5

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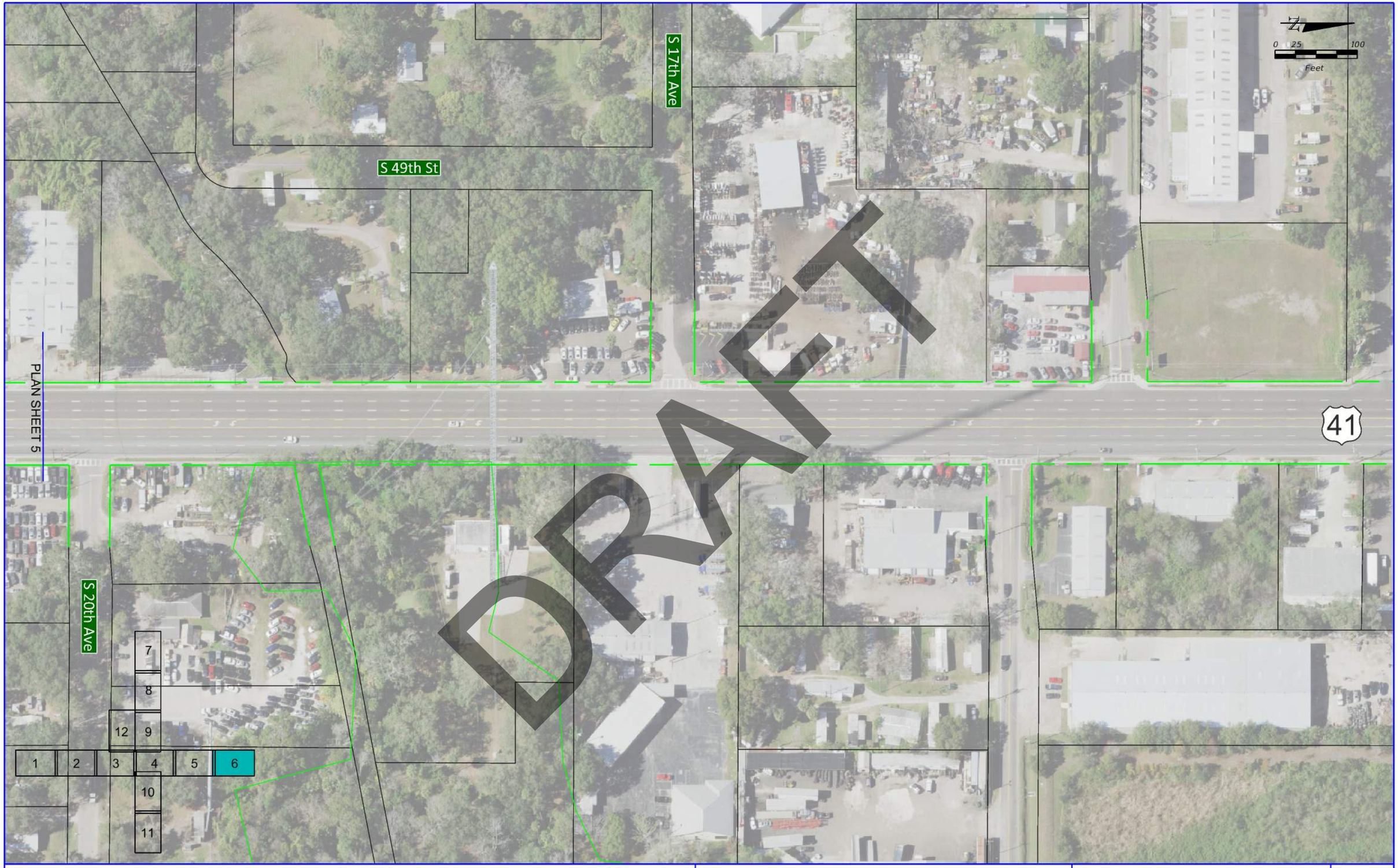

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 6

SHEET NO. 6

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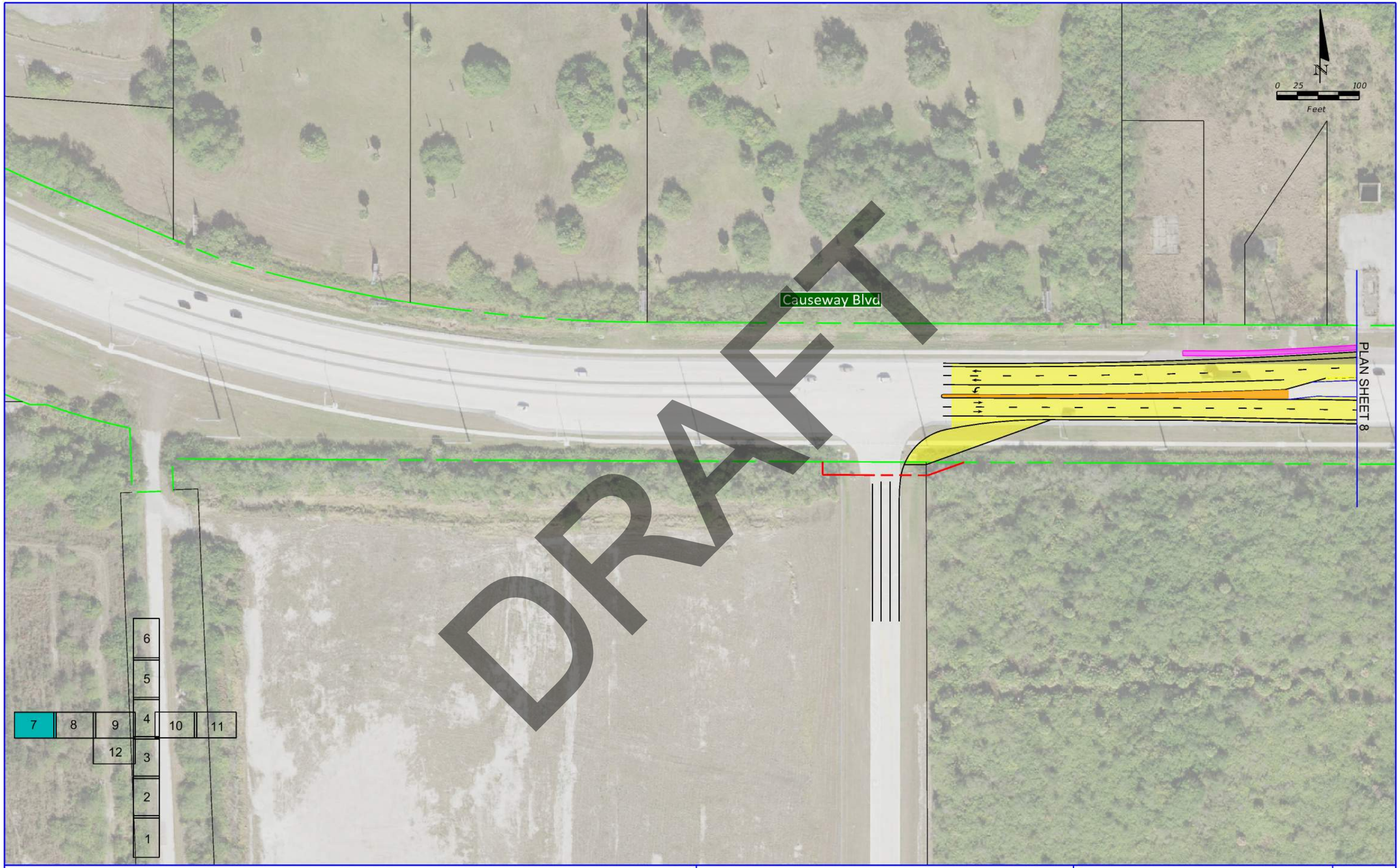


LEGEND

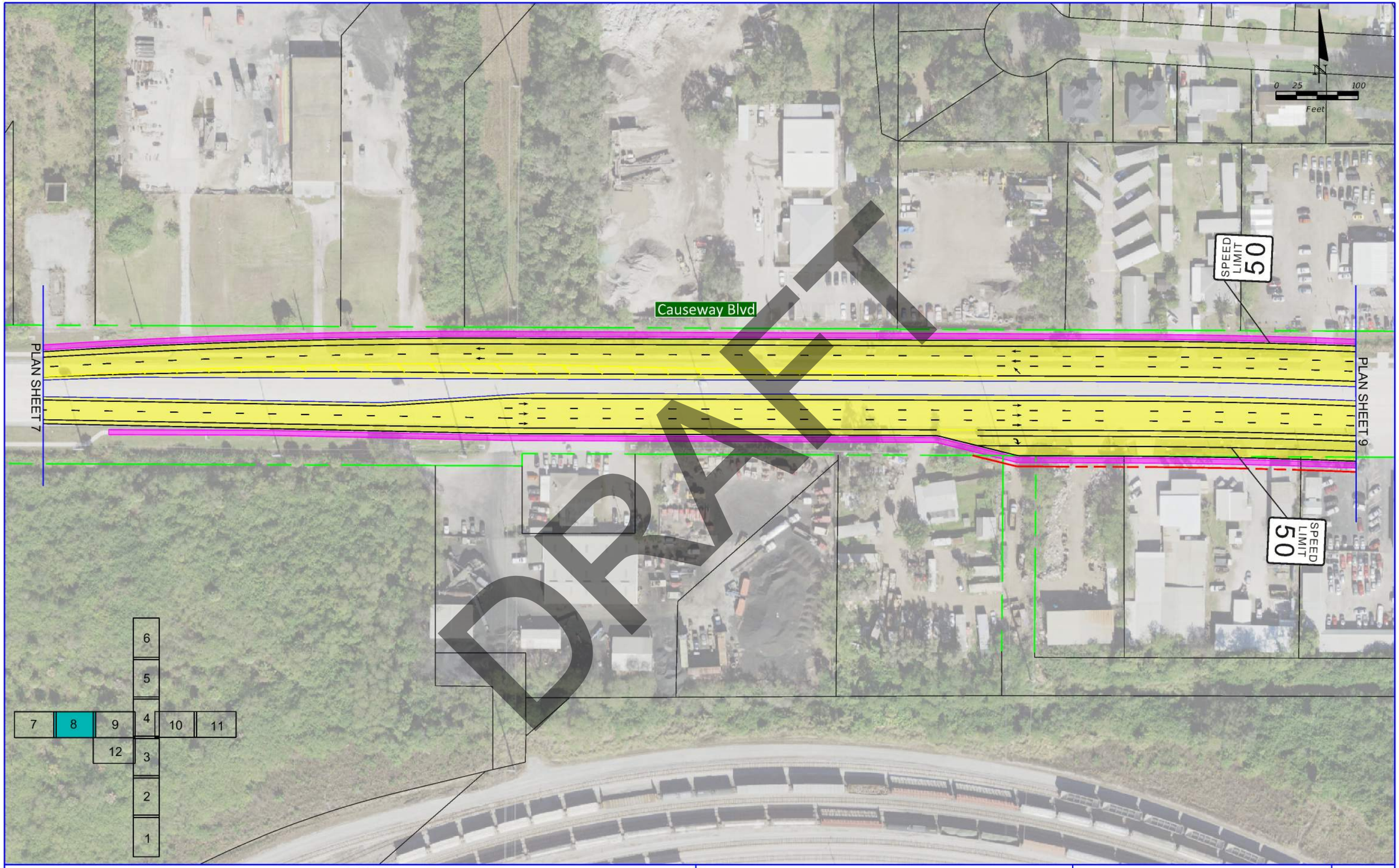
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 7

SHEET NO. 7



DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 8

SHEET NO. 8

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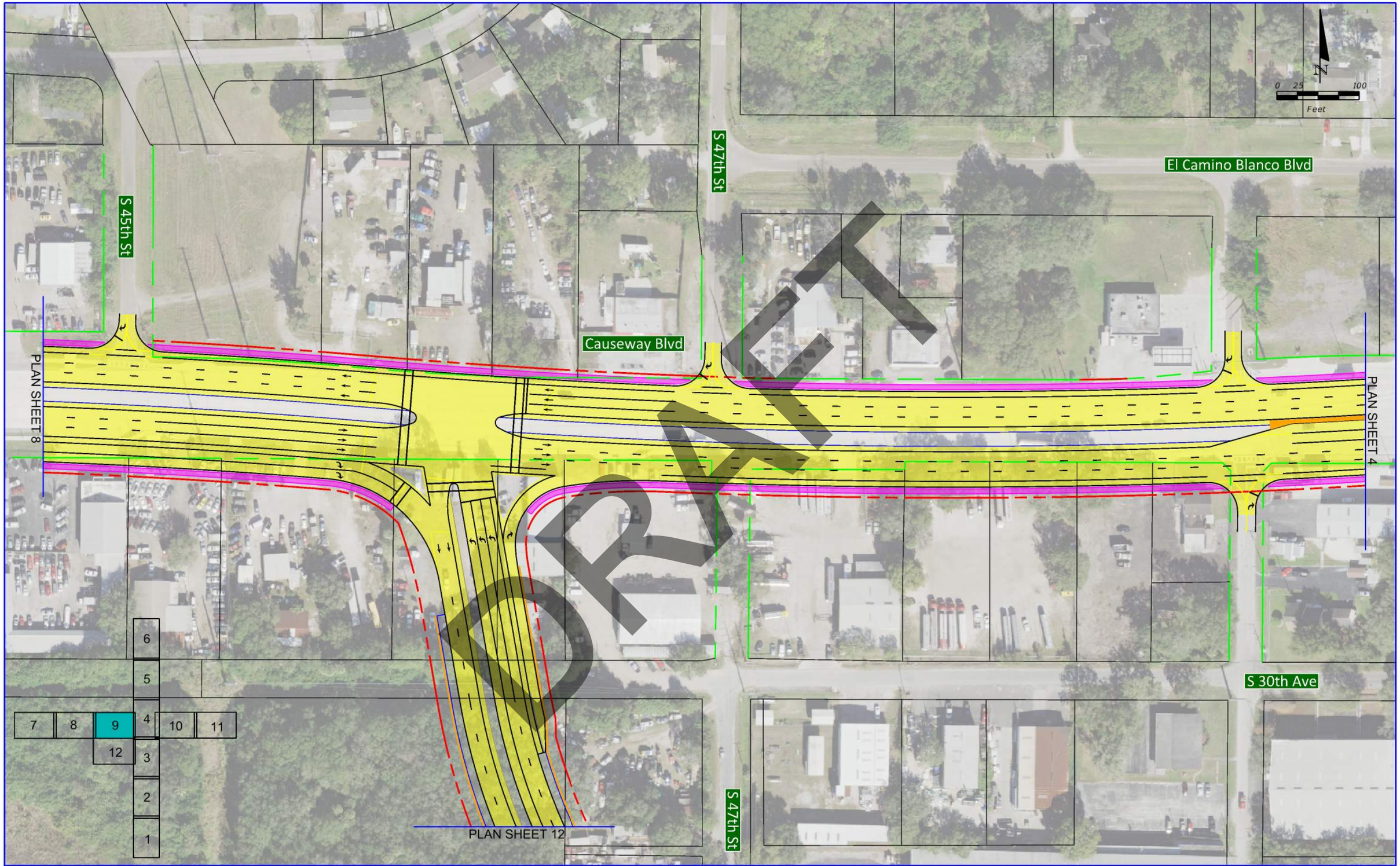

LEGEND

Existing Right-of-Way Line	Proposed Sidewalk	Proposed Retaining Wall
Existing Parcel Line	Proposed Pavement	Wetland
Proposed Right-of-Way Line	Proposed Bridge	

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 9

SHEET NO.
9

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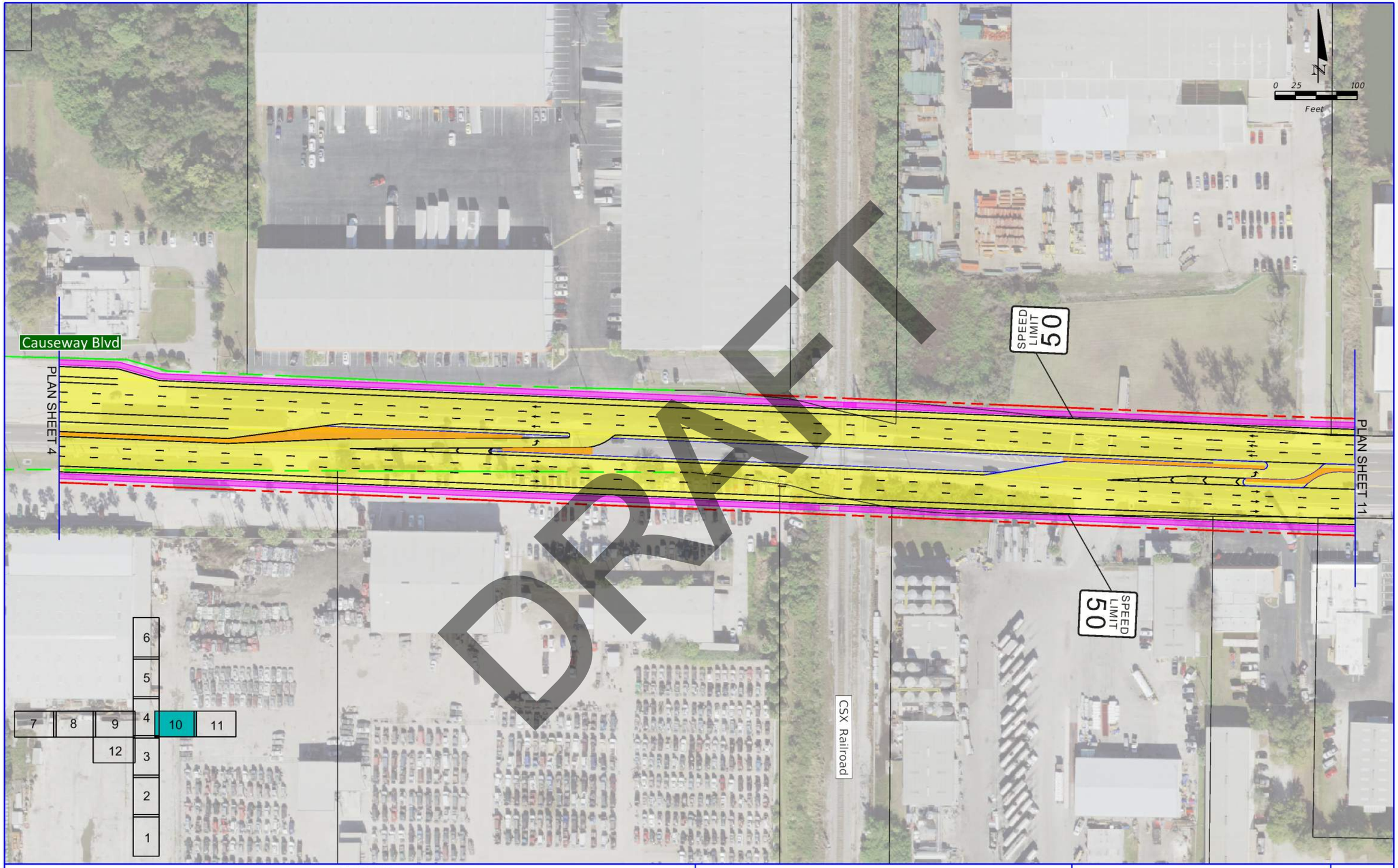

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 10

SHEET NO.
10

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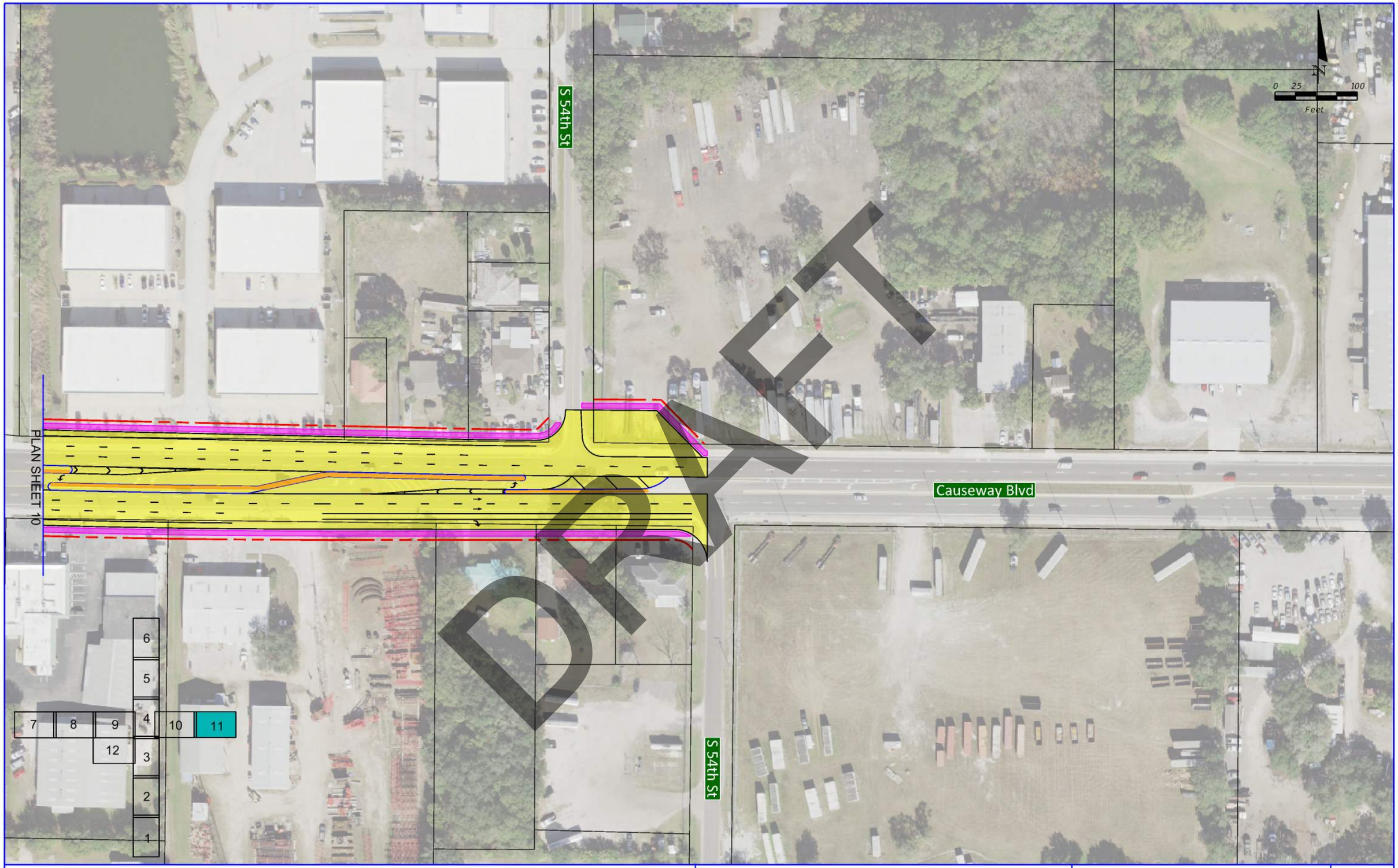


LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2 PLAN SHEET 11

SHEET NO. 11

vperez 8/5/2019 8:53:16 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\41

PLAN SHEET 9

S 47th St

S 31st Ave

N

0 25 100

Feet

SPEED LIMIT 50

SPEED LIMIT 50

PLAN SHEET 3

CSX Railroad

DRAFT

6
5
7 8 9 4 10 11
12 3
2
1

LEGEND

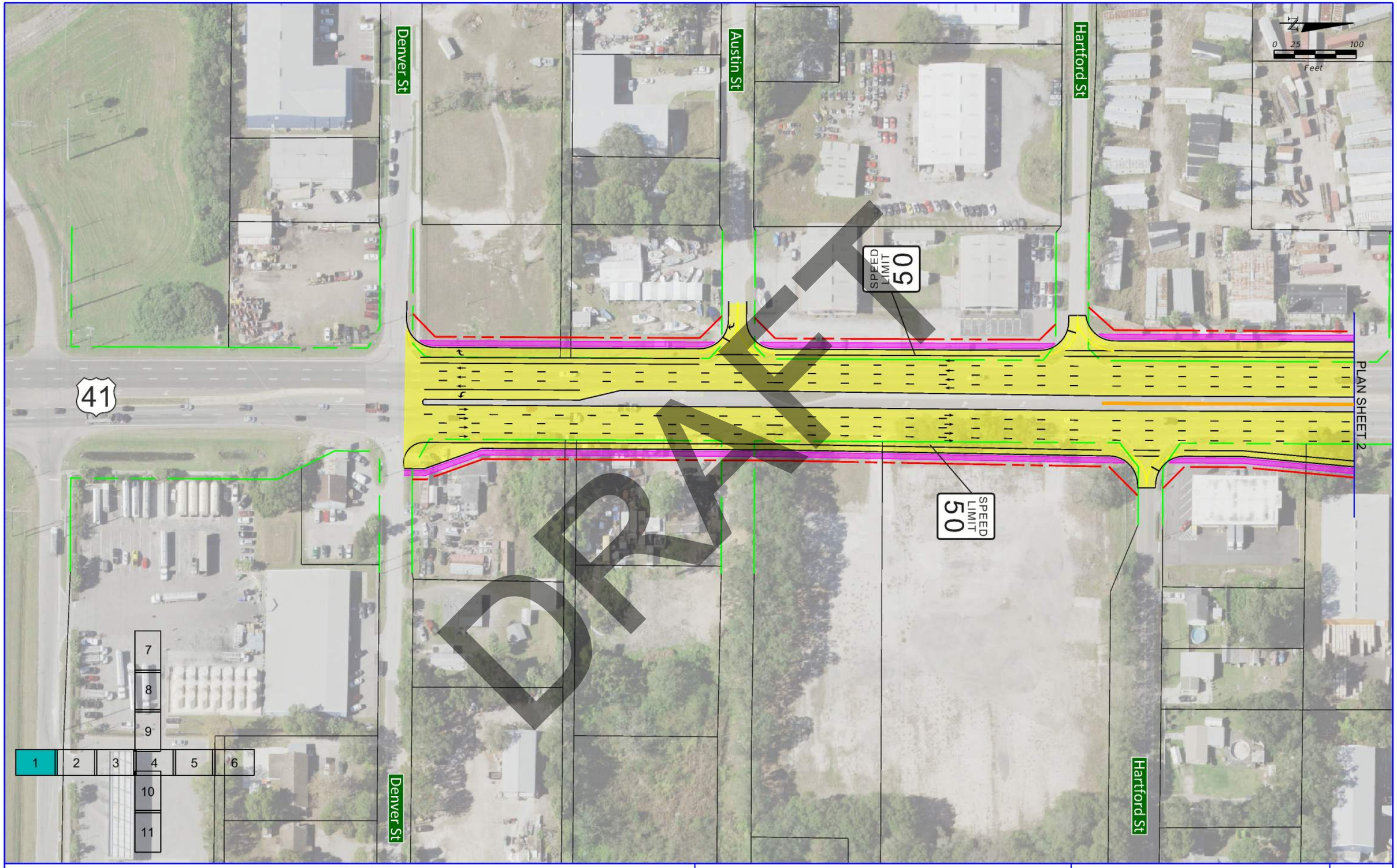
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 2
PLAN SHEET 12

SHEET NO.
12



DRAFT

LEGEND

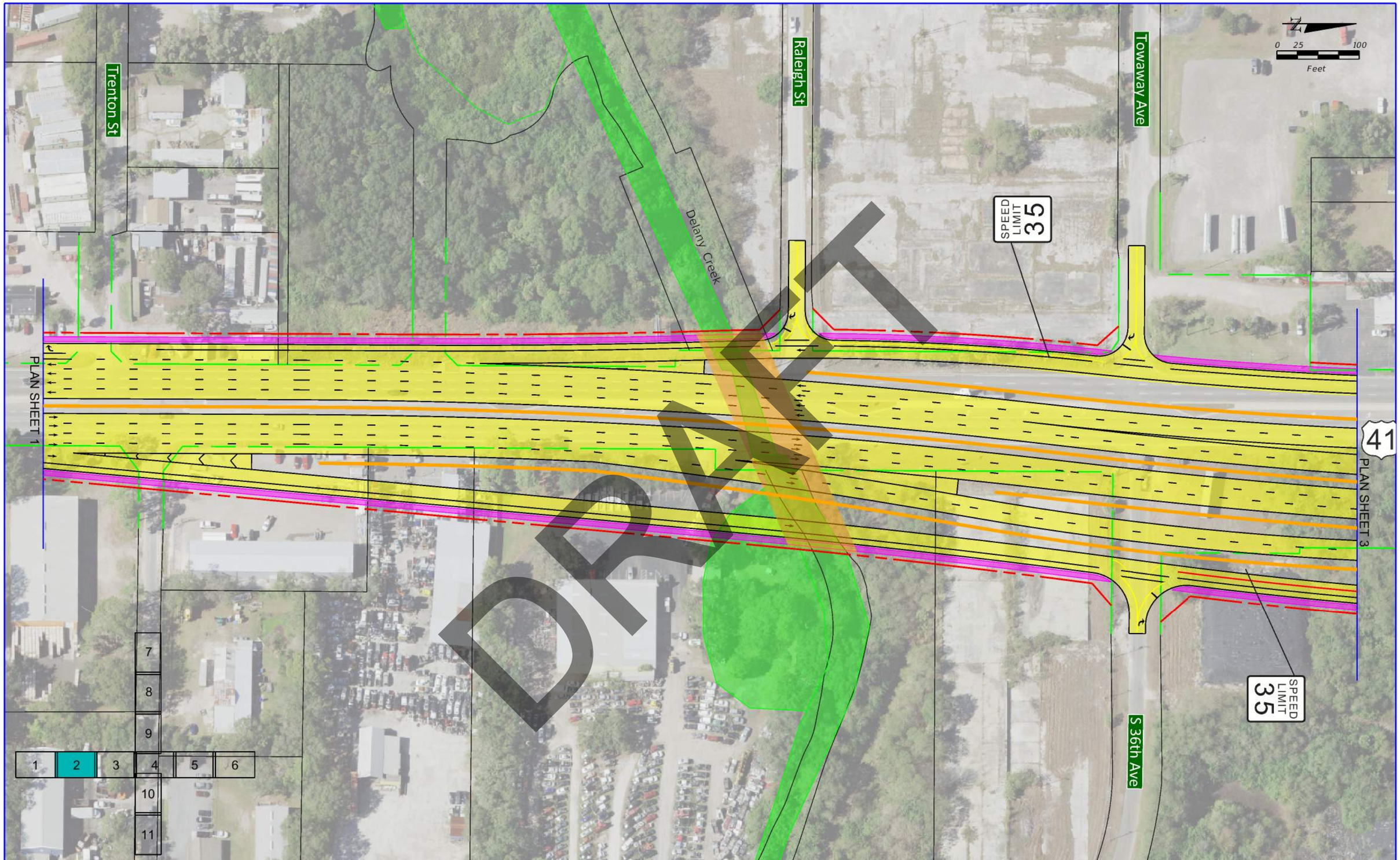
- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 3 PLAN SHEET 1

SHEET NO. 1



LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

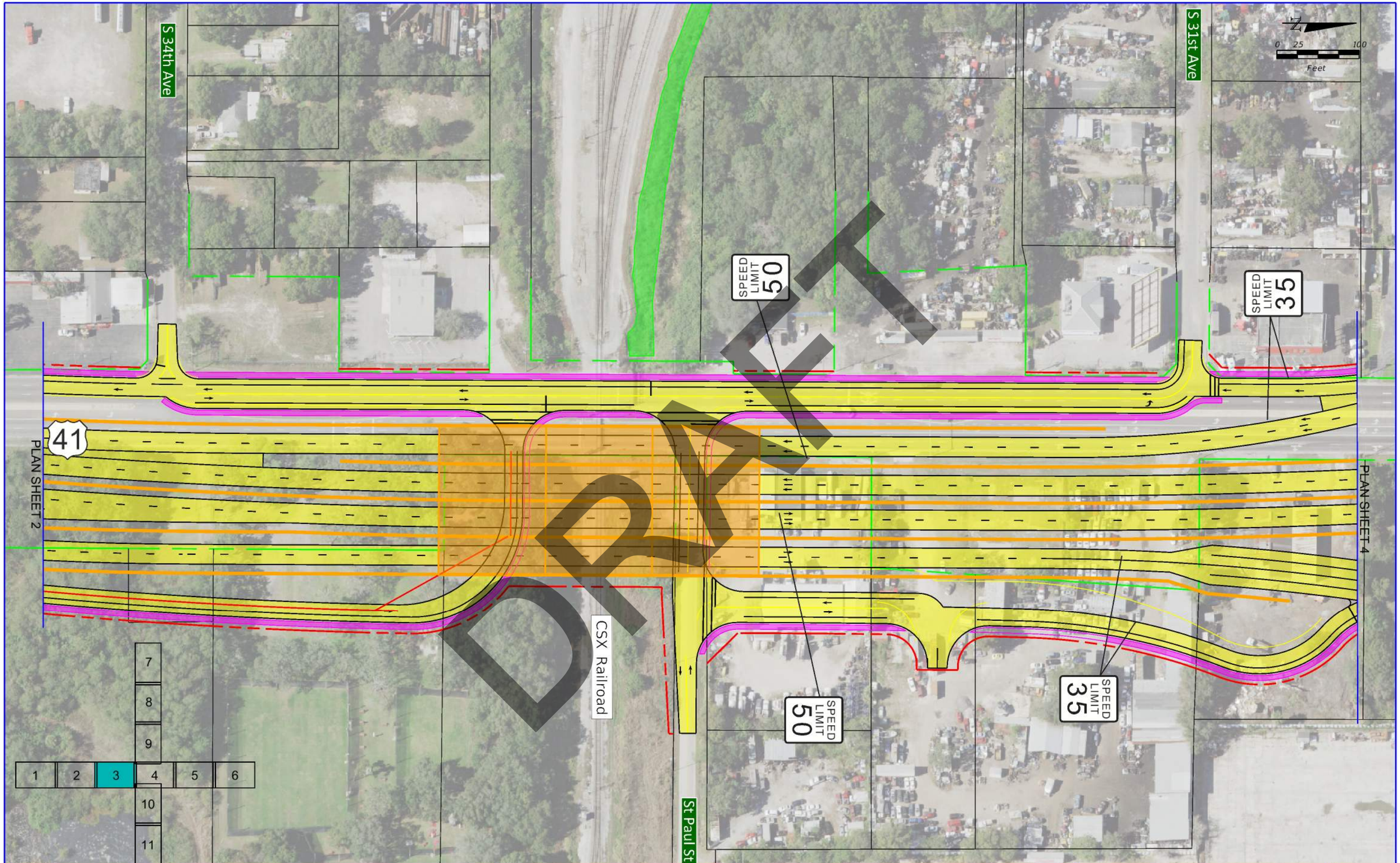
US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 3
PLAN SHEET 2

SHEET NO.
2

vperez 8/5/2019 8:55:19 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\41



LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 3
PLAN SHEET 3

SHEET NO. 3

vperez 8/5/2019 8:55:26 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\410

PLAN SHEET 9

S 30th Ave

El Camino Blvd

SPEED LIMIT 35

SPEED LIMIT 50

PLAN SHEET 5

41

PLAN SHEET 3

SPEED LIMIT 50

S 27th Ave

SPEED LIMIT 35

7
8
9
1 2 3 4 5 6
10
11

PLAN SHEET 10

Causeway Blvd

0 25 100
Feet

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 3
PLAN SHEET 4

SHEET NO. 4

vperez 8/5/2019 8:55:34 AM M:\PROJECTS\2018\18033 (P1710-008) D7 US 41@CSX Grade Crossing\CADD\Roadway\41

S 23rd Ave

S 21st Ave

S 49th St

0 25 100
Feet

SPEED LIMIT 50

SPEED LIMIT 50

PLAN SHEET 4

PLAN SHEET 6

41

S 24th Ave

Habersham Ln

7
8
9
1 2 3 4 5 6
10
11

DRAFT

LEGEND

- Existing Right-of-Way Line
- Existing Parcel Line
- Proposed Right-of-Way Line
- Proposed Sidewalk
- Proposed Pavement
- Proposed Bridge
- Proposed Retaining Wall
- Wetland

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 3
PLAN SHEET 5

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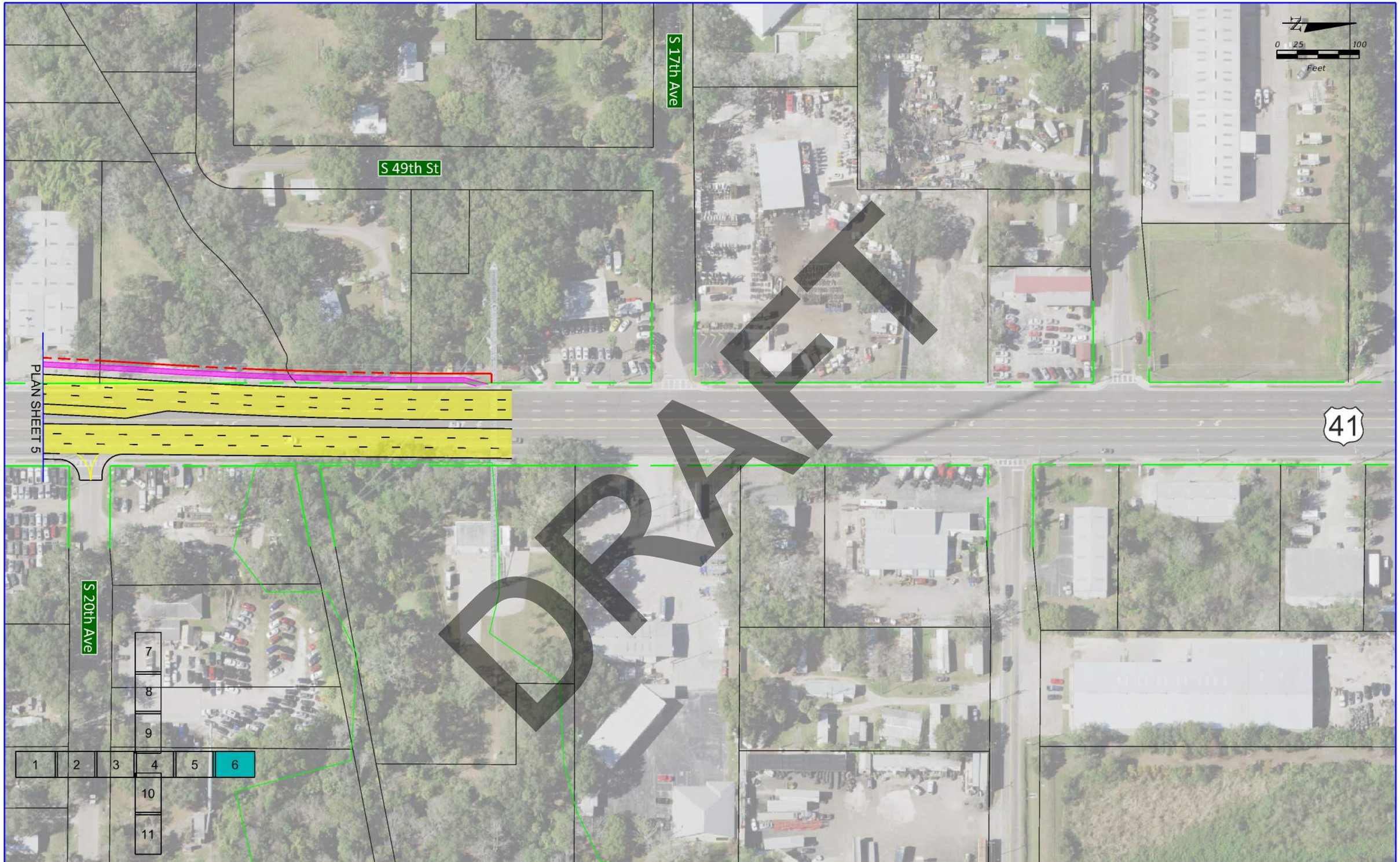

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ALTERNATIVE 3
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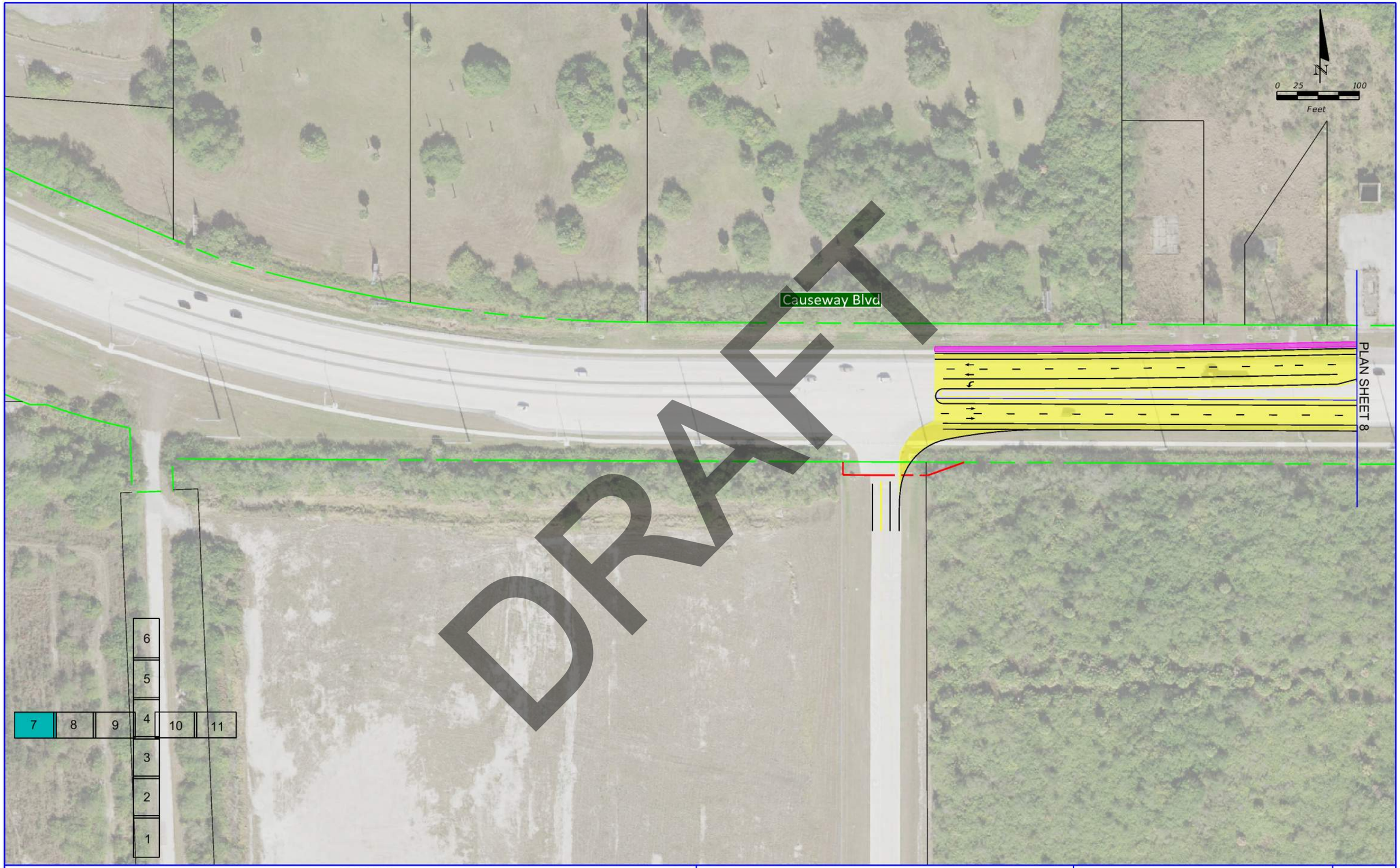

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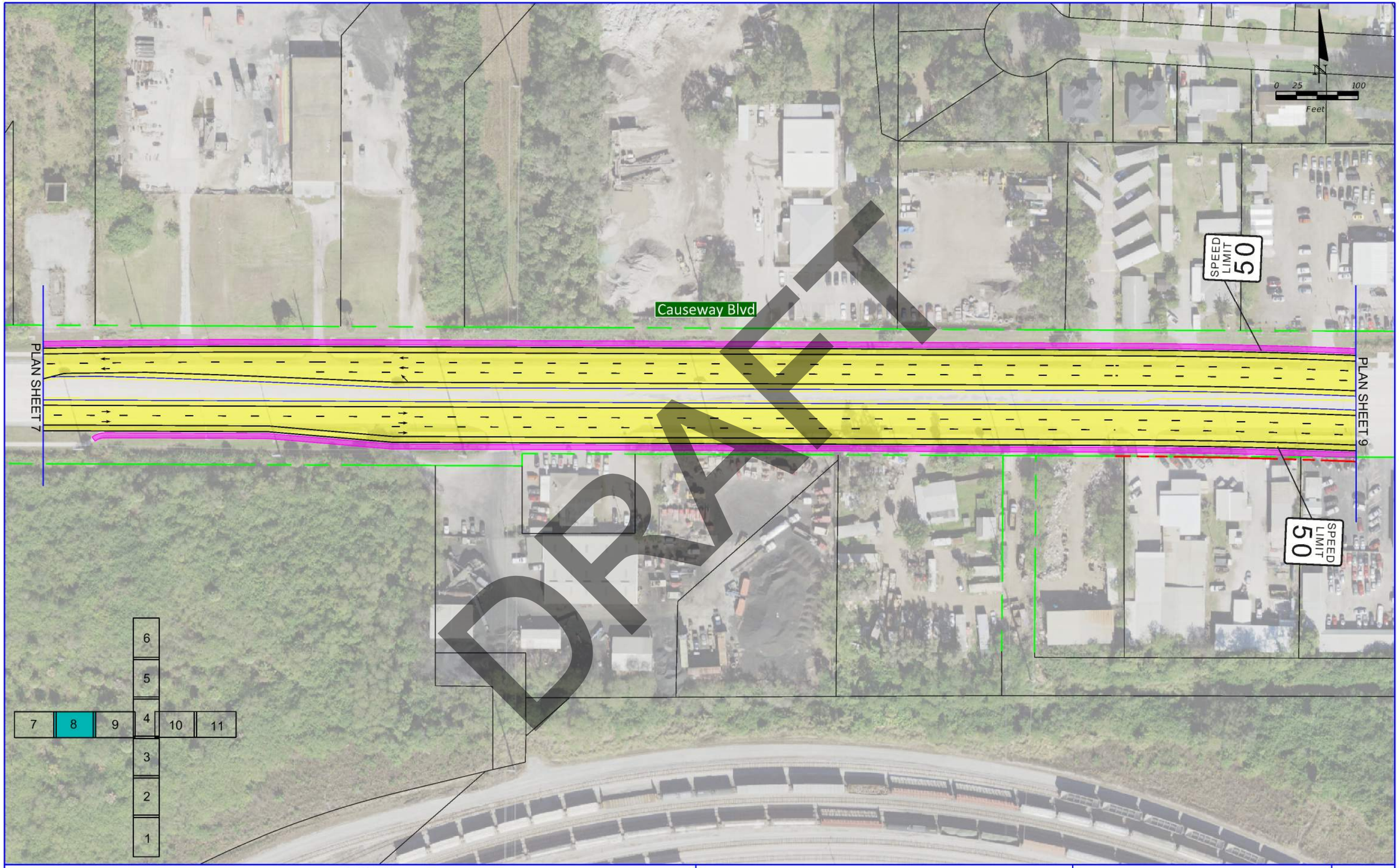

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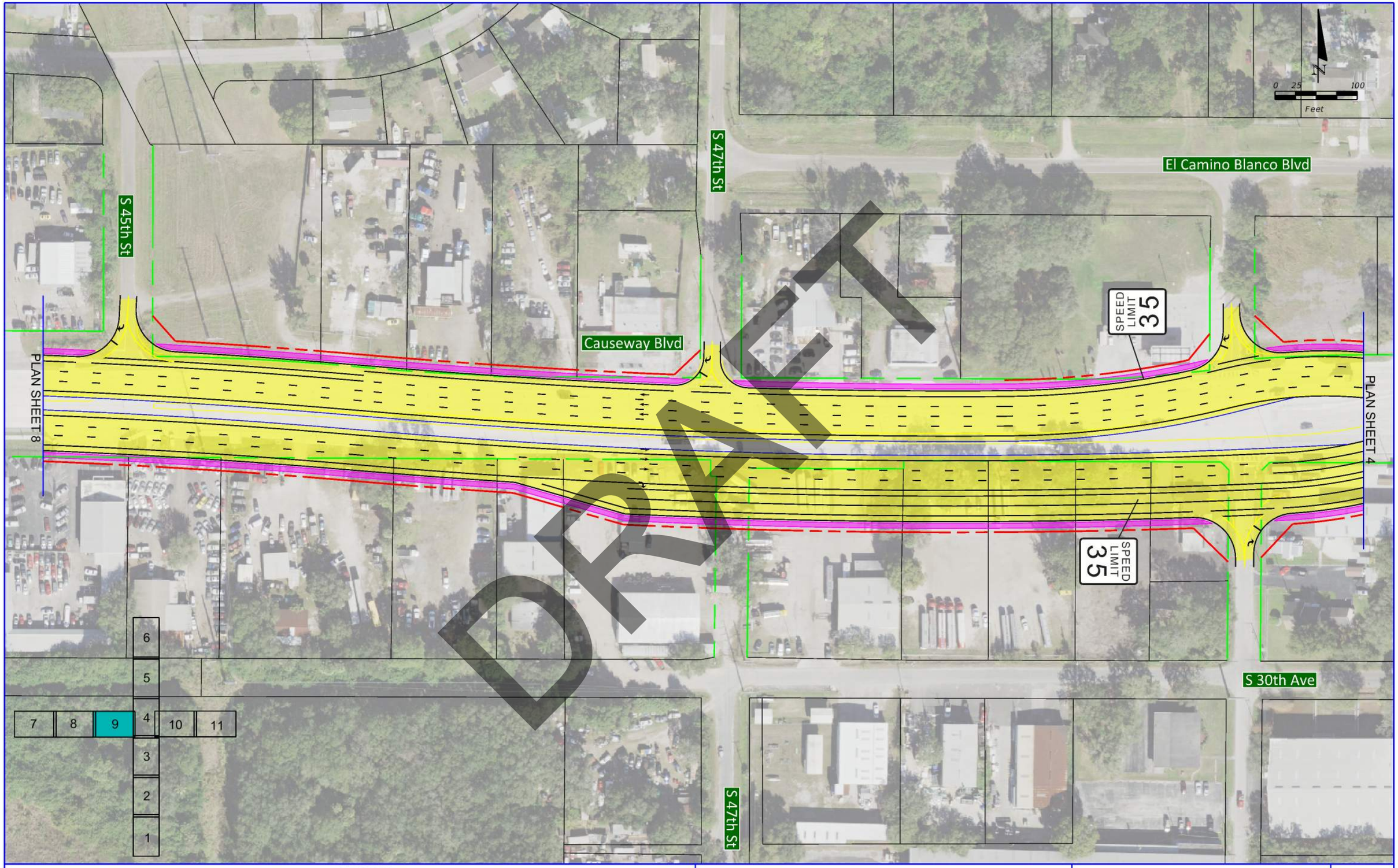

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Hillsborough County, Florida

WPI Segment No. 440749-1

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Feet

SPEED LIMIT 35

SPEED LIMIT 50

Causeway Blvd

PLAN SHEET 4

PLAN SHEET 11

SPEED LIMIT 35

SPEED LIMIT 50

CSX Railroad

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- Existing Right-of-Way Line
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ALTERNATIVE 3
PLAN SHEET 10

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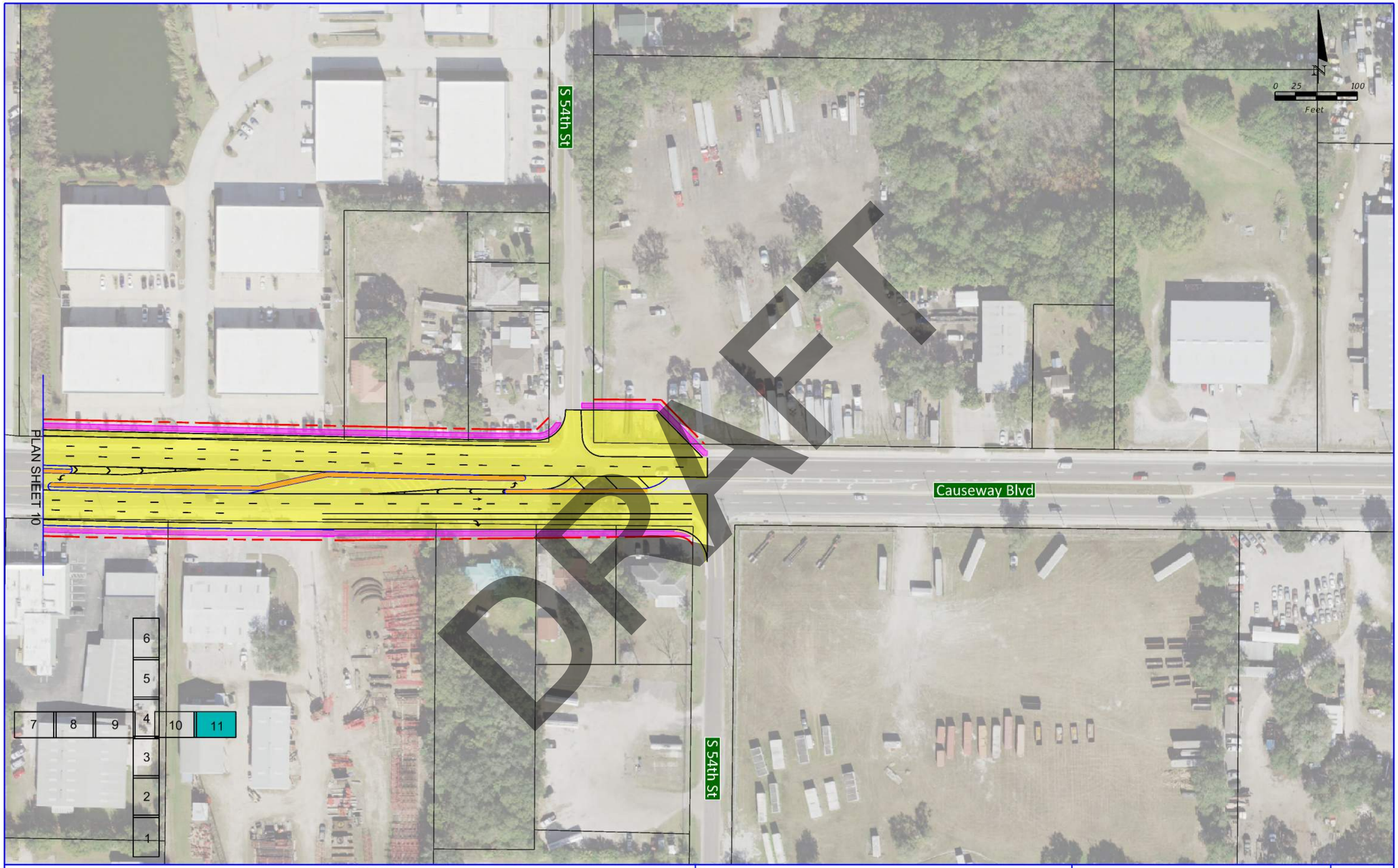

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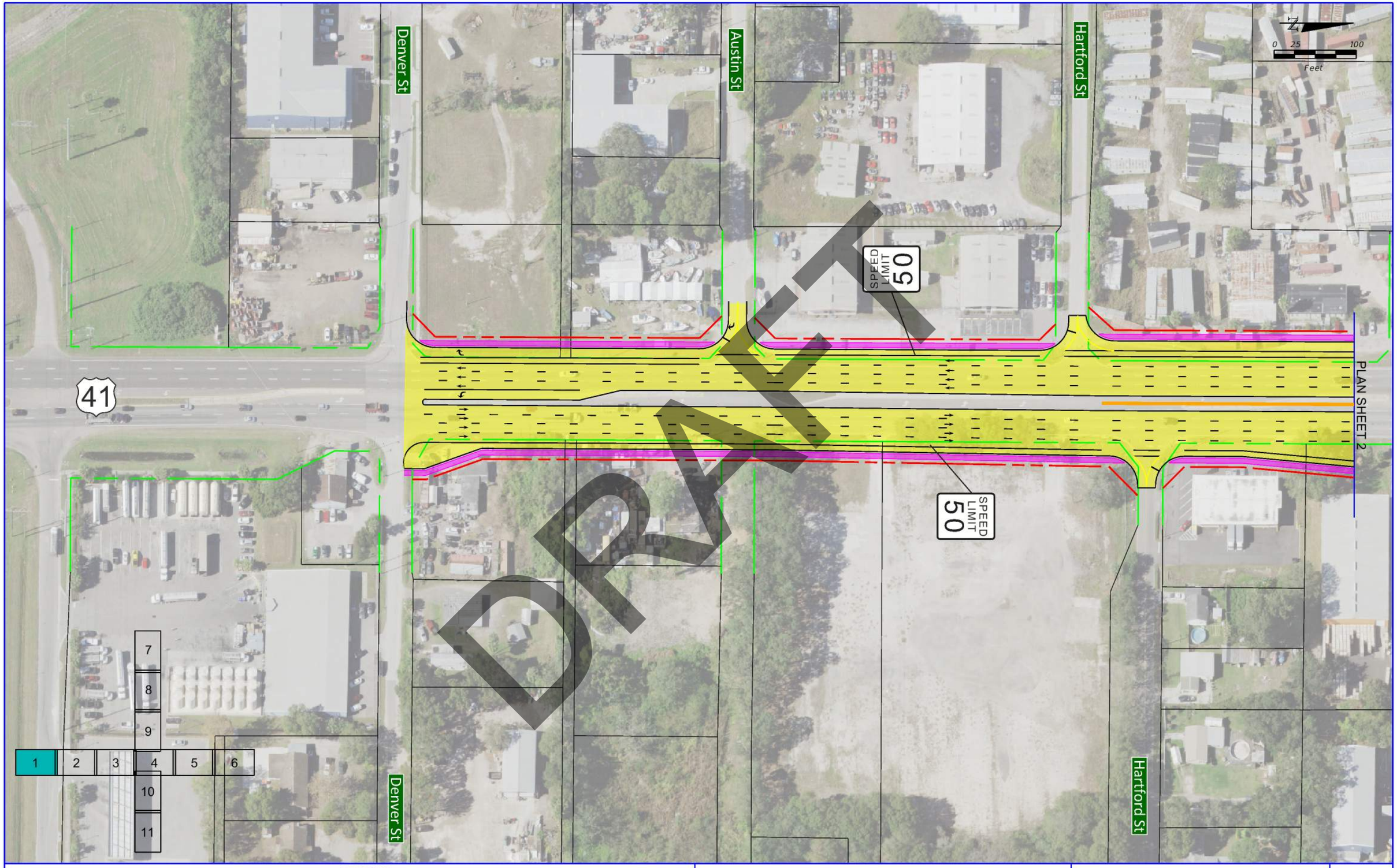

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From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 4 PLAN SHEET 1

SHEET NO. 1

Trenton St

Raleigh St

Towaway Ave

Delany Creek

SPEED LIMIT 35

SPEED LIMIT 35

S 36th Ave

41

PLAN SHEET 1

PLAN SHEET 3

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Feet

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WPI Segment No. 440749-1

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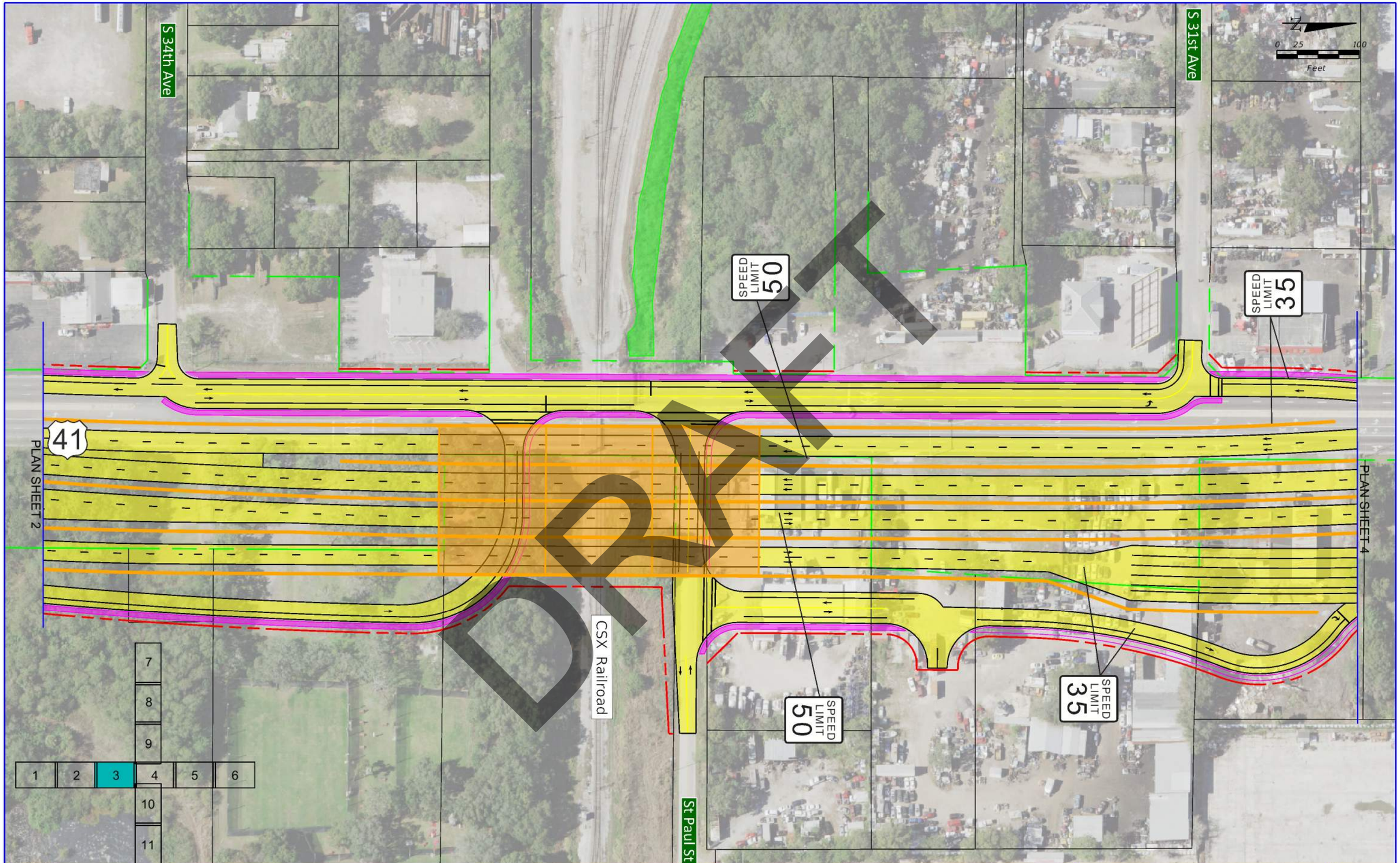

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From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 4 PLAN SHEET 3

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PLAN SHEET 9

S 30th Ave

El Camino Blanco Blvd

SPEED LIMIT 35

SPEED LIMIT 50

PLAN SHEET 5

41

PLAN SHEET 3

S 27th Ave

SPEED LIMIT 50

SPEED LIMIT 35

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PLAN SHEET 10

Causeway Blvd

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WPI Segment No. 440749-1

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PLAN SHEET 4

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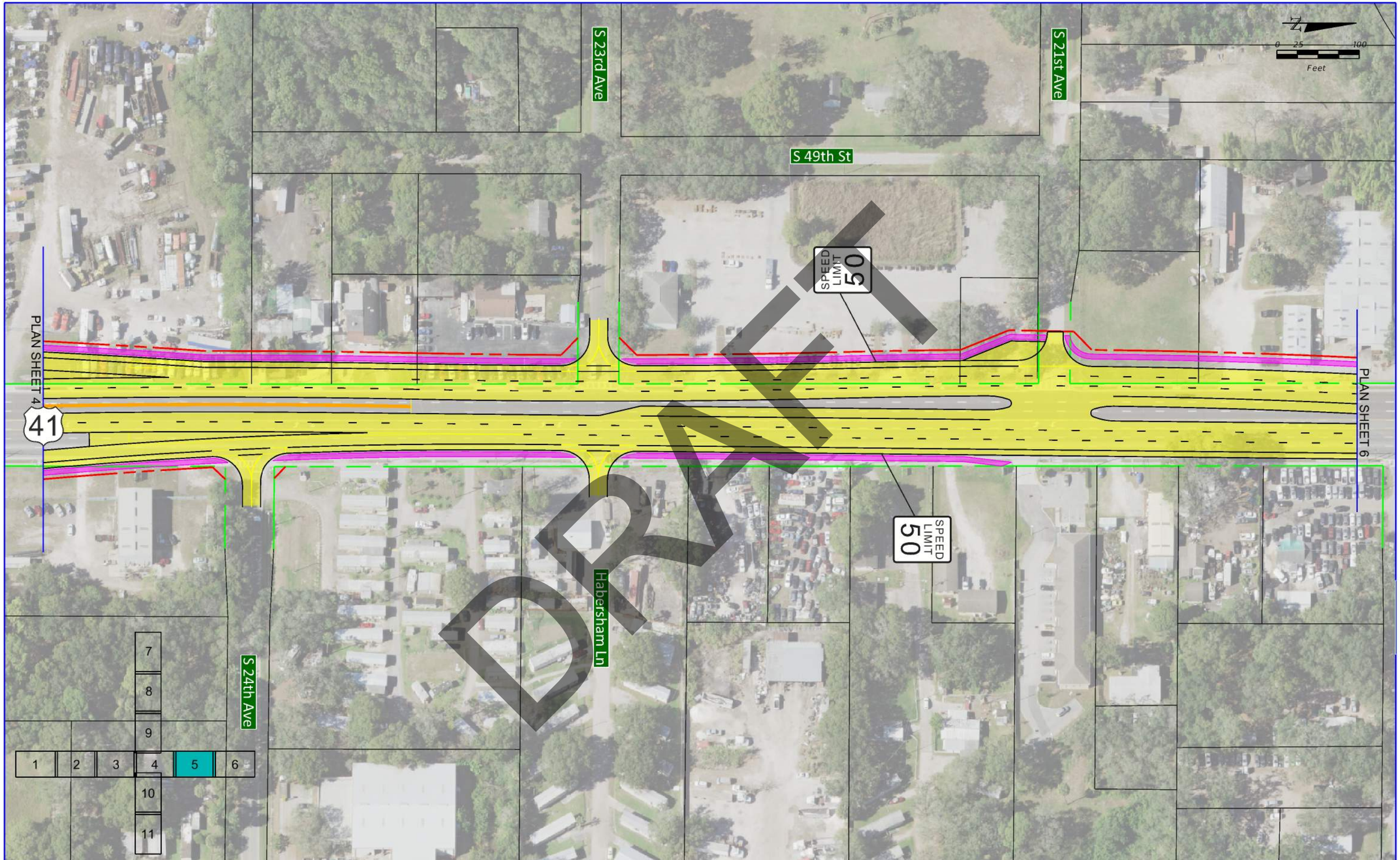

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WPI Segment No. 440749-1

ALTERNATIVE 4 PLAN SHEET 5

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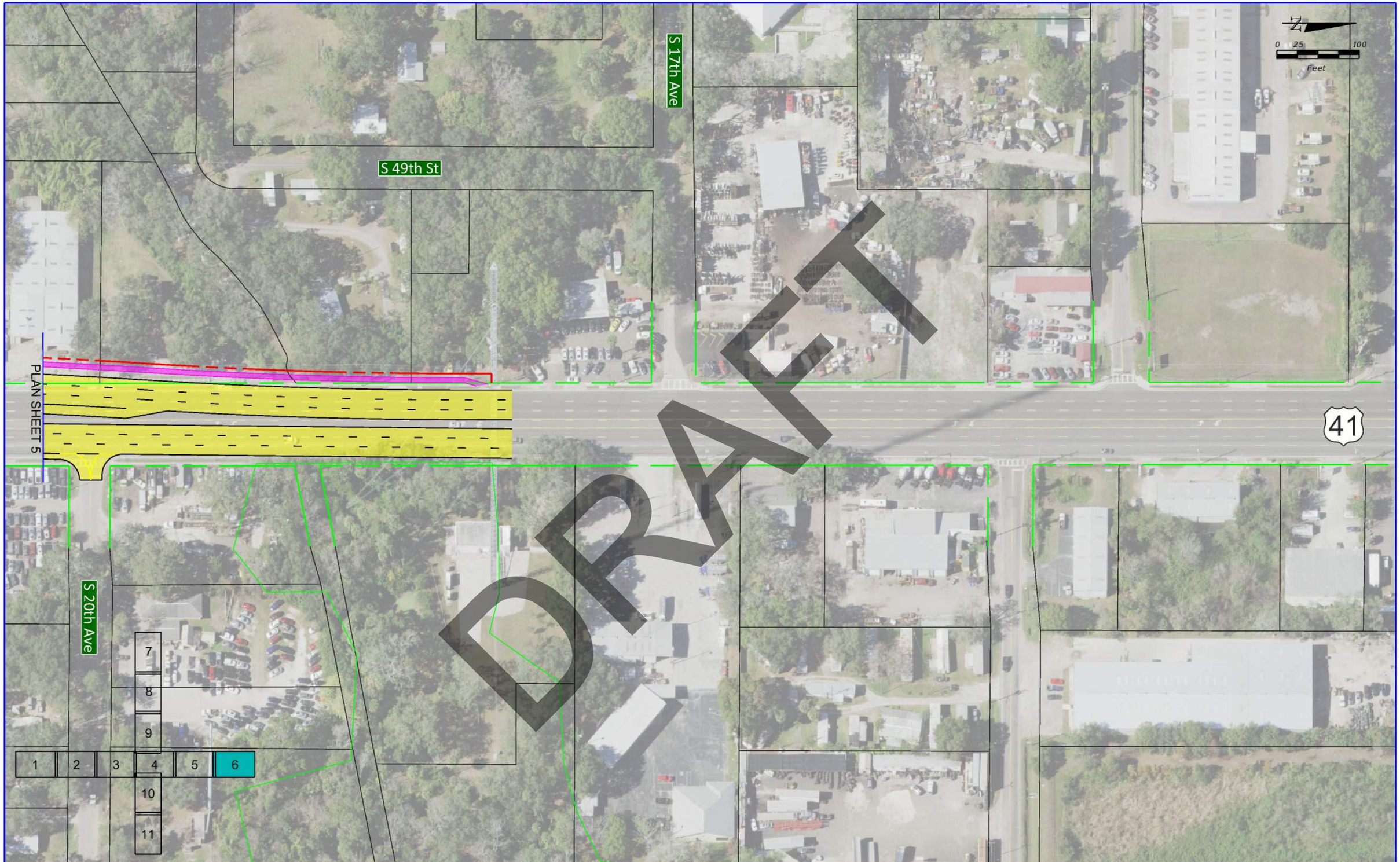

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ALTERNATIVE 4
PLAN SHEET 6

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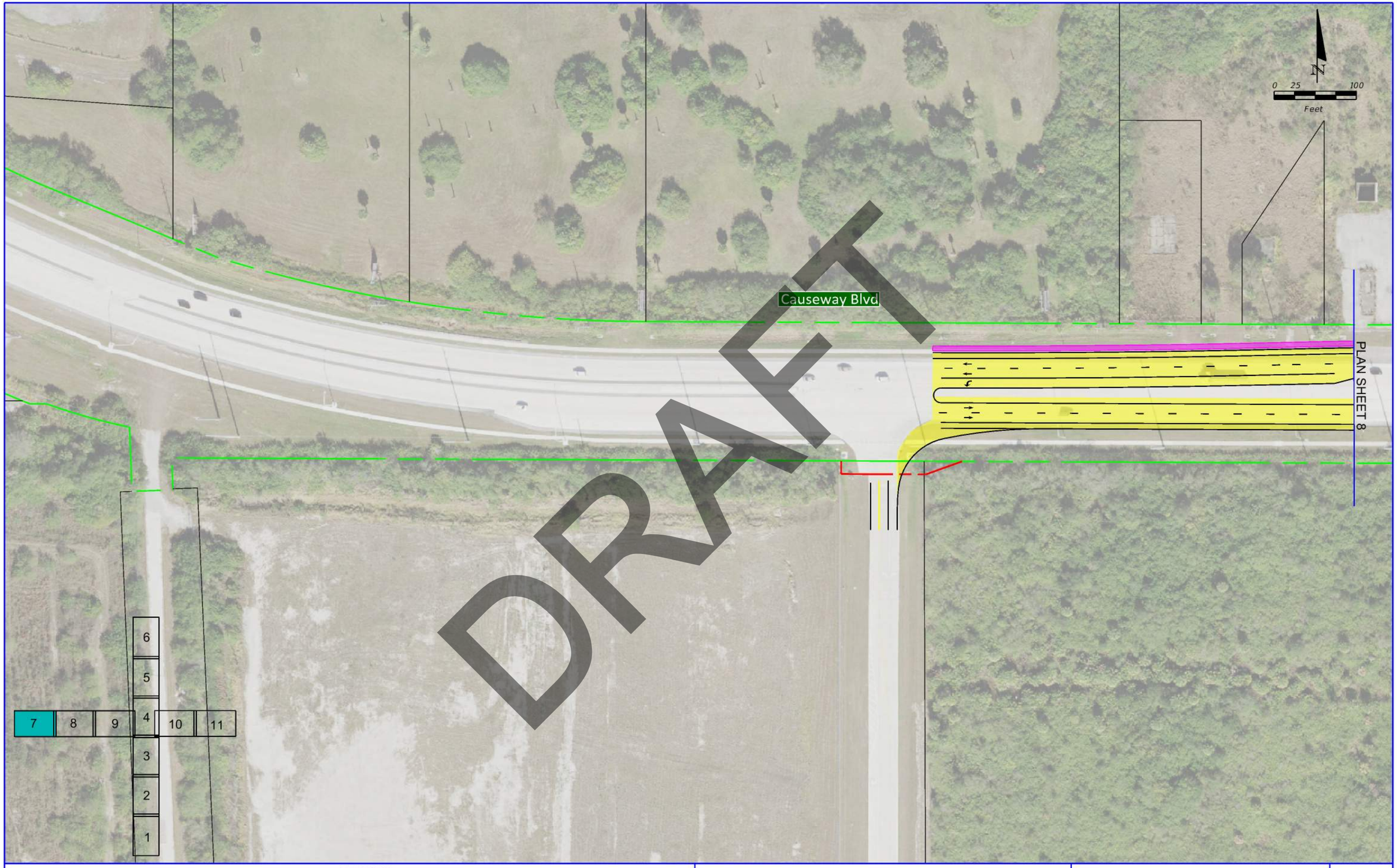

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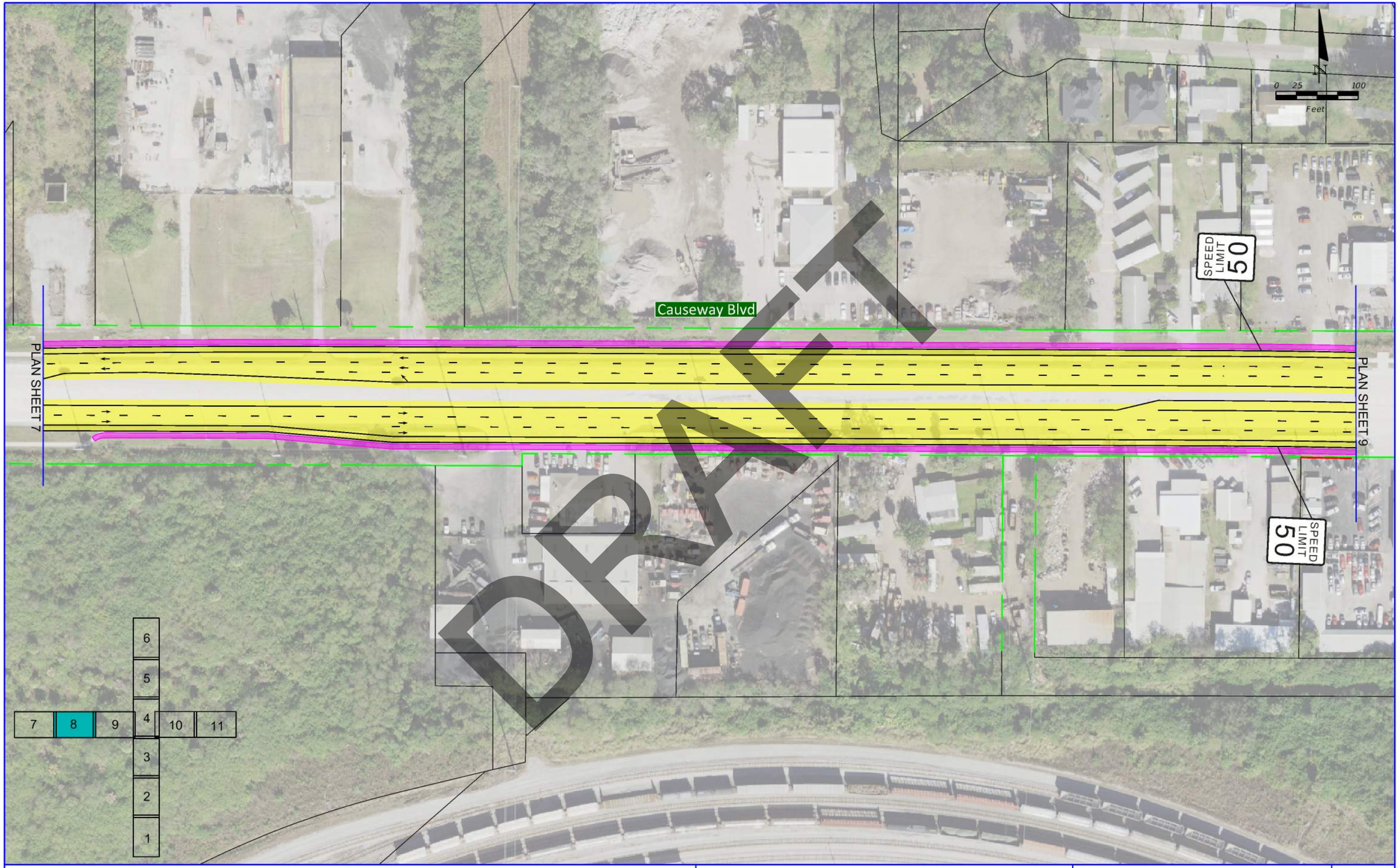

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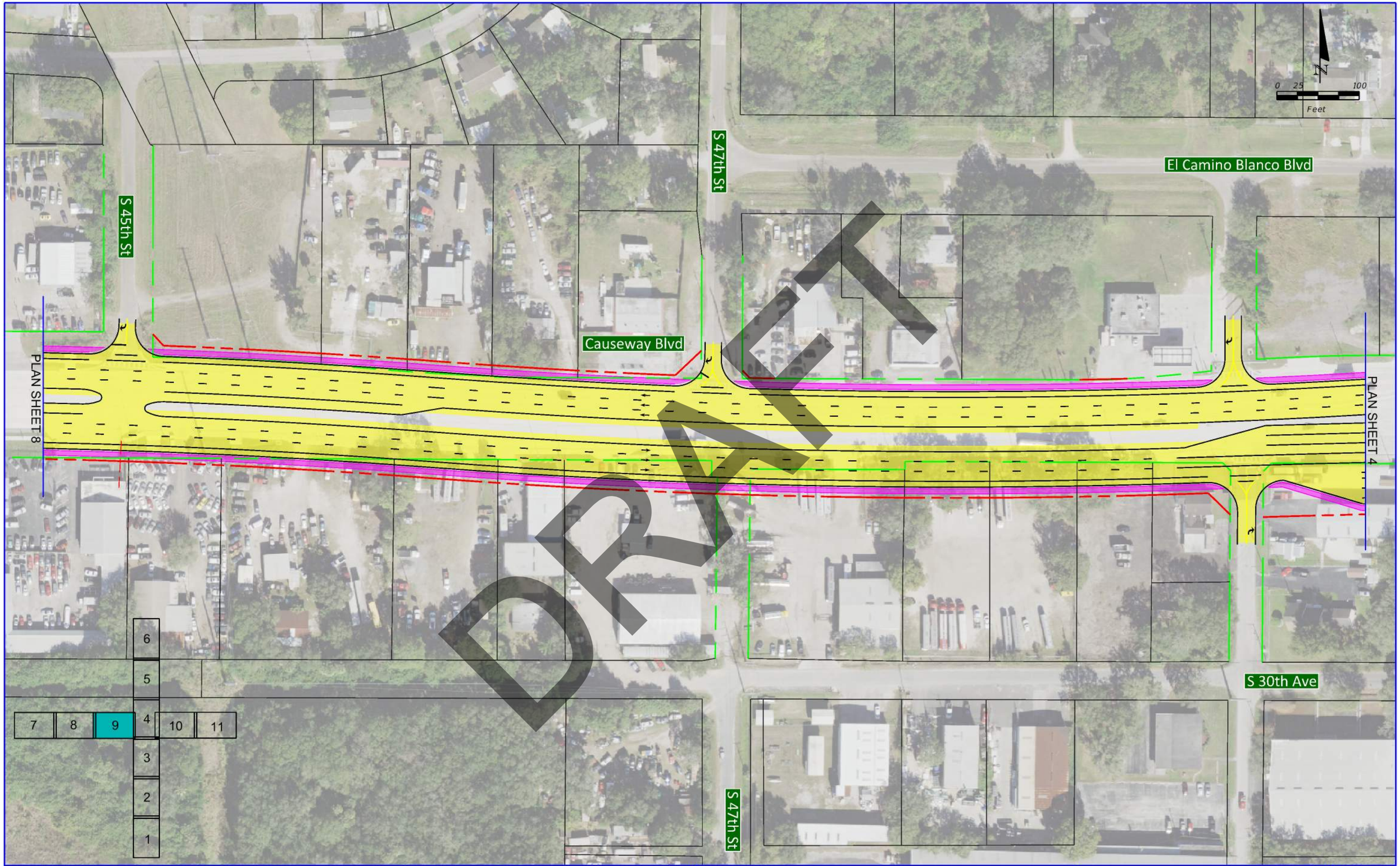

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PLAN SHEET 9

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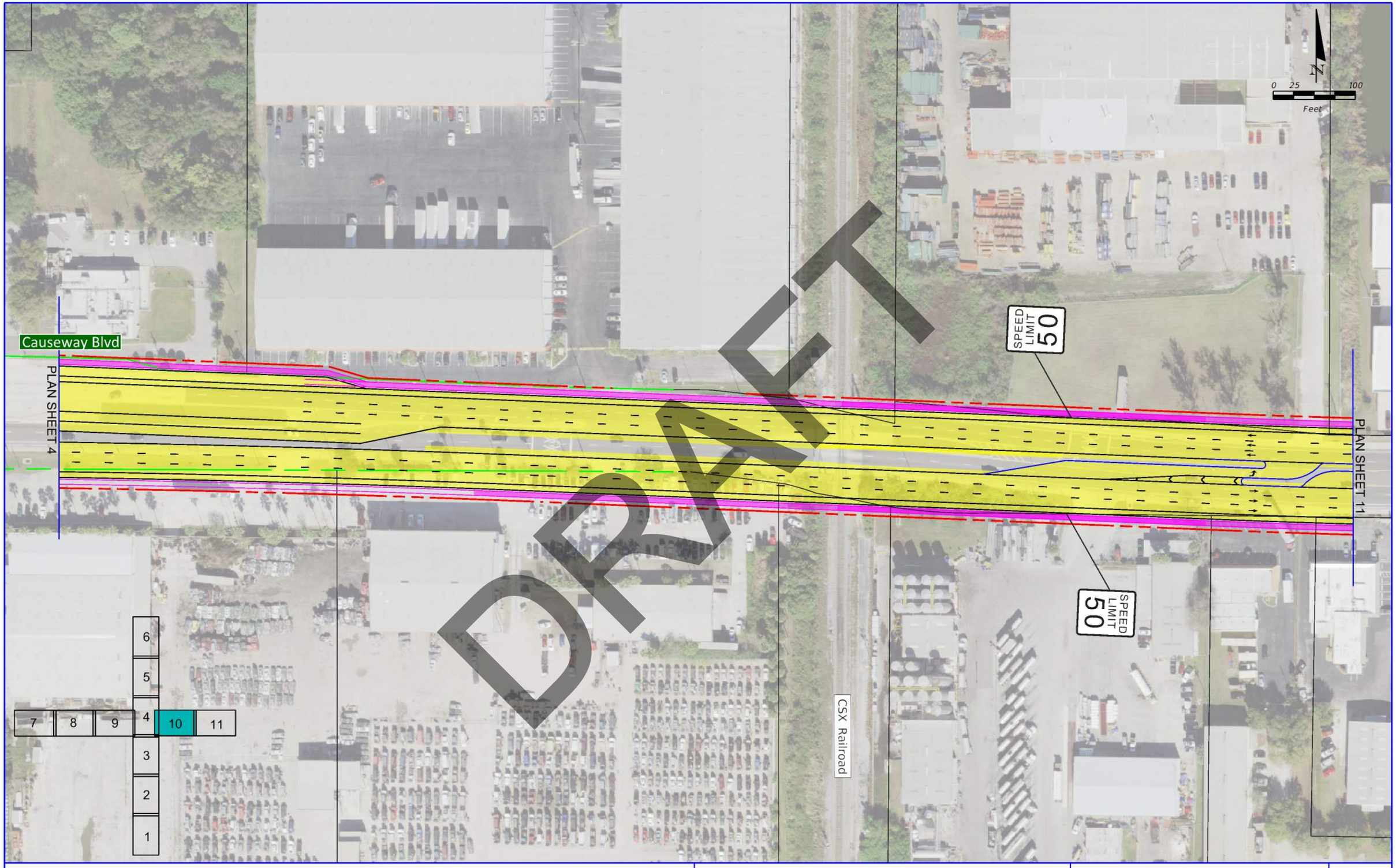

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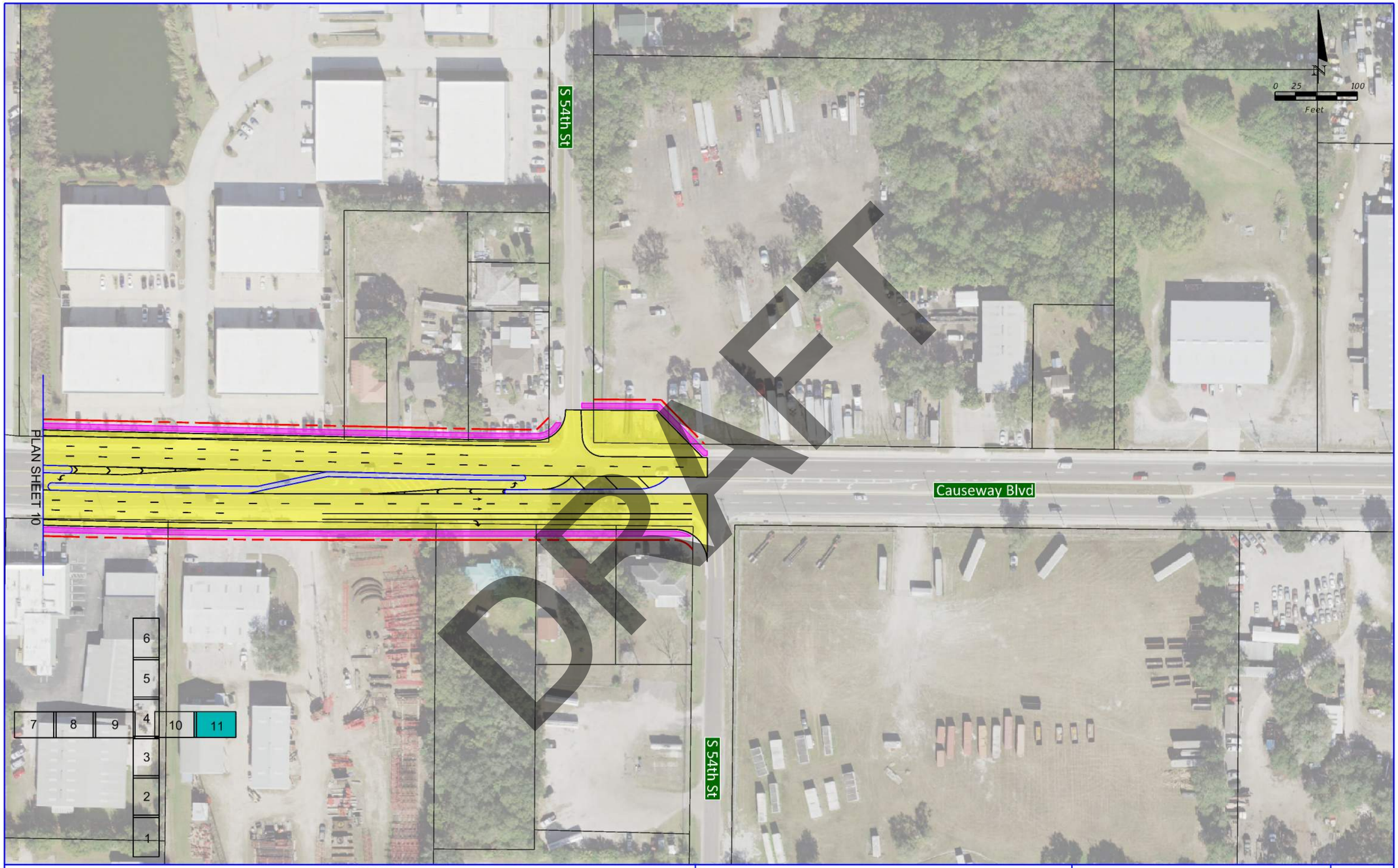

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Hillsborough County, Florida

WPI Segment No. 440749-1

ALTERNATIVE 4 PLAN SHEET 11

SHEET NO. 11

Appendix C: Traffic Methodology Report

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Traffic Analysis Methodology

US 41/SR 45/S 50TH ST at CSX Grade Separation

PD&E Study & Design

(WPI: 440749-1)

1 Introduction

This traffic analysis methodology is prepared to document how the analysis shall be conducted to meet project goals. The methodology includes the following elements:

2 Project Description

US 41/SR 45/S 50th St and US 41B/SR 45/SR 676/Causeway Boulevard are vital arterial highways which serve the City of Tampa located in Hillsborough County. The proposed improvements have been identified in the Hillsborough County Metropolitan Planning Organization (MPO) 2040 Adopted Long Range Transportation Plan under the Hillsborough County Freight Hot Spots. US 41 has also been identified by the MPO as a Goods Movement Roadway Corridor from I-4 to Manatee County Line and is a priority project for the National Highway Freight Program.

The proposed project re-evaluation involves reassessing the environmental and engineering impacts of a grade separation of US 41 and the CSX crossing including operational improvements to the US 41 and Causeway Boulevard intersection, improvements to the vehicle queues caused by CSX trains, and safety improvements for vehicles, pedestrians, and bicyclists.

The purpose of the PD&E Study is to develop grade separation roadway improvement alternatives for the intersection of US 41 and Causeway Boulevard to reduce traffic delays associated with the CSX crossing and to adequately support the safe movement of truck traffic through the project corridor. This project will be using the Statewide Acceleration Transformation (SWAT) process to facilitate key engagement efforts that will ensure timely development of both the recommended alternative and design-phase plans.

3 Traffic Analysis Objective

The objective of this traffic analysis is to assess the current travel conditions, determine forecasted future travel characteristics and needs, and identify potential improvements for the future travel needs.

4 Project Limits

The study area limits are along US 41 from south of Causeway Blvd to north of Causeway Blvd (including the intersection of US 41 and Causeway Blvd).

5 Analysis Years

The following analysis shall be considered for the traffic operational analysis:

- Existing year: 2018

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- Opening year: 2026
- Mid-design year: 2036
- Design year: 2046

6 Traffic Data Collection

72-hour bi-directional (approach and departure volumes at 15-minute increments) machine classification counts and 2-hour a.m. (from 7:00 to 9:00) and 2-hour p.m. (from 4:00 to 6:00) peak hour turning movement counts will be collected during August 21-23, 2018 at the intersection and the approach locations identified in the traffic count location map provided in Appendix A; the traffic data will be collected on the Tuesday, Wednesday, and Thursday in accordance with the FDOT 2014 Project Traffic Forecasting Handbook. This data shall be used to support the traffic analysis of the study area. In addition, pedestrian, bicycle, truck, and transit data shall be collected for the same 4-hour time-period as the turning movement counts.

7 Traffic Factors

The Consultant will develop and recommend K, D, T_{24}, DHT, and peak hour factors to be provided to the Department in a design traffic factors memorandum.

The K-Factor (K) shall be developed based on the 2014 Project Traffic Forecasting Handbook's Standard K Factors Table. The directional factor (D) and daily truck factor (T_{24}) shall be obtained from calculating a five-year average of historical traffic count data from FDOT count stations approaching the US 41 and Causeway Boulevard intersection. This factor will be compared with the directional factor obtained from the 2018 bi-directional and turning movement counts. Design Hour Trucks (DHT) shall be estimated to be one half of T_{24}. Peak directions of travel will be established based on existing travel patterns identified from review of the traffic count data and historical data.

A seasonal factor (SF) will be applied to the three-day average of the bi-directional approach classification counts to obtain 2018 Annual Average Daily Traffic (AADT) Volumes. The 2018 AADT volumes will be provided to the Department for the development of design hour volumes.

An overall intersection peak hour factor (PHF) will be calculated for the study intersection. The PHF will be compared to the FDOT's Traffic Analysis Handbook's recommended default PHF of 0.95 for urban arterials. If there is minimal variation between intersection and the default PHF, then a PHF of 0.95 will be utilized in the existing conditions analysis. It is recommended that the same PHF of 0.95 be used for both existing and future traffic conditions to assess the benefit of a proposed improvement, and to prevent an "artificial" benefit being achieved based on the use of different PHFs.

8 Design Hour Volumes

The design hour volumes for all the alternatives shall be provided by the Consultant. The Consultant shall multiply AADT's by the K and D Factors to develop directional design hour volumes (DDHV) and additionally multiply by turning movement percentages to calculate design hour turning movement volumes (DHTMV). The 2018 AADT will be developed from the data collection efforts and the Department shall provide the future year 2026, 2036, and 2046 AADT's.

The Consultant shall provide DDHV's and DHTMV's for existing (2018), No-Build (2026, 2036 and 2046) alternative and Build (2026, 2036 and 2046) alternative using the aforementioned AADT, K, D, and turning

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movement percentage calculation procedure. The Consultant shall review these design hour volumes, in coordination with the Department, before using them for the alternatives analysis.

Frontage road volumes shall be estimated from traffic generated from the Tampa Bay Regional Planning Model centroids and using the Institute of Transportation Engineer's trip generation rates.

9 Analysis Tools

Intersection analysis will be conducted using Synchro 10. Highway Capacity Manual (HCM) 6th edition vehicle delay and Level of Service (LOS) will be reported. Traffic signal timing information shall be obtained from the maintaining agency and used in the existing conditions analysis.

Arterial analysis will be conducted using Synchro 10 and FDOT 2012 Generalized Service Volume Tables for the roadway segments approaching the intersection.

10 Existing Analysis

10.1 Existing Traffic Volumes

Existing AADTs for year 2018 shall be developed based on the existing field collected data and applying the seasonal factor and axle correction factor from the latest available Florida Transportation Information Database.

10.2 Existing Traffic Analysis

The existing conditions shall be evaluated using the existing design hour traffic volumes, existing signal timings, CSX railroad crossing, and other pertinent field collected data using Synchro. Automobile intersection and approach Levels of Service (LOS) shall be reported for the existing year.

11 Future Analysis

Intersection and arterial analyses will be conducted using the same procedures outlined for the existing conditions, including use of a PHF of 0.95.

Vehicle queue length analysis will be conducted for the design year 2046 a.m. and p.m. peak hours for the preferred build alternative. Synchro's 95th percentile results and HCM 6th edition calculations will be used to develop queue length analysis.

The LOS Target shall be LOS "D" at the study intersection and along the study roadway segments. However, it may not be possible within the scope of "reasonable" improvements to achieve the LOS standard at the intersection in future years. If this standard cannot be obtained, then an approach intersection volume-to-capacity ratio of less than 1.00 may be sought for the approaches, whereby additional meetings shall be required for discussion purposes.

Synchro's HCM 6th edition reporting methodology will be used to document existing and future year analysis results.

11.1 No Build Analysis

The No Build conditions shall be evaluated using the No-Build design hour traffic volumes, existing signal timings and other pertinent data using Synchro.

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Automobile intersection and approach Levels of Service (LOS) shall be reported for the analysis years. In addition, pedestrian and bicycle LOS shall be provided at the study intersection.

11.2 Build Analysis

Up to four (4) Build alternatives shall be evaluated for this study for design year 2046. The Build conditions shall be evaluated using the Build DDHV's, signal timings developed through sound engineering judgement and other pertinent data using Synchro.

The recommended alternative shall be put forth and 2026 and 2036 DDHV and DHTV's developed in the Project Traffic Analysis Report (PTAR) following Public Involvement.

Automobile intersection and approach Levels of Service (LOS) shall be reported for the analysis years.

12 Safety

The Consultant shall document the historical five-year crash data of the area using FDOT's CARS crash data from 2012 to 2017. The historical data will be summarized with respect to crash characteristics such as severity, types, frequency, rates, density, patterns, clusters, and their relationships with crash contributing causes.

13 Documents for Submittal

The following reports shall be submitted in support of this study:

13.1 Traffic Factors Memorandum, approximately one page

This report shall document the data collection task and traffic factors.

13.2 Existing Conditions Technical Memorandum

This report shall document the data collection task, development of existing AADTs, and the results of the existing design hour conditions.

13.3 Future Year AADT and Design Hour Volumes

This report shall document the development of future AADTs and design hour volumes.

13.4 Project Traffic Analysis Report

This report shall document the results from above two reports along with the No Build and Build analyses for future years. The future capacity analysis shall be used to identify potential improvements for the future travel needs of the study corridor.

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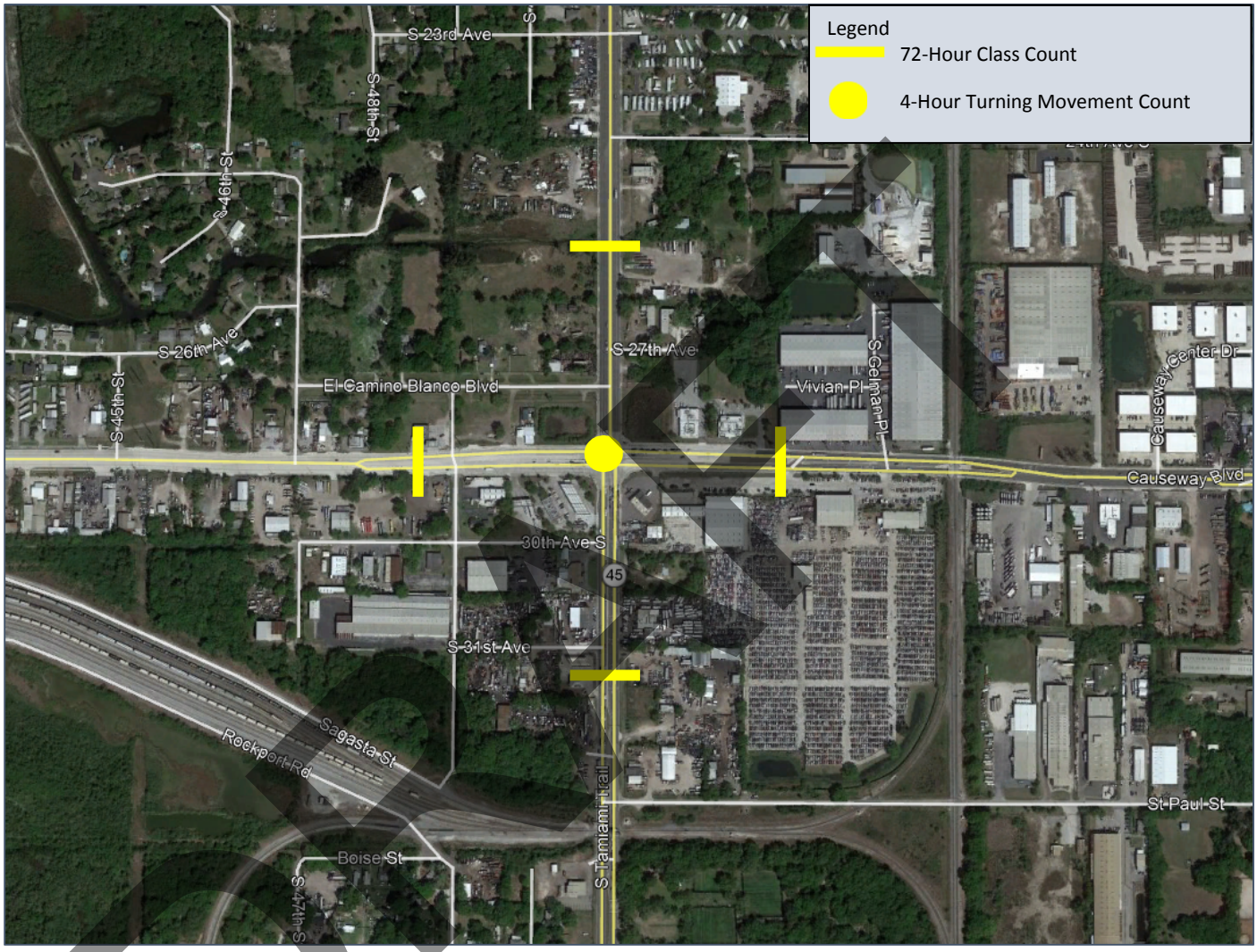
Appendix A

Traffic Count Location Map



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Appendix D: Data Collection

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Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between St Paul Street and S 31st Street

VHB Project #: 63286

28-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	33	22	30	38	46	167	288	584	578	327	260	262
30	25	39	9	37	90	220	523	570	588	304	282	209
45	32	39	12	69	88	243	531	632	516	327	301	270
00	15	22	32	51	127	339	489	610	447	266	254	206
Hr Total	**105**	**122**	**83**	**195**	**351**	**969**	**1,831**	**2,396**	**2,129**	**1,224**	**1,097**	**947**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	367	237	222	312	166	329	210	160	114	46	42	44
30	295	239	295	289	343	276	189	148	94	70	58	41
45	262	271	294	303	354	214	172	186	70	57	68	44
00	212	229	313	322	301	257	194	127	60	39	44	30
Hr Total	**1,136**	**976**	**1,124**	**1,226**	**1,164**	**1,076**	**765**	**621**	**338**	**212**	**212**	**159**

24 Hour Total : 20,458
AM Peak Hour begins : 7:30 AM Peak Volume : 2,408 AM Peak Hour Factor : 0.95
PM Peak Hour begins : 16:15 PM Peak Volume : 1,327 PM PeaK Hour Factor : 0.94

28-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	47	31	35	30	42	115	158	196	218	232	244	250
30	49	40	30	31	68	143	206	221	239	234	226	245
45	41	40	41	55	101	166	278	242	196	219	235	212
00	34	32	30	40	102	192	268	230	234	203	221	190
Hr Total	**171**	**143**	**136**	**156**	**313**	**616**	**910**	**889**	**887**	**888**	**926**	**897**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	266	257	258	346	438	511	365	287	180	121	87	76
30	250	257	293	388	491	530	383	244	149	110	94	68
45	273	270	320	392	439	485	363	239	169	152	87	69
00	251	302	340	435	484	536	303	206	146	122	83	48
Hr Total	**1,040**	**1,086**	**1,211**	**1,561**	**1,852**	**2,062**	**1,414**	**976**	**644**	**505**	**351**	**261**

24 Hour Total : 19,895
AM Peak Hour begins : 6:30 AM Peak Volume : 963 AM Peak Hour Factor : 0.87
PM Peak Hour begins : 17:00 PM Peak Volume : 2,062 PM PeaK Hour Factor : 0.96

28-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	80	53	65	68	88	282	446	780	796	559	504	512
30	74	79	39	68	158	363	729	791	827	538	508	454
45	73	79	53	124	189	409	809	874	712	546	536	482
00	49	54	62	91	229	531	757	840	681	469	475	396
Hr Total	**276**	**265**	**219**	**351**	**664**	**1,585**	**2,741**	**3,285**	**3,016**	**2,112**	**2,023**	**1,844**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	633	494	480	658	604	840	575	447	294	167	129	120
30	545	496	588	677	834	806	572	392	243	180	152	109
45	535	541	614	695	793	699	535	425	239	209	155	113
00	463	531	653	757	785	793	497	333	206	161	127	78
Hr Total	**2,176**	**2,062**	**2,335**	**2,787**	**3,016**	**3,138**	**2,179**	**1,597**	**982**	**717**	**563**	**420**

24 Hour Total : 40,353
AM Peak Hour begins : 7:30 AM Peak Volume : 3,337 AM Peak Hour Factor : 0.96
PM Peak Hour begins : 16:15 PM Peak Volume : 3,252 PM PeaK Hour Factor : 0.97

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between St Paul Street and S 31st Street

VHB Project #: 63286

29-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	41	32	17	59	123	152	410	534	573	375	283	240
30	30	20	23	56	73	206	456	524	628	320	275	252
45	32	25	15	8	104	293	535	545	582	330	271	237
00	14	14	17	8	113	290	544	576	526	223	254	265
Hr Total	**117**	**91**	**72**	**131**	**413**	**941**	**1,945**	**2,179**	**2,309**	**1,248**	**1,083**	**994**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	289	250	241	269	302	280	195	126	77	50	60	36
30	271	258	238	284	294	269	186	113	103	84	43	25
45	266	249	319	348	268	264	196	131	68	52	49	38
00	205	239	262	286	284	203	173	77	62	72	47	32
Hr Total	**1,031**	**996**	**1,060**	**1,187**	**1,148**	**1,016**	**750**	**447**	**310**	**258**	**199**	**131**

24 Hour Total : 20,056
AM Peak Hour begins : 7:45 AM Peak Volume : 2,359 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 15:30 PM Peak Volume : 1,230 PM PeaK Hour Factor : 0.88

29-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	50	42	22	33	103	117	213	193	205	234	240	228
30	44	39	23	25	57	134	223	246	180	190	207	216
45	57	43	37	37	110	154	246	277	201	228	240	222
00	41	40	11	0	118	189	248	221	222	193	237	237
Hr Total	**192**	**164**	**93**	**95**	**388**	**594**	**930**	**937**	**808**	**845**	**924**	**903**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	232	274	279	328	460	525	543	325	175	138	97	68
30	239	262	276	374	491	504	513	278	179	117	92	53
45	268	248	307	409	517	497	418	260	147	124	63	59
00	239	228	307	405	515	532	385	209	143	92	76	68
Hr Total	**978**	**1,012**	**1,169**	**1,516**	**1,983**	**2,058**	**1,859**	**1,072**	**644**	**471**	**328**	**248**

24 Hour Total : 20,211
AM Peak Hour begins : 6:45 AM Peak Volume : 964 AM Peak Hour Factor : 0.87
PM Peak Hour begins : 17:30 PM Peak Volume : 2,085 PM PeaK Hour Factor : 0.96

29-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	91	74	39	92	226	269	623	727	778	609	523	468
30	74	59	46	81	130	340	679	770	808	510	482	468
45	89	68	52	45	214	447	781	822	783	558	511	459
00	55	54	28	8	231	479	792	797	748	416	491	502
Hr Total	**309**	**255**	**165**	**226**	**801**	**1,535**	**2,875**	**3,116**	**3,117**	**2,093**	**2,007**	**1,897**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	521	524	520	597	762	805	738	451	252	188	157	104
30	510	520	514	658	785	773	699	391	282	201	135	78
45	534	497	626	757	785	761	614	391	215	176	112	97
00	444	467	569	691	799	735	558	286	205	164	123	100
Hr Total	**2,009**	**2,008**	**2,229**	**2,703**	**3,131**	**3,074**	**2,609**	**1,519**	**954**	**729**	**527**	**379**

24 Hour Total : 40,267
AM Peak Hour begins : 7:30 AM Peak Volume : 3,205 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:15 PM Peak Volume : 3,174 PM PeaK Hour Factor : 0.99

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between St Paul Street and S 31st Street

VHB Project #: 63286

30-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	40	15	21	49	47	177	331	589	587	351	275	219
30	33	25	15	36	50	244	450	504	538	280	249	232
45	26	14	29	50	90	257	496	581	493	334	243	274
00	20	32	36	27	122	273	547	583	420	336	234	254
Hr Total	**119**	**86**	**101**	**162**	**309**	**951**	**1,824**	**2,257**	**2,038**	**1,301**	**1,001**	**979**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	289	227	257	253	297	274	221	139	95	82	34	45
30	245	286	276	274	230	256	191	146	89	67	59	35
45	180	244	247	233	292	247	108	157	102	80	45	43
00	266	246	266	267	251	207	238	112	78	69	53	35
Hr Total	**980**	**1,003**	**1,046**	**1,027**	**1,070**	**984**	**758**	**554**	**364**	**298**	**191**	**158**

24 Hour Total : 19,561
AM Peak Hour begins : 7:30 AM Peak Volume : 2,289 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 15:45 PM Peak Volume : 1,086 PM PeaK Hour Factor : 0.91

30-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	46	39	22	29	41	99	131	196	219	182	206	204
30	41	37	32	21	51	157	173	206	244	161	220	227
45	36	46	29	37	75	143	211	254	201	188	228	248
00	30	24	18	35	83	139	233	242	191	222	208	252
Hr Total	**153**	**146**	**101**	**122**	**250**	**538**	**748**	**898**	**855**	**753**	**862**	**931**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	272	257	220	339	497	598	404	278	228	156	112	96
30	227	309	261	321	566	609	386	260	210	143	111	91
45	187	226	245	370	499	580	248	218	204	142	112	74
00	317	234	322	411	568	595	458	308	160	107	110	52
Hr Total	**1,003**	**1,026**	**1,048**	**1,441**	**2,130**	**2,382**	**1,496**	**1,064**	**802**	**548**	**445**	**313**

24 Hour Total : 20,055
AM Peak Hour begins : 7:30 AM Peak Volume : 959 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 17:00 PM Peak Volume : 2,382 PM PeaK Hour Factor : 0.98

30-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	86	54	43	78	88	276	462	785	806	533	481	423
30	74	62	47	57	101	401	623	710	782	441	469	459
45	62	60	58	87	165	400	707	835	694	522	471	522
00	50	56	54	62	205	412	780	825	611	558	442	506
Hr Total	**272**	**232**	**202**	**284**	**559**	**1,489**	**2,572**	**3,155**	**2,893**	**2,054**	**1,863**	**1,910**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	561	484	477	592	794	872	625	417	323	238	146	141
30	472	595	537	595	796	865	577	406	299	210	170	126
45	367	470	492	603	791	827	356	375	306	222	157	117
00	583	480	588	678	819	802	696	420	238	176	163	87
Hr Total	**1,983**	**2,029**	**2,094**	**2,468**	**3,200**	**3,366**	**2,254**	**1,618**	**1,166**	**846**	**636**	**471**

24 Hour Total : 39,616
AM Peak Hour begins : 7:30 AM Peak Volume : 3,248 AM Peak Hour Factor : 0.97
PM Peak Hour begins : 16:45 PM Peak Volume : 3,383 PM PeaK Hour Factor : 0.97

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between S 27th Avenue & S 24th Avenue

VHB Project #: 63286

28-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	23	12	26	21	26	70	136	338	366	234	191	185
30	21	31	7	29	48	102	194	352	346	194	182	168
45	19	28	13	53	50	110	230	302	349	197	165	194
00	8	26	17	26	58	132	201	370	289	197	200	192
Hr Total	**71**	**97**	**63**	**129**	**182**	**414**	**761**	**1,362**	**1,350**	**822**	**738**	**739**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	224	187	181	188	177	263	228	139	103	42	40	41
30	217	180	202	170	241	244	191	122	74	64	34	39
45	218	185	183	147	293	230	181	117	58	44	50	40
00	168	212	195	167	271	215	128	118	56	27	38	29
Hr Total	**827**	**764**	**761**	**672**	**982**	**952**	**728**	**496**	**291**	**177**	**162**	**149**

24 Hour Total : 13,689
AM Peak Hour begins : 7:45 AM Peak Volume : 1,431 AM Peak Hour Factor : 0.97
PM Peak Hour begins : 16:30 PM Peak Volume : 1,071 PM PeaK Hour Factor : 0.91

28-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	19	20	11	14	20	70	94	125	153	162	155	181
30	24	23	14	21	44	95	104	150	201	171	169	182
45	15	22	31	28	65	102	116	198	195	164	221	170
00	22	25	20	34	68	103	119	126	199	173	167	188
Hr Total	**80**	**90**	**76**	**97**	**197**	**370**	**433**	**599**	**748**	**670**	**712**	**721**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	179	194	164	218	275	304	333	180	83	65	35	41
30	189	189	188	231	266	318	158	120	74	61	47	26
45	194	192	236	234	293	323	135	124	86	62	53	26
00	163	193	214	215	305	326	179	95	80	68	41	22
Hr Total	**725**	**768**	**802**	**898**	**1,139**	**1,271**	**805**	**519**	**323**	**256**	**176**	**115**

24 Hour Total : 12,590
AM Peak Hour begins : 8:15 AM Peak Volume : 757 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 17:15 PM Peak Volume : 1,300 PM PeaK Hour Factor : 0.98

28-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	42	32	37	35	46	140	230	463	519	396	346	366
30	45	54	21	50	92	197	298	502	547	365	351	350
45	34	50	44	81	115	212	346	500	544	361	386	364
00	30	51	37	60	126	235	320	496	488	370	367	380
Hr Total	**151**	**187**	**139**	**226**	**379**	**784**	**1,194**	**1,961**	**2,098**	**1,492**	**1,450**	**1,460**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	403	381	345	406	452	567	561	319	186	107	75	82
30	406	369	390	401	507	562	349	242	148	125	81	65
45	412	377	419	381	586	553	316	241	144	106	103	66
00	331	405	409	382	576	541	307	213	136	95	79	51
Hr Total	**1,552**	**1,532**	**1,563**	**1,570**	**2,121**	**2,223**	**1,533**	**1,015**	**614**	**433**	**338**	**264**

24 Hour Total : 26,279
AM Peak Hour begins : 7:45 AM Peak Volume : 2,106 AM Peak Hour Factor : 0.96
PM Peak Hour begins : 16:30 PM Peak Volume : 2,291 PM PeaK Hour Factor : 0.98

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between S 27th Avenue & S 24th Avenue

VHB Project #: 63286

29-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	32	20	11	42	69	60	176	305	338	241	199	170
30	23	16	20	32	42	74	177	349	347	189	200	176
45	20	14	19	14	50	112	211	342	316	186	146	167
00	12	10	11	13	59	141	224	367	341	131	191	216
Hr Total	**87**	**60**	**61**	**101**	**220**	**387**	**788**	**1,363**	**1,342**	**747**	**736**	**729**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	202	181	182	182	174	268	224	107	58	44	47	38
30	191	209	192	172	238	245	144	84	71	45	35	22
45	196	164	212	163	271	232	130	102	53	36	26	33
00	190	212	198	167	268	213	114	73	50	38	35	25
Hr Total	**779**	**766**	**784**	**684**	**951**	**958**	**612**	**366**	**232**	**163**	**143**	**118**

24 Hour Total : 13,177
AM Peak Hour begins : 7:15 AM Peak Volume : 1,396 AM Peak Hour Factor : 0.95
PM Peak Hour begins : 16:30 PM Peak Volume : 1,052 PM PeaK Hour Factor : 0.97

29-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	18	20	16	23	30	58	175	131	163	186	156	172
30	16	23	15	26	31	106	158	155	206	154	156	155
45	29	20	20	32	65	114	164	198	172	177	167	138
00	16	19	25	32	64	143	117	130	167	177	149	185
Hr Total	**79**	**82**	**76**	**113**	**190**	**421**	**614**	**614**	**708**	**694**	**628**	**650**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	176	181	170	203	275	317	322	162	87	71	55	36
30	175	194	167	200	244	300	230	145	96	58	51	28
45	195	197	209	229	275	283	236	116	81	65	40	23
00	164	176	182	197	321	335	189	111	70	61	53	31
Hr Total	**710**	**748**	**728**	**829**	**1,115**	**1,235**	**977**	**534**	**334**	**255**	**199**	**118**

24 Hour Total : 12,651
AM Peak Hour begins : 8:15 AM Peak Volume : 731 AM Peak Hour Factor : 0.89
PM Peak Hour begins : 17:15 PM Peak Volume : 1,240 PM PeaK Hour Factor : 0.93

29-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	50	40	27	65	99	118	351	436	501	427	355	342
30	39	39	35	58	73	180	335	504	553	343	356	331
45	49	34	39	46	115	226	375	540	488	363	313	305
00	28	29	36	45	123	284	341	497	508	308	340	401
Hr Total	**166**	**142**	**137**	**214**	**410**	**808**	**1,402**	**1,977**	**2,050**	**1,441**	**1,364**	**1,379**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	378	362	352	385	449	585	546	269	145	115	102	74
30	366	403	359	372	482	545	374	229	167	103	86	50
45	391	361	421	392	546	515	366	218	134	101	66	56
00	354	388	380	364	589	548	303	184	120	99	88	56
Hr Total	**1,489**	**1,514**	**1,512**	**1,513**	**2,066**	**2,193**	**1,589**	**900**	**566**	**418**	**342**	**236**

24 Hour Total : 25,828
AM Peak Hour begins : 7:30 AM Peak Volume : 2,091 AM Peak Hour Factor : 0.95
PM Peak Hour begins : 16:30 PM Peak Volume : 2,265 PM PeaK Hour Factor : 0.96

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between S 27th Avenue & S 24th Avenue

VHB Project #: 63286

30-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	31	11	13	36	25	64	145	282	329	238	170	167
30	23	15	8	24	24	101	183	321	312	182	176	204
45	14	14	20	41	48	108	198	318	306	188	174	195
00	14	26	18	19	63	132	226	318	278	200	166	183
Hr Total	**82**	**66**	**59**	**120**	**160**	**405**	**752**	**1,239**	**1,225**	**808**	**686**	**749**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	212	176	158	194	197	267	216	102	75	53	27	30
30	209	209	207	222	218	251	137	87	60	53	33	37
45	138	209	173	207	297	227	118	110	71	56	38	33
00	243	180	213	197	290	194	165	85	50	51	28	23
Hr Total	**802**	**774**	**751**	**820**	**1,002**	**939**	**636**	**384**	**256**	**213**	**126**	**123**

24 Hour Total : 13,177
AM Peak Hour begins : 7:15 AM Peak Volume : 1,286 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:30 PM Peak Volume : 1,105 PM PeaK Hour Factor : 0.93

30-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	25	25	16	21	30	57	120	160	162	133	163	161
30	26	19	16	17	34	104	160	151	203	176	144	165
45	21	24	18	26	53	107	136	190	182	152	170	179
00	18	15	17	26	58	129	115	176	147	167	161	174
Hr Total	**90**	**83**	**67**	**90**	**175**	**397**	**531**	**677**	**694**	**628**	**638**	**679**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	180	185	142	207	315	364	288	178	141	73	55	36
30	172	217	197	194	339	351	186	154	122	70	60	46
45	179	175	218	200	290	332	200	109	126	71	59	36
00	217	172	206	233	342	332	193	203	83	67	62	29
Hr Total	**748**	**749**	**763**	**834**	**1,286**	**1,379**	**867**	**644**	**472**	**281**	**236**	**147**

24 Hour Total : 13,155
AM Peak Hour begins : 7:30 AM Peak Volume : 731 AM Peak Hour Factor : 0.90
PM Peak Hour begins : 16:45 PM Peak Volume : 1,389 PM PeaK Hour Factor : 0.95

30-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	56	36	29	57	55	121	265	442	491	371	333	328
30	49	34	24	41	58	205	343	472	515	358	320	369
45	35	38	38	67	101	215	334	508	488	340	344	374
00	32	41	35	45	121	261	341	494	425	367	327	357
Hr Total	**172**	**149**	**126**	**210**	**335**	**802**	**1,283**	**1,916**	**1,919**	**1,436**	**1,324**	**1,428**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	392	361	300	401	512	631	504	280	216	126	82	66
30	381	426	404	416	557	602	323	241	182	123	93	83
45	317	384	391	407	587	559	318	219	197	127	97	69
00	460	352	419	430	632	526	358	288	133	118	90	52
Hr Total	**1,550**	**1,523**	**1,514**	**1,654**	**2,288**	**2,318**	**1,503**	**1,028**	**728**	**494**	**362**	**270**

24 Hour Total : 26,332
AM Peak Hour begins : 7:30 AM Peak Volume : 2,008 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:30 PM Peak Volume : 2,452 PM PeaK Hour Factor : 0.97

DRAFT

TRAFFIC COUNT DATA

VHB PROJECT NO: 63286.00
LOCATION CODE: 3
COUNT LOCATION: Causeway Blvd -BTW Sagasta St and S 47th St-W of US 41
EQUIPMENT ID: 101/27

TYPE OF COUNT: 72 Hour Classification Count

TIME OF COUNT:

Start Date:	8/20/2018	Start Time:	Midnight
End Date:	8/23/2018	End Time:	Midnight

VOLUMES:

Average Daily:	27,046	Peak Hour Time:	7:15 AM
Daily Truck Avg:	3,568	Average Peak Hour:	2,536
		Max Hour Truck Avg:	375
		Peak Hour Truck Avg:	292

TRAVEL CHARACTERISTICS:

K MEASURED		D MEASURED	
K=	9.4%	D=	74.2%
T Max Hour	14.8%	T daily	13.2%
T med (max)	2.9%	T med Daily	2.7%
T heavy (max)	11.9%	T heavy Daily	10.5%
T Peak Hour	11.5%		
T med Peak Hour	2.1%	Axle Factor	0.94
T heavy Peak Hour	9.4%		

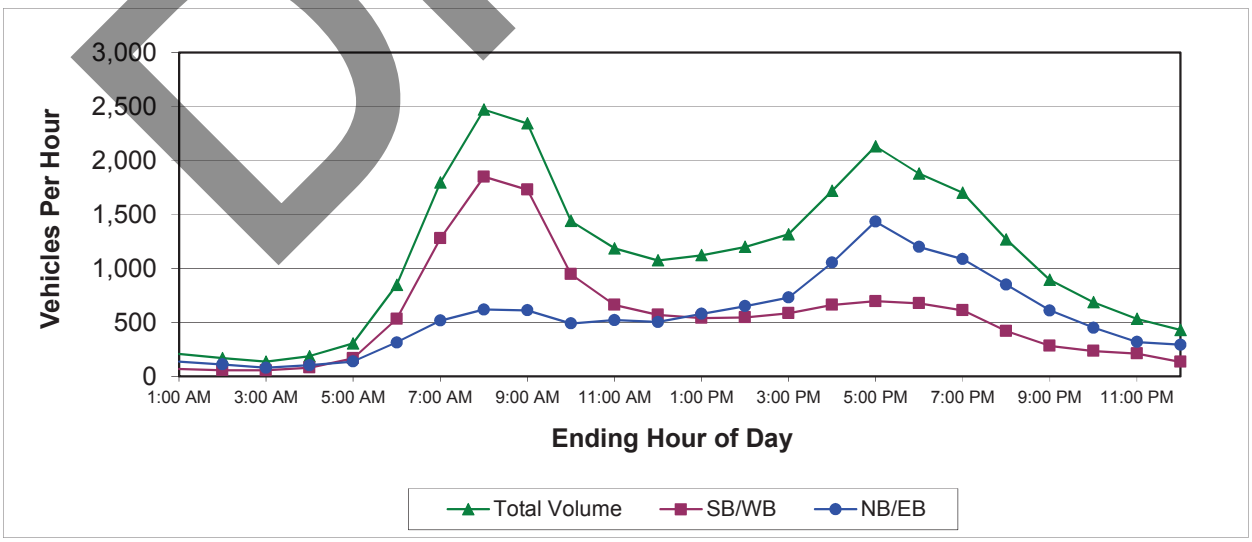
DRAFT

HOURLY DISTRIBUTIONS OF TRAFFIC VOLUMES

VHB PROJECT NO: 63286.00
LOCATION CODE: 3
COUNT LOCATION: Causeway Blvd -BTW Sagasta St and S 47th St-W of US 41
EQUIPMENT ID: 101/27

HOUR ENDING AT	HOURLY VOLUME DIRECTION (NB OR EB)	HOURLY VOLUME DIRECTION (SB OR WB)	TOTAL VOLUME BOTH DIRECTIONS	DISTRIBUTION PERCENT DIRECTION (NB OR EB)	DISTRIBUTION PERCENT DIRECTION (SB OR WB)	TOTAL PERCENT BOTH DIRECTIONS
1:00 AM	139	69	209	1.04%	0.51%	0.77%
2:00 AM	111	58	170	0.83%	0.43%	0.63%
3:00 AM	80	57	137	0.60%	0.42%	0.51%
4:00 AM	105	83	188	0.78%	0.61%	0.69%
5:00 AM	138	168	306	1.03%	1.23%	1.13%
6:00 AM	315	533	848	2.34%	3.91%	3.13%
7:00 AM	517	1,279	1,796	3.85%	9.39%	6.64%
8:00 AM	620	1,850	2,471	4.62%	13.58%	9.13%
9:00 AM	613	1,730	2,344	4.57%	12.70%	8.67%
10:00 AM	492	947	1,439	3.67%	6.95%	5.32%
11:00 AM	523	663	1,186	3.89%	4.87%	4.38%
12:00 PM	504	570	1,075	3.76%	4.19%	3.97%
1:00 PM	581	541	1,122	4.33%	3.97%	4.15%
2:00 PM	652	548	1,200	4.85%	4.03%	4.44%
3:00 PM	732	585	1,317	5.45%	4.30%	4.87%
4:00 PM	1,054	663	1,718	7.85%	4.87%	6.35%
5:00 PM	1,435	697	2,132	10.69%	5.12%	7.88%
6:00 PM	1,200	678	1,879	8.94%	4.98%	6.95%
7:00 PM	1,087	613	1,700	8.10%	4.50%	6.29%
8:00 PM	849	420	1,269	6.33%	3.08%	4.69%
9:00 PM	611	283	894	4.55%	2.08%	3.31%
10:00 PM	451	236	687	3.36%	1.73%	2.54%
11:00 PM	319	213	533	2.38%	1.57%	1.97%
12:00 AM	294	136	430	2.19%	1.00%	1.59%
TOTALS	13,424	13,622	27,046	100.0%	100.0%	100.0%

DRAFT



ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63286.00
LOCATION CODE: 3
COUNT LOCATION: Causeway Blvd -BTW Sagasta St and S 47th St-W of US 41
EQUIPMENT ID: 101/27

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	797	2.95%
Class 2	Cars	19,382	71.79%
Class 3	Pick-Ups & Vans	3,252	12.05%
Class 4	Buses	104	0.39%
Class 5	2 Axle, Single Unit Trucks	632	2.34%
Class 6	3 Axle, Single Unit Trucks	820	3.04%
Class 7	4 Axle, Single Unit Trucks	253	0.94%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	190	0.70%
Class 9	3 Axle Tractor with 2 Axle Trailer	907	3.36%
Class 10	3 Axle Tractor with 3 Axle Trailer	123	0.46%
Class 11	5 Axle Multi Trailer	113	0.42%
Class 12	6 Axle Multi Trailer	143	0.53%
Class 13	7 or more Axles	281	1.04%
Class 14	Not Used	0	0.00%
Class 15	Other	0	0.00%
TOTALS		**26,997**	**100.00%**

DRAFT

TRAFFIC COUNT DATA

VHB PROJECT NO:	63286.00
LOCATION CODE:	4
COUNT LOCATION:	Causeway Blvd - between US 41 and S Gelman Pl
EQUIPMENT ID:	109/247

TYPE OF COUNT: 72 Hour Classification Count

TIME OF COUNT:

Start Date:	8/20/2018	Start Time:	Midnight
End Date:	8/23/2018	End Time:	Midnight

VOLUMES:

		Peak Hour Time:	5:00 PM
Average Daily:	18,586	Average Peak Hour:	1,598
Daily Truck Avg:	2,427	Max Hour Truck Avg:	230
		Peak Hour Truck Avg:	133

TRAVEL CHARACTERISTICS:

K MEASURED		D MEASURED	
K=	8.6%	D=	61.1%
T Max Hour	14.4%	T daily	13.1%
T med (max)	5.8%	T med Daily	5.0%
T heavy (max)	8.6%	T heavy Daily	8.1%
T Peak Hour	8.3%		
T med Peak Hour	3.4%	Axle Factor	0.96
T heavy Peak Hour	4.9%		

DRAFT

HOURLY DISTRIBUTIONS OF TRAFFIC VOLUMES

VHB PROJECT NO: 63286.00
LOCATION CODE: 4
COUNT LOCATION: Causeway Blvd - between US 41 and S Gelman Pl
EQUIPMENT ID: 109/247

HOUR ENDING AT	HOURLY VOLUME DIRECTION (NB OR EB)	HOURLY VOLUME DIRECTION (SB OR WB)	TOTAL VOLUME BOTH DIRECTIONS	DISTRIBUTION PERCENT DIRECTION (NB OR EB)	DISTRIBUTION PERCENT DIRECTION (SB OR WB)	TOTAL PERCENT BOTH DIRECTIONS
1:00 AM	95	58	153	1.00%	0.64%	0.82%
2:00 AM	74	55	129	0.78%	0.60%	0.69%
3:00 AM	62	49	110	0.65%	0.54%	0.59%
4:00 AM	57	77	134	0.59%	0.85%	0.72%
5:00 AM	78	127	205	0.82%	1.40%	1.10%
6:00 AM	166	354	520	1.74%	3.91%	2.80%
7:00 AM	253	628	881	2.66%	6.93%	4.74%
8:00 AM	417	460	878	4.38%	5.08%	4.72%
9:00 AM	450	492	942	4.73%	5.43%	5.07%
10:00 AM	446	635	1,081	4.68%	7.01%	5.81%
11:00 AM	483	566	1,050	5.07%	6.25%	5.65%
12:00 PM	480	492	972	5.04%	5.43%	5.23%
1:00 PM	505	473	978	5.30%	5.22%	5.26%
2:00 PM	509	507	1,016	5.34%	5.60%	5.47%
3:00 PM	540	561	1,101	5.67%	6.20%	5.92%
4:00 PM	711	583	1,294	7.46%	6.44%	6.96%
5:00 PM	883	583	1,466	9.27%	6.44%	7.89%
6:00 PM	977	621	1,598	10.25%	6.86%	8.60%
7:00 PM	770	499	1,269	8.08%	5.51%	6.83%
8:00 PM	495	382	877	5.20%	4.21%	4.72%
9:00 PM	373	284	657	3.91%	3.14%	3.53%
10:00 PM	302	254	556	3.17%	2.81%	2.99%
11:00 PM	210	202	412	2.20%	2.23%	2.22%
12:00 AM	195	113	308	2.04%	1.25%	1.66%
TOTALS	9,531	9,056	18,586	100.0%	100.0%	100.0%

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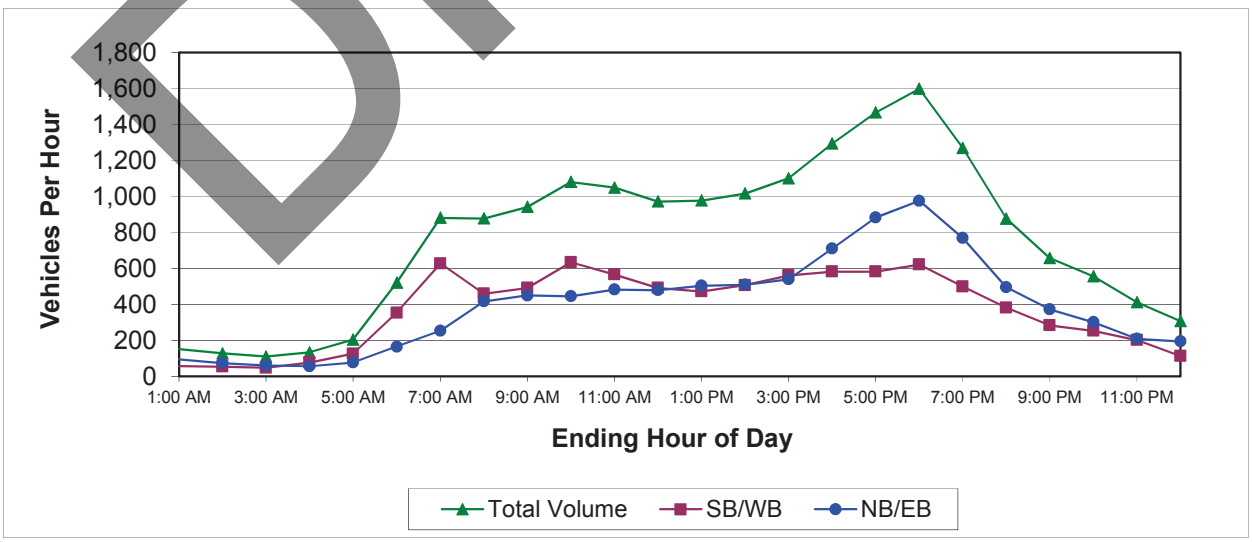


ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63286.00
LOCATION CODE: 4
COUNT LOCATION: Causeway Blvd - between US 41 and S Gelman Pl
EQUIPMENT ID: 109/247

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	1,039	5.60%
Class 2	Cars	12,909	69.59%
Class 3	Pick-Ups & Vans	2,177	11.74%
Class 4	Buses	133	0.72%
Class 5	2 Axle, Single Unit Trucks	790	4.26%
Class 6	3 Axle, Single Unit Trucks	345	1.86%
Class 7	4 Axle, Single Unit Trucks	113	0.61%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	209	1.13%
Class 9	3 Axle Tractor with 2 Axle Trailer	533	2.87%
Class 10	3 Axle Tractor with 3 Axle Trailer	54	0.29%
Class 11	5 Axle Multi Trailer	56	0.30%
Class 12	6 Axle Multi Trailer	59	0.32%
Class 13	7 or more Axles	132	0.71%
Class 14	Not Used	0	0.00%
Class 15	Other	0	0.00%
TOTALS		**18,549**	**100.00%**

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41			& Causeway Blvd	
Date	Tuesday, August 21, 2018				**All Vehicles**
Time Period	7:00	to	9:00	**AM**	

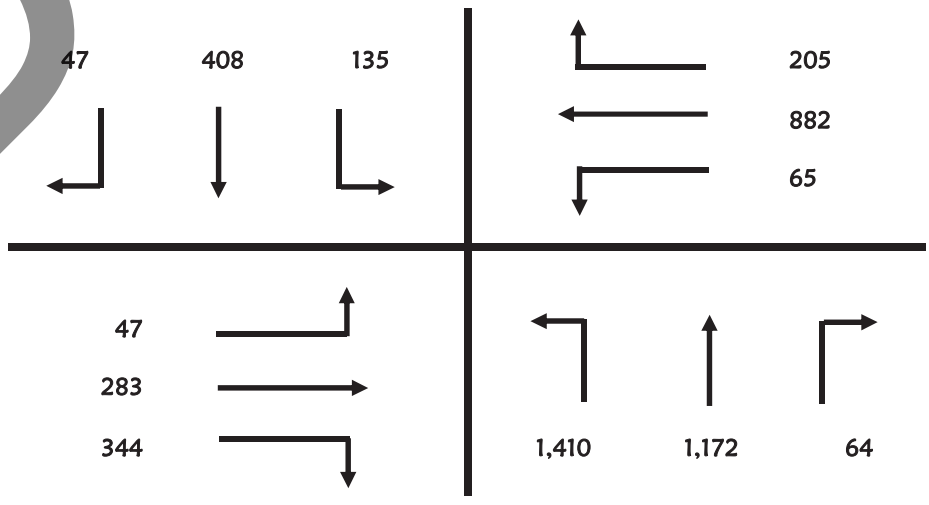
VHB Project #: 63286.00

Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	324	264	16	38	99	13
7:15 - 7:30	430	202	10	28	77	13
7:30 - 7:45	318	256	13	45	137	12
7:45 - 8:00	409	285	22	34	85	12
8:00 - 8:15	321	337	19	27	121	13
8:15 - 8:30	362	294	10	29	65	10
8:30 - 8:45	276	281	27	44	136	8
8:45 - 9:00	217	179	25	39	129	12
	2,657	2,098	142	284	849	93

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	6	59	69	15	282	56
7:15 - 7:30	4	82	95	12	208	42
7:30 - 7:45	8	68	96	8	255	42
7:45 - 8:00	8	84	114	16	198	65
8:00 - 8:15	14	35	49	17	253	52
8:15 - 8:30	17	96	85	24	176	46
8:30 - 8:45	10	74	59	17	200	40
8:45 - 9:00	14	70	74	17	126	37
	81	568	641	126	1,698	380

North / South
US 41

East / West
Causeway Blvd



Peak Hour
7:30 - 8:30

Peak Hour Factor
0.95

Total Pk Hr Voume
5,062

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	7:00	to	9:00	AM	**Trucks**

VHB Project #: 63286.00

DRAFT

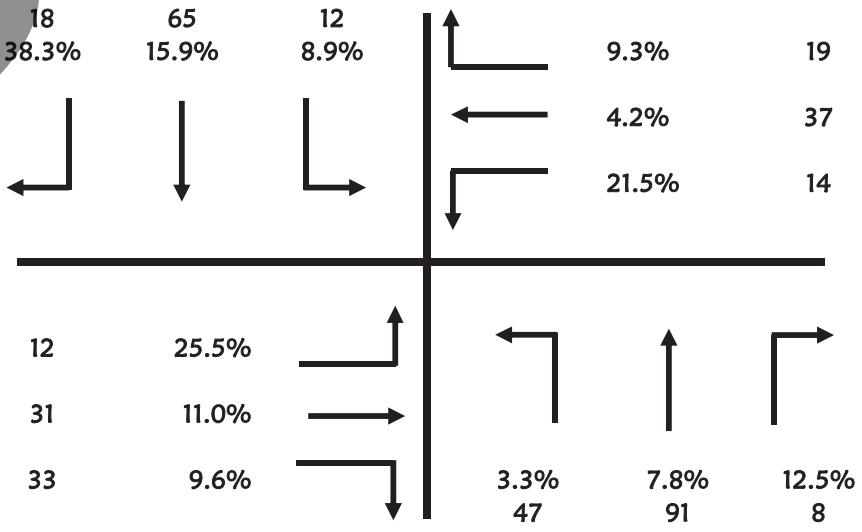
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	11	30	1	7	12	2
7:15 - 7:30	18	22	1	1	7	0
7:30 - 7:45	8	27	1	5	12	4
7:45 - 8:00	14	16	2	3	18	4
8:00 - 8:15	11	28	4	3	24	4
8:15 - 8:30	14	20	1	1	11	6
8:30 - 8:45	17	31	6	2	30	2
8:45 - 9:00	9	23	3	3	25	4

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	1	5	11	3	1	5
7:15 - 7:30	1	8	10	2	6	7
7:30 - 7:45	2	5	5	0	11	4
7:45 - 8:00	3	6	10	1	7	4
8:00 - 8:15	2	4	7	5	13	7
8:15 - 8:30	5	16	11	8	6	4
8:30 - 8:45	2	9	8	7	5	4
8:45 - 9:00	5	11	12	2	9	6

North / South
US 41

East / West
Causeway Blvd

Peak Hour
7:30 - 8:30



Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	7:00	to 9:00	AM	**U-Turn & RTOR**	

VHB Project #: 63286.00

DRAFT

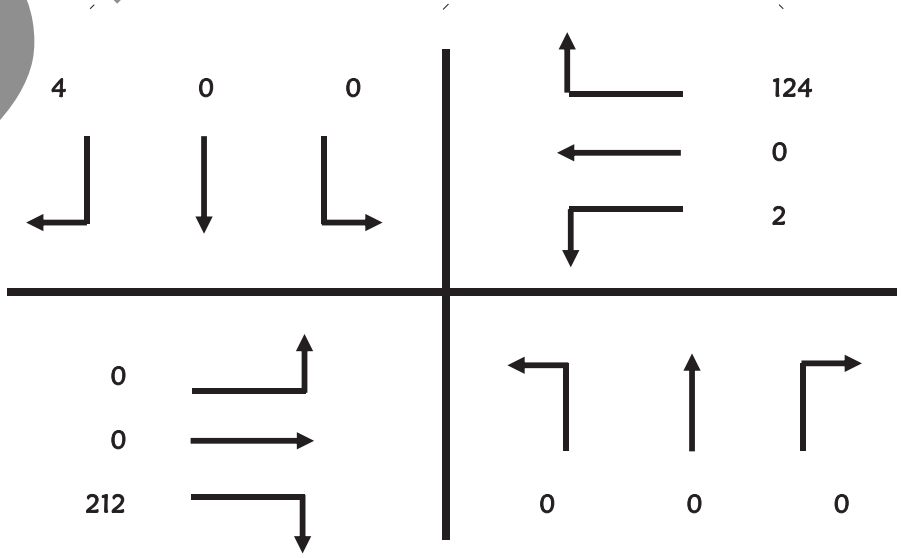
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	0	0	1	0	0	0
7:15 - 7:30	1	0	0	0	0	5
7:30 - 7:45	0	0	0	0	0	1
7:45 - 8:00	0	0	0	0	0	2
8:00 - 8:15	0	0	0	0	0	1
8:15 - 8:30	0	0	0	0	0	0
8:30 - 8:45	0	0	0	0	0	0
8:45 - 9:00	0	0	1	0	0	0

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	0	0	47	0	0	39
7:15 - 7:30	0	0	52	1	0	30
7:30 - 7:45	0	0	71	0	0	25
7:45 - 8:00	0	0	64	0	0	35
8:00 - 8:15	0	0	39	2	0	32
8:15 - 8:30	0	0	38	0	0	32
8:30 - 8:45	0	0	34	0	0	19
8:45 - 9:00	0	0	54	0	0	21

North / South
US 41

East / West
Causeway Blvd

Peak Hour
7:30 - 8:30



Pedestrian & Bicycle Summary

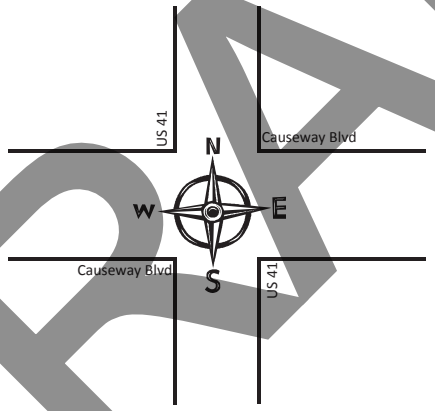
Project #: 63286.00
Date: Tuesday, August 21, 2018

NB/SB: US 41
EB/WB: Causeway Blvd

Hour

	7:00	8:00							
	1	2	3	4	5	6	7	8	
Eastbound ▶ Bike	0	0							0
Ped	0	0							0
Westbound ◀ Bike	1	0							1
Ped	0	0							0

Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
1 7:00	0	0	0	0
2 8:00	0	0	0	0
3				
4				
5				
6				
7				
8				
	0	0	0	0



Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
1 7:00	1	0	1	0
2 8:00	0	1	0	0
3				
4				
5				
6				
7				
8				
	1	1	1	0

	7:00	8:00							
	1	2	3	4	5	6	7	8	
Eastbound ▶ Bike	0	0							0
Ped	0	0							0
Westbound ◀ Bike	0	0							0
Ped	0	0							0

Hour

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough	**City**	Tampa
Intersection	US 41	&	Causeway Blvd
Date	Tuesday, August 21, 2018		**All Vehicles**
Time Period	16:00 to 18:00	**PM**	

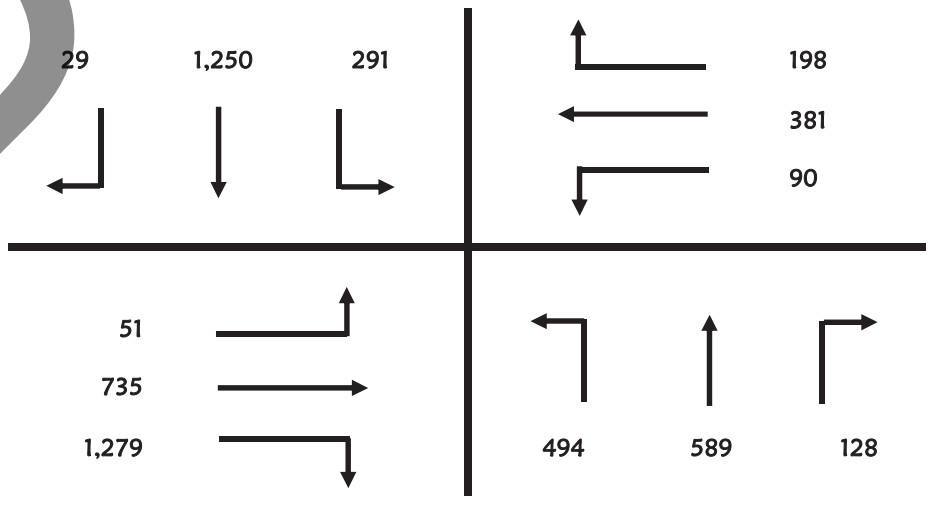
VHB Project #: 63286.00

Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	124	133	46	66	236	10
16:15 - 16:30	112	123	35	57	258	5
16:30 - 16:45	127	160	34	68	278	8
16:45 - 17:00	127	146	24	71	277	10
17:00 - 17:15	113	147	43	78	326	7
17:15 - 17:30	152	153	34	59	310	4
17:30 - 17:45	102	143	27	83	337	8
17:45 - 18:00	100	112	16	53	328	6
	957	1,117	259	535	2,350	58

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	11	157	259	25	101	57
16:15 - 16:30	16	166	282	29	108	48
16:30 - 16:45	16	160	300	31	85	51
16:45 - 17:00	18	186	313	21	108	54
17:00 - 17:15	17	184	324	25	113	54
17:15 - 17:30	7	178	331	28	100	52
17:30 - 17:45	9	187	311	16	60	38
17:45 - 18:00	8	164	337	17	129	56
	102	1,382	2,457	192	804	410

North / South
US 41

East / West
Causeway Blvd



Peak Hour
16:45 - 17:45

Peak Hour Factor
0.96

Total Pk Hr Voume
5,515

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	16:00	to	18:00	**PM**	**Trucks**

VHB Project #: 63286.00

DRAFT

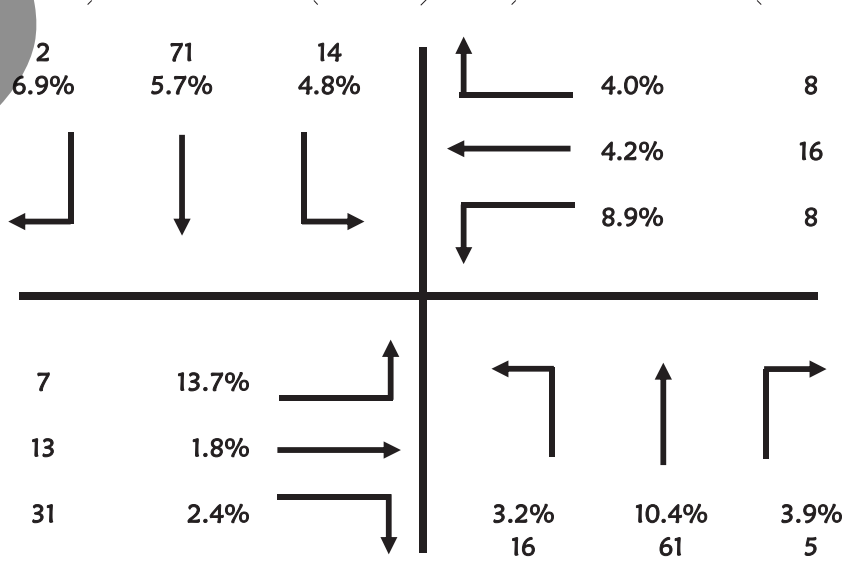
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	4	13	6	8	22	2
16:15 - 16:30	4	14	4	2	29	2
16:30 - 16:45	8	25	5	3	24	4
16:45 - 17:00	3	21	1	8	26	0
17:00 - 17:15	6	16	2	4	10	1
17:15 - 17:30	3	11	1	1	12	1
17:30 - 17:45	4	13	1	1	23	0
17:45 - 18:00	1	7	0	2	14	1

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	3	12	6	7	5	6
16:15 - 16:30	1	2	13	9	7	2
16:30 - 16:45	3	10	10	1	5	3
16:45 - 17:00	4	4	15	3	6	3
17:00 - 17:15	2	2	7	2	6	0
17:15 - 17:30	0	3	3	2	3	1
17:30 - 17:45	1	4	6	1	1	4
17:45 - 18:00	2	0	8	0	2	2

North / South
US 41

East / West
Causeway Blvd

Peak Hour
16:45 - 17:45



Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough	**City**	Tampa
Intersection	US 41	&	Causeway Blvd
Date	Tuesday, August 21, 2018		
Time Period	16:00 to 18:00 PM	**U-Turn & RTOR**	

VHB Project #: 63286.00

DRAFT

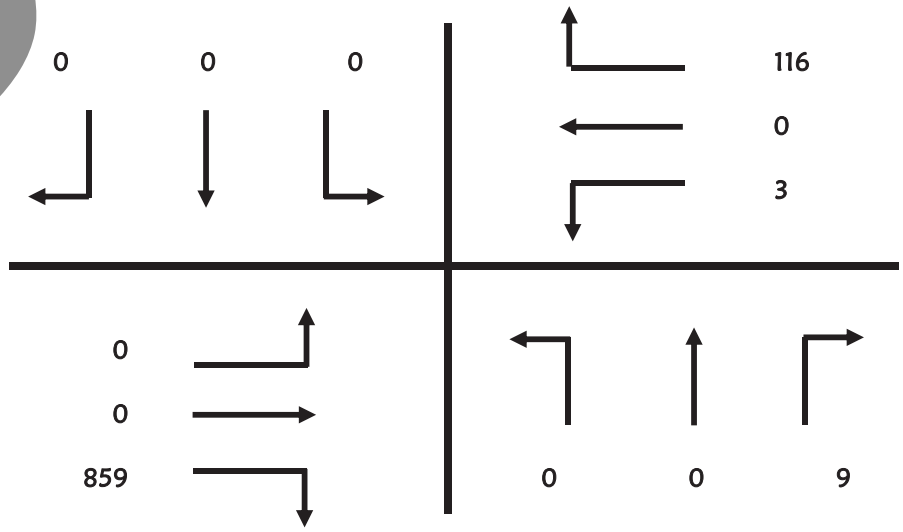
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	0	0	4	0	0	2
16:15 - 16:30	0	0	8	0	0	0
16:30 - 16:45	0	0	1	0	0	0
16:45 - 17:00	0	0	3	0	0	0
17:00 - 17:15	0	0	2	0	0	0
17:15 - 17:30	0	0	0	0	0	0
17:30 - 17:45	0	0	4	0	0	0
17:45 - 18:00	0	0	2	0	0	0

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	0	0	165	2	0	34
16:15 - 16:30	0	0	173	0	0	30
16:30 - 16:45	0	0	202	0	0	24
16:45 - 17:00	0	0	213	1	0	31
17:00 - 17:15	0	0	213	1	0	33
17:15 - 17:30	0	0	222	0	0	28
17:30 - 17:45	0	0	211	1	0	24
17:45 - 18:00	0	0	228	0	0	38

North / South
US 41

East / West
Causeway Blvd

Peak Hour
16:45 - 17:45



Pedestrian & Bicycle Summary

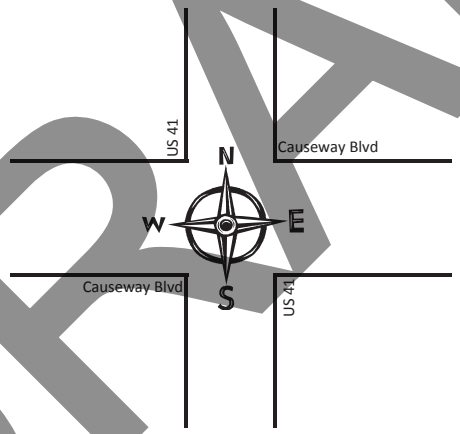
Project #: 63286.00
Date: Tuesday, August 2

NB/SB: US 41
EB/WB: Causeway Blvd

Hour

			16:00	17:00						
			1	2	3			6	7	8
Eastbound	▶	Bike	0	0						0
		Ped	0	0						0
Westbound	◀	Bike	0	0						0
		Ped	0	0						0

Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
16:00	0	0	0	0
17:00	0	0	0	0
	0	0	0	0



Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲	Hour
	0	0	0	0	16:00
	1	0	0	0	17:00
	1	0	0	0	

Eastbound	▶	Bike	0	0						0
		Ped	0	0						0
Westbound	◀	Bike	0	0						0
		Ped	0	0						0

16:00 17:00

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FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0003 - SR 599/US 41/S 50TH ST, N OF SR 676/CAUSEWAY BLVD

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	25500 F	N 12000	S 13500	9.00	59.60	13.60
2016	24500 C	N 11500	S 13000	9.00	57.00	13.60
2015	18100 C	N 8100	S 10000	9.00	56.80	11.50
2014	23000 C	N 11000	S 12000	9.00	58.60	9.30
2013	21500 C	N 10500	S 11000	9.00	58.20	10.10
2012	21000 C	N 10500	S 10500	9.00	59.00	10.60
2011	22000 C	N 11000	S 11000	9.00	57.20	11.40
2010	21500 C	N 11000	S 10500	9.51	56.00	11.70
2009	21000 C	N 10500	S 10500	9.54	55.72	12.90
2008	22000 C	N 10500	S 11500	9.13	55.29	12.90
2007	21500 C	N 11000	S 10500	9.52	56.79	12.90
2005	22500 C	N 11500	S 11000	9.70	55.90	8.60
2004	24000 C	N 12000	S 12000	8.60	54.00	14.30
2003	23500 C	N 11500	S 12000	9.80	58.50	11.10
2002	25000 C	N 12500	S 12500	9.80	55.20	9.00

DRAFT

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0004 - SR 45/US 41/S 50TH ST, S OF SR 676/CAUSEWAY BLVD (REPL BY 100373)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	31000 S	N 15000	S 16000	9.00	59.60	15.60
2016	30000 F	N 14500	S 15500	9.00	57.00	15.60
2015	29000 C	N 14000	S 15000	9.00	56.80	15.60
2014	36500 C	N 18000	S 18500	9.00	58.60	9.30
2013	35500 C	N 17500	S 18000	9.00	58.20	9.80
2012	34500 C	N 16000	S 18500	9.00	59.00	10.20
2010	33000 C	N 16000	S 17000	9.51	56.00	11.30
2009	34500 C	N 17000	S 17500	9.54	55.72	10.60
2008	35000 C	N 17000	S 18000	9.13	55.29	11.00
2007	36000 C	N 17500	S 18500	9.52	56.79	11.30
2006	33000 C	N 16000	S 17000	9.41	55.29	14.50
2005	31500 C	N 14500	S 17000	9.70	55.90	16.50
2004	30500 C	N 15000	S 15500	8.60	54.00	16.50
2003	27000 C	N 13500	S 13500	9.80	58.50	14.40
2002	27500 C	N 13500	S 14000	9.80	55.20	12.60

DRAFT

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0022 - SR 676/CAUSEWAY BLVD, E OF US 41/SR 45/50TH ST

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	18900 F	E 9500	W 9400	9.00	59.60	11.70
2016	18300 C	E 9200	W 9100	9.00	57.00	11.70
2015	22000 F	E 11000	W 11000	9.00	56.80	8.30
2014	22000 C	E 11000	W 11000	9.00	58.60	8.80
2013	23500 C	E 12000	W 11500	9.00	58.20	7.20
2012	20500 C	E 10500	W 10000	9.00	59.00	7.80
2011	19700 C	E 9700	W 10000	9.00	57.20	8.60
2010	16300 C	E 8100	W 8200	9.51	56.00	7.70
2009	15700 F	E 7900	W 7800	9.54	55.72	8.40
2008	15900 C	E 8000	W 7900	9.13	55.29	8.40
2007	17000 C	E 8600	W 8400	9.52	56.79	8.40
2006	18300 C	E 9400	W 8900	9.41	55.29	14.20
2005	26000 C	E 12500	W 13500	9.70	55.90	4.40
2004	29000 F	E 13000	W 16000	8.60	54.00	5.60
2003	28000 C	E 12500	W 15500	9.80	58.50	17.80

DRAFT

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0033 - SR 45/USB 41/22ND ST CAUSEWAY, W OF US 41/SR 45

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	27500 F	E 14000	W 13500	9.00	59.60	8.90
2016	26500 C	E 13500	W 13000	9.00	57.00	8.90
2015	29500 F	E 15000	W 14500	9.00	56.80	11.10
2014	29500 C	E 15000	W 14500	9.00	58.60	11.10
2013	32500 C	E 17000	W 15500	9.00	58.20	11.10
2012	30500 C	E 15000	W 15500	9.00	59.00	10.30
2011	28500 C	E 13500	W 15000	9.00	57.20	11.00
2010	27500 C	E 13500	W 14000	9.51	56.00	11.00
2009	25500 C	E 13000	W 12500	9.54	55.72	8.80
2008	25500 C	E 12500	W 13000	9.13	55.29	6.40
2007	27500 C	E 14000	W 13500	9.52	56.79	10.70
2006	28000 C	E 14500	W 13500	9.41	55.29	17.20
2005	27000 C	E 14000	W 13000	9.70	55.90	4.40
2004	24500 S	E 12500	W 12000	8.60	54.00	15.40
2003	23500 F	E 12000	W 11500	9.80	58.50	15.40
2002	22500 C	E 11500	W 11000	9.80	55.20	15.40

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0373 - US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD, TAMPA, HILLS CO

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	30711 C	N 14795	S 15916	9.00	72.40	11.40
2016	27391 C	N 13219	S 14172	9.00	71.30	12.10
2015	24063 C	N 11491	S 12572	9.00	69.80	12.40
2014	27200 C	N 13122	S 14078	9.00	70.90	11.70
2013	27551 C	N 13215	S 14336	9.00	72.60	11.50
2012	27598 C	N 13330	S 14268	9.00	72.90	10.30
2011	27141 C	N 13213	S 13928	9.00	57.20	10.70

Avg - 71.40%,
Min - 69.80% and
Max - 72.60%,

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
200 HIGHEST HOUR REPORT - REPORT TYPE: ALL
YEAR 2017

COUNTY: 10 - HILLSBOROUGH
SITE: 0373
DESCRIPTION: US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD, TAMPA, HI
LOCATION: 10060000 MILEPOST 23.05
AADT: 30711

VALID DATA	
HOURS	8688
DAYS	362
WEEKS	53
MONTHS	12

POSITION	COUNTS					COLLECTION			"D"	"K"
	TOTAL COUNT	LOW DIR	LOW COUNT	HIGH DIR	HIGH COUNT	DAY	DATE	HOUR	FACTOR	FACTOR
1	3963	N	1376	S	2587	TUE	02/28/17	18	65.28	12.90
2	3872	N	987	S	2885	TUE	10/31/17	18	74.51	12.61
3	3826	N	1349	S	2477	WED	09/06/17	18	64.74	12.46
4	3825	N	1008	S	2817	THU	08/31/17	18	73.65	12.45
5	3792	N	1065	S	2727	WED	11/29/17	18	71.91	12.35
6	3779	N	1120	S	2659	THU	11/09/17	18	70.36	12.31
7	3775	N	1142	S	2633	TUE	07/11/17	18	69.75	12.29
8	3742	N	1111	S	2631	WED	11/01/17	18	70.31	12.18
9	3739	N	1012	S	2727	MON	10/30/17	18	72.93	12.17
10	3730	N	1130	S	2600	THU	12/07/17	18	69.71	12.15
11	3701	N	1077	S	2624	TUE	12/19/17	18	70.90	12.05
12	3695	N	1021	S	2674	FRI	07/14/17	18	72.37	12.03
13	3695	N	1051	S	2644	WED	10/11/17	18	71.56	12.03
14	3671	N	1052	S	2619	WED	12/13/17	18	71.34	11.95
15	3669	N	973	S	2696	TUE	10/17/17	18	73.48	11.95
16	3661	N	1014	S	2647	WED	10/25/17	18	72.30	11.92
17	3654	N	1108	S	2546	THU	11/30/17	18	69.68	11.90
18	3651	N	990	S	2661	WED	05/24/17	18	72.88	11.89
19	3647	N	1024	S	2623	TUE	10/10/17	18	71.92	11.88
20	3647	N	1057	S	2590	WED	10/18/17	18	71.02	11.88
21	3640	N	993	S	2647	TUE	10/24/17	18	72.72	11.85
22	3636	N	1021	S	2615	TUE	11/07/17	18	71.92	11.84
23	3630	N	1093	S	2537	TUE	11/14/17	18	69.89	11.82
24	3628	N	1052	S	2576	WED	11/15/17	18	71.00	11.81
25	3621	N	907	S	2714	WED	07/12/17	18	74.95	11.79
26	3614	N	1112	S	2502	MON	12/11/17	18	69.23	11.77
27	3613	N	1065	S	2548	TUE	03/28/17	18	70.52	11.76
28	3613	N	966	S	2647	THU	08/24/17	18	73.26	11.76
29	3612	N	1026	S	2586	MON	11/06/17	18	71.59	11.76
30	3611	N	1115	S	2496	TUE	12/05/17	18	69.12	11.76
31	3608	N	894	S	2714	FRI	05/19/17	18	75.22	11.75
32	3606	N	1129	S	2477	THU	12/14/17	18	68.69	11.74
33	3605	N	1149	S	2456	THU	11/16/17	18	68.13	11.74
34	3604	N	1091	S	2513	THU	11/02/17	18	69.73	11.74
35	3586	N	1045	S	2541	WED	11/08/17	18	70.86	11.68
36	3585	N	1057	S	2528	THU	08/31/17	17	70.52	11.67
37	3585	N	1162	S	2423	WED	10/04/17	18	67.59	11.67
38	3584	N	922	S	2662	WED	08/09/17	18	74.27	11.67
39	3582	N	992	S	2590	WED	09/27/17	18	72.31	11.66
40	3582	N	1037	S	2545	TUE	12/12/17	18	71.05	11.66

DESIGN HOUR DATA

MEDIAN "D" = 72.4% (MEDIAN D FACTOR OF ALL 200 HIGHEST HOURS)
STANDARD "K" = 9.0%

DRAFT

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
200 HIGHEST HOUR REPORT - REPORT TYPE: ALL
YEAR 2017

COUNTY: 10 - HILLSBOROUGH
SITE: 0373
DESCRIPTION: US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD, TAMPA, HI
LOCATION: 10060000 MILEPOST 23.05
AADT: 30711

VALID DATA	
HOURS	8688
DAYS	362
WEEKS	53
MONTHS	12

POSITION	COUNTS					COLLECTION			"D"	"K"
	TOTAL COUNT	LOW DIR	LOW COUNT	HIGH DIR	HIGH COUNT	DAY	DATE	HOUR	FACTOR	FACTOR
45	3562	N	1041	S	2521	THU	09/28/17	18	70.77	11.60
50	3541	N	982	S	2559	TUE	02/14/17	18	72.27	11.53
55	3517	N	947	S	2570	TUE	09/26/17	18	73.07	11.45
60	3501	N	1013	S	2488	THU	10/12/17	18	71.07	11.40
65	3486	N	925	S	2561	WED	02/15/17	18	73.47	11.35
70	3478	N	968	S	2510	WED	12/20/17	18	72.17	11.32
75	3464	N	912	S	2552	THU	08/17/17	18	73.67	11.28
80	3454	N	915	S	2539	TUE	04/18/17	18	73.51	11.25
85	3446	S	878	N	2568	TUE	11/14/17	8	74.52	11.22
90	3432	N	858	S	2574	FRI	01/20/17	18	75.00	11.18
95	3422	S	831	N	2591	WED	08/16/17	8	75.72	11.14
100	3411	S	829	N	2582	THU	10/26/17	8	75.70	11.11
105	3402	N	1122	S	2280	WED	10/04/17	17	67.02	11.08
110	3396	N	976	S	2420	THU	07/27/17	18	71.26	11.06
115	3389	N	793	S	2596	MON	06/26/17	18	76.60	11.04
120	3383	N	985	S	2398	WED	01/25/17	18	70.88	11.02
125	3376	N	1040	S	2336	FRI	10/20/17	18	69.19	10.99
130	3370	S	873	N	2497	WED	10/18/17	8	74.09	10.97
135	3361	N	1191	S	2170	TUE	07/11/17	17	64.56	10.94
140	3356	S	881	N	2475	WED	10/25/17	8	73.75	10.93
145	3346	N	900	S	2446	WED	06/28/17	18	73.10	10.90
150	3340	N	1003	S	2337	TUE	04/25/17	17	69.97	10.88
155	3332	N	996	S	2336	THU	02/09/17	18	70.11	10.85
160	3320	N	894	S	2426	THU	07/13/17	18	73.07	10.81
165	3315	N	778	S	2537	MON	07/17/17	18	76.53	10.79
170	3307	N	1075	S	2232	WED	11/01/17	17	67.49	10.77
175	3302	N	817	S	2485	MON	07/24/17	18	75.26	10.75
180	3299	N	889	S	2410	THU	04/13/17	18	73.05	10.74
185	3291	N	931	S	2360	WED	04/12/17	18	71.71	10.72
190	3288	N	1011	S	2277	TUE	08/08/17	17	69.25	10.71
195	3278	N	859	S	2419	THU	02/16/17	18	73.79	10.67
200	3272	N	913	S	2359	FRI	03/03/17	18	72.10	10.65

DESIGN HOUR DATA

MEDIAN "D" = 72.4% (MEDIAN D FACTOR OF ALL 200 HIGHEST HOURS)
STANDARD "K" = 9.0%

DRAFT

Historical FTI Data- D Values

Year	US 41		Average US 41 Only	SR 676		Average SR 676 Only	Average Both US 41 & SR 676
	100003	100004		100022	100033		
	N. of SR 676	S. of SR 676		E. of US 41	W. of US 41		
2017	59.60%	59.60%		59.60%	59.60%		
2016	57.00%	57.00%		57.00%	57.00%		
2015	56.80%	56.80%		56.80%	56.80%		
2014	58.60%	58.60%		58.60%	58.60%		
2013	58.20%	58.20%		58.20%	58.20%		
Average	58.04%	58.04%	**58.04%**	58.04%	58.04%	**58.04%**	**58.04%**
Minimum	56.80%	56.80%	**56.80%**	56.80%	56.80%	**56.80%**	**56.80%**
Maximum	59.60%	59.60%	**59.60%**	59.60%	59.60%	**59.60%**	**59.60%**

Historical FTO Data- T_{24} Values

Year	US 41		SR 676		Average Both US 41 & SR 676	Average US 41 Only	Average SR 676 Only
	100003	100004	100022	100033			
	N. of SR 676	S. of SR 676	E. of US 41	W. of US 41			
2017	13.60%	15.60%	11.70%	8.90%			
2016	13.60%	15.60%	11.70%	8.90%			
2015	11.50%	15.60%	8.30%	11.10%			
2014	9.30%	9.30%	8.80%	11.10%			
2013	10.10%	9.80%	7.20%	11.10%			
Average	11.62%	13.18%	9.54%	10.22%	**11.14%**	**12.40%**	**9.88%**
Minimum	9.30%	9.30%	7.20%	8.90%	**8.68%**	**9.30%**	**8.05%**
Maximum	13.60%	15.60%	11.70%	11.10%	**13.00%**	**14.60%**	**11.40%**

DRAFT

2017 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL

CATEGORY: 1000 HILLSBOROUGH COUNTYWIDE

MOCF: 0.96

WEEK	DATES	SF	PSCF
1	01/01/2017 - 01/07/2017	1.03	1.07
2	01/08/2017 - 01/14/2017	1.02	1.06
3	01/15/2017 - 01/21/2017	1.02	1.06
4	01/22/2017 - 01/28/2017	1.00	1.04
5	01/29/2017 - 02/04/2017	0.99	1.03
* 6	02/05/2017 - 02/11/2017	0.97	1.01
* 7	02/12/2017 - 02/18/2017	0.96	1.00
* 8	02/19/2017 - 02/25/2017	0.96	1.00
* 9	02/26/2017 - 03/04/2017	0.95	0.99
*10	03/05/2017 - 03/11/2017	0.95	0.99
*11	03/12/2017 - 03/18/2017	0.95	0.99
*12	03/19/2017 - 03/25/2017	0.95	0.99
*13	03/26/2017 - 04/01/2017	0.95	0.99
*14	04/02/2017 - 04/08/2017	0.96	1.00
*15	04/09/2017 - 04/15/2017	0.96	1.00
*16	04/16/2017 - 04/22/2017	0.97	1.01
*17	04/23/2017 - 04/29/2017	0.98	1.02
*18	04/30/2017 - 05/06/2017	0.99	1.03
19	05/07/2017 - 05/13/2017	0.99	1.03
20	05/14/2017 - 05/20/2017	1.00	1.04
21	05/21/2017 - 05/27/2017	1.01	1.05
22	05/28/2017 - 06/03/2017	1.02	1.06
23	06/04/2017 - 06/10/2017	1.02	1.06
24	06/11/2017 - 06/17/2017	1.03	1.07
25	06/18/2017 - 06/24/2017	1.03	1.07
26	06/25/2017 - 07/01/2017	1.03	1.07
27	07/02/2017 - 07/08/2017	1.03	1.07
28	07/09/2017 - 07/15/2017	1.04	1.08
29	07/16/2017 - 07/22/2017	1.03	1.07
30	07/23/2017 - 07/29/2017	1.02	1.06
31	07/30/2017 - 08/05/2017	1.01	1.05
32	08/06/2017 - 08/12/2017	1.01	1.05
33	08/13/2017 - 08/19/2017	1.00	1.04
34	08/20/2017 - 08/26/2017	1.02	1.06
35	08/27/2017 - 09/02/2017	1.05	1.09
36	09/03/2017 - 09/09/2017	1.08	1.13
37	09/10/2017 - 09/16/2017	1.10	1.15
38	09/17/2017 - 09/23/2017	1.08	1.13
39	09/24/2017 - 09/30/2017	1.05	1.09
40	10/01/2017 - 10/07/2017	1.02	1.06
41	10/08/2017 - 10/14/2017	1.00	1.04
42	10/15/2017 - 10/21/2017	0.97	1.01
43	10/22/2017 - 10/28/2017	0.98	1.02
44	10/29/2017 - 11/04/2017	0.99	1.03
45	11/05/2017 - 11/11/2017	1.00	1.04
46	11/12/2017 - 11/18/2017	1.01	1.05
47	11/19/2017 - 11/25/2017	1.02	1.06
48	11/26/2017 - 12/02/2017	1.02	1.06
49	12/03/2017 - 12/09/2017	1.03	1.07
50	12/10/2017 - 12/16/2017	1.03	1.07
51	12/17/2017 - 12/23/2017	1.03	1.07
52	12/24/2017 - 12/30/2017	1.02	1.06
53	12/31/2017 - 12/31/2017	1.02	1.06

* PEAK SEASON

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2017 WEEKLY AXLE FACTOR CATEGORY REPORT - REPORT TYPE: ALL

COUNTY: 10 - HILLSBOROUGH

WEEK	DATES	1030 US41,SR676-SR60	1012 US41	1029 US41,APOL BCH BL-676
1	01/01/2017 - 01/07/2017	0.96	0.96	0.93
2	01/08/2017 - 01/14/2017	0.96	0.96	0.93
3	01/15/2017 - 01/21/2017	0.96	0.96	0.92
4	01/22/2017 - 01/28/2017	0.96	0.96	0.92
5	01/29/2017 - 02/04/2017	0.96	0.96	0.92
6	02/05/2017 - 02/11/2017	0.96	0.96	0.92
7	02/12/2017 - 02/18/2017	0.96	0.96	0.92
8	02/19/2017 - 02/25/2017	0.96	0.96	0.92
9	02/26/2017 - 03/04/2017	0.96	0.96	0.92
10	03/05/2017 - 03/11/2017	0.96	0.96	0.92
11	03/12/2017 - 03/18/2017	0.96	0.96	0.92
12	03/19/2017 - 03/25/2017	0.96	0.96	0.92
13	03/26/2017 - 04/01/2017	0.96	0.96	0.93
14	04/02/2017 - 04/08/2017	0.96	0.96	0.93
15	04/09/2017 - 04/15/2017	0.96	0.96	0.93
16	04/16/2017 - 04/22/2017	0.96	0.96	0.93
17	04/23/2017 - 04/29/2017	0.96	0.96	0.93
18	04/30/2017 - 05/06/2017	0.96	0.96	0.92
19	05/07/2017 - 05/13/2017	0.96	0.96	0.92
20	05/14/2017 - 05/20/2017	0.96	0.96	0.92
21	05/21/2017 - 05/27/2017	0.96	0.96	0.92
22	05/28/2017 - 06/03/2017	0.96	0.96	0.92
23	06/04/2017 - 06/10/2017	0.96	0.96	0.92
24	06/11/2017 - 06/17/2017	0.96	0.96	0.92
25	06/18/2017 - 06/24/2017	0.96	0.96	0.92
26	06/25/2017 - 07/01/2017	0.96	0.96	0.92
27	07/02/2017 - 07/08/2017	0.96	0.96	0.93
28	07/09/2017 - 07/15/2017	0.96	0.96	0.93
29	07/16/2017 - 07/22/2017	0.96	0.96	0.93
30	07/23/2017 - 07/29/2017	0.96	0.96	0.93
31	07/30/2017 - 08/05/2017	0.96	0.96	0.93
32	08/06/2017 - 08/12/2017	0.96	0.96	0.93
33	08/13/2017 - 08/19/2017	0.96	0.96	0.93
34	08/20/2017 - 08/26/2017	0.96	0.96	0.93
35	08/27/2017 - 09/02/2017	0.96	0.96	0.93
36	09/03/2017 - 09/09/2017	0.96	0.96	0.92
37	09/10/2017 - 09/16/2017	0.96	0.96	0.92
38	09/17/2017 - 09/23/2017	0.96	0.96	0.92
39	09/24/2017 - 09/30/2017	0.96	0.96	0.92
40	10/01/2017 - 10/07/2017	0.96	0.96	0.92
41	10/08/2017 - 10/14/2017	0.96	0.96	0.92
42	10/15/2017 - 10/21/2017	0.96	0.96	0.92
43	10/22/2017 - 10/28/2017	0.96	0.96	0.92
44	10/29/2017 - 11/04/2017	0.96	0.96	0.93
45	11/05/2017 - 11/11/2017	0.96	0.96	0.93
46	11/12/2017 - 11/18/2017	0.96	0.96	0.93
47	11/19/2017 - 11/25/2017	0.96	0.96	0.93
48	11/26/2017 - 12/02/2017	0.96	0.96	0.93
49	12/03/2017 - 12/09/2017	0.96	0.96	0.93
50	12/10/2017 - 12/16/2017	0.96	0.96	0.93
51	12/17/2017 - 12/23/2017	0.96	0.96	0.93
52	12/24/2017 - 12/30/2017	0.96	0.96	0.92
53	12/31/2017 - 12/31/2017	0.96	0.96	0.92

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Appendix E: FDOT Generalized Tables

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TABLE 1

Generalized **Annual Average Daily** Volumes for Florida's **Urbanized Areas**

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	16,800	17,700	**
4	Divided	*	37,900	39,800	**
6	Divided	*	58,400	59,900	**
8	Divided	*	78,800	80,100	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	7,300	14,800	15,600
4	Divided	*	14,500	32,400	33,800
6	Divided	*	23,300	50,000	50,900
8	Divided	*	32,000	67,300	68,100

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,900	7,600	19,700
50-84%	2,100	6,700	19,700	>19,700
85-100%	9,300	19,700	>19,700	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,500
50-84%	*	1,600	8,700	15,800
85-100%	3,800	10,700	17,400	>19,700

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Core Urbanized

Lanes	B	C	D	E
4	47,400	64,000	77,900	84,600
6	69,900	95,200	116,600	130,600
8	92,500	126,400	154,300	176,600
10	115,100	159,700	194,500	222,700
12	162,400	216,700	256,600	268,900

Urbanized

Lanes	B	C	D	E
4	45,800	61,500	74,400	79,900
6	68,100	93,000	111,800	123,300
8	91,500	123,500	148,700	166,800
10	114,800	156,000	187,100	210,300

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 20,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	8,600	17,000	24,200	33,300
4	Divided	36,700	51,800	65,600	72,600
6	Divided	55,000	77,700	98,300	108,800

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 1
(continued)

Generalized **Annual Average Daily** Volumes for Florida's **Urbanized Areas**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials				Class I	
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (u,lu)	lu	lu	u	u	u	u	u	u	u	u
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (n, nr, r)			n	r	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	4	4	5	5	2	2	1.9	1.8	2	2
Number of basic segments	4	4								
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.547	0.547	0.550	0.550	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)			1,700	2,100	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Local adjustment factor	0.91	0.91	0.97	0.98						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
	Density	Two-Lane %ffs	Multilane Density	Class I ats	Class II ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

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TABLE 2

Generalized **Annual Average Daily** Volumes for Florida's **Transitioning Areas** and **Areas Over 5,000 Not In Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	14,400	16,200	**
4	Divided	*	34,000	35,500	**
6	Divided	*	52,100	53,500	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	6,500	13,300	14,200
4	Divided	*	9,900	28,800	31,600
6	Divided	*	16,000	44,900	47,600

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,600	6,100	19,500
50-84%	1,900	5,500	18,400	>19,500
85-100%	7,500	19,500	>19,500	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,400
50-84%	*	1,600	8,600	15,600
85-100%	3,800	10,500	17,100	>19,500

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	44,100	57,600	68,900	71,700
6	65,100	85,600	102,200	111,000
8	85,100	113,700	135,200	150,000
10	106,200	141,700	168,800	189,000

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 20,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	9,200	17,300	24,400	33,300
4	Divided	35,300	49,600	62,900	69,600
6	Divided	52,800	74,500	94,300	104,500

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 2
(continued)

Generalized **Annual Average Daily** Volumes for Florida's **Transitioning** and **Areas Over 5,000 Not In Urbanized Areas**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (t,uo)	t	t	t	t	t	t	t	t	t
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n	n	n						
Median (n, nr, r)		n	r	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	8	5	5	1.8	2	2	2	2	2
Number of basic segments	4								
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,100	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Local adjustment factor	0.85	0.97	0.95						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
	Density	Two-Lane	Multilane	Class I	Class II	Score	Score	Buses/hr.
		%ffs	Density	ats	ats			
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

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TABLE 3

Generalized **Annual Average Daily** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	*	12,900	14,200	**
4	Divided	*	29,300	30,400	**
6	Divided	*	45,200	45,800	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	1,300	2,000	3,200
50-84%	1,000	2,100	3,200	10,600
85-100%	2,600	3,900	18,500	>18,500

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,300	4,900	15,600
50-84%	1,700	4,500	13,300	18,500
85-100%	5,900	18,500	>18,500	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,700	9,200
50-84%	*	1,500	8,400	14,900
85-100%	3,600	10,200	16,700	>19,200

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	28,800	43,000	52,300	60,000
6	43,000	64,000	78,300	92,500
8	57,500	85,400	104,400	123,500

Freeway Adjustments

Auxiliary Lanes Present in Both Directions + 20,000

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
2	Undivided	4,700	8,400	14,300	28,600
4	Divided	25,700	40,300	51,000	57,900
6	Divided	38,800	60,400	76,700	86,800

Developed Areas

Lanes	Median	B	C	D	E
2	Undivided	8,700	16,400	23,100	31,500
4	Divided	25,900	40,700	52,400	59,600
6	Divided	38,800	61,000	78,400	89,500

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 3
(continued)

Generalized **Annual Average Daily** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials		Bicycle		Pedestrian
ROADWAY CHARACTERISTICS										
Area type (ru, rd)	rural	ru	ru	rd	rd	rd	rd	ru	rd	rd
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	65	50	55	45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (n, nr, r)		n	r	n	r	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	14	10	10	5	5	1.9	2.2	4	2	2
Number of basic segments	4									
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.550	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,300	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	4.0	4.0	3.0	3.0	6.0	3.5	3.0
Local adjustment factor	0.84	0.88	0.73	0.97	0.82					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways				
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	Arterials	Bicycle	Pedestrian
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

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TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's **Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,510	1,600	**
4	Divided	*	3,420	3,580	**
6	Divided	*	5,250	5,390	**
8	Divided	*	7,090	7,210	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	660	1,330	1,410
4	Divided	*	1,310	2,920	3,040
6	Divided	*	2,090	4,500	4,590
8	Divided	*	2,880	6,060	6,130

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	260	680	1,770
50-84%	190	600	1,770	>1,770
85-100%	830	1,770	>1,770	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,420
85-100%	340	960	1,560	>1,770

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	4,120	5,540	6,700	7,190
6	6,130	8,370	10,060	11,100
8	8,230	11,100	13,390	15,010
10	10,330	14,040	16,840	18,930
12	14,450	18,880	22,030	22,860

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	770	1,530	2,170	2,990
4	Divided	3,300	4,660	5,900	6,530
6	Divided	4,950	6,990	8,840	9,790

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 4
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's **Urbanized Areas**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (lu, u)	lu	u	u	u	u	u	u	u	u
Number of through lanes (both dir.)	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (n, nr, r)		n	r	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		80							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	4	5	5	2	2	1.9	1.8	2	2
Number of basic segments	4								
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.547	0.550	0.550	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,100	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Local adjustment factor	0.91	0.97	0.98						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				4	4	10	10	4	6
Arrival type (1-6)				3	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	120	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
	Density	Two-Lane %ffs	Multilane Density	Class I ats	Class II ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

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TABLE 5

Generalized **Peak Hour Two-Way** Volumes for Florida's **Transitioning** and **Areas Over 5,000 Not In Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,300	1,460	**
4	Divided	*	3,060	3,200	**
6	Divided	*	4,690	4,820	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	580	1,200	1,280
4	Divided	*	890	2,590	2,850
6	Divided	*	1,440	4,040	4,280

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	140	550	1,760
50-84%	170	500	1,650	>1,760
85-100%	670	1,760	>1,760	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,410
85-100%	340	950	1,540	>1,760

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	3,970	5,190	6,200	6,460
6	5,860	7,710	9,190	9,990
8	7,660	10,230	12,170	13,500
10	9,550	12,750	15,190	17,010

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	820	1,550	2,190	2,990
4	Divided	3,170	4,460	5,660	6,260
6	Divided	4,750	6,700	8,480	9,400

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 5
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's **Transitioning Areas** and **Areas Over 5,000 Not In Urbanized Areas**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (t,uo)	t	t	t	t	t	t	t	t	t
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n	n	n						
Median (n, nr, r)		n	r	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	8	5	5	1.8	2	2	2	2	2
Number of basic segments	4								
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,100	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Local adjustment factor	0.85	0.97	0.95						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
	Density	Two-Lane %ffs	Multilane Density	Class I ats	Class II ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

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TABLE 6

Generalized **Peak Hour Two-Way** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	*	1,220	1,350	**
4	Divided	*	2,790	2,890	**
6	Divided	*	4,300	4,350	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	120	190	300
50-84%	100	200	310	>1,010
85-100%	250	370	1,760	>1,760

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	220	460	1,480
50-84%	170	430	1,270	>1,760
85-100%	560	1,760	>1,760	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	220	840
50-84%	*	120	780	1,390
85-100%	320	940	1,560	>1,820

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	3,020	4,510	5,490	6,300
6	4,510	6,720	8,220	9,720
8	6,040	8,970	10,960	12,970

Freeway Adjustments

Auxiliary Lanes Present in Both Directions + 1,800

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
2	Undivided	440	790	1,350	2,710
4	Divided	2,440	3,820	4,840	5,500
6	Divided	3,680	5,730	7,280	8,240

Developed Areas

Lanes	Median	B	C	D	E
2	Undivided	820	1,550	2,190	2,990
4	Divided	2,460	3,860	4,970	5,660
6	Divided	3,680	5,790	7,440	8,500

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 6
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials		Bicycle		Pedestrian
ROADWAY CHARACTERISTICS										
Area type (ru, rd)	rural	ru	ru	rd	rd	rd	rd	ru	rd	rd
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	65	50	55	45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (n, nr, r)		n	r	n	r	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	14	10	10	5	5	1.9	2.2	4	2	2
Number of basic segments	4									
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.550	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,300	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	4.0	4.0	3.0	3.0	6.0	3.5	3.0
Local adjustment factor	0.84	0.88	0.73	0.97	0.82					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, w)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways				
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	Arterials	Bicycle	Pedestrian
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

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TABLE 7

Generalized **Peak Hour Directional** Volumes for Florida's **Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	830	880	**
2	Divided	*	1,910	2,000	**
3	Divided	*	2,940	3,020	**
4	Divided	*	3,970	4,040	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	370	750	800
2	Divided	*	730	1,630	1,700
3	Divided	*	1,170	2,520	2,560
4	Divided	*	1,610	3,390	3,420

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
1	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	150	390	1,000
50-84%	110	340	1,000	>1,000
85-100%	470	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	140	480
50-84%	*	80	440	800
85-100%	200	540	880	>1,000

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
2	2,260	3,020	3,660	3,940
3	3,360	4,580	5,500	6,080
4	4,500	6,080	7,320	8,220
5	5,660	7,680	9,220	10,360
6	7,900	10,320	12,060	12,500

Freeway Adjustments

Auxiliary Lane	Ramp Metering
+ 1,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	420	840	1,190	1,640
2	Divided	1,810	2,560	3,240	3,590
3	Divided	2,720	3,840	4,860	5,380

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 7
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's **Urbanized Areas**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (lu, u)	lu	u	u	u	u	u	u	u	u
Number of through lanes (both dir.)	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (n, nr, r)		n	r	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		80							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	4	5	5	2	2	1.9	1.8	2	2
Number of basic segments	4								
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.547	0.550	0.550	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,100	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Local adjustment factor	0.91	0.97	0.98						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				4	4	10	10	4	6
Arrival type (1-6)				3	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	120	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, w)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
	Density	Two-Lane %ffs	Multilane Density	Class I ats	Class II ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

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TABLE 8

Generalized **Peak Hour Directional** Volumes for Florida's **Transitioning** and **Areas Over 5,000 Not In Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	710	800	**
2	Divided	*	1,740	1,820	**
3	Divided	*	2,670	2,740	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	330	680	720
2	Divided	*	500	1,460	1,600
3	Divided	*	810	2,280	2,420

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	140	320	1,000
50-84%	100	280	940	>1,000
85-100%	380	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	140	480
50-84%	*	80	440	800
85-100%	200	540	880	>1,000

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
2	2,200	2,880	3,440	3,580
3	3,260	4,280	5,100	5,540
4	4,260	5,680	6,760	7,500
5	5,300	7,080	8,440	9,440

Freeway Adjustments

Auxiliary Lane	Ramp Metering
+ 1,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	450	850	1,200	1,640
2	Divided	1,740	2,450	3,110	3,440
3	Divided	2,610	3,680	4,660	5,170

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 8
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's **Transitioning** and **Areas Over 5,000 Not In Urbanized Areas**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (t,uo)	t	t	t	t	t	t	t	t	t
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n	n	n						
Median (n, nr, r)		n	r	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	8	5	5	1.8	2	2	2	2	2
Number of basic segments	4								
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,100	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Local adjustment factor	0.85	0.97	0.95						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
CONTROL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
	Density	Two-Lane	Multilane	Class I	Class II	Score	Score	Buses/hr.
		%ffs	Density	ats	ats			
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

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TABLE 9

Generalized **Peak Hour Directional** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
1	Undivided	*	670	740	**
2	Divided	*	1,530	1,580	**
3	Divided	*	2,360	2,400	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
1	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	70	110	170
50-84%	60	120	180	580
85-100%	140	210	1,000	>1,000

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	120	260	840
50-84%	100	240	720	1,000
85-100%	320	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	120	460
50-84%	*	80	430	770
85-100%	180	520	860	>1,000

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
2	1,680	2,500	3,040	3,500
3	2,500	3,720	4,560	5,400
4	3,360	4,980	6,080	7,200

Freeway Adjustments

Auxiliary Lanes Present in Both Directions + 1,000

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
1	Undivided	240	430	740	1,490
2	Divided	1,340	2,100	2,660	3,020
3	Divided	2,020	3,150	4,000	4,530

Developed Areas

Lanes	Median	B	C	D	E
1	Undivided	450	850	1,200	1,640
2	Divided	1,350	2,120	2,730	3,110
3	Divided	2,020	3,180	4,090	4,670

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:

Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

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TABLE 9
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's **Rural Undeveloped Areas** and **Developed Areas Less Than 5,000 Population**

12/18/12

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials		Bicycle		Pedestrian
ROADWAY CHARACTERISTICS										
Area type (ru, rd)	rural	ru	ru	rd	rd	rd	rd	ru	rd	rd
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	65	50	55	45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (n, nr, r)		n	r	n	r	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	14	10	10	5	5	1.9	2.2	4	2	2
Number of basic segments	4									
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.555	0.550	0.550	0.550	0.550	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)		1,700	2,300	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	4.0	4.0	3.0	3.0	6.0	3.5	3.0
Local adjustment factor	0.84	0.88	0.73	0.97	0.82					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways				
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	Arterials	Bicycle	Pedestrian
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

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Appendix F: Existing Signal Timing

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Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Phase [1.1.1]

	1 (NL)	2 (ST)	3 (EL)	4 (WT)	5 (SL)	6 (NT)	7 (WL)	8 (ET)	9	10	11	12	13	14	15	16
Walk		7		7		7		7	7							
Ped Clearance		35		27		37		26	36							
Min Green	5	15	5	7	5	15	5	7	45							
Passage	6	8	6	8	6	8	6	8	3							
Max1	40	40	15	35	20	40	15	25	100							
Max2																
Yellow	5.5	5.5	4.8	4.8	5.5	5.5	4.8	4.8	5.1	9	9	9	9	9	9	9
Red	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7							
Red Revert	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Added Initial																
Max Initial																
Time Before Reduce	10					15										
Cars Before Reduce																
Time To Reduce	10					15										
Reduce By																
Min Gap	4					4										
Dynamic Max Limit																
Dynamic Max Step																
Auto Exit		ON				ON										
Rest In Walk																

Phase Option [1.1.2]

	1 (NL)	2 (ST)	3 (EL)	4 (WT)	5 (SL)	6 (NT)	7 (WL)	8 (ET)	9	10	11	12	13	14	15	16
Enable	ON	ON	ON	ON	ON	ON	ON	ON	ON							
Auto Entry				ON				ON								
Non Act1																
Non Act2																
Lock Call																
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable		ON		ON		ON		ON								
Guar Passage																
Cond Service																
Add Init Calc																

Alternate Phase Program 1, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Alternate Phase Program 2, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Alternate Phase Program 1, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 2, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

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Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Unit Parameters [1.2.1]

StartUp Flash	Auto Ped Clear	Backup Time	Red Revert	Console Timeout	Tone Disable	Feature Profile	Phase Mode	Diamond Mode	SDLC Retry Time	TS2 Det Faults	Cycle Fault Action	Max Cycle Time	Max Seek Track Time	Max Seek Dwell Time	Enable Run	Local Flash Start	Start Red Time	Disable Init Ped	Yellow 3 Second Disable	Omit Yellow Enable	Free Ring Sequence
	ON		3	30	OFF		USER	4PH		OFF	ALARM				ON	OFF		OFF	OFF	OFF	2

Comm, General Comm Parameters [6.1]

Station ID	Master Station ID	Fallback time	Allow Pencil	Port	System-Up	Sys-Down	PC/Print	Aux 232
1307		900	OFF					

Port Parameters [6.2]

Comm	Mode	Baud	MsgTime	Duplex	Enable	DialTime	Modem	ModemTime	Tel#1	Tel#2
System Up(P-A)										
System Down(P-B)										
PC/Print(P-2)										

Overlap General Parameters [1.5.1]

Conflict Lock	Lock Inhibit	Program Card	Use Parent	Canadian Fast Flash
ON	ON	OFF	ON	OFF

Overlap Program Parameters [1.5.2.1]

Overlap	Included Phases								Modifer Phases								Type	Green	Yellow	Red
Overlap 1	1	9															NORMAL		4.8	2.6
Overlap 2																	NORMAL		3.5	1.5
Overlap 3																	NORMAL		3.5	1.5
Overlap 4																	NORMAL		3.5	1.5
Overlap 5																	NORMAL		3.5	1.5
Overlap 6	6	9															NORMAL		3.5	1.5
Overlap 7																	NORMAL		3.5	1.5
Overlap 8																	NORMAL		3.5	1.5

Overlap Conflict Parameters+ [1.5.2.2]

Overlap	Conflicting Phases								Conflicting Overlaps								Conflicting Peds									
Overlap 1	2	3	4	7	8																				OFF	OFF
Overlap 2																									OFF	OFF
Overlap 3																									OFF	OFF
Overlap 4																									OFF	OFF
Overlap 5																									OFF	OFF
Overlap 6	5	3	4	7	8																				OFF	OFF
Overlap 7																									OFF	OFF
Overlap 8																									OFF	OFF

Detector, Vehicle Parameters 1-16 [5.1]

	1 (WBR1)	2 (WBT1)	3 (WBT2)	4 (WBL1)	5 (WBL2)	6 (NBT1)	7 (NBT2)	8 (NBL1)	9 (NBL2)	10 (EBR1)	11 (EBR2)	12 (EBT1)	13 (EBT2)	14 (EBL1)	15 (EBL2)	16
Call Phase						6	6	1								
Switch Phase																
Delay Time																

Detector, Vehicle Parameters 17-32 [5.1]

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Call Phase	4	4	4	7	7	6	6	1	1	8	8	3	2	2	2	5
Switch Phase						9	9	9	9							
Delay Time	5									5						

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Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Detector Alternate Program 1, Vehicle Parameters [5.5.1]

	1 (WBR1)	2 (WBT1)	3 (WBT2)	4 (WBL1)	5 (WBL2)	6 (NBT1)	7 (NBT2)	8 (NBL1)	9 (NBL2)	10 (EBR1)	11 (EBR2)	12 (EBT1)	13 (EBT2)	14 (EBL1)	15 (EBL2)	16
Call Phase																
Switch Phase																
Delay Time																

Channels/SDLC, Assign to Phases [1.3.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PH/OLP #	1	2	3	4	5	6	7	8	9	8			2	4	15	8								
Type	OLP	VEH	VEH	VEH	VEH	OLP	VEH	VEH	OLP	PED	OLP	OLP	PED	PED	OLP	PED								
Flash	RED	YEL	RED	RED	RED	YEL	RED	RED	RED	DRK	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz																								
Dimming Green																								
Dimming Yellow																								
Dimming Red																								
Alt Cyc	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Channel/SDLC, Parameters [1.3.3]

TOD Dim Enable	Extra Maps Enable	D Connector Enable	Single BIU Map	IO Mode	Preempt or Ext Output
OFF	DEFAULT		ON	AUTO	EXT

Channel/SDLC, MMU Map [1.3.5]

MMU-to-Controller Channel Map

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Channel/SDLC, Permissive [1.3.4]

Channel	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1		1						1			1	1			
2		1		1							1	1			
3	1						1	1	1	1					
4	1		1				1	1	1	1					
5				1				1							
6		1		1				1							
7			1												
8	1		1				1	1							
9		1	1				1								
10	1		1												
11															
12															
13		1													
14	1														
15															

Channel/SDLC, Permissive [1.3.7]

SDLC Device	Term/Fac								Detector								MMU	Diag
BIU#	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Present	ON	ON							ON	ON							ON	
Peer to Peer																		

Ring Sequence [1.2.4]

Ring	P1	P2	P3	P4	P5	P6	P7	P8
Ring 1	1	2	3	4				
Ring 2	5	6	7	8				
Ring 3								
Ring 4								

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Alarms, Enable Events [1.6.1]

Event#	Event Enable
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	ON
14	ON
15	ON
16	ON
17	
18	
19	
20	
21	
22	ON
23	ON
24	
25	
26	ON
27	
28	
29	ON
30	
31	
32	
33	
34	
35	
36	
37	ON
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	

Alarms, Enable Alarms [1.6.4]

Alarm#	Alarm Enable
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	ON
14	ON
15	ON
16	ON
17	
18	
19	
20	
21	
22	ON
23	ON
24	
25	
26	ON
27	
28	
29	ON
30	
31	
32	
33	
34	
35	
36	
37	ON
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	

Preemption Times[3.1]/Phases[3.2]/Options[3.3]

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON				
Override Higher						
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green	5	5	5	5	5	5
Min Walk						
Ped Clear						
Track Green						
Min Dwell	5	5	10	10	10	10
Max Presence						
Track R1						
Track R2						
Track R3						
Track R4						
Dwell P1						
Dwell P2						
Dwell P3						
Dwell P4						
Dwell P5						
Dwell P6						
Dwell P7						
Dwell P8						
Dwell P9						
Dwell P10						
Dwell P11						
Dwell P12						
Dwell Ped1						
Dwell Ped2						
Dwell Ped3						
Dwell Ped4						
Dwell Ped5						
Dwell Ped6						
Dwell Ped7						
Dwell Ped8						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Alarms, Parameters [1.4.1]

Auto Flash Parameter

Yellow	Red	Mode	Source
		VOT_MON	TEST A

Alarms, Parameters [1.6.7]

Preempt Event Enabled	Pattern Event Enabled
ON	ON

Alarms, Phases/Overlaps [1.4.2]

Auto Flash	1	2	3	4	5	6	7	8	9	10	11	12
Phases												
Overlaps												

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Preemption Times+[3.4]/Overlaps+[3.5]/Options+[3.6]

Preempt	1	2	3	4	5	6
Enable						
Type	RAIL	RAIL	EMERG	EMERG	EMERG	EMERG
Skip Track						
Volt Mon Flash						
Coord in Preempt						
Max2						
Return Max/Min	MAX	MAX	MIN	MIN	MIN	MIN
Extend Dwell	1	1				
Pattern						
Output Mode						
Track Over 1						
Track Over 2						
Track Over 3						
Track Over 4						
Track Over 5						
Track Over 6						
Track Over 7						
Track Over 8						
Track Over 9						
Track Over 10						
Track Over 11						
Track Over 12						
Dwell Over 1						
Dwell Over 2						
Dwell Over 3						
Dwell Over 4						
Dwell Over 5						
Dwell Over 6						
Dwell Over 7						
Dwell Over 8						
Dwell Over 9						
Dwell Over 10						
Dwell Over 11						
Dwell Over 12						
Ped Clear						
Yellow						
Red						
Return Min/Max						
Delay Inh						
Exit Time						
All Red B4						

Coordination, Modes,+ [2.1]

Modes

Operational	Correct	Maximum	Force-Off
	SHRT/LNG	MAX INH	FLOAT

Modes+

Mode	Leave Before	Leave After	Recycle	Stop In Walk	External	Auto Reset	Latch Sec Foff	Coord Easy Float	Yield Value	Coord NTCIP Yield Sign	Closed Loop Active	
FRC	TIMED	TIMED	P3478 INH	ON	OFF	ON	OFF	OFF	0	+	ON	OFF

Coordination, Pattern 1-16 [2.1]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle Time	200	120	150	110	110											
Offset Time	75	87	117	52	12											
Split Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seq Number	10	1	7	9	5	2	2	2	2	2	2	2	2	2	2	2
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn

Coordination, Pattern 17-32 [2.1]

Pattern	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Cycle Time																
Offset Time																
Split Number	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Seq Number	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn

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Coordination, Splits [2.7.1]

Split Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	90	30	18	62	30	90	18	62								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph						ON										

Split Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	28	54	15	23	29	53	15	23								
Mode	NON	MAX	NON	MAX	NON	MAX	NON	MAX	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	35	52	20	43	35	52	20	43								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	23	42	20	25	23	42	20	25								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	24	42	20	24	24	42	20	24								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	85	25	10	73	18	85	15	25	90							
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	85	26	10	62	22	85	15	25	90							
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

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Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Split Table 13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	25	45	15	35	30	42	15	45	90							
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 26	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 27	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT

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Coord-Ph																

Split Table 29	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 30	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 31	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 32	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

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Hillsborough County Timing Sheet 6/26/2018 8:15:12 AM

Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

TB Coor, Advanced Scheduler [4.3]

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
4	1												1	1	1	1	1	1	1	1																														2
5							1						1	1	1	1	1	1	1				1																											2
6												1	1	1	1	1	1	1	1																											1				2
7					1									1																															1	1	1	1	1	1	1	2
8									1					1						1	1	1	1	1	1	1																										2
9											1						1																											1	1	1	1	1	1	1			2
10											1							1																											1	1	1	1	1	1	1	2
11																																																		1
12																																																			1
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30																																																			1
31																																																			1
32																																																			1

TB Coor, Day Plan [4.4]

Day Plan Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		6	10	15	19	21										
Minute			30	30	30											
Action	99	1	2	3	4	99										

Day Plan Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		8	19													
Minute		30	30													
Action	99	5	99													

Day Plan Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		8	19													
Minute		30	30													
Action	99	5	99													

Day Plan Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

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Hillsborough County | Timing Sheet | 6/26/2018 8:15:12 AM

Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Day Plan Table 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

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Hillsborough County Timing Sheet 6/26/2018 8:15:12 AM

Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

TB Coor, Action Table [4.5]

Action	Pattern	Aux 1	Aux 2	Aux 3	Special 1	Special 2	Special 3	Special 4	Special 5	Special 6	Special 7	Special 8
1	1											
2	2											
3	3											
4	4											
5	5											
6	6											
7	7											
8	8											
9	9											
10	10											
11	11											
12	12											
13	13											
14	14											
15	15											
16	16											
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19	19											
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38	38											
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41	41											
42	42											
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57												
58												
59												
60												
61												
62												
63												
64												
99	254											
100	255											

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Appendix G: Existing Conditions Report

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NOVEMBER 2018

US 41@ CSX Grade Separation
FPID 440749-1-22-01
Draft Existing Conditions Report

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PREPARED FOR
FDOT DISTRICT 7

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1 Introduction

This memorandum provides the existing conditions traffic data, the design traffic characteristics and existing operational analysis information for the **US 41from South of SR 676 /Causeway Boulevard to North of SR 676 /Causeway Boulevard (including the intersection of US 41 and SR 676/Causeway Boulevard) – Corridor Study (FPID: 440749-1)**, within Hillsborough County, Florida. **Figure 1** shows the study area.

2 Existing Conditions Traffic Data

2.1 Traffic Count Information

72-hour bi-directional (approach and departure volumes at 15-minute increments) machine volume/classification counts and 2-hour a.m. (from 7:00 to 9:00) and 2-hour p.m. (from 4:00 to 6:00) peak hour turning movement counts were collected during August 21-23 and August 28-30, 2018 at the intersection and the approach locations identified in the traffic count location map provided in **Figure 2**.

- Location 1: US 41, S of Causeway Blvd – 72 Hour Volume Count,
- Location 2: US 41, N of Causeway Blvd – 72 Hour Volume Count
- Location 3: Causeway Blvd, W of US 41 – 72 Hour Classification Count and
- Location 4: Causeway Blvd, E of US 41 – 72 Hour Classification Count

Copies of all traffic count data are provided in **Appendix A.** The adjusted Annual Average Daily Traffic (AADT) volumes for the individual roadway segments are provided in **Table 1.**

Table 1: Existing Year 2018 Traffic Volumes

Roadway / Segment	Date of Count	Source and Type	ADT	Axle Adj.[2]	Seasonal Adj.[1]	Adjusted AADT [3]
Mainline Characteristics (US 41)						
US 41						
North of SR 676/Causeway Blvd	8/28/2018	72-hr Volume Count	26,146	0.96	1.05	26,000
South of SR 676/Causeway Blvd	8/28/2018	72-hr Volume Count	40,083	0.93	1.05	39,000
Side street Characteristics (SR 676)						
SR 676/Causeway Blvd						
East of US 41	8/21/2018	72-hr Classification	18,586		1.02	19,000
West of US 41	8/21/2018	72-hr Classification	27,046		1.02	28,000

Notes:
1. Most Recent Seasonal Adjustment factors were obtained from FDOT 2017 Florida Traffic Online website
2. Most Recent Axle Adjustment factors were obtained from FDOT 2017 Florida Traffic Online website.
3. Adjusted AADT = Measured ADT * Axle Adjustment * Seasonal Adjustment

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Source: Google Maps

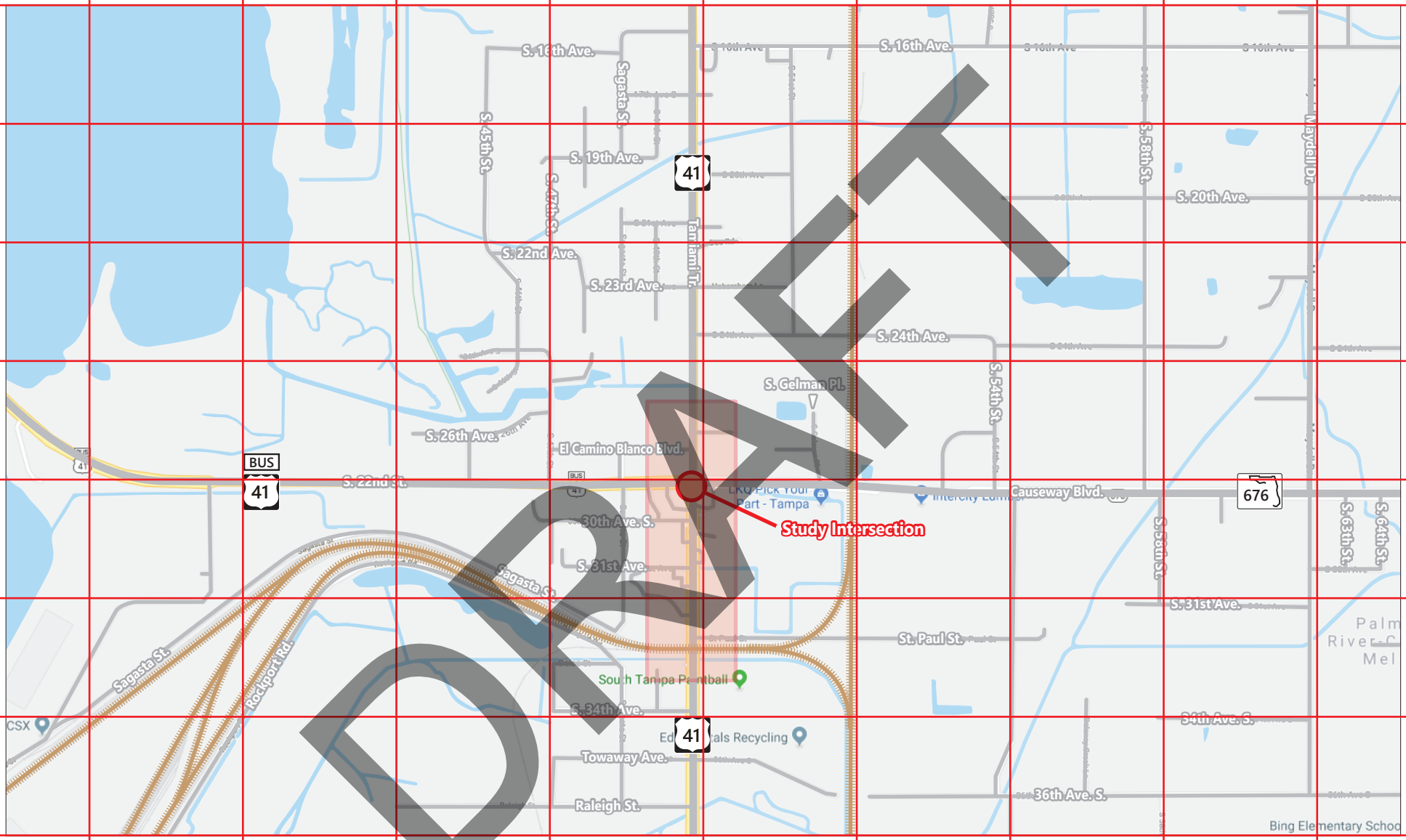

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Figure 1

Project Location Map
US 41 at CSX Grade Separation

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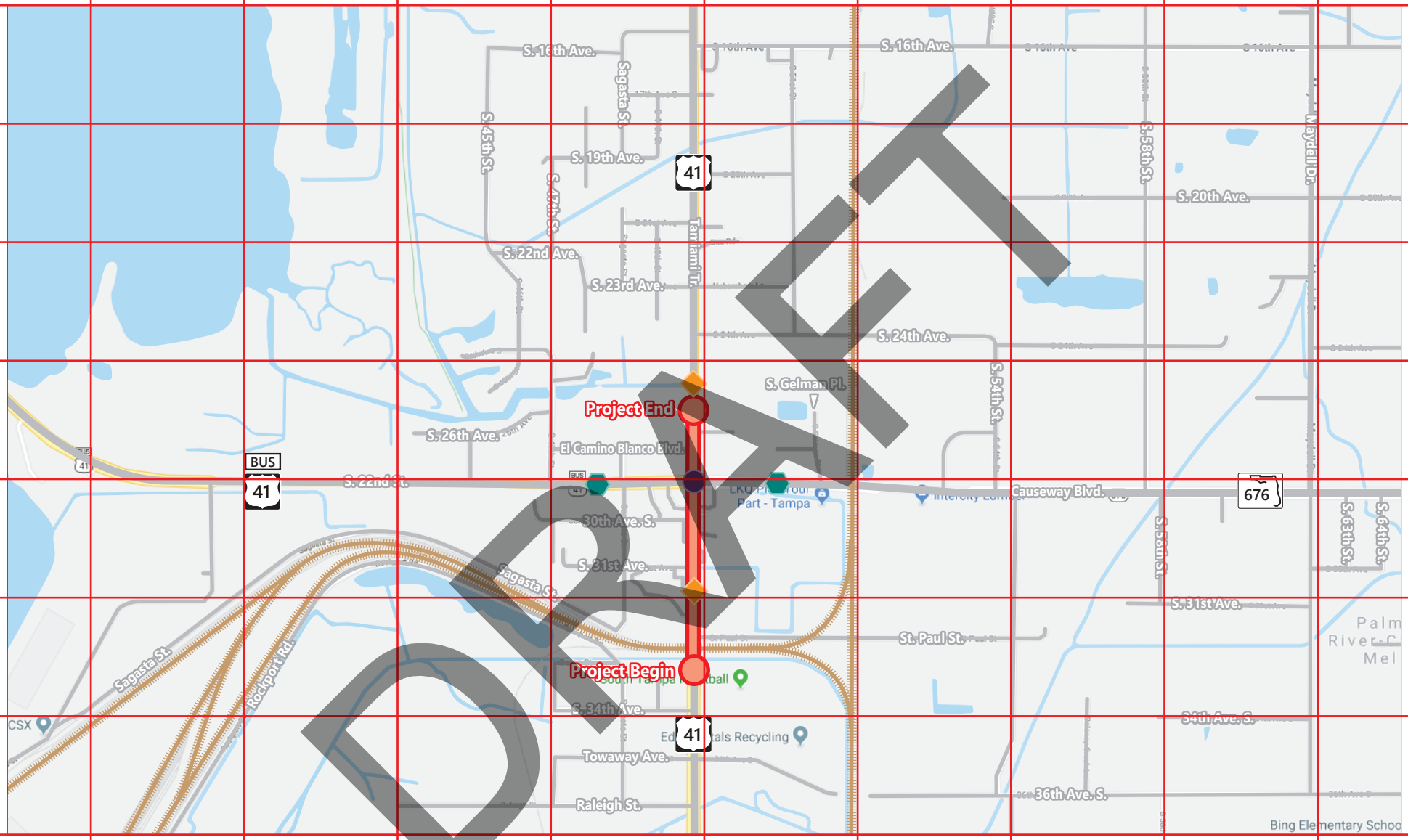
Source: Google Maps



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- 72-Hour Class Count
- 4-Hour Turning Movement Count (7-9 AM and 4-6 PM)
- 72-Hour Volume Count

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Figure 2

Traffic Count Location Map
US 41 at CSX Grade Separation

3 Development of Design Characteristics

The design traffic characteristics established in this section will be used in developing design hour volumes (DHV's) for the intersections and directional design hour volumes (DDHV's) for the roadway segments for the existing and future conditions. These characteristics are determined based on the procedures outlined in the FDOT's Project Traffic Forecasting Handbook, dated January 2014.

3.1 Standard K Factor

The Florida Department of Transportation's (FDOT) 2014 Project Traffic Forecasting Handbook documents the implementation of a standard peak hour to annual daily traffic factor. A review of handbook's standard K factor's table showed that the study area's "Large Urbanized area with Core freeways" consisting of arterials and highways has a standard K factor of 9.0 percent representative of a typical weekday peak hour.

The standard K factor of 9.0% is recommended for both US 41 Corridor and SR 676/Causeway Boulevard

3.2 D Factor

The historical D factors from the two cosites on US 41 (cosites #100003 & #100004) and the two cosites on SR 676/Causeway Boulevard (cosites #100022 & #100033) were obtained for 5 years between 2013 and 2017. The average, minimum and maximum D factors are 58.04%, 56.80% and 59.6%, respectively.

A telemetered count station (Co Site #100373) was located on US 41, 0.5 miles south of SR 676/Causeway Boulevard. The 200 highest hours median D factor was 72.4% for this permanent station during 2017 and the average, minimum and maximum D factors for the past 5 years, between 2013 and 2017, are 71.40%, 69.80% and 72.60%, respectively. The historical information for all the cosites from the 2017 FDOT Florida Traffic Online (FTO) website are provided in **Appendix B**.

The measured D factors for the major corridor US 41 and the side street SR 676/Causeway Boulevard are shown in **Table 2**.

Based on historical D factors and measured D factors, a D factor of 61.1% and 72.4% are recommended for North & East legs and South & West legs of the US 41 and SR 676/Causeway Boulevard intersection, respectively. The 72.4% D factor recommendation based on the median D factor for the 200 highest hour, while outside of the FDOT's Project Traffic Forecasting Handbooks recommended high of 67.1%, adheres to the document's utilization of highest 200 hours when feasible.

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Table 2: Existing Year 2018 – Measured D Factors

Roadway / Segment	ADT	Peak Hr.	NB/EB	SB/WB	"D"
Mainline Characteristics (US 41)					
US 41					
North of SR 676/Causeway Blvd	26,146	2,336	1,076	1,260	53.90%
South of SR 676/Causeway Blvd	40,083	3,264	2,340	924	71.70%
Side street Characteristics (SR 676)					
SR 676/Causeway Blvd					
East of US 41	18,586	1,598	977	621	61.10%
West of US 41	27,046	2,536	653	1,883	74.30%

3.3 T Factors

The historical T factors from the two cosites on US 41 (Cosites #100003 & #100004) and the two cosites on SR 676/Causeway Boulevard (Cosites #100022 & #100033) were obtained for 5 years between 2013 and 2017. The average, minimum and maximum T factors for US 41 are 12.40%, 9.30% and 14.60%, respectively. And the average, minimum and maximum T factors for SR 676/Causeway Boulevard are 9.88%, 8.05% and 11.40%, respectively.

The measured T factors for SR 676/Causeway Boulevard, east and west of US 41 are 13.1% and 13.2%, respectively.

Based on the measured and historical T factors, a T factor of 13.0% is recommended for both the US 41 and SR 676/Causeway Boulevard. The design hour truck (DHT) factor is one -half of the daily truck percentages. The DHT factor for the corridor is calculated to 6.5% and then rounded to the nearest whole value. The recommended DHT factor is 7.0%.

3.4 PHF Factor

Based on existing turning movement counts, an overall intersection peak hour factor (PHF) of 0.95 and 0.96 were observed for the study intersection during AM (7:30 – 8:30 AM) peak hour and PM (4:45 – 5:45 PM) peak hour, respectively. A PHF of 0.95 is recommended, from FDOT' Traffic Analysis Handbook, for an urban arterial.

Based on existing turning movement counts and FDOT's Traffic Analysis Handbook, a PHF of 0.95 is recommended for the study intersection.

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3.5 Recommended Design Traffic Characteristics

Based on the afore-mentioned discussion, the following **Table 3** provides a summary of the recommended design traffic characteristics for this study.

Table 3: Recommended Design Traffic Characteristics

Roadway / Segment	Recommended Factors				
	K Factor	D Factor	T Factor	DHT	PHF
US 41 & SR 676/Causeway Boulevard	9.00%	-	13.00%	7.00%	0.95
US 41, N. of SR 676/Causeway Boulevard and SR 676/Causeway Boulevard, E. of US 41	-	61.10%	-	-	-
US 41, S. of SR 676/Causeway Boulevard and SR 676/Causeway Boulevard, W. of US 41	-	72.40%	-	-	-

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4 Existing Operational Analysis

4.1 Design Hour Turning Movement Volumes

The existing design hour volumes were developed using the existing turning movement counts and AADT volumes and the recommended design traffic characteristics. The existing design hour volumes along with the existing AADT and geometry are illustrated in **Figure 3.**

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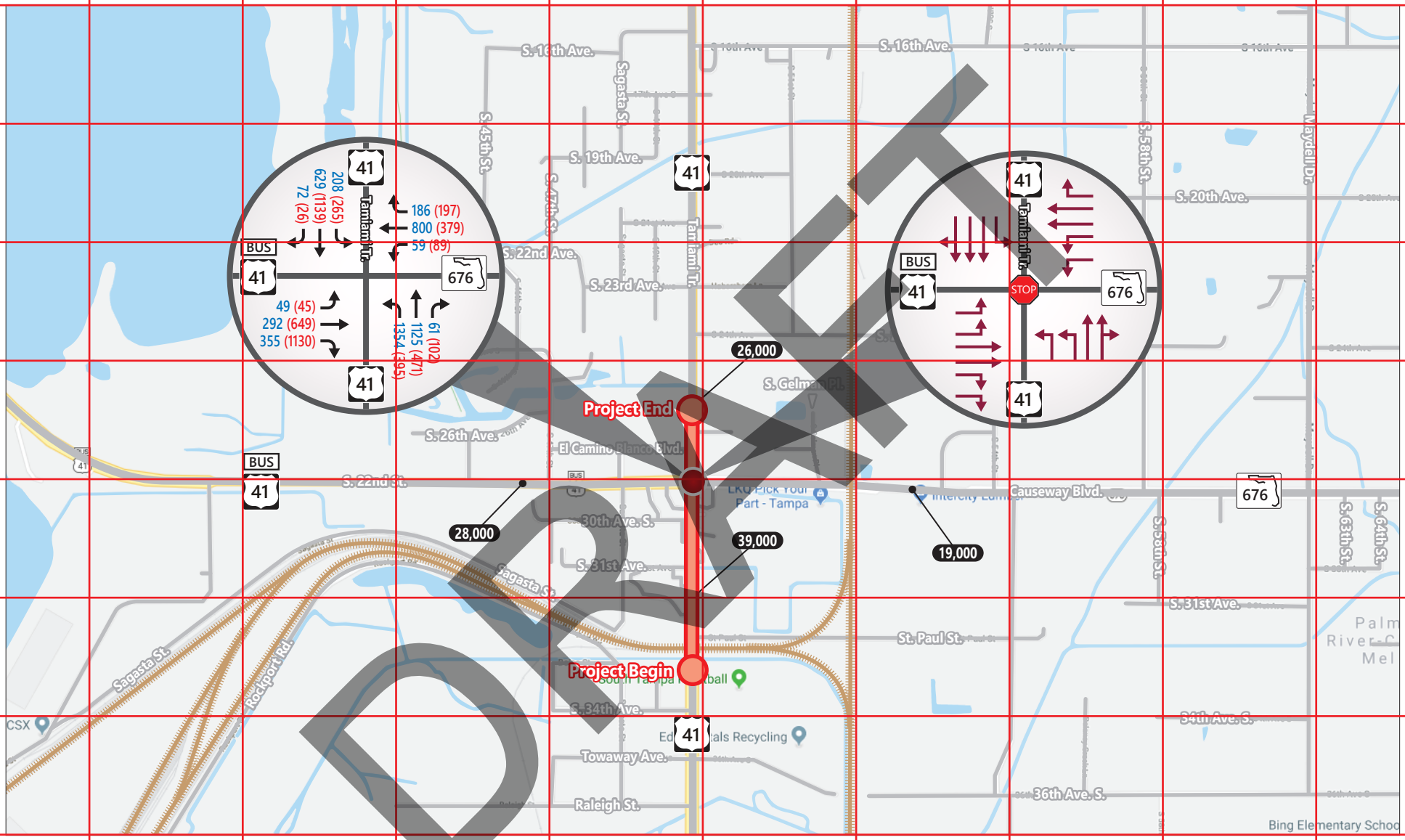
Source: Google Maps



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0000 Annual Average Daily Traffic

AM (PM) Turning Movement Volumes

Lane Geometry

FDOT

Figure 3

Existing AADT & Design Hour Turning Movement Counts

US 41 at CSX Grade Separation

4.2 Existing Operational Analysis

The existing conditions were evaluated using the existing design hour traffic volumes, existing signal timings and other pertinent field collected data using Synchro 10. Levels of service (LOS) for the study intersection was determined utilizing the HCM 6th edition methodologies incorporated within Synchro software.

A summary of the LOS analysis for the study intersections is included in **Table 4**. The study intersection was found to operate at LOS F and LOS E during 2018 AM and PM peak hour conditions, respectively. The synchro outputs along with the signal timings are provided in the **Appendix C.**

Table 4: Existing Year 2018 – Intersection LOS Analysis Summary

US 41 @ SR 676/Causeway Blvd	Control Type	FDOT Target LOS	Delay (sec/vehicle)	LOS
AM Peak Hour	Signal	D	108.3	F
PM Peak Hour			71.7	E

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Appendix A

Traffic Count Information

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Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between St Paul Street and S 31st Street

VHB Project #: 63286

28-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	33	22	30	38	46	167	288	584	578	327	260	262
30	25	39	9	37	90	220	523	570	588	304	282	209
45	32	39	12	69	88	243	531	632	516	327	301	270
00	15	22	32	51	127	339	489	610	447	266	254	206
Hr Total	**105**	**122**	**83**	**195**	**351**	**969**	**1,831**	**2,396**	**2,129**	**1,224**	**1,097**	**947**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	367	237	222	312	166	329	210	160	114	46	42	44
30	295	239	295	289	343	276	189	148	94	70	58	41
45	262	271	294	303	354	214	172	186	70	57	68	44
00	212	229	313	322	301	257	194	127	60	39	44	30
Hr Total	**1,136**	**976**	**1,124**	**1,226**	**1,164**	**1,076**	**765**	**621**	**338**	**212**	**212**	**159**

24 Hour Total : 20,458
AM Peak Hour begins : 7:30 AM Peak Volume : 2,408 AM Peak Hour Factor : 0.95
PM Peak Hour begins : 16:15 PM Peak Volume : 1,327 PM PeaK Hour Factor : 0.94

28-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	47	31	35	30	42	115	158	196	218	232	244	250
30	49	40	30	31	68	143	206	221	239	234	226	245
45	41	40	41	55	101	166	278	242	196	219	235	212
00	34	32	30	40	102	192	268	230	234	203	221	190
Hr Total	**171**	**143**	**136**	**156**	**313**	**616**	**910**	**889**	**887**	**888**	**926**	**897**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	266	257	258	346	438	511	365	287	180	121	87	76
30	250	257	293	388	491	530	383	244	149	110	94	68
45	273	270	320	392	439	485	363	239	169	152	87	69
00	251	302	340	435	484	536	303	206	146	122	83	48
Hr Total	**1,040**	**1,086**	**1,211**	**1,561**	**1,852**	**2,062**	**1,414**	**976**	**644**	**505**	**351**	**261**

24 Hour Total : 19,895
AM Peak Hour begins : 6:30 AM Peak Volume : 963 AM Peak Hour Factor : 0.87
PM Peak Hour begins : 17:00 PM Peak Volume : 2,062 PM PeaK Hour Factor : 0.96

28-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	80	53	65	68	88	282	446	780	796	559	504	512
30	74	79	39	68	158	363	729	791	827	538	508	454
45	73	79	53	124	189	409	809	874	712	546	536	482
00	49	54	62	91	229	531	757	840	681	469	475	396
Hr Total	**276**	**265**	**219**	**351**	**664**	**1,585**	**2,741**	**3,285**	**3,016**	**2,112**	**2,023**	**1,844**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	633	494	480	658	604	840	575	447	294	167	129	120
30	545	496	588	677	834	806	572	392	243	180	152	109
45	535	541	614	695	793	699	535	425	239	209	155	113
00	463	531	653	757	785	793	497	333	206	161	127	78
Hr Total	**2,176**	**2,062**	**2,335**	**2,787**	**3,016**	**3,138**	**2,179**	**1,597**	**982**	**717**	**563**	**420**

24 Hour Total : 40,353
AM Peak Hour begins : 7:30 AM Peak Volume : 3,337 AM Peak Hour Factor : 0.96
PM Peak Hour begins : 16:15 PM Peak Volume : 3,252 PM PeaK Hour Factor : 0.97

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between St Paul Street and S 31st Street

VHB Project #: 63286

29-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	41	32	17	59	123	152	410	534	573	375	283	240
30	30	20	23	56	73	206	456	524	628	320	275	252
45	32	25	15	8	104	293	535	545	582	330	271	237
00	14	14	17	8	113	290	544	576	526	223	254	265
Hr Total	**117**	**91**	**72**	**131**	**413**	**941**	**1,945**	**2,179**	**2,309**	**1,248**	**1,083**	**994**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	289	250	241	269	302	280	195	126	77	50	60	36
30	271	258	238	284	294	269	186	113	103	84	43	25
45	266	249	319	348	268	264	196	131	68	52	49	38
00	205	239	262	286	284	203	173	77	62	72	47	32
Hr Total	**1,031**	**996**	**1,060**	**1,187**	**1,148**	**1,016**	**750**	**447**	**310**	**258**	**199**	**131**

24 Hour Total : 20,056
AM Peak Hour begins : 7:45 AM Peak Volume : 2,359 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 15:30 PM Peak Volume : 1,230 PM PeaK Hour Factor : 0.88

29-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	50	42	22	33	103	117	213	193	205	234	240	228
30	44	39	23	25	57	134	223	246	180	190	207	216
45	57	43	37	37	110	154	246	277	201	228	240	222
00	41	40	11	0	118	189	248	221	222	193	237	237
Hr Total	**192**	**164**	**93**	**95**	**388**	**594**	**930**	**937**	**808**	**845**	**924**	**903**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	232	274	279	328	460	525	543	325	175	138	97	68
30	239	262	276	374	491	504	513	278	179	117	92	53
45	268	248	307	409	517	497	418	260	147	124	63	59
00	239	228	307	405	515	532	385	209	143	92	76	68
Hr Total	**978**	**1,012**	**1,169**	**1,516**	**1,983**	**2,058**	**1,859**	**1,072**	**644**	**471**	**328**	**248**

24 Hour Total : 20,211
AM Peak Hour begins : 6:45 AM Peak Volume : 964 AM Peak Hour Factor : 0.87
PM Peak Hour begins : 17:30 PM Peak Volume : 2,085 PM PeaK Hour Factor : 0.96

29-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	91	74	39	92	226	269	623	727	778	609	523	468
30	74	59	46	81	130	340	679	770	808	510	482	468
45	89	68	52	45	214	447	781	822	783	558	511	459
00	55	54	28	8	231	479	792	797	748	416	491	502
Hr Total	**309**	**255**	**165**	**226**	**801**	**1,535**	**2,875**	**3,116**	**3,117**	**2,093**	**2,007**	**1,897**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	521	524	520	597	762	805	738	451	252	188	157	104
30	510	520	514	658	785	773	699	391	282	201	135	78
45	534	497	626	757	785	761	614	391	215	176	112	97
00	444	467	569	691	799	735	558	286	205	164	123	100
Hr Total	**2,009**	**2,008**	**2,229**	**2,703**	**3,131**	**3,074**	**2,609**	**1,519**	**954**	**729**	**527**	**379**

24 Hour Total : 40,267
AM Peak Hour begins : 7:30 AM Peak Volume : 3,205 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:15 PM Peak Volume : 3,174 PM PeaK Hour Factor : 0.99

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between St Paul Street and S 31st Street

VHB Project #: 63286

30-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	40	15	21	49	47	177	331	589	587	351	275	219
30	33	25	15	36	50	244	450	504	538	280	249	232
45	26	14	29	50	90	257	496	581	493	334	243	274
00	20	32	36	27	122	273	547	583	420	336	234	254
Hr Total	**119**	**86**	**101**	**162**	**309**	**951**	**1,824**	**2,257**	**2,038**	**1,301**	**1,001**	**979**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	289	227	257	253	297	274	221	139	95	82	34	45
30	245	286	276	274	230	256	191	146	89	67	59	35
45	180	244	247	233	292	247	108	157	102	80	45	43
00	266	246	266	267	251	207	238	112	78	69	53	35
Hr Total	**980**	**1,003**	**1,046**	**1,027**	**1,070**	**984**	**758**	**554**	**364**	**298**	**191**	**158**

24 Hour Total : 19,561
AM Peak Hour begins : 7:30 AM Peak Volume : 2,289 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 15:45 PM Peak Volume : 1,086 PM PeaK Hour Factor : 0.91

30-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	46	39	22	29	41	99	131	196	219	182	206	204
30	41	37	32	21	51	157	173	206	244	161	220	227
45	36	46	29	37	75	143	211	254	201	188	228	248
00	30	24	18	35	83	139	233	242	191	222	208	252
Hr Total	**153**	**146**	**101**	**122**	**250**	**538**	**748**	**898**	**855**	**753**	**862**	**931**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	272	257	220	339	497	598	404	278	228	156	112	96
30	227	309	261	321	566	609	386	260	210	143	111	91
45	187	226	245	370	499	580	248	218	204	142	112	74
00	317	234	322	411	568	595	458	308	160	107	110	52
Hr Total	**1,003**	**1,026**	**1,048**	**1,441**	**2,130**	**2,382**	**1,496**	**1,064**	**802**	**548**	**445**	**313**

24 Hour Total : 20,055
AM Peak Hour begins : 7:30 AM Peak Volume : 959 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 17:00 PM Peak Volume : 2,382 PM PeaK Hour Factor : 0.98

30-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	86	54	43	78	88	276	462	785	806	533	481	423
30	74	62	47	57	101	401	623	710	782	441	469	459
45	62	60	58	87	165	400	707	835	694	522	471	522
00	50	56	54	62	205	412	780	825	611	558	442	506
Hr Total	**272**	**232**	**202**	**284**	**559**	**1,489**	**2,572**	**3,155**	**2,893**	**2,054**	**1,863**	**1,910**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	561	484	477	592	794	872	625	417	323	238	146	141
30	472	595	537	595	796	865	577	406	299	210	170	126
45	367	470	492	603	791	827	356	375	306	222	157	117
00	583	480	588	678	819	802	696	420	238	176	163	87
Hr Total	**1,983**	**2,029**	**2,094**	**2,468**	**3,200**	**3,366**	**2,254**	**1,618**	**1,166**	**846**	**636**	**471**

24 Hour Total : 39,616
AM Peak Hour begins : 7:30 AM Peak Volume : 3,248 AM Peak Hour Factor : 0.97
PM Peak Hour begins : 16:45 PM Peak Volume : 3,383 PM PeaK Hour Factor : 0.97

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between S 27th Avenue & S 24th Avenue

VHB Project #: 63286

28-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	23	12	26	21	26	70	136	338	366	234	191	185
30	21	31	7	29	48	102	194	352	346	194	182	168
45	19	28	13	53	50	110	230	302	349	197	165	194
00	8	26	17	26	58	132	201	370	289	197	200	192
Hr Total	**71**	**97**	**63**	**129**	**182**	**414**	**761**	**1,362**	**1,350**	**822**	**738**	**739**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	224	187	181	188	177	263	228	139	103	42	40	41
30	217	180	202	170	241	244	191	122	74	64	34	39
45	218	185	183	147	293	230	181	117	58	44	50	40
00	168	212	195	167	271	215	128	118	56	27	38	29
Hr Total	**827**	**764**	**761**	**672**	**982**	**952**	**728**	**496**	**291**	**177**	**162**	**149**

24 Hour Total : 13,689
AM Peak Hour begins : 7:45 AM Peak Volume : 1,431 AM Peak Hour Factor : 0.97
PM Peak Hour begins : 16:30 PM Peak Volume : 1,071 PM PeaK Hour Factor : 0.91

28-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	19	20	11	14	20	70	94	125	153	162	155	181
30	24	23	14	21	44	95	104	150	201	171	169	182
45	15	22	31	28	65	102	116	198	195	164	221	170
00	22	25	20	34	68	103	119	126	199	173	167	188
Hr Total	**80**	**90**	**76**	**97**	**197**	**370**	**433**	**599**	**748**	**670**	**712**	**721**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	179	194	164	218	275	304	333	180	83	65	35	41
30	189	189	188	231	266	318	158	120	74	61	47	26
45	194	192	236	234	293	323	135	124	86	62	53	26
00	163	193	214	215	305	326	179	95	80	68	41	22
Hr Total	**725**	**768**	**802**	**898**	**1,139**	**1,271**	**805**	**519**	**323**	**256**	**176**	**115**

24 Hour Total : 12,590
AM Peak Hour begins : 8:15 AM Peak Volume : 757 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 17:15 PM Peak Volume : 1,300 PM PeaK Hour Factor : 0.98

28-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	42	32	37	35	46	140	230	463	519	396	346	366
30	45	54	21	50	92	197	298	502	547	365	351	350
45	34	50	44	81	115	212	346	500	544	361	386	364
00	30	51	37	60	126	235	320	496	488	370	367	380
Hr Total	**151**	**187**	**139**	**226**	**379**	**784**	**1,194**	**1,961**	**2,098**	**1,492**	**1,450**	**1,460**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	403	381	345	406	452	567	561	319	186	107	75	82
30	406	369	390	401	507	562	349	242	148	125	81	65
45	412	377	419	381	586	553	316	241	144	106	103	66
00	331	405	409	382	576	541	307	213	136	95	79	51
Hr Total	**1,552**	**1,532**	**1,563**	**1,570**	**2,121**	**2,223**	**1,533**	**1,015**	**614**	**433**	**338**	**264**

24 Hour Total : 26,279
AM Peak Hour begins : 7:45 AM Peak Volume : 2,106 AM Peak Hour Factor : 0.96
PM Peak Hour begins : 16:30 PM Peak Volume : 2,291 PM PeaK Hour Factor : 0.98

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between S 27th Avenue & S 24th Avenue

VHB Project #: 63286

29-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	32	20	11	42	69	60	176	305	338	241	199	170
30	23	16	20	32	42	74	177	349	347	189	200	176
45	20	14	19	14	50	112	211	342	316	186	146	167
00	12	10	11	13	59	141	224	367	341	131	191	216
Hr Total	**87**	**60**	**61**	**101**	**220**	**387**	**788**	**1,363**	**1,342**	**747**	**736**	**729**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	202	181	182	182	174	268	224	107	58	44	47	38
30	191	209	192	172	238	245	144	84	71	45	35	22
45	196	164	212	163	271	232	130	102	53	36	26	33
00	190	212	198	167	268	213	114	73	50	38	35	25
Hr Total	**779**	**766**	**784**	**684**	**951**	**958**	**612**	**366**	**232**	**163**	**143**	**118**

24 Hour Total : 13,177
AM Peak Hour begins : 7:15 AM Peak Volume : 1,396 AM Peak Hour Factor : 0.95
PM Peak Hour begins : 16:30 PM Peak Volume : 1,052 PM PeaK Hour Factor : 0.97

29-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	18	20	16	23	30	58	175	131	163	186	156	172
30	16	23	15	26	31	106	158	155	206	154	156	155
45	29	20	20	32	65	114	164	198	172	177	167	138
00	16	19	25	32	64	143	117	130	167	177	149	185
Hr Total	**79**	**82**	**76**	**113**	**190**	**421**	**614**	**614**	**708**	**694**	**628**	**650**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	176	181	170	203	275	317	322	162	87	71	55	36
30	175	194	167	200	244	300	230	145	96	58	51	28
45	195	197	209	229	275	283	236	116	81	65	40	23
00	164	176	182	197	321	335	189	111	70	61	53	31
Hr Total	**710**	**748**	**728**	**829**	**1,115**	**1,235**	**977**	**534**	**334**	**255**	**199**	**118**

24 Hour Total : 12,651
AM Peak Hour begins : 8:15 AM Peak Volume : 731 AM Peak Hour Factor : 0.89
PM Peak Hour begins : 17:15 PM Peak Volume : 1,240 PM PeaK Hour Factor : 0.93

29-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	50	40	27	65	99	118	351	436	501	427	355	342
30	39	39	35	58	73	180	335	504	553	343	356	331
45	49	34	39	46	115	226	375	540	488	363	313	305
00	28	29	36	45	123	284	341	497	508	308	340	401
Hr Total	**166**	**142**	**137**	**214**	**410**	**808**	**1,402**	**1,977**	**2,050**	**1,441**	**1,364**	**1,379**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	378	362	352	385	449	585	546	269	145	115	102	74
30	366	403	359	372	482	545	374	229	167	103	86	50
45	391	361	421	392	546	515	366	218	134	101	66	56
00	354	388	380	364	589	548	303	184	120	99	88	56
Hr Total	**1,489**	**1,514**	**1,512**	**1,513**	**2,066**	**2,193**	**1,589**	**900**	**566**	**418**	**342**	**236**

24 Hour Total : 25,828
AM Peak Hour begins : 7:30 AM Peak Volume : 2,091 AM Peak Hour Factor : 0.95
PM Peak Hour begins : 16:30 PM Peak Volume : 2,265 PM PeaK Hour Factor : 0.96

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : August 28, 2018 Start Time 00:00
Stop Date : August 31, 2018 Stop Time 24:00
County : Hillsborough
Location : US 41 between S 27th Avenue & S 24th Avenue

VHB Project #: 63286

30-Aug-18 **Northbound Volume for Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	31	11	13	36	25	64	145	282	329	238	170	167
30	23	15	8	24	24	101	183	321	312	182	176	204
45	14	14	20	41	48	108	198	318	306	188	174	195
00	14	26	18	19	63	132	226	318	278	200	166	183
Hr Total	**82**	**66**	**59**	**120**	**160**	**405**	**752**	**1,239**	**1,225**	**808**	**686**	**749**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	212	176	158	194	197	267	216	102	75	53	27	30
30	209	209	207	222	218	251	137	87	60	53	33	37
45	138	209	173	207	297	227	118	110	71	56	38	33
00	243	180	213	197	290	194	165	85	50	51	28	23
Hr Total	**802**	**774**	**751**	**820**	**1,002**	**939**	**636**	**384**	**256**	**213**	**126**	**123**

24 Hour Total : 13,177
AM Peak Hour begins : 7:15 AM Peak Volume : 1,286 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:30 PM Peak Volume : 1,105 PM PeaK Hour Factor : 0.93

30-Aug-18 **Southbound Volume for Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	25	25	16	21	30	57	120	160	162	133	163	161
30	26	19	16	17	34	104	160	151	203	176	144	165
45	21	24	18	26	53	107	136	190	182	152	170	179
00	18	15	17	26	58	129	115	176	147	167	161	174
Hr Total	**90**	**83**	**67**	**90**	**175**	**397**	**531**	**677**	**694**	**628**	**638**	**679**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	180	185	142	207	315	364	288	178	141	73	55	36
30	172	217	197	194	339	351	186	154	122	70	60	46
45	179	175	218	200	290	332	200	109	126	71	59	36
00	217	172	206	233	342	332	193	203	83	67	62	29
Hr Total	**748**	**749**	**763**	**834**	**1,286**	**1,379**	**867**	**644**	**472**	**281**	**236**	**147**

24 Hour Total : 13,155
AM Peak Hour begins : 7:30 AM Peak Volume : 731 AM Peak Hour Factor : 0.90
PM Peak Hour begins : 16:45 PM Peak Volume : 1,389 PM PeaK Hour Factor : 0.95

30-Aug-18 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	56	36	29	57	55	121	265	442	491	371	333	328
30	49	34	24	41	58	205	343	472	515	358	320	369
45	35	38	38	67	101	215	334	508	488	340	344	374
00	32	41	35	45	121	261	341	494	425	367	327	357
Hr Total	**172**	**149**	**126**	**210**	**335**	**802**	**1,283**	**1,916**	**1,919**	**1,436**	**1,324**	**1,428**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	392	361	300	401	512	631	504	280	216	126	82	66
30	381	426	404	416	557	602	323	241	182	123	93	83
45	317	384	391	407	587	559	318	219	197	127	97	69
00	460	352	419	430	632	526	358	288	133	118	90	52
Hr Total	**1,550**	**1,523**	**1,514**	**1,654**	**2,288**	**2,318**	**1,503**	**1,028**	**728**	**494**	**362**	**270**

24 Hour Total : 26,332
AM Peak Hour begins : 7:30 AM Peak Volume : 2,008 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:30 PM Peak Volume : 2,452 PM PeaK Hour Factor : 0.97

DRAFT

TRAFFIC COUNT DATA

VHB PROJECT NO:	63286.00
LOCATION CODE:	3
COUNT LOCATION:	Causeway Blvd -BTW Sagasta St and S 47th St-W of US 41
EQUIPMENT ID:	101/27

TYPE OF COUNT: 72 Hour Classification Count

TIME OF COUNT:

Start Date:	8/20/2018	Start Time:	Midnight
End Date:	8/23/2018	End Time:	Midnight

VOLUMES:

		Peak Hour Time:	7:15 AM
Average Daily:	27,046	Average Peak Hour:	2,536
Daily Truck Avg:	3,568	Max Hour Truck Avg:	375
		Peak Hour Truck Avg:	292

TRAVEL CHARACTERISTICS:

K MEASURED		D MEASURED	
K=	9.4%	D=	74.2%
T Max Hour	14.8%	T daily	13.2%
T med (max)	2.9%	T med Daily	2.7%
T heavy (max)	11.9%	T heavy Daily	10.5%
T Peak Hour	11.5%		
T med Peak Hour	2.1%	Axle Factor	0.94
T heavy Peak Hour	9.4%		

DRAFT

HOURLY DISTRIBUTIONS OF TRAFFIC VOLUMES

VHB PROJECT NO: 63286.00
LOCATION CODE: 3
COUNT LOCATION: Causeway Blvd -BTW Sagasta St and S 47th St-W of US 41
EQUIPMENT ID: 101/27

HOUR ENDING AT	HOURLY VOLUME DIRECTION (NB OR EB)	HOURLY VOLUME DIRECTION (SB OR WB)	TOTAL VOLUME BOTH DIRECTIONS	DISTRIBUTION PERCENT DIRECTION (NB OR EB)	DISTRIBUTION PERCENT DIRECTION (SB OR WB)	TOTAL PERCENT BOTH DIRECTIONS
1:00 AM	139	69	209	1.04%	0.51%	0.77%
2:00 AM	111	58	170	0.83%	0.43%	0.63%
3:00 AM	80	57	137	0.60%	0.42%	0.51%
4:00 AM	105	83	188	0.78%	0.61%	0.69%
5:00 AM	138	168	306	1.03%	1.23%	1.13%
6:00 AM	315	533	848	2.34%	3.91%	3.13%
7:00 AM	517	1,279	1,796	3.85%	9.39%	6.64%
8:00 AM	620	1,850	2,471	4.62%	13.58%	9.13%
9:00 AM	613	1,730	2,344	4.57%	12.70%	8.67%
10:00 AM	492	947	1,439	3.67%	6.95%	5.32%
11:00 AM	523	663	1,186	3.89%	4.87%	4.38%
12:00 PM	504	570	1,075	3.76%	4.19%	3.97%
1:00 PM	581	541	1,122	4.33%	3.97%	4.15%
2:00 PM	652	548	1,200	4.85%	4.03%	4.44%
3:00 PM	732	585	1,317	5.45%	4.30%	4.87%
4:00 PM	1,054	663	1,718	7.85%	4.87%	6.35%
5:00 PM	1,435	697	2,132	10.69%	5.12%	7.88%
6:00 PM	1,200	678	1,879	8.94%	4.98%	6.95%
7:00 PM	1,087	613	1,700	8.10%	4.50%	6.29%
8:00 PM	849	420	1,269	6.33%	3.08%	4.69%
9:00 PM	611	283	894	4.55%	2.08%	3.31%
10:00 PM	451	236	687	3.36%	1.73%	2.54%
11:00 PM	319	213	533	2.38%	1.57%	1.97%
12:00 AM	294	136	430	2.19%	1.00%	1.59%
TOTALS	13,424	13,622	27,046	100.0%	100.0%	100.0%

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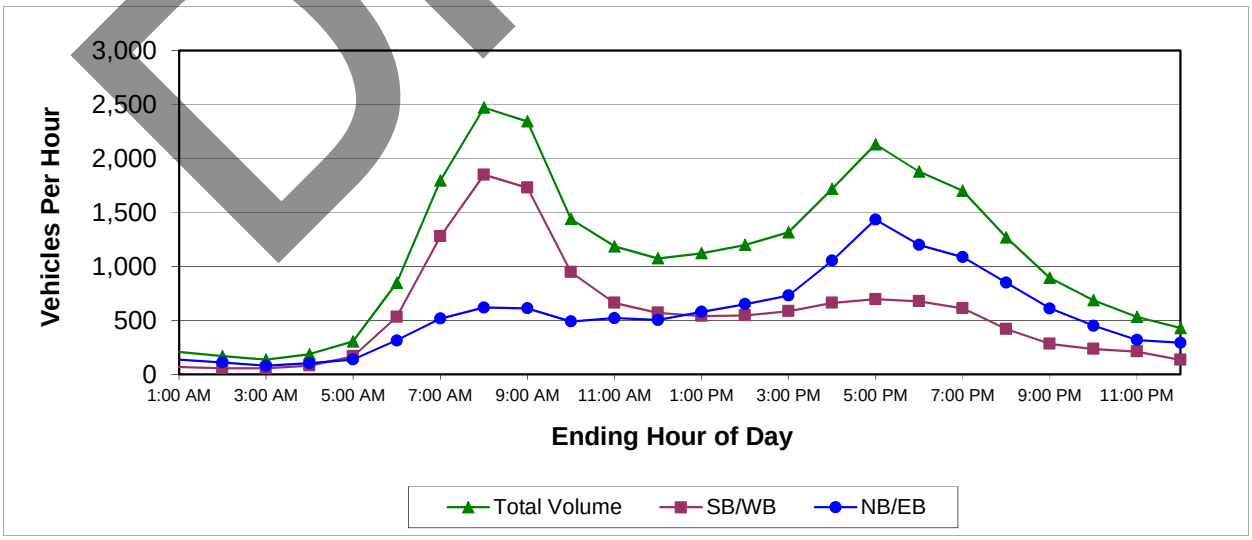

ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63286.00
LOCATION CODE: 3
COUNT LOCATION: Causeway Blvd -BTW Sagasta St and S 47th St-W of US 41
EQUIPMENT ID: 101/27

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	797	2.95%
Class 2	Cars	19,382	71.79%
Class 3	Pick-Ups & Vans	3,252	12.05%
Class 4	Buses	104	0.39%
Class 5	2 Axle, Single Unit Trucks	632	2.34%
Class 6	3 Axle, Single Unit Trucks	820	3.04%
Class 7	4 Axle, Single Unit Trucks	253	0.94%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	190	0.70%
Class 9	3 Axle Tractor with 2 Axle Trailer	907	3.36%
Class 10	3 Axle Tractor with 3 Axle Trailer	123	0.46%
Class 11	5 Axle Multi Trailer	113	0.42%
Class 12	6 Axle Multi Trailer	143	0.53%
Class 13	7 or more Axles	281	1.04%
Class 14	Not Used	0	0.00%
Class 15	Other	0	0.00%
TOTALS		**26,997**	**100.00%**

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TRAFFIC COUNT DATA

VHB PROJECT NO:	63286.00
LOCATION CODE:	4
COUNT LOCATION:	Causeway Blvd - between US 41 and S Gelman Pl
EQUIPMENT ID:	109/247

TYPE OF COUNT: 72 Hour Classification Count

TIME OF COUNT:

Start Date:	8/20/2018	Start Time:	Midnight
End Date:	8/23/2018	End Time:	Midnight

VOLUMES:

		Peak Hour Time:	5:00 PM
Average Daily:	18,586	Average Peak Hour:	1,598
Daily Truck Avg:	2,427	Max Hour Truck Avg:	230
		Peak Hour Truck Avg:	133

TRAVEL CHARACTERISTICS:

K MEASURED		D MEASURED	
K=	8.6%	D=	61.1%
T Max Hour	14.4%	T daily	13.1%
T med (max)	5.8%	T med Daily	5.0%
T heavy (max)	8.6%	T heavy Daily	8.1%
T Peak Hour	8.3%		
T med Peak Hour	3.4%	Axle Factor	0.96
T heavy Peak Hour	4.9%		

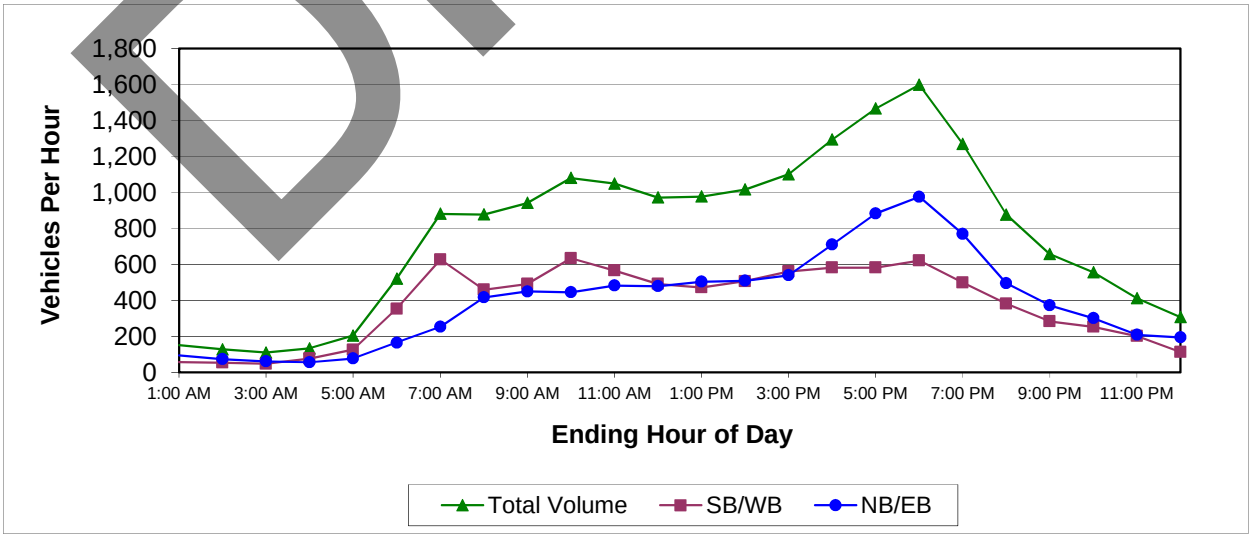
DRAFT

HOURLY DISTRIBUTIONS OF TRAFFIC VOLUMES

VHB PROJECT NO: 63286.00
LOCATION CODE: 4
COUNT LOCATION: Causeway Blvd - between US 41 and S Gelman Pl
EQUIPMENT ID: 109/247

HOUR ENDING AT	HOURLY VOLUME DIRECTION (NB OR EB)	HOURLY VOLUME DIRECTION (SB OR WB)	TOTAL VOLUME BOTH DIRECTIONS	DISTRIBUTION PERCENT DIRECTION (NB OR EB)	DISTRIBUTION PERCENT DIRECTION (SB OR WB)	TOTAL PERCENT BOTH DIRECTIONS
1:00 AM	95	58	153	1.00%	0.64%	0.82%
2:00 AM	74	55	129	0.78%	0.60%	0.69%
3:00 AM	62	49	110	0.65%	0.54%	0.59%
4:00 AM	57	77	134	0.59%	0.85%	0.72%
5:00 AM	78	127	205	0.82%	1.40%	1.10%
6:00 AM	166	354	520	1.74%	3.91%	2.80%
7:00 AM	253	628	881	2.66%	6.93%	4.74%
8:00 AM	417	460	878	4.38%	5.08%	4.72%
9:00 AM	450	492	942	4.73%	5.43%	5.07%
10:00 AM	446	635	1,081	4.68%	7.01%	5.81%
11:00 AM	483	566	1,050	5.07%	6.25%	5.65%
12:00 PM	480	492	972	5.04%	5.43%	5.23%
1:00 PM	505	473	978	5.30%	5.22%	5.26%
2:00 PM	509	507	1,016	5.34%	5.60%	5.47%
3:00 PM	540	561	1,101	5.67%	6.20%	5.92%
4:00 PM	711	583	1,294	7.46%	6.44%	6.96%
5:00 PM	883	583	1,466	9.27%	6.44%	7.89%
6:00 PM	977	621	1,598	10.25%	6.86%	8.60%
7:00 PM	770	499	1,269	8.08%	5.51%	6.83%
8:00 PM	495	382	877	5.20%	4.21%	4.72%
9:00 PM	373	284	657	3.91%	3.14%	3.53%
10:00 PM	302	254	556	3.17%	2.81%	2.99%
11:00 PM	210	202	412	2.20%	2.23%	2.22%
12:00 AM	195	113	308	2.04%	1.25%	1.66%
TOTALS	9,531	9,056	18,586	100.0%	100.0%	100.0%

DRAFT



ANNUAL VEHICLE CLASSIFICATION REPORT

VHB PROJECT NO: 63286.00
LOCATION CODE: 4
COUNT LOCATION: Causeway Blvd - between US 41 and S Gelman Pl
EQUIPMENT ID: 109/247

Vehicle Classification	Vehicle Type	Average Daily Statistics	
		Volume	Percentage
Class 1	Motorcycles	1,039	5.60%
Class 2	Cars	12,909	69.59%
Class 3	Pick-Ups & Vans	2,177	11.74%
Class 4	Buses	133	0.72%
Class 5	2 Axle, Single Unit Trucks	790	4.26%
Class 6	3 Axle, Single Unit Trucks	345	1.86%
Class 7	4 Axle, Single Unit Trucks	113	0.61%
Class 8	2 Axle Trctr with 1 or 2 Axle Trlr, 3 Axle Trctr with 1 Axle	209	1.13%
Class 9	3 Axle Tractor with 2 Axle Trailer	533	2.87%
Class 10	3 Axle Tractor with 3 Axle Trailer	54	0.29%
Class 11	5 Axle Multi Trailer	56	0.30%
Class 12	6 Axle Multi Trailer	59	0.32%
Class 13	7 or more Axles	132	0.71%
Class 14	Not Used	0	0.00%
Class 15	Other	0	0.00%
TOTALS		**18,549**	**100.00%**

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough	**City**	Tampa
Intersection	US 41	&	Causeway Blvd
Date	Tuesday, August 21, 2018		**All Vehicles**
Time Period	7:00 to 9:00	**AM**	

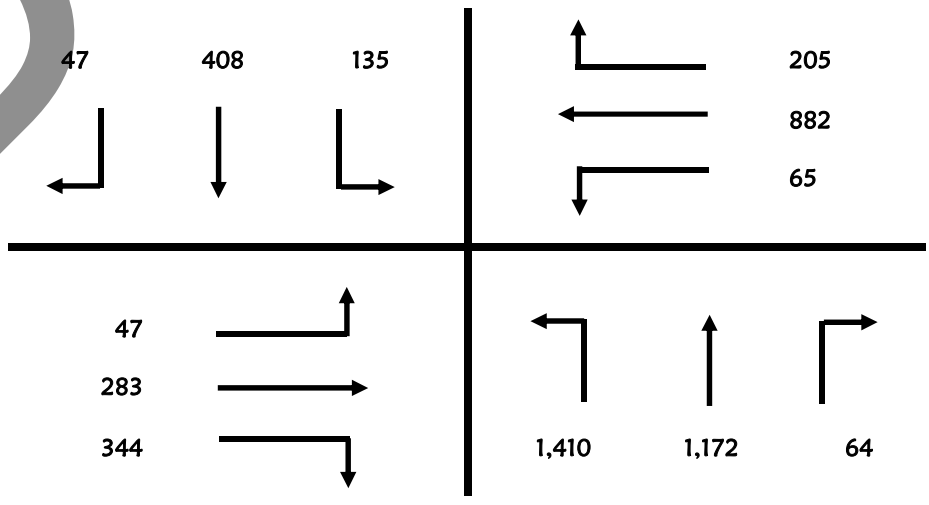
VHB Project #: 63286.00

Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	324	264	16	38	99	13
7:15 - 7:30	430	202	10	28	77	13
7:30 - 7:45	318	256	13	45	137	12
7:45 - 8:00	409	285	22	34	85	12
8:00 - 8:15	321	337	19	27	121	13
8:15 - 8:30	362	294	10	29	65	10
8:30 - 8:45	276	281	27	44	136	8
8:45 - 9:00	217	179	25	39	129	12
	2,657	2,098	142	284	849	93

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	6	59	69	15	282	56
7:15 - 7:30	4	82	95	12	208	42
7:30 - 7:45	8	68	96	8	255	42
7:45 - 8:00	8	84	114	16	198	65
8:00 - 8:15	14	35	49	17	253	52
8:15 - 8:30	17	96	85	24	176	46
8:30 - 8:45	10	74	59	17	200	40
8:45 - 9:00	14	70	74	17	126	37
	81	568	641	126	1,698	380

North / South
US 41

East / West
Causeway Blvd



Peak Hour
7:30 - 8:30

Peak Hour Factor
0.95

Total Pk Hr Voume
5,062

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	7:00	to	9:00	AM	**Trucks**

VHB Project #: 63286.00

DRAFT

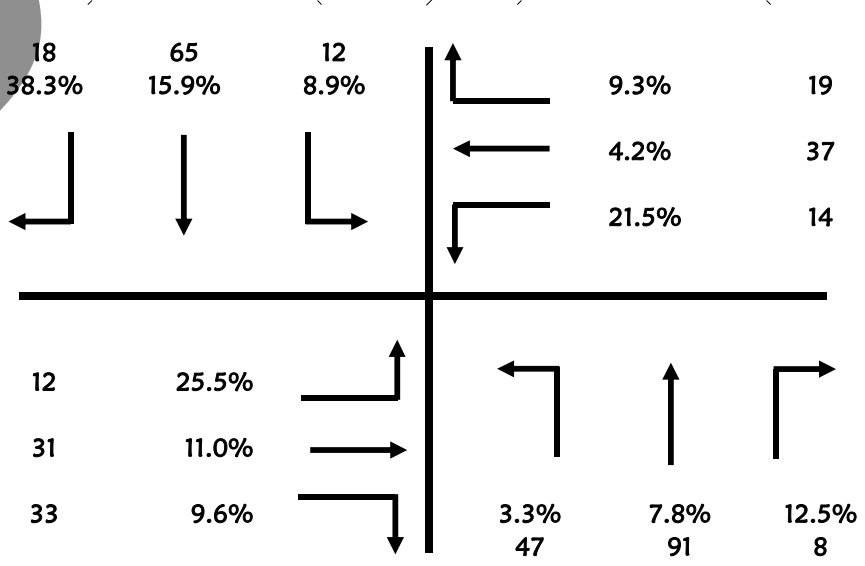
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	11	30	1	7	12	2
7:15 - 7:30	18	22	1	1	7	0
7:30 - 7:45	8	27	1	5	12	4
7:45 - 8:00	14	16	2	3	18	4
8:00 - 8:15	11	28	4	3	24	4
8:15 - 8:30	14	20	1	1	11	6
8:30 - 8:45	17	31	6	2	30	2
8:45 - 9:00	9	23	3	3	25	4

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	1	5	11	3	1	5
7:15 - 7:30	1	8	10	2	6	7
7:30 - 7:45	2	5	5	0	11	4
7:45 - 8:00	3	6	10	1	7	4
8:00 - 8:15	2	4	7	5	13	7
8:15 - 8:30	5	16	11	8	6	4
8:30 - 8:45	2	9	8	7	5	4
8:45 - 9:00	5	11	12	2	9	6

North / South
US 41

East / West
Causeway Blvd

Peak Hour
7:30 - 8:30



Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	7:00	to 9:00	AM	**U-Turn & RTOR**	

VHB Project #: 63286.00

DRAFT

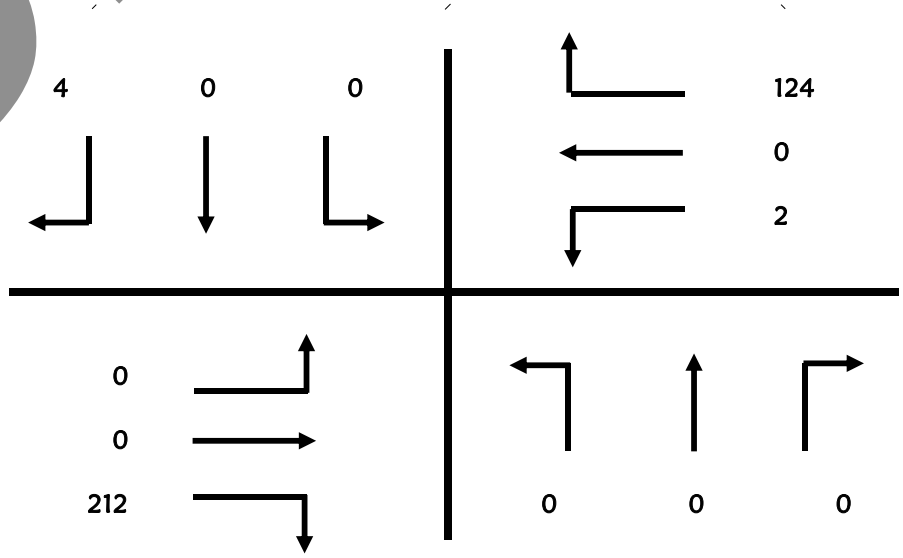
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	0	0	1	0	0	0
7:15 - 7:30	1	0	0	0	0	5
7:30 - 7:45	0	0	0	0	0	1
7:45 - 8:00	0	0	0	0	0	2
8:00 - 8:15	0	0	0	0	0	1
8:15 - 8:30	0	0	0	0	0	0
8:30 - 8:45	0	0	0	0	0	0
8:45 - 9:00	0	0	1	0	0	0

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	0	0	47	0	0	39
7:15 - 7:30	0	0	52	1	0	30
7:30 - 7:45	0	0	71	0	0	25
7:45 - 8:00	0	0	64	0	0	35
8:00 - 8:15	0	0	39	2	0	32
8:15 - 8:30	0	0	38	0	0	32
8:30 - 8:45	0	0	34	0	0	19
8:45 - 9:00	0	0	54	0	0	21

North / South
US 41

East / West
Causeway Blvd

Peak Hour
7:30 - 8:30



Pedestrian & Bicycle Summary

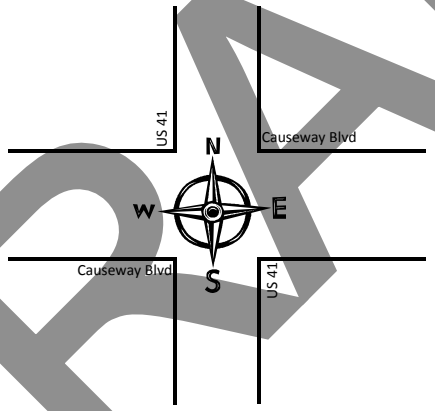
Project #: 63286.00
Date: Tuesday, August 21, 2018

NB/SB: US 41
EB/WB: Causeway Blvd

Hour

	7:00	8:00							
	1	2	3	4	5	6	7	8	
Eastbound ▶ Bike	0	0							0
Ped	0	0							0
Westbound ◀ Bike	1	0							1
Ped	0	0							0

Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
1 7:00	0	0	0	0
2 8:00	0	0	0	0
3				
4				
5				
6				
7				
8				
	0	0	0	0



Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
1 7:00	1	0	1	0
2 8:00	0	1	0	0
3				
4				
5				
6				
7				
8				
	1	1	1	0

	7:00	8:00							
	1	2	3	4	5	6	7	8	
Eastbound ▶ Bike	0	0							0
Ped	0	0							0
Westbound ◀ Bike	0	0							0
Ped	0	0							0

Hour

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough	**City**	Tampa
Intersection	US 41	&	Causeway Blvd
Date	Tuesday, August 21, 2018		**All Vehicles**
Time Period	16:00 to 18:00	**PM**	

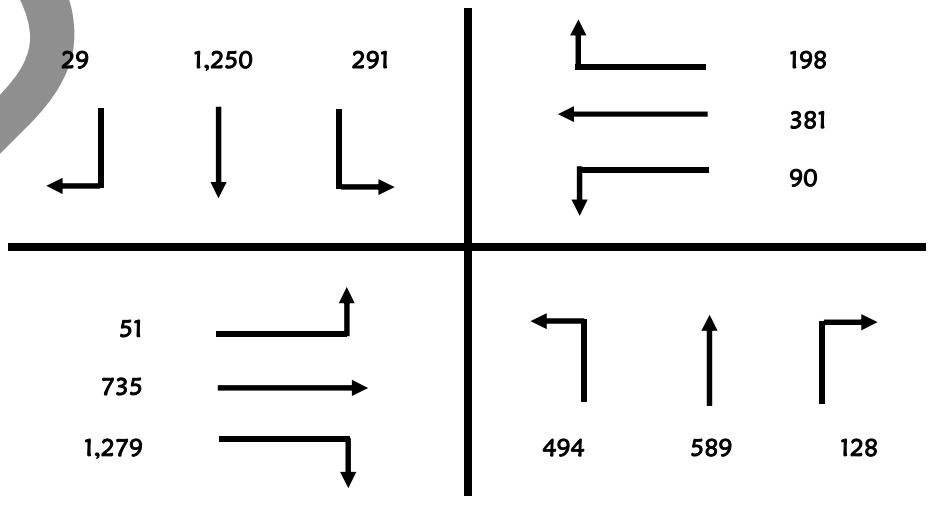
VHB Project #: 63286.00

Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	124	133	46	66	236	10
16:15 - 16:30	112	123	35	57	258	5
16:30 - 16:45	127	160	34	68	278	8
16:45 - 17:00	127	146	24	71	277	10
17:00 - 17:15	113	147	43	78	326	7
17:15 - 17:30	152	153	34	59	310	4
17:30 - 17:45	102	143	27	83	337	8
17:45 - 18:00	100	112	16	53	328	6
	957	1,117	259	535	2,350	58

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	11	157	259	25	101	57
16:15 - 16:30	16	166	282	29	108	48
16:30 - 16:45	16	160	300	31	85	51
16:45 - 17:00	18	186	313	21	108	54
17:00 - 17:15	17	184	324	25	113	54
17:15 - 17:30	7	178	331	28	100	52
17:30 - 17:45	9	187	311	16	60	38
17:45 - 18:00	8	164	337	17	129	56
	102	1,382	2,457	192	804	410

North / South
US 41

East / West
Causeway Blvd



Peak Hour
16:45 - 17:45

Peak Hour Factor
0.96

Total Pk Hr Voume
5,515

DRAFT

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	16:00	to 18:00	**PM**	**Trucks**	

VHB Project #: 63286.00

DRAFT

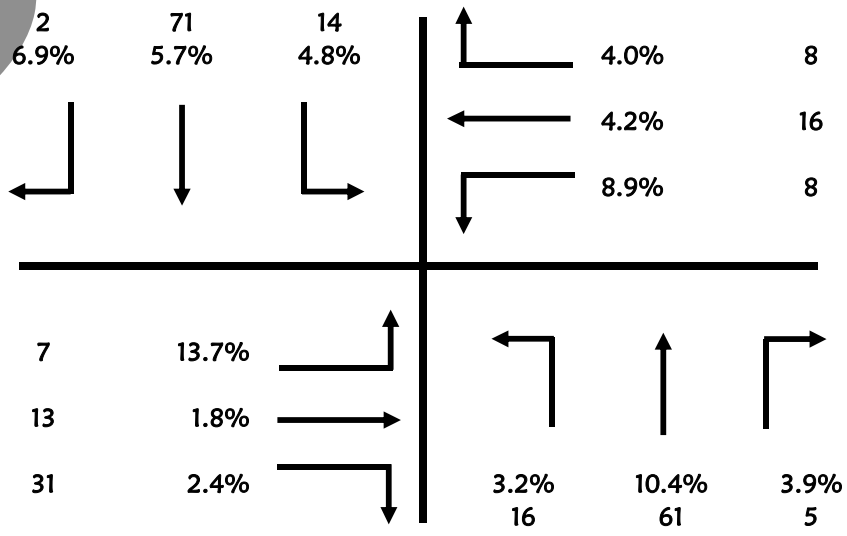
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	4	13	6	8	22	2
16:15 - 16:30	4	14	4	2	29	2
16:30 - 16:45	8	25	5	3	24	4
16:45 - 17:00	3	21	1	8	26	0
17:00 - 17:15	6	16	2	4	10	1
17:15 - 17:30	3	11	1	1	12	1
17:30 - 17:45	4	13	1	1	23	0
17:45 - 18:00	1	7	0	2	14	1

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	3	12	6	7	5	6
16:15 - 16:30	1	2	13	9	7	2
16:30 - 16:45	3	10	10	1	5	3
16:45 - 17:00	4	4	15	3	6	3
17:00 - 17:15	2	2	7	2	6	0
17:15 - 17:30	0	3	3	2	3	1
17:30 - 17:45	1	4	6	1	1	4
17:45 - 18:00	2	0	8	0	2	2

North / South
US 41

East / West
Causeway Blvd

Peak Hour
16:45 - 17:45



Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Hillsborough		**City**	Tampa	
Intersection	US 41		&	Causeway Blvd	
Date	Tuesday, August 21, 2018				
Time Period	16:00	to 18:00	**PM**	**U-Turn & RTOR**	

VHB Project #: 63286.00

DRAFT

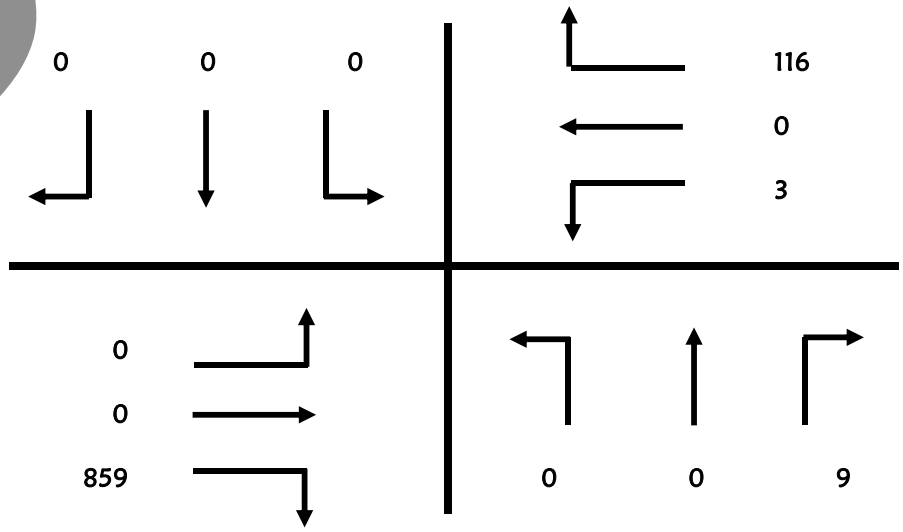
Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	0	0	4	0	0	2
16:15 - 16:30	0	0	8	0	0	0
16:30 - 16:45	0	0	1	0	0	0
16:45 - 17:00	0	0	3	0	0	0
17:00 - 17:15	0	0	2	0	0	0
17:15 - 17:30	0	0	0	0	0	0
17:30 - 17:45	0	0	4	0	0	0
17:45 - 18:00	0	0	2	0	0	0

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:00 - 16:15	0	0	165	2	0	34
16:15 - 16:30	0	0	173	0	0	30
16:30 - 16:45	0	0	202	0	0	24
16:45 - 17:00	0	0	213	1	0	31
17:00 - 17:15	0	0	213	1	0	33
17:15 - 17:30	0	0	222	0	0	28
17:30 - 17:45	0	0	211	1	0	24
17:45 - 18:00	0	0	228	0	0	38

North / South
US 41

East / West
Causeway Blvd

Peak Hour
16:45 - 17:45



Pedestrian & Bicycle Summary

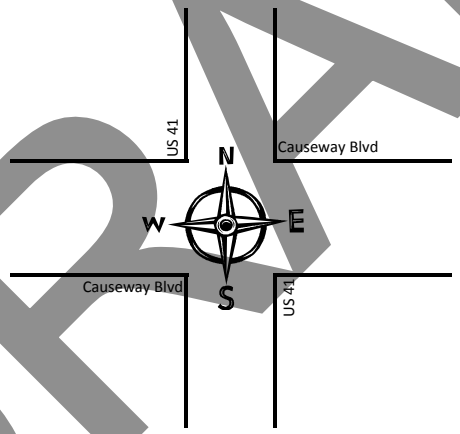
Project #: 63286.00
Date: Tuesday, August 2

NB/SB: US 41
EB/WB: Causeway Blvd

Hour

			16:00	17:00						
			1	2	3			6	7	8
Eastbound	▶	Bike	0	0							0
		Ped	0	0							0
Westbound	◀	Bike	0	0							0
		Ped	0	0							0

Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
16:00	0	0	0	0
17:00	0	0	0	0
	0	0	0	0



Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲	Hour
1	0	0	0	0	16:00
2	1	0	0	0	17:00
3					
4					
5					
6					
7					
8					
	1	0	0	0	

Eastbound	▶	Bike	0	0							0
		Ped	0	0							0
Westbound	◀	Bike	0	0							0
		Ped	0	0							0

16:00 17:00

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Appendix B

Historical Traffic Design Factors

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FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0003 - SR 599/US 41/S 50TH ST, N OF SR 676/CAUSEWAY BLVD

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	25500 F	N 12000	S 13500	9.00	59.60	13.60
2016	24500 C	N 11500	S 13000	9.00	57.00	13.60
2015	18100 C	N 8100	S 10000	9.00	56.80	11.50
2014	23000 C	N 11000	S 12000	9.00	58.60	9.30
2013	21500 C	N 10500	S 11000	9.00	58.20	10.10
2012	21000 C	N 10500	S 10500	9.00	59.00	10.60
2011	22000 C	N 11000	S 11000	9.00	57.20	11.40
2010	21500 C	N 11000	S 10500	9.51	56.00	11.70
2009	21000 C	N 10500	S 10500	9.54	55.72	12.90
2008	22000 C	N 10500	S 11500	9.13	55.29	12.90
2007	21500 C	N 11000	S 10500	9.52	56.79	12.90
2005	22500 C	N 11500	S 11000	9.70	55.90	8.60
2004	24000 C	N 12000	S 12000	8.60	54.00	14.30
2003	23500 C	N 11500	S 12000	9.80	58.50	11.10
2002	25000 C	N 12500	S 12500	9.80	55.20	9.00

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0004 - SR 45/US 41/S 50TH ST, S OF SR 676/CAUSEWAY BLVD (REPL BY 100373)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	31000 S	N 15000	S 16000	9.00	59.60	15.60
2016	30000 F	N 14500	S 15500	9.00	57.00	15.60
2015	29000 C	N 14000	S 15000	9.00	56.80	15.60
2014	36500 C	N 18000	S 18500	9.00	58.60	9.30
2013	35500 C	N 17500	S 18000	9.00	58.20	9.80
2012	34500 C	N 16000	S 18500	9.00	59.00	10.20
2010	33000 C	N 16000	S 17000	9.51	56.00	11.30
2009	34500 C	N 17000	S 17500	9.54	55.72	10.60
2008	35000 C	N 17000	S 18000	9.13	55.29	11.00
2007	36000 C	N 17500	S 18500	9.52	56.79	11.30
2006	33000 C	N 16000	S 17000	9.41	55.29	14.50
2005	31500 C	N 14500	S 17000	9.70	55.90	16.50
2004	30500 C	N 15000	S 15500	8.60	54.00	16.50
2003	27000 C	N 13500	S 13500	9.80	58.50	14.40
2002	27500 C	N 13500	S 14000	9.80	55.20	12.60

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0022 - SR 676/CAUSEWAY BLVD, E OF US 41/SR 45/50TH ST

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	18900 F	E 9500	W 9400	9.00	59.60	11.70
2016	18300 C	E 9200	W 9100	9.00	57.00	11.70
2015	22000 F	E 11000	W 11000	9.00	56.80	8.30
2014	22000 C	E 11000	W 11000	9.00	58.60	8.80
2013	23500 C	E 12000	W 11500	9.00	58.20	7.20
2012	20500 C	E 10500	W 10000	9.00	59.00	7.80
2011	19700 C	E 9700	W 10000	9.00	57.20	8.60
2010	16300 C	E 8100	W 8200	9.51	56.00	7.70
2009	15700 F	E 7900	W 7800	9.54	55.72	8.40
2008	15900 C	E 8000	W 7900	9.13	55.29	8.40
2007	17000 C	E 8600	W 8400	9.52	56.79	8.40
2006	18300 C	E 9400	W 8900	9.41	55.29	14.20
2005	26000 C	E 12500	W 13500	9.70	55.90	4.40
2004	29000 F	E 13000	W 16000	8.60	54.00	5.60
2003	28000 C	E 12500	W 15500	9.80	58.50	17.80

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0033 - SR 45/USB 41/22ND ST CAUSEWAY, W OF US 41/SR 45

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	27500 F	E 14000	W 13500	9.00	59.60	8.90
2016	26500 C	E 13500	W 13000	9.00	57.00	8.90
2015	29500 F	E 15000	W 14500	9.00	56.80	11.10
2014	29500 C	E 15000	W 14500	9.00	58.60	11.10
2013	32500 C	E 17000	W 15500	9.00	58.20	11.10
2012	30500 C	E 15000	W 15500	9.00	59.00	10.30
2011	28500 C	E 13500	W 15000	9.00	57.20	11.00
2010	27500 C	E 13500	W 14000	9.51	56.00	11.00
2009	25500 C	E 13000	W 12500	9.54	55.72	8.80
2008	25500 C	E 12500	W 13000	9.13	55.29	6.40
2007	27500 C	E 14000	W 13500	9.52	56.79	10.70
2006	28000 C	E 14500	W 13500	9.41	55.29	17.20
2005	27000 C	E 14000	W 13000	9.70	55.90	4.40
2004	24500 S	E 12500	W 12000	8.60	54.00	15.40
2003	23500 F	E 12000	W 11500	9.80	58.50	15.40
2002	22500 C	E 11500	W 11000	9.80	55.20	15.40

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 10 - HILLSBOROUGH

SITE: 0373 - US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD, TAMPA, HILLS CO

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	30711 C	N 14795	S 15916	9.00	72.40	11.40
2016	27391 C	N 13219	S 14172	9.00	71.30	12.10
2015	24063 C	N 11491	S 12572	9.00	69.80	12.40
2014	27200 C	N 13122	S 14078	9.00	70.90	11.70
2013	27551 C	N 13215	S 14336	9.00	72.60	11.50
2012	27598 C	N 13330	S 14268	9.00	72.90	10.30
2011	27141 C	N 13213	S 13928	9.00	57.20	10.70

Avg - 71.40%,
Min - 69.80% and
Max - 72.60%,

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AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
200 HIGHEST HOUR REPORT - REPORT TYPE: ALL
YEAR 2017

COUNTY: 10 - HILLSBOROUGH
SITE: 0373
DESCRIPTION: US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD, TAMPA, HI
LOCATION: 10060000 MILEPOST 23.05
AADT: 30711

VALID DATA
HOURS 8688
DAYS 362
WEEKS 53
MONTHS 12

POSITION	COUNTS					COLLECTION			"D"	"K"
	TOTAL COUNT	LOW DIR	LOW COUNT	HIGH DIR	HIGH COUNT	DAY	DATE	HOUR	FACTOR	FACTOR
1	3963	N	1376	S	2587	TUE	02/28/17	18	65.28	12.90
2	3872	N	987	S	2885	TUE	10/31/17	18	74.51	12.61
3	3826	N	1349	S	2477	WED	09/06/17	18	64.74	12.46
4	3825	N	1008	S	2817	THU	08/31/17	18	73.65	12.45
5	3792	N	1065	S	2727	WED	11/29/17	18	71.91	12.35
6	3779	N	1120	S	2659	THU	11/09/17	18	70.36	12.31
7	3775	N	1142	S	2633	TUE	07/11/17	18	69.75	12.29
8	3742	N	1111	S	2631	WED	11/01/17	18	70.31	12.18
9	3739	N	1012	S	2727	MON	10/30/17	18	72.93	12.17
10	3730	N	1130	S	2600	THU	12/07/17	18	69.71	12.15
11	3701	N	1077	S	2624	TUE	12/19/17	18	70.90	12.05
12	3695	N	1021	S	2674	FRI	07/14/17	18	72.37	12.03
13	3695	N	1051	S	2644	WED	10/11/17	18	71.56	12.03
14	3671	N	1052	S	2619	WED	12/13/17	18	71.34	11.95
15	3669	N	973	S	2696	TUE	10/17/17	18	73.48	11.95
16	3661	N	1014	S	2647	WED	10/25/17	18	72.30	11.92
17	3654	N	1108	S	2546	THU	11/30/17	18	69.68	11.90
18	3651	N	990	S	2661	WED	05/24/17	18	72.88	11.89
19	3647	N	1024	S	2623	TUE	10/10/17	18	71.92	11.88
20	3647	N	1057	S	2590	WED	10/18/17	18	71.02	11.88
21	3640	N	993	S	2647	TUE	10/24/17	18	72.72	11.85
22	3636	N	1021	S	2615	TUE	11/07/17	18	71.92	11.84
23	3630	N	1093	S	2537	TUE	11/14/17	18	69.89	11.82
24	3628	N	1052	S	2576	WED	11/15/17	18	71.00	11.81
25	3621	N	907	S	2714	WED	07/12/17	18	74.95	11.79
26	3614	N	1112	S	2502	MON	12/11/17	18	69.23	11.77
27	3613	N	1065	S	2548	TUE	03/28/17	18	70.52	11.76
28	3613	N	966	S	2647	THU	08/24/17	18	73.26	11.76
29	3612	N	1026	S	2586	MON	11/06/17	18	71.59	11.76
30	3611	N	1115	S	2496	TUE	12/05/17	18	69.12	11.76
31	3608	N	894	S	2714	FRI	05/19/17	18	75.22	11.75
32	3606	N	1129	S	2477	THU	12/14/17	18	68.69	11.74
33	3605	N	1149	S	2456	THU	11/16/17	18	68.13	11.74
34	3604	N	1091	S	2513	THU	11/02/17	18	69.73	11.74
35	3586	N	1045	S	2541	WED	11/08/17	18	70.86	11.68
36	3585	N	1057	S	2528	THU	08/31/17	17	70.52	11.67
37	3585	N	1162	S	2423	WED	10/04/17	18	67.59	11.67
38	3584	N	922	S	2662	WED	08/09/17	18	74.27	11.67
39	3582	N	992	S	2590	WED	09/27/17	18	72.31	11.66
40	3582	N	1037	S	2545	TUE	12/12/17	18	71.05	11.66

DESIGN HOUR DATA

MEDIAN "D" = 72.4% (MEDIAN D FACTOR OF ALL 200 HIGHEST HOURS)
STANDARD "K" = 9.0%

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FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
200 HIGHEST HOUR REPORT - REPORT TYPE: ALL
YEAR 2017

COUNTY: 10 - HILLSBOROUGH
SITE: 0373
DESCRIPTION: US-41, 0.5 MI S OF SR-676/CAUSEWAY BLVD, TAMPA, HI
LOCATION: 10060000 MILEPOST 23.05
AADT: 30711

VALID DATA
HOURS 8688
DAYS 362
WEEKS 53
MONTHS 12

POSITION	COUNTS					COLLECTION			"D"	"K"
	TOTAL COUNT	LOW DIR	LOW COUNT	HIGH DIR	HIGH COUNT	DAY	DATE	HOUR	FACTOR	FACTOR
45	3562	N	1041	S	2521	THU	09/28/17	18	70.77	11.60
50	3541	N	982	S	2559	TUE	02/14/17	18	72.27	11.53
55	3517	N	947	S	2570	TUE	09/26/17	18	73.07	11.45
60	3501	N	1013	S	2488	THU	10/12/17	18	71.07	11.40
65	3486	N	925	S	2561	WED	02/15/17	18	73.47	11.35
70	3478	N	968	S	2510	WED	12/20/17	18	72.17	11.32
75	3464	N	912	S	2552	THU	08/17/17	18	73.67	11.28
80	3454	N	915	S	2539	TUE	04/18/17	18	73.51	11.25
85	3446	S	878	N	2568	TUE	11/14/17	8	74.52	11.22
90	3432	N	858	S	2574	FRI	01/20/17	18	75.00	11.18
95	3422	S	831	N	2591	WED	08/16/17	8	75.72	11.14
100	3411	S	829	N	2582	THU	10/26/17	8	75.70	11.11
105	3402	N	1122	S	2280	WED	10/04/17	17	67.02	11.08
110	3396	N	976	S	2420	THU	07/27/17	18	71.26	11.06
115	3389	N	793	S	2596	MON	06/26/17	18	76.60	11.04
120	3383	N	985	S	2398	WED	01/25/17	18	70.88	11.02
125	3376	N	1040	S	2336	FRI	10/20/17	18	69.19	10.99
130	3370	S	873	N	2497	WED	10/18/17	8	74.09	10.97
135	3361	N	1191	S	2170	TUE	07/11/17	17	64.56	10.94
140	3356	S	881	N	2475	WED	10/25/17	8	73.75	10.93
145	3346	N	900	S	2446	WED	06/28/17	18	73.10	10.90
150	3340	N	1003	S	2337	TUE	04/25/17	17	69.97	10.88
155	3332	N	996	S	2336	THU	02/09/17	18	70.11	10.85
160	3320	N	894	S	2426	THU	07/13/17	18	73.07	10.81
165	3315	N	778	S	2537	MON	07/17/17	18	76.53	10.79
170	3307	N	1075	S	2232	WED	11/01/17	17	67.49	10.77
175	3302	N	817	S	2485	MON	07/24/17	18	75.26	10.75
180	3299	N	889	S	2410	THU	04/13/17	18	73.05	10.74
185	3291	N	931	S	2360	WED	04/12/17	18	71.71	10.72
190	3288	N	1011	S	2277	TUE	08/08/17	17	69.25	10.71
195	3278	N	859	S	2419	THU	02/16/17	18	73.79	10.67
200	3272	N	913	S	2359	FRI	03/03/17	18	72.10	10.65

DESIGN HOUR DATA

MEDIAN "D" = 72.4% (MEDIAN D FACTOR OF ALL 200 HIGHEST HOURS)
STANDARD "K" = 9.0%

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Historical FTI Data- D Values

Year	US 41		Average US 41 Only	SR 676		Average SR 676 Only	Average Both US 41 & SR 676
	100003	100004		100022	100033		
	N. of SR 676	S. of SR 676		E. of US 41	W. of US 41		
2017	59.60%	59.60%		59.60%	59.60%		
2016	57.00%	57.00%		57.00%	57.00%		
2015	56.80%	56.80%		56.80%	56.80%		
2014	58.60%	58.60%		58.60%	58.60%		
2013	58.20%	58.20%		58.20%	58.20%		
Average	58.04%	58.04%	**58.04%**	58.04%	58.04%	**58.04%**	**58.04%**
Minimum	56.80%	56.80%	**56.80%**	56.80%	56.80%	**56.80%**	**56.80%**
Maximum	59.60%	59.60%	**59.60%**	59.60%	59.60%	**59.60%**	**59.60%**

Historical FTO Data- T_{24} Values

Year	US 41		SR 676		Average Both US 41 & SR 676	Average US 41 Only	Average SR 676 Only
	100003	100004	100022	100033			
	N. of SR 676	S. of SR 676	E. of US 41	W. of US 41			
2017	13.60%	15.60%	11.70%	8.90%			
2016	13.60%	15.60%	11.70%	8.90%			
2015	11.50%	15.60%	8.30%	11.10%			
2014	9.30%	9.30%	8.80%	11.10%			
2013	10.10%	9.80%	7.20%	11.10%			
Average	11.62%	13.18%	9.54%	10.22%	**11.14%**	**12.40%**	**9.88%**
Minimum	9.30%	9.30%	7.20%	8.90%	**8.68%**	**9.30%**	**8.05%**
Maximum	13.60%	15.60%	11.70%	11.10%	**13.00%**	**14.60%**	**11.40%**

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2017 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 1000 HILLSBOROUGH COUNTYWIDE

MOCF: 0.96

WEEK	DATES	SF	PSCF
1	01/01/2017 - 01/07/2017	1.03	1.07
2	01/08/2017 - 01/14/2017	1.02	1.06
3	01/15/2017 - 01/21/2017	1.02	1.06
4	01/22/2017 - 01/28/2017	1.00	1.04
5	01/29/2017 - 02/04/2017	0.99	1.03
* 6	02/05/2017 - 02/11/2017	0.97	1.01
* 7	02/12/2017 - 02/18/2017	0.96	1.00
* 8	02/19/2017 - 02/25/2017	0.96	1.00
* 9	02/26/2017 - 03/04/2017	0.95	0.99
*10	03/05/2017 - 03/11/2017	0.95	0.99
*11	03/12/2017 - 03/18/2017	0.95	0.99
*12	03/19/2017 - 03/25/2017	0.95	0.99
*13	03/26/2017 - 04/01/2017	0.95	0.99
*14	04/02/2017 - 04/08/2017	0.96	1.00
*15	04/09/2017 - 04/15/2017	0.96	1.00
*16	04/16/2017 - 04/22/2017	0.97	1.01
*17	04/23/2017 - 04/29/2017	0.98	1.02
*18	04/30/2017 - 05/06/2017	0.99	1.03
19	05/07/2017 - 05/13/2017	0.99	1.03
20	05/14/2017 - 05/20/2017	1.00	1.04
21	05/21/2017 - 05/27/2017	1.01	1.05
22	05/28/2017 - 06/03/2017	1.02	1.06
23	06/04/2017 - 06/10/2017	1.02	1.06
24	06/11/2017 - 06/17/2017	1.03	1.07
25	06/18/2017 - 06/24/2017	1.03	1.07
26	06/25/2017 - 07/01/2017	1.03	1.07
27	07/02/2017 - 07/08/2017	1.03	1.07
28	07/09/2017 - 07/15/2017	1.04	1.08
29	07/16/2017 - 07/22/2017	1.03	1.07
30	07/23/2017 - 07/29/2017	1.02	1.06
31	07/30/2017 - 08/05/2017	1.01	1.05
32	08/06/2017 - 08/12/2017	1.01	1.05
33	08/13/2017 - 08/19/2017	1.00	1.04
34	08/20/2017 - 08/26/2017	1.02	1.06
35	08/27/2017 - 09/02/2017	1.05	1.09
36	09/03/2017 - 09/09/2017	1.08	1.13
37	09/10/2017 - 09/16/2017	1.10	1.15
38	09/17/2017 - 09/23/2017	1.08	1.13
39	09/24/2017 - 09/30/2017	1.05	1.09
40	10/01/2017 - 10/07/2017	1.02	1.06
41	10/08/2017 - 10/14/2017	1.00	1.04
42	10/15/2017 - 10/21/2017	0.97	1.01
43	10/22/2017 - 10/28/2017	0.98	1.02
44	10/29/2017 - 11/04/2017	0.99	1.03
45	11/05/2017 - 11/11/2017	1.00	1.04
46	11/12/2017 - 11/18/2017	1.01	1.05
47	11/19/2017 - 11/25/2017	1.02	1.06
48	11/26/2017 - 12/02/2017	1.02	1.06
49	12/03/2017 - 12/09/2017	1.03	1.07
50	12/10/2017 - 12/16/2017	1.03	1.07
51	12/17/2017 - 12/23/2017	1.03	1.07
52	12/24/2017 - 12/30/2017	1.02	1.06
53	12/31/2017 - 12/31/2017	1.02	1.06

* PEAK SEASON

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2017 WEEKLY AXLE FACTOR CATEGORY REPORT - REPORT TYPE: ALL

COUNTY: 10 - HILLSBOROUGH

WEEK	DATES	1030 US41,SR676-SR60	1012 US41	1029 US41,APOL BCH BL-676
1	01/01/2017 - 01/07/2017	0.96	0.96	0.93
2	01/08/2017 - 01/14/2017	0.96	0.96	0.93
3	01/15/2017 - 01/21/2017	0.96	0.96	0.92
4	01/22/2017 - 01/28/2017	0.96	0.96	0.92
5	01/29/2017 - 02/04/2017	0.96	0.96	0.92
6	02/05/2017 - 02/11/2017	0.96	0.96	0.92
7	02/12/2017 - 02/18/2017	0.96	0.96	0.92
8	02/19/2017 - 02/25/2017	0.96	0.96	0.92
9	02/26/2017 - 03/04/2017	0.96	0.96	0.92
10	03/05/2017 - 03/11/2017	0.96	0.96	0.92
11	03/12/2017 - 03/18/2017	0.96	0.96	0.92
12	03/19/2017 - 03/25/2017	0.96	0.96	0.92
13	03/26/2017 - 04/01/2017	0.96	0.96	0.93
14	04/02/2017 - 04/08/2017	0.96	0.96	0.93
15	04/09/2017 - 04/15/2017	0.96	0.96	0.93
16	04/16/2017 - 04/22/2017	0.96	0.96	0.93
17	04/23/2017 - 04/29/2017	0.96	0.96	0.93
18	04/30/2017 - 05/06/2017	0.96	0.96	0.92
19	05/07/2017 - 05/13/2017	0.96	0.96	0.92
20	05/14/2017 - 05/20/2017	0.96	0.96	0.92
21	05/21/2017 - 05/27/2017	0.96	0.96	0.92
22	05/28/2017 - 06/03/2017	0.96	0.96	0.92
23	06/04/2017 - 06/10/2017	0.96	0.96	0.92
24	06/11/2017 - 06/17/2017	0.96	0.96	0.92
25	06/18/2017 - 06/24/2017	0.96	0.96	0.92
26	06/25/2017 - 07/01/2017	0.96	0.96	0.92
27	07/02/2017 - 07/08/2017	0.96	0.96	0.93
28	07/09/2017 - 07/15/2017	0.96	0.96	0.93
29	07/16/2017 - 07/22/2017	0.96	0.96	0.93
30	07/23/2017 - 07/29/2017	0.96	0.96	0.93
31	07/30/2017 - 08/05/2017	0.96	0.96	0.93
32	08/06/2017 - 08/12/2017	0.96	0.96	0.93
33	08/13/2017 - 08/19/2017	0.96	0.96	0.93
34	08/20/2017 - 08/26/2017	0.96	0.96	0.93
35	08/27/2017 - 09/02/2017	0.96	0.96	0.93
36	09/03/2017 - 09/09/2017	0.96	0.96	0.92
37	09/10/2017 - 09/16/2017	0.96	0.96	0.92
38	09/17/2017 - 09/23/2017	0.96	0.96	0.92
39	09/24/2017 - 09/30/2017	0.96	0.96	0.92
40	10/01/2017 - 10/07/2017	0.96	0.96	0.92
41	10/08/2017 - 10/14/2017	0.96	0.96	0.92
42	10/15/2017 - 10/21/2017	0.96	0.96	0.92
43	10/22/2017 - 10/28/2017	0.96	0.96	0.92
44	10/29/2017 - 11/04/2017	0.96	0.96	0.93
45	11/05/2017 - 11/11/2017	0.96	0.96	0.93
46	11/12/2017 - 11/18/2017	0.96	0.96	0.93
47	11/19/2017 - 11/25/2017	0.96	0.96	0.93
48	11/26/2017 - 12/02/2017	0.96	0.96	0.93
49	12/03/2017 - 12/09/2017	0.96	0.96	0.93
50	12/10/2017 - 12/16/2017	0.96	0.96	0.93
51	12/17/2017 - 12/23/2017	0.96	0.96	0.93
52	12/24/2017 - 12/30/2017	0.96	0.96	0.92
53	12/31/2017 - 12/31/2017	0.96	0.96	0.92

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Appendix C

Existing Conditions – Synchro Outputs

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	292	355	59	800	186	1354	1125	61	208	629	72
Future Volume (veh/h)	49	292	355	59	800	186	1354	1125	61	208	629	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	52	307	374	62	842	196	1425	1184	64	219	662	76
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	82	911	1812	94	923	406	1359	1347	73	187	489	56
Arrive On Green	0.02	0.27	0.27	0.03	0.27	0.27	0.41	0.41	0.41	0.11	0.11	0.11
Sat Flow, veh/h	3319	3413	2679	3319	3413	1503	3319	3290	178	1711	4466	508
Grp Volume(v), veh/h	52	307	374	62	842	196	1425	614	634	219	483	255
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1503	1659	1706	1761	1711	1635	1705
Q Serve(g_s), s	3.1	14.5	10.5	3.7	47.8	21.9	81.9	66.3	66.5	21.9	21.9	21.9
Cycle Q Clear(g_c), s	3.1	14.5	10.5	3.7	47.8	21.9	81.9	66.3	66.5	21.9	21.9	21.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.30
Lane Grp Cap(c), veh/h	82	911	1812	94	923	406	1359	699	721	187	358	187
V/C Ratio(X)	0.64	0.34	0.21	0.66	0.91	0.48	1.05	0.88	0.88	1.17	1.35	1.37
Avail Cap(c_a), veh/h	176	932	1829	176	932	410	1359	699	721	187	358	187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	96.7	59.1	12.2	96.2	70.7	61.2	59.1	54.4	54.5	89.1	89.1	89.1
Incr Delay (d2), s/veh	26.1	1.0	0.3	25.4	14.8	4.1	38.2	14.6	14.4	118.7	174.6	195.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	10.7	6.0	3.5	30.8	13.8	54.1	40.7	41.9	24.0	28.0	30.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.8	60.1	12.4	121.6	85.4	65.3	97.2	69.1	68.9	207.7	263.7	284.2
LnGrp LOS	F	E	B	F	F	E	F	E	E	F	F	F
Approach Vol, veh/h		733			1100			2673			957	
Approach Delay, s/veh		40.2			83.9			84.1			256.3	
Approach LOS		D			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	90.0	30.0	12.3	61.5	30.0	90.0	13.0	60.8
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 82	* 22	10.6	54.6	* 22	* 82	10.6	54.6
Max Q Clear Time (g_c+I1), s	83.9	23.9	5.1	49.8	23.9	68.5	5.7	16.5
Green Ext Time (p_c), s	0.0	0.0	0.1	4.3	0.0	12.3	0.1	16.4

Intersection Summary	
HCM 6th Ctrl Delay	108.3
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	649	1130	89	379	197	395	471	102	265	1139	26
Future Volume (veh/h)	45	649	1130	89	379	197	395	471	102	265	1139	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	47	683	1189	94	399	207	416	496	107	279	1199	27
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	95	810	1035	141	857	649	495	945	203	300	1798	40
Arrive On Green	0.03	0.24	0.24	0.04	0.25	0.25	0.15	0.34	0.34	0.18	0.36	0.36
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	2795	600	1711	4934	111
Grp Volume(v), veh/h	47	683	1189	94	399	207	416	302	301	279	794	432
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1688	1711	1635	1776
Q Serve(g_s), s	2.1	28.6	35.6	4.2	14.9	13.5	18.3	21.3	21.6	24.1	30.6	30.6
Cycle Q Clear(g_c), s	2.1	28.6	35.6	4.2	14.9	13.5	18.3	21.3	21.6	24.1	30.6	30.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		0.06
Lane Grp Cap(c), veh/h	95	810	1035	141	857	649	495	577	571	300	1191	647
V/C Ratio(X)	0.49	0.84	1.15	0.67	0.47	0.32	0.84	0.52	0.53	0.93	0.67	0.67
Avail Cap(c_a), veh/h	279	810	1035	279	857	649	595	577	571	307	1191	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.8	54.5	46.0	70.8	47.6	28.6	62.1	39.9	40.0	61.0	40.0	40.0
Incr Delay (d2), s/veh	13.8	10.4	78.2	18.0	1.8	1.3	14.0	3.4	3.5	35.9	3.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	19.5	42.7	3.9	10.8	9.0	13.5	14.7	14.7	19.5	18.8	20.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.5	65.0	124.2	88.8	49.4	29.9	76.1	43.3	43.4	96.9	43.0	45.4
LnGrp LOS	F	E	F	F	D	C	E	D	D	F	D	D
Approach Vol, veh/h		1919			700			1019			1505	
Approach Delay, s/veh		102.2			48.9			56.7			53.7	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.5	62.8	11.7	45.1	34.4	58.8	13.8	43.0
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 27	* 44	12.6	35.6	* 27	* 44	12.6	35.6
Max Q Clear Time (g_c+I1), s	20.3	32.6	4.1	16.9	26.1	23.6	6.2	37.6
Green Ext Time (p_c), s	2.1	10.3	0.1	9.9	0.2	11.0	0.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	71.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

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

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Hillsborough County | Timing Sheet | 6/26/2018 8:15:12 AM

Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Phase [1.1.1]

	1 (NL)	2 (ST)	3 (EL)	4 (WT)	5 (SL)	6 (NT)	7 (WL)	8 (ET)	9	10	11	12	13	14	15	16
Walk		7		7		7		7	7							
Ped Clearance		35		27		37		26	36							
Min Green	5	15	5	7	5	15	5	7	45							
Passage	6	8	6	8	6	8	6	8	3							
Max1	40	40	15	35	20	40	15	25	100							
Max2																
Yellow	5.5	5.5	4.8	4.8	5.5	5.5	4.8	4.8	5.1	9	9	9	9	9	9	9
Red	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7							
Red Revert	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Added Initial																
Max Initial																
Time Before Reduce	10					15										
Cars Before Reduce																
Time To Reduce	10					15										
Reduce By																
Min Gap	4					4										
Dynamic Max Limit																
Dynamic Max Step																
Auto Exit		ON				ON										
Rest In Walk																

Phase Option [1.1.2]

	1 (NL)	2 (ST)	3 (EL)	4 (WT)	5 (SL)	6 (NT)	7 (WL)	8 (ET)	9	10	11	12	13	14	15	16
Enable	ON	ON	ON	ON	ON	ON	ON	ON	ON							
Auto Entry				ON				ON								
Non Act1																
Non Act2																
Lock Call																
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable		ON		ON		ON		ON								
Guar Passage																
Cond Service																
Add Init Calc																

Alternate Phase Program 1, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Alternate Phase Program 2, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Alternate Phase Program 1, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 2, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

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Hillsborough County | Timing Sheet | 6/26/2018 8:15:12 AM

Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Unit Parameters [1.2.1]

StartUp Flash	Auto Ped Clear	Backup Time	Red Revert	Console Timeout	Tone Disable	Feature Profile	Phase Mode	Diamond Mode	SDLC Retry Time	TS2 Det Faults	Cycle Fault Action	Max Cycle Time	Max Seek Track Time	Max Seek Dwell Time	Enable Run	Local Flash Start	Start Red Time	Disable Init Ped	Yellow 3 Second Disable	Omit Yellow Enable	Free Ring Sequence
	ON		3	30	OFF		USER	4PH		OFF	ALARM				ON	OFF		OFF	OFF	OFF	2

Comm, General Comm Parameters [6.1]

Station ID	Master Station ID	Fallback time	Allow Pencil	Port	System-Up	Sys-Down	PC/Print	Aux 232
1307		900	OFF					

Port Parameters [6.2]

Comm	Mode	Baud	MsgTime	Duplex	Enable	DialTime	Modem	ModemTime	Tel#1	Tel#2
System Up(P-A)										
System Down(P-B)										
PC/Print(P-2)										

Overlap General Parameters [1.5.1]

Conflict Lock	Lock Inhibit	Program Card	Use Parent	Canadian Fast Flash
ON	ON	OFF	ON	OFF

Overlap Program Parameters [1.5.2.1]

Overlap	Included Phases								Modifer Phases								Type	Green	Yellow	Red
Overlap 1	1	9															NORMAL		4.8	2.6
Overlap 2																	NORMAL		3.5	1.5
Overlap 3																	NORMAL		3.5	1.5
Overlap 4																	NORMAL		3.5	1.5
Overlap 5																	NORMAL		3.5	1.5
Overlap 6	6	9															NORMAL		3.5	1.5
Overlap 7																	NORMAL		3.5	1.5
Overlap 8																	NORMAL		3.5	1.5

Overlap Conflict Parameters+ [1.5.2.2]

Overlap	Conflicting Phases								Conflicting Overlaps								Conflicting Peds									
Overlap 1	2	3	4	7	8																				OFF	OFF
Overlap 2																									OFF	OFF
Overlap 3																									OFF	OFF
Overlap 4																									OFF	OFF
Overlap 5																									OFF	OFF
Overlap 6	5	3	4	7	8																				OFF	OFF
Overlap 7																									OFF	OFF
Overlap 8																									OFF	OFF

Detector, Vehicle Parameters 1-16 [5.1]

	1 (WBR1)	2 (WBT1)	3 (WBT2)	4 (WBL1)	5 (WBL2)	6 (NBT1)	7 (NBT2)	8 (NBL1)	9 (NBL2)	10 (EBR1)	11 (EBR2)	12 (EBT1)	13 (EBT2)	14 (EBL1)	15 (EBL2)	16
Call Phase						6	6	1								
Switch Phase																
Delay Time																

Detector, Vehicle Parameters 17-32 [5.1]

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Call Phase	4	4	4	7	7	6	6	1	1	8	8	3	2	2	2	5
Switch Phase						9	9	9	9							
Delay Time	5									5						

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Hillsborough County | Timing Sheet | 6/26/2018 8:15:12 AM

Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Detector Alternate Program 1, Vehicle Parameters [5.5.1]

	1 (WBR1)	2 (WBT1)	3 (WBT2)	4 (WBL1)	5 (WBL2)	6 (NBT1)	7 (NBT2)	8 (NBL1)	9 (NBL2)	10 (EBR1)	11 (EBR2)	12 (EBT1)	13 (EBT2)	14 (EBL1)	15 (EBL2)	16
Call Phase																
Switch Phase																
Delay Time																

Channels/SDLC, Assign to Phases [1.3.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PH/OLP #	1	2	3	4	5	6	7	8	9	8			2	4	15	8								
Type	OLP	VEH	VEH	VEH	VEH	OLP	VEH	VEH	OLP	PED	OLP	OLP	PED	PED	OLP	PED								
Flash	RED	YEL	RED	RED	RED	YEL	RED	RED	RED	DRK	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz																								
Dimming Green																								
Dimming Yellow																								
Dimming Red																								
Alt Cyc	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Channel/SDLC, Parameters [1.3.3]

TOD Dim Enable	Extra Maps Enable	D Connector Enable	Single BIU Map	IO Mode	Preempt or Ext Output
OFF	DEFAULT		ON	AUTO	EXT

Channel/SDLC, MMU Map [1.3.5]

MMU-to-Controller Channel Map

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Channel/SDLC, Permissive [1.3.4]

Channel	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1		1						1			1	1			
2		1		1							1	1			
3	1						1	1	1	1					
4	1		1				1	1	1	1					
5				1				1							
6		1		1				1							
7			1												
8	1		1				1	1							
9		1	1				1								
10	1		1												
11															
12															
13		1													
14	1														
15															

Channel/SDLC, Permissive [1.3.7]

SDLC Device	Term/Fac								Detector								MMU	Diag
BIU#	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Present	ON	ON							ON	ON							ON	
Peer to Peer																		

Ring Sequence [1.2.4]

Ring	P1	P2	P3	P4	P5	P6	P7	P8
Ring 1	1	2	3	4				
Ring 2	5	6	7	8				
Ring 3								
Ring 4								

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Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Alarms, Enable Events [1.6.1]

Event#	Event Enable
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	ON
14	ON
15	ON
16	ON
17	
18	
19	
20	
21	
22	ON
23	ON
24	
25	
26	ON
27	
28	
29	ON
30	
31	
32	
33	
34	
35	
36	
37	ON
38	
39	
40	
41	
42	
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61	
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63	
64	

Alarms, Enable Alarms [1.6.4]

Alarm#	Alarm Enable
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	ON
14	ON
15	ON
16	ON
17	
18	
19	
20	
21	
22	ON
23	ON
24	
25	
26	ON
27	
28	
29	ON
30	
31	
32	
33	
34	
35	
36	
37	ON
38	
39	
40	
41	
42	
43	
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64	

Preemption Times[3.1]/Phases[3.2]/Options[3.3]

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON				
Override Higher						
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green	5	5	5	5	5	5
Min Walk						
Ped Clear						
Track Green						
Min Dwell	5	5	10	10	10	10
Max Presence						
Track R1						
Track R2						
Track R3						
Track R4						
Dwell P1						
Dwell P2						
Dwell P3						
Dwell P4						
Dwell P5						
Dwell P6						
Dwell P7						
Dwell P8						
Dwell P9						
Dwell P10						
Dwell P11						
Dwell P12						
Dwell Ped1						
Dwell Ped2						
Dwell Ped3						
Dwell Ped4						
Dwell Ped5						
Dwell Ped6						
Dwell Ped7						
Dwell Ped8						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Alarms, Parameters [1.4.1]

Auto Flash Parameter

Yellow	Red	Mode	Source
		VOT_MON	TEST A

Alarms, Parameters [1.6.7]

Preempt Event Enabled	Pattern Event Enabled
ON	ON

Alarms, Phases/Overlaps [1.4.2]

Auto Flash	1	2	3	4	5	6	7	8	9	10	11	12
Phases												
Overlaps												

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Station : 1307 - Causeway Blvd & US 41 (G003) (Standard File)

Preemption Times+[3.4]/Overlaps+[3.5]/Options+[3.6]

Preempt	1	2	3	4	5	6
Enable						
Type	RAIL	RAIL	EMERG	EMERG	EMERG	EMERG
Skip Track						
Volt Mon Flash						
Coord in Preempt						
Max2						
Return Max/Min	MAX	MAX	MIN	MIN	MIN	MIN
Extend Dwell	1	1				
Pattern						
Output Mode						
Track Over 1						
Track Over 2						
Track Over 3						
Track Over 4						
Track Over 5						
Track Over 6						
Track Over 7						
Track Over 8						
Track Over 9						
Track Over 10						
Track Over 11						
Track Over 12						
Dwell Over 1						
Dwell Over 2						
Dwell Over 3						
Dwell Over 4						
Dwell Over 5						
Dwell Over 6						
Dwell Over 7						
Dwell Over 8						
Dwell Over 9						
Dwell Over 10						
Dwell Over 11						
Dwell Over 12						
Ped Clear						
Yellow						
Red						
Return Min/Max						
Delay Inh						
Exit Time						
All Red B4						

Coordination, Modes,+ [2.1]

Modes

Operational	Correct	Maximum	Force-Off
	SHRT/LNG	MAX INH	FLOAT

Modes+

Mode	Leave Before	Leave After	Recycle	Stop In Walk	External	Auto Reset	Latch Sec Foff	Coord Easy Float	Yield Value	Coord NTCIP Yield Sign	Closed Loop Active	
FRC	TIMED	TIMED	P3478 INH	ON	OFF	ON	OFF	OFF	0	+	ON	OFF

Coordination, Pattern 1-16 [2.1]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle Time	200	120	150	110	110											
Offset Time	75	87	117	52	12											
Split Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seq Number	10	1	7	9	5	2	2	2	2	2	2	2	2	2	2	2
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn

Coordination, Pattern 17-32 [2.1]

Pattern	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Cycle Time																
Offset Time																
Split Number	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Seq Number	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn

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Coordination, Splits [2.7.1]

Split Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	90	30	18	62	30	90	18	62								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph						ON										

Split Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	28	54	15	23	29	53	15	23								
Mode	NON	MAX	NON	MAX	NON	MAX	NON	MAX	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	35	52	20	43	35	52	20	43								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	23	42	20	25	23	42	20	25								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	24	42	20	24	24	42	20	24								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph		ON														

Split Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	85	25	10	73	18	85	15	25	90							
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	85	26	10	62	22	85	15	25	90							
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

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Split Table 13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	25	45	15	35	30	42	15	45	90							
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 26	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 27	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT

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Coord-Ph																

Split Table 29	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 30	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 31	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

Split Table 32	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	OMT	OMT	OMT	OMT	OMT	OMT	OMT	OMT
Coord-Ph																

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TB Coor, Advanced Scheduler [4.3]

	Month											Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3	1	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
4	1												1	1	1	1	1	1	1	1																														2
5							1						1	1	1	1	1	1	1				1																											2
6												1	1	1	1	1	1	1	1																											1				2
7					1									1																															1	1	1	1	1	1	1	2
8									1					1						1	1	1	1	1	1	1																										2
9											1						1																											1	1	1	1	1	1	1			2
10											1							1																											1	1	1	1	1	1	1			2
11																																																		1
12																																																			1
13																																																		1
14																																																			1
15																																																		1
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28																																																		1
29																																																		1
30																																																		1
31																																																		1
32																																																		1

TB Coor, Day Plan [4.4]

Day Plan Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		6	10	15	19	21										
Minute			30	30	30											
Action	99	1	2	3	4	99										

Day Plan Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		8	19													
Minute		30	30													
Action	99	5	99													

Day Plan Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		8	19													
Minute		30	30													
Action	99	5	99													

Day Plan Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

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Day Plan Table 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

Day Plan Table 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action	99															

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TB Coor, Action Table [4.5]

Action	Pattern	Aux 1	Aux 2	Aux 3	Special 1	Special 2	Special 3	Special 4	Special 5	Special 6	Special 7	Special 8
1	1											
2	2											
3	3											
4	4											
5	5											
6	6											
7	7											
8	8											
9	9											
10	10											
11	11											
12	12											
13	13											
14	14											
15	15											
16	16											
17	17											
18	18											
19	19											
20	20											
21	21											
22	22											
23	23											
24	24											
25	25											
26	26											
27	27											
28	28											
29	29											
30	30											
31	31											
32	32											
33	33											
34	34											
35	35											
36	36											
37	37											
38	38											
39	39											
40	40											
41	41											
42	42											
43	43											
44	44											
45	45											
46	46											
47	47											
48	48											
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
99	254											
100	255											

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Appendix H: Historical Crash Data (Trains Only)

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **040012020**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **040012020**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**04/13/00**	**09:05 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
TAMPA	**FLORIDA BU**	**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)* **TAMPA** | 12. Highway Name or No. **SR 45. HWY 41** | ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **A**

14. Vehicle Speed *(est. mph at impact)*: **5**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **1**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **0**

20c. State the name and quantity of the hazardous material released, if any: **0**

21. Temperature *(specify if minus)*: **73** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **4**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **MAIN**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code	31. Time Table Direction	Code
1	**2**	**25**	R. Recorded / E. Estimated **7** mph	**E**	1. North 2. South 3. East 4. West	**1**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None

Code(s): **01** **02** **03** **06**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code: **2**

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **1**

38. Driver's Age: **21**

39. Driver's Gender — 1. Male, 2. Female — Code: **1**

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **1**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **1**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**2**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **2**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$2,000**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **2**

50. Total Number of People on Train *(include passengers and crew)*: **3**

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

VEHICLE WENT AROUND WORKING CROSSING GATES AND WAS STRUCK BY TRAIN SHOVIN INTO ROCKPORT.

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **119012040**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **119012040**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**11/27/90**	**12:50 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12** / **FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**HIGHWAY 41**	☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **H**

14. Vehicle Speed *(est. mph at impact)*: **40**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **2**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **1**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **1**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)*	23. Weather *(single entry)*
80 °F	1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **3**

26. Track Number or Name: **LEAD RKPT YARD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code	31. Time Table Direction	Code
1	**3**	**96**	R. Recorded / E. Estimated **5** mph	**E**	1. North 2. South 3. East 4. West	**2**

32. Type of Crossing Warning	33. Signaled Crossing Warning	34. Whistle Ban	Code
1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None	**20 sec warn min (1);**	1. Yes 2. No 3. Unknown	
Code(s): **01** **02**			

35. Location of Warning	Code	36. Crossing Warning Interconnected with Highway Signals	Code	37. Crossing Illuminated by Street Lights or Special Lights	Code
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	**1**	1. Yes 2. No 3. Unknown	**2**	1. Yes 2. No 3. Unknown	**1**

38. Driver's Age	39. Driver's Gender	Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train	Code	41. Driver	Code
	1. Male 2. Female		1. Yes 2. No 3. Unknown	**2**	1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)*	**1**

42. Driver Passed Standing Highway Vehicle	Code	43. View of Track Obscured by *(primary obstruction)*	Code
1. Yes 2. No 3. Unknown	**3**	1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed	**8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was	Code	45. Was Driver in the Vehicle?	Code
1. Killed 2. Injured 3. Uninjured	**3**	1. Yes 2. No	**1**

47. Highway Vehicle Property Damage *(est. dollar damage)*	48. Total Number of Highway-Rail Crossing Users *(include driver)*
$1,750	**1**

50. Total Number of People on Train *(include passengers and crew)*	51. Is a Rail Equipment Accident / Incident Report Being Filed	Code
	1. Yes 2. No	**2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **098912008**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **098912008**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**09/06/89**	**05:35 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12** / **FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**HWY 41**	☑ Public ☐ Private

Highway User Involved

13. Type — Code: **B**
A. Auto; B. Truck; C. Truck-trailer; D. Pick-up truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(specify)*

14. Vehicle Speed *(est. mph at impact)*: **10**

15. Direction *(geographical)* — Code: **1**
1. North 2. South 3. East 4. West

16. Position — Code: **3**
1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: **4**
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

17. Equipment — Code: **2**
1. Train *(units pulling)*; 2. Train *(units pushing)*; 3. Train *(standing)*; 4. Car(s) *(moving)*; 5. Car(s) *(standing)*; 6. Light loco(s) *(moving)*; 7. Light loco(s) *(standing)*; 8. Other *(specify)*
A. Train pulling- RCL; B. Train pushing- RCL; C. Train standing- RCL

18. Position of Car Unit in Train: **1**

19. Circumstance — Code: **2**
1. Rail equipment struck highway user 2. Rail equipment struck by highway user

20b. Was there a hazardous materials release by — Code:
1. Highway User 2. Rail Equipment 3. Both 4. Neither

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)* — Code	23. Weather *(single entry)* — Code
78 °F	1. Dawn 2. Day 3. Dusk 4. Dark — **4**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — **1**

24. Type of Equipment Consist *(single entry)* — Code: **7**
1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/Switching 8. Light loco(s) 9. Main./inspect. car A. Spec. MoW Equip.

25. Track Type Used by Rail Equipment Involved — Code: **2**
1. Main 2. Yard 3. Siding 4. Industry

26. Track Number or Name: **LEAD FROM ROCKPORT**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)* — Code	31. Time Table Direction — Code
2	**3**	**55**	R. Recorded / E. Estimated **3** mph **E**	1. North 2. South 3. East 4. West — **2**

32. Type of Crossing Warning — Code(s): **01**
1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — Code:
1. Yes 2. No 3. Unknown

35. Location of Warning — Code	36. Crossing Warning Interconnected with Highway Signals — Code	37. Crossing Illuminated by Street Lights or Special Lights — Code
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — **1**	1. Yes 2. No 3. Unknown — **2**	1. Yes 2. No 3. Unknown — **2**

38. Driver's Age	39. Driver's Gender — Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code	41. Driver — Code
	1. Male 2. Female	1. Yes 2. No 3. Unknown — **2**	1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)* — **1**

42. Driver Passed Standing Highway Vehicle — Code	43. View of Track Obscured by *(primary obstruction)* — Code
1. Yes 2. No 3. Unknown — **2**	1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed — **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — Code	45. Was Driver in the Vehicle? — Code
1. Killed 2. Injured 3. Uninjured — **3**	1. Yes 2. No — **1**
47. Highway Vehicle Property Damage *(est. dollar damage)*: **$6,000**	48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**
50. Total Number of People on Train *(include passengers and crew)*	51. Is a Rail Equipment Accident / Incident Report Being Filed — Code: **2** (1. Yes 2. No)

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **108812009**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **108812009**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**10/06/88**	**10:45 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
SUTTON		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**U S HWY 41**	☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **C**

14. Vehicle Speed *(est. mph at impact)*: **3**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **2**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **80** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **ROCKPORT**

27. FRA Track Class: **2**

28. Number of Locomotive Units: **2**

29. Number of Cars: **25**

30. Consist Speed *(Recorded if available)* — R. Recorded, E. Estimated: **3** mph — Code: **E**

31. Time Table Direction — 1. North 2. South 3. East 4. West — Code: **2**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None — Code(s): **01** **02** **10**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **2**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **2**

38. Driver's Age:

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **1**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **3**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$0**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title

56. Signature

57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **108812005**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **108812005**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**10/02/88**	**06:34 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
ROCKPORT		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)* **TAMPA**
12. Highway Name or No. **U S HIGHWAY 41** ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **A**

14. Vehicle Speed *(est. mph at impact)*: **3**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **1**

18. Position of Car Unit in Train: **80**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **72** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **4**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **ROCKPORT**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code
2	**3**	**127**	R. Recorded / E. Estimated **5** mph	**E**

31. Time Table Direction — 1. North 2. South 3. East 4. West — Code: **1**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None

Code(s): **01** **02** **07**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **1**

38. Driver's Age

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **1**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$2,000**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title

56. Signature

57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **128108481**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **Seaboard Coast Line Railroad [SCL]**	3a. **SCL**	3b. **128108481**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**12/04/81**	**09:15 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12 / FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**US 41**	☑ Public ☐ Private

Highway User Involved

13. Type — Code: **A**
A. Auto; B. Truck; C. Truck-trailer; D. Pick-up truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(specify)*

14. Vehicle Speed *(est. mph at impact)*: **10**

15. Direction *(geographical)* — Code: **1**
1. North 2. South 3. East 4. West

16. Position — Code: **3**
1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: **4**
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

17. Equipment — Code: **2**
1. Train *(units pulling)*; 2. Train *(units pushing)*; 3. Train *(standing)*; 4. Car(s) *(moving)*; 5. Car(s) *(standing)*; 6. Light loco(s) *(moving)*; 7. Light loco(s) *(standing)*; 8. Other *(specify)*
A. Train pulling- RCL; B. Train pushing- RCL; C. Train standing- RCL

18. Position of Car Unit in Train: **27**

19. Circumstance — Code: **2**
1. Rail equipment struck highway user 2. Rail equipment struck by highway user

20b. Was there a hazardous materials release by — Code:
1. Highway User 2. Rail Equipment 3. Both 4. Neither

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)* — Code	23. Weather *(single entry)* — Code
80 °F	1. Dawn 2. Day 3. Dusk 4. Dark — **2**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — **1**

24. Type of Equipment Consist *(single entry)* — Code: **1**
1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/Switching; 8. Light loco(s); 9. Main./inspect. car; A. Spec. MoW Equip.

25. Track Type Used by Rail Equipment Involved — Code: **2**
1. Main 2. Yard 3. Siding 4. Industry

26. Track Number or Name: **EAST LEAD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)* — Code	31. Time Table Direction — Code
2	**2**	**107**	R. Recorded / E. Estimated **10** mph **E**	1. North 2. South 3. East 4. West — **1**

32. Type of Crossing Warning	33. Signaled Crossing Warning	34. Whistle Ban — Code
1. Gates; 2. Cantilever FLS; 3. Standard FLS; 4. Wig wags; 5. Hwy. traffic signals; 6. Audible; 7. Crossbucks; 8. Stop signs; 9. Watchman; 10. Flagged by crew; 11. Other *(specify)*; 12. None	**20 sec warn min (1);**	1. Yes 2. No 3. Unknown
Code(s): **02**		

35. Location of Warning — Code	36. Crossing Warning Interconnected with Highway Signals — Code	37. Crossing Illuminated by Street Lights or Special Lights — Code
1. Both Sides; 2. Side of Vehicle Approach; 3. Opposite Side of Vehicle Approach — **1**	1. Yes 2. No 3. Unknown — **2**	1. Yes 2. No 3. Unknown — **2**

38. Driver's Age	39. Driver's Gender — Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code	41. Driver — Code
	1. Male; 2. Female	1. Yes 2. No 3. Unknown — **2**	1. Drove around or thru the gate; 2. Stopped and then proceeded; 3. Did not stop; 4. Stopped on crossing; 5. Other *(specify)* — **3**

42. Driver Passed Standing Highway Vehicle — Code	43. View of Track Obscured by *(primary obstruction)* — Code
1. Yes 2. No 3. Unknown — **2**	1. Permanent Structure; 2. Standing railroad equipment; 3. Passing Train; 4. Topography; 5. Vegetation; 6. Highway Vehicles; 7. Other *(specify)*; 8. Not Obstructed — **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — Code	45. Was Driver in the Vehicle? — Code
1. Killed 2. Injured 3. Uninjured — **3**	1. Yes 2. No — **1**
47. Highway Vehicle Property Damage *(est. dollar damage)*: **$23,000**	**48. Total Number of Highway-Rail Crossing Users** *(include driver)*: **1**
50. Total Number of People on Train *(include passengers and crew)*	**51. Is a Rail Equipment Accident / Incident Report Being Filed** — Code: **2** (1. Yes 2. No)

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **048008409**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **Seaboard Coast Line Railroad [SCL]**	3a. **SCL**	3b. **048008409**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**04/25/80**	**02:25 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
SUTTON		**HILLSBOROUGH**	**12 / FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**US 41**	☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto; B. Truck; C. Truck-trailer; D. Pick-up truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(specify)* — Code: **C**

14. Vehicle Speed *(est. mph at impact)*: **0**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped — Code: **2**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*; 2. Train *(units pushing)*; 3. Train *(standing)*; 4. Car(s) *(moving)*; 5. Car(s) *(standing)*; 6. Light loco(s) *(moving)*; 7. Light loco(s) *(standing)*; 8. Other *(specify)*; A. Train pulling- RCL; B. Train pushing- RCL; C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user 2. Rail equipment struck by highway user — Code: **1**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)*	23. Weather *(single entry)*
80 °F	1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/Switching 8. Light loco(s) 9. Main./inspect. car A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **2**

26. Track Number or Name: **STEM OF WYE**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	31. Time Table Direction
1	**2**	**102**	R. Recorded / E. Estimated **3** mph **E** — Code:	1. North 2. South 3. East 4. West — Code: **2**

32. Type of Crossing Warning — 1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None — Code(s): **01**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **2**

38. Driver's Age

39. Driver's Gender — 1. Male 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)* — Code: **4**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$600**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **047808403**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **Seaboard Coast Line Railroad [SCL]**	3a. **SCL**	3b. **047808403**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**04/05/78**	**06:30 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12 / FL**

11. City *(if in a city)* **TAMPA** | 12. Highway Name or No. **US 41** | ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **A**

14. Vehicle Speed *(est. mph at impact)*: **1**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **1**

18. Position of Car Unit in Train: **15**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **80** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **3**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **MAIN LINE**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code
2	**3**	**102**	R. Recorded / E. Estimated **4** mph	**E**

31. Time Table Direction — 1. North 2. South 3. East 4. West — Code: **2**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None — Code(s): **02**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **2**

38. Driver's Age

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **2**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$500**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title | 56. Signature | 57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **1830807225**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance	3a.	3b.

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**08/11/76**	**09:05 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
ROCKPORT		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**US 41**	☑ Public ☐ Private

Highway User Involved

13. Type (A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)*)	Code
	A

14. Vehicle Speed *(est. mph at impact)*	15. Direction *(geographical)* (1. North 2. South 3. East 4. West)	Code
1	**1**	**1**

16. Position (1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped)	Code
	3

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? (1. Highway User 2. Rail Equipment 3. Both 4. Neither)	Code
	4

Rail Equipment Involved

17. Equipment (1. Train *(units pulling)* 2. Train *(units pushing)* 3. Train *(standing)* 4. Car(s) *(moving)* 5. Car(s) *(standing)* 6. Light loco(s) *(moving)* 7. Light loco(s) *(standing)* 8. Other *(specify)* A. Train pulling- RCL B. Train pushing- RCL C. Train standing- RCL)	Code
	1

18. Position of Car Unit in Train
1

19. Circumstance (1. Rail equipment struck highway user 2. Rail equipment struck by highway user)	Code
	2

20b. Was there a hazardous materials release by (1. Highway User 2. Rail Equipment 3. Both 4. Neither)	Code

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)* (1. Dawn 2. Day 3. Dusk 4. Dark)	Code	23. Weather *(single entry)* (1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow)	Code
73 °F		**4**		**1**

24. Type of Equipment Consist *(single entry)* (1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/Switching 8. Light loco(s) 9. Main./inspect. car A. Spec. MoW Equip.)	Code	25. Track Type Used by Rail Equipment Involved (1. Main 2. Yard 3. Siding 4. Industry)	Code	26. Track Number or Name
	1		**4**	**INDUSTRIAL LEAD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)* R. Recorded E. Estimated	Code	31. Time Table Direction (1. North 2. South 3. East 4. West)	Code
2	**2**	**1**	**5** mph	**E**		**1**

32. Type of Crossing Warning (1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None)		33. Signaled Crossing Warning	34. Whistle Ban (1. Yes 2. No 3. Unknown)	Code
Code(s)	**03**	**20 sec warn min (1);**		

35. Location of Warning (1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach)	Code	36. Crossing Warning Interconnected with Highway Signals (1. Yes 2. No 3. Unknown)	Code	37. Crossing Illuminated by Street Lights or Special Lights (1. Yes 2. No 3. Unknown)	Code
	1		**1**		**2**

38. Driver's Age	39. Driver's Gender (1. Male 2. Female)	Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train (1. Yes 2. No 3. Unknown)	Code	41. Driver (1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)*)	Code
			2			**2**

42. Driver Passed Standing Highway Vehicle (1. Yes 2. No 3. Unknown)	Code	43. View of Track Obscured by *(primary obstruction)* (1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed)	Code
	2		**8**

Casualties to:	Killed	Injured	44. Driver was (1. Killed 2. Injured 3. Uninjured)	Code	45. Was Driver in the Vehicle? (1. Yes 2. No)	Code
				3		**1**
46. Highway-Rail Crossing Users	**0**	**0**	47. Highway Vehicle Property Damage *(est. dollar damage)*	**$400**	48. Total Number of Highway-Rail Crossing Users *(include driver)*	**2**
49. Railroad Employees	**0**	**0**	50. Total Number of People on Train *(include passengers and crew)*		51. Is a Rail Equipment Accident / Incident Report Being Filed (1. Yes 2. No)	Code
52. Passengers on Train	**0**	**0**				**2**

53a. Special Study Block	53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **1830206803**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance	3a.	3b.

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**02/09/76**	**10:00 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
ROCKPORT		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)* **ROCKPORT** | 12. Highway Name or No. **US 41** | ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **B**

14. Vehicle Speed *(est. mph at impact)*: **30**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **4**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **3**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **70** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **2**

26. Track Number or Name: **YARD LEAD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code	31. Time Table Direction	Code
4	**2**	**50**	R. Recorded / E. Estimated **5** mph	**E**	1. North 2. South 3. East 4. West	**2**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None

Code(s)							
	03	**10**	**03**	**10**			

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code:

38. Driver's Age

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **3**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$500**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

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FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

Appendix I: BEBR Data

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Projections of Florida Population by County, 2020-2045, with Estimates for 2017

County and State	Estimates April 1, 2017	Projections, April 1 2020	2025	2030	2035	2040	2045
ALACHUA	260,003						
Low		255,500	257,400	259,400	260,000	259,100	257,300
Medium		268,000	279,700	289,900	298,800	306,300	313,100
High		280,900	300,900	320,600	339,300	357,100	374,800
BAKER	27,191						
Low		26,200	26,100	26,100	26,000	25,800	25,600
Medium		27,800	28,800	29,700	30,500	31,300	32,100
High		29,400	31,500	33,600	35,700	38,000	40,300
BAY	178,820						
Low		175,400	177,600	179,200	179,800	179,200	177,600
Medium		186,000	196,200	204,800	212,600	219,200	225,100
High		196,700	213,900	230,700	246,900	262,800	278,400
BRADFORD	27,642						
Low		27,100	26,600	26,100	25,500	24,900	24,300
Medium		28,700	29,300	29,700	30,000	30,400	30,700
High		30,500	32,000	33,500	35,000	36,600	38,200
BREVARD	575,211						
Low		574,200	588,000	600,200	608,500	614,100	617,900
Medium		596,100	627,600	653,200	674,900	693,700	711,100
High		618,800	666,900	712,700	756,400	799,100	842,000
BROWARD	1,873,970						
Low		1,852,800	1,882,100	1,903,100	1,909,300	1,903,000	1,888,100
Medium		1,943,800	2,045,800	2,126,900	2,193,900	2,249,300	2,298,200
High		2,037,100	2,199,600	2,352,200	2,491,400	2,622,900	2,750,600
CALHOUN	15,001						
Low		14,500	14,400	14,300	14,200	13,900	13,700
Medium		15,400	15,900	16,300	16,700	17,000	17,300
High		16,300	17,400	18,400	19,500	20,500	21,600
CHARLOTTE	172,720						
Low		169,200	171,200	173,000	174,100	174,200	173,700
Medium		179,300	189,200	197,800	205,700	212,800	219,600
High		189,700	206,200	222,700	239,100	255,500	272,300
CITRUS	143,801						
Low		140,700	141,200	141,800	141,500	140,600	139,400
Medium		147,600	153,000	157,700	161,600	164,900	168,000
High		154,700	165,000	175,200	184,900	194,500	204,000
CLAY	208,549						
Low		210,500	220,400	230,500	239,500	245,900	250,900
Medium		221,000	239,900	257,400	273,900	288,000	301,000
High		231,400	257,600	284,800	312,500	338,900	365,400
COLLIER	357,470						
Low		361,700	380,100	397,100	411,800	423,300	430,600
Medium		379,900	413,700	443,600	471,100	495,600	517,100
High		397,700	444,200	490,900	537,400	583,400	627,300
COLUMBIA	68,943						
Low		67,300	67,300	67,400	66,900	66,300	65,500
Medium		70,500	73,000	75,000	76,500	77,800	79,100
High		74,000	78,700	83,300	87,500	91,700	95,900
DE SOTO	35,621						
Low		34,200	33,900	33,700	33,500	33,200	32,700
Medium		35,800	36,700	37,500	38,300	38,900	39,500
High		37,600	39,600	41,700	43,800	45,900	47,900
DIXIE	16,726						
Low		16,100	15,800	15,600	15,300	14,900	14,500
Medium		17,000	17,400	17,700	18,000	18,200	18,300
High		18,000	19,100	20,100	21,000	21,900	22,800

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Projections of Florida Population by County, 2020-2045, with Estimates for 2017

County and State	Estimates April 1, 2017	Projections, April 1 2020	2025	2030	2035	2040	2045
DUVAL	936,811						
Low		933,200	958,200	976,800	989,500	999,600	1,006,200
Medium		979,400	1,042,000	1,091,400	1,135,500	1,176,700	1,215,900
High		1,026,000	1,119,900	1,207,300	1,291,200	1,377,700	1,465,800
ESCAMBIA	313,381						
Low		308,700	309,800	310,000	308,700	306,300	303,300
Medium		320,300	330,300	337,600	343,300	347,900	352,000
High		332,700	351,300	368,100	383,800	398,600	413,300
FLAGLER	105,157						
Low		105,700	112,100	117,400	121,400	124,200	126,300
Medium		113,500	126,400	137,500	147,700	156,900	165,800
High		121,000	139,000	157,100	174,700	192,200	210,500
FRANKLIN	12,161						
Low		11,700	11,700	11,600	11,400	11,200	11,000
Medium		12,400	12,900	13,200	13,500	13,700	13,900
High		13,200	14,100	14,900	15,700	16,500	17,300
GADSDEN	48,263						
Low		46,200	45,300	44,500	43,700	42,800	42,000
Medium		48,400	49,000	49,600	50,000	50,500	50,900
High		50,800	52,900	55,000	57,100	59,200	61,400
GILCHRIST	17,224						
Low		16,700	16,800	16,800	16,700	16,500	16,200
Medium		17,700	18,500	19,100	19,600	20,000	20,400
High		18,800	20,200	21,600	22,900	24,200	25,600
GLADES	13,087						
Low		12,700	12,700	12,700	12,600	12,500	12,300
Medium		13,500	14,000	14,400	14,800	15,200	15,500
High		14,200	15,300	16,300	17,300	18,300	19,300
GULF	16,297						
Low		15,800	15,600	15,400	15,200	15,000	14,700
Medium		16,800	17,200	17,600	17,900	18,200	18,500
High		17,800	18,800	19,900	20,900	22,000	23,100
HAMILTON	14,663						
Low		13,900	13,700	13,500	13,300	13,000	12,700
Medium		14,800	15,100	15,400	15,600	15,800	16,100
High		15,600	16,500	17,400	18,200	19,100	20,000
HARDEE	27,426						
Low		26,100	25,300	24,600	23,900	23,200	22,400
Medium		27,700	27,900	28,000	28,200	28,300	28,500
High		29,300	30,500	31,700	32,900	34,100	35,300
HENDRY	39,057						
Low		38,200	38,100	38,100	38,000	37,800	37,600
Medium		40,000	41,300	42,400	43,400	44,300	45,200
High		42,000	44,600	47,100	49,700	52,300	55,000
HERNANDO	181,882						
Low		179,400	183,400	186,800	189,300	190,400	190,600
Medium		190,300	202,700	213,500	223,500	232,200	240,400
High		201,300	220,900	240,400	260,000	279,200	298,800
HIGHLANDS	102,138						
Low		100,000	100,100	100,200	99,800	99,100	98,000
Medium		104,800	108,500	111,500	114,100	116,200	118,200
High		109,900	117,000	123,900	130,500	137,000	143,500
HILLSBOROUGH	1,379,302						
Low		1,384,300	1,448,100	1,502,200	1,533,200	1,556,000	1,569,300
Medium		1,469,600	1,604,200	1,720,100	1,814,300	1,901,400	1,983,200
High		1,552,700	1,742,200	1,929,500	2,094,900	2,254,700	2,415,100

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Projections of Florida Population by County, 2020-2045, with Estimates for 2017

County and State	Estimates April 1, 2017	Projections, April 1 2020	2025	2030	2035	2040	2045
HOLMES	20,210						
Low		19,400	19,000	18,600	18,100	17,700	17,200
Medium		20,500	20,900	21,100	21,300	21,600	21,800
High		21,700	22,800	23,900	24,900	26,000	27,100
INDIAN RIVER	148,962						
Low		147,500	152,200	156,300	159,200	161,000	161,300
Medium		156,500	168,300	178,600	187,800	196,000	203,300
High		165,500	183,300	201,200	218,600	236,100	252,900
JACKSON	50,418						
Low		48,700	47,700	46,700	45,700	44,600	43,400
Medium		51,100	51,700	52,000	52,400	52,600	52,800
High		53,600	55,800	57,800	59,700	61,700	63,500
JEFFERSON	14,611						
Low		14,000	13,700	13,400	13,100	12,700	12,300
Medium		14,800	15,000	15,200	15,400	15,500	15,600
High		15,700	16,500	17,200	18,000	18,700	19,400
LAFAYETTE	8,479						
Low		7,900	7,800	7,800	7,700	7,600	7,500
Medium		8,300	8,600	8,900	9,100	9,300	9,400
High		8,800	9,400	10,000	10,600	11,200	11,700
LAKE	331,724						
Low		335,200	354,500	373,500	387,200	397,700	405,600
Medium		356,000	392,900	427,600	457,300	484,200	509,600
High		376,000	426,500	479,800	529,100	576,300	624,200
LEE	698,468						
Low		705,900	746,200	778,400	805,600	827,100	843,400
Medium		749,600	826,900	891,200	951,500	1,007,100	1,059,900
High		791,800	897,700	999,800	1,100,700	1,198,500	1,298,000
LEON	287,899						
Low		282,800	285,200	287,100	287,100	285,000	282,400
Medium		296,600	309,900	320,900	330,000	337,300	344,100
High		310,900	333,300	354,900	374,600	392,900	411,400
LEVY	41,015						
Low		40,000	40,000	39,900	39,600	39,100	38,500
Medium		42,000	43,400	44,400	45,300	45,900	46,600
High		44,000	46,800	49,300	51,700	54,100	56,400
LIBERTY	8,719						
Low		8,400	8,300	8,300	8,200	8,100	7,900
Medium		9,000	9,400	9,700	10,000	10,300	10,600
High		9,600	10,400	11,100	11,900	12,600	13,400
MADISON	19,377						
Low		18,200	17,700	17,200	16,700	16,200	15,700
Medium		19,300	19,400	19,600	19,700	19,800	19,900
High		20,500	21,300	22,100	23,000	23,800	24,700
MANATEE	368,782						
Low		371,400	392,300	410,100	423,500	431,800	436,500
Medium		394,300	434,700	469,500	500,400	526,800	550,800
High		416,600	471,900	526,800	578,600	625,700	671,800
MARION	349,267						
Low		347,100	355,100	362,400	368,900	372,500	374,700
Medium		364,200	386,100	404,900	423,000	438,500	452,900
High		381,600	415,000	447,900	481,300	513,400	545,900
MARTIN	153,022						
Low		151,000	152,900	154,300	154,800	154,800	154,700
Medium		158,400	165,800	171,700	176,700	181,200	185,700
High		166,100	178,700	190,700	202,300	214,100	226,400

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Projections of Florida Population by County, 2020-2045, with Estimates for 2017

County and State	Estimates April 1, 2017	Projections, April 1 2020	2025	2030	2035	2040	2045
MIAMI-DADE	2,743,095						
Low		2,737,000	2,816,200	2,877,400	2,920,400	2,955,800	2,972,000
Medium		2,872,800	3,062,600	3,215,100	3,350,400	3,477,600	3,592,200
High		3,009,200	3,291,200	3,556,500	3,810,600	4,073,900	4,329,600
MONROE	76,889						
Low		72,000	70,100	68,500	66,900	65,300	63,600
Medium		75,300	75,900	76,300	76,700	77,000	77,400
High		79,200	81,900	84,700	87,500	90,300	93,100
NASSAU	80,456						
Low		79,800	83,300	86,100	87,800	88,500	88,500
Medium		85,700	93,800	100,900	107,000	112,300	117,200
High		91,400	103,300	115,200	126,400	136,900	147,600
OKALOOSA	195,488						
Low		191,900	193,500	194,900	195,900	195,600	194,800
Medium		201,200	209,800	216,900	223,600	229,100	234,200
High		211,000	226,200	240,900	256,100	270,600	285,100
OKEECHOBEE	41,140						
Low		40,100	39,800	39,600	39,300	38,900	38,300
Medium		42,000	43,100	44,100	44,900	45,600	46,300
High		44,100	46,500	49,000	51,300	53,700	56,100
ORANGE	1,313,880						
Low		1,341,900	1,422,600	1,489,800	1,535,700	1,573,200	1,600,500
Medium		1,425,900	1,576,700	1,705,500	1,814,900	1,917,000	2,013,600
High		1,505,200	1,711,500	1,913,400	2,098,300	2,279,600	2,463,100
OSCEOLA	337,614						
Low		357,200	400,000	434,000	460,500	480,600	495,700
Medium		384,500	452,400	509,300	560,200	606,200	649,800
High		408,700	495,500	579,500	659,400	733,400	808,100
PALM BEACH	1,414,144						
Low		1,403,800	1,434,500	1,464,500	1,484,900	1,493,300	1,493,000
Medium		1,473,000	1,559,600	1,636,400	1,703,700	1,760,000	1,809,800
High		1,543,400	1,676,400	1,810,200	1,937,500	2,058,200	2,174,900
PASCO	505,709						
Low		509,300	531,700	553,700	573,300	588,100	598,700
Medium		534,800	578,600	618,400	656,000	689,000	719,000
High		560,000	621,400	684,400	748,100	810,600	872,200
PINELLAS	962,003						
Low		944,900	942,700	941,400	934,400	925,000	913,600
Medium		980,100	1,005,000	1,025,000	1,039,300	1,051,300	1,061,600
High		1,018,300	1,069,200	1,117,700	1,161,500	1,203,800	1,244,800
POLK	661,645						
Low		671,100	705,900	736,000	757,600	772,000	784,800
Medium		704,900	768,300	822,000	867,500	906,100	943,600
High		737,800	824,900	909,700	988,500	1,064,000	1,143,200
PUTNAM	73,176						
Low		70,300	68,600	67,100	65,500	63,900	62,200
Medium		73,600	74,200	74,700	75,100	75,400	75,700
High		77,300	80,100	82,900	85,700	88,400	91,100
ST. JOHNS	229,715						
Low		237,500	261,700	280,800	295,200	305,800	314,000
Medium		255,300	295,800	329,600	359,600	386,600	412,700
High		271,800	324,200	375,000	422,800	466,600	511,900
ST. LUCIE	297,634						
Low		299,900	314,700	328,600	340,500	351,000	360,400
Medium		315,000	342,500	367,000	389,600	410,600	431,200
High		329,800	367,800	406,100	444,300	483,800	525,100

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Projections of Florida Population by County, 2020-2045, with Estimates for 2017

County and State	Estimates April 1, 2017	Projections, April 1 2020	2025	2030	2035	2040	2045
SANTA ROSA	170,835						
Low		169,700	177,500	183,900	187,500	189,100	189,800
Medium		182,100	199,900	215,500	228,500	239,900	250,900
High		194,300	220,100	246,100	269,800	292,600	316,400
SARASOTA	407,260						
Low		406,200	417,700	425,900	430,200	431,500	430,700
Medium		426,300	454,200	475,900	493,900	509,000	522,600
High		446,600	488,100	526,400	561,300	594,700	627,400
SEMINOLE	454,757						
Low		452,400	462,600	471,100	477,300	480,400	480,800
Medium		474,700	502,900	526,400	547,700	566,100	582,600
High		497,400	540,600	582,200	622,800	662,100	700,500
SUMTER	120,700						
Low		124,400	138,100	149,800	158,500	164,900	169,400
Medium		135,300	158,900	180,000	198,800	216,100	232,600
High		145,300	176,400	208,400	239,200	269,700	301,000
SUWANNEE	44,690						
Low		43,400	43,500	43,500	43,300	42,900	42,500
Medium		45,500	47,100	48,400	49,500	50,400	51,200
High		47,700	50,800	53,800	56,600	59,300	62,100
TAYLOR	22,295						
Low		21,100	20,600	20,100	19,700	19,200	18,700
Medium		22,400	22,700	22,900	23,200	23,400	23,700
High		23,700	24,800	25,900	27,100	28,200	29,400
UNION	15,947						
Low		15,000	14,800	14,600	14,300	14,000	13,700
Medium		15,900	16,300	16,600	16,900	17,100	17,300
High		16,800	17,800	18,800	19,700	20,600	21,500
VOLUSIA	523,405						
Low		523,400	534,100	544,400	551,900	555,900	557,300
Medium		543,500	570,000	592,600	612,100	628,300	642,400
High		564,100	605,800	646,400	686,000	723,400	759,400
WAKULLA	31,909						
Low		31,200	32,100	32,800	33,200	33,300	33,300
Medium		33,100	35,500	37,500	39,200	40,700	42,000
High		35,000	38,600	42,200	45,600	48,800	52,200
WALTON	65,301						
Low		66,300	71,700	76,500	79,600	81,700	83,100
Medium		71,200	80,900	89,500	96,700	103,100	109,100
High		75,900	88,900	102,300	114,500	126,400	138,500
WASHINGTON	24,985						
Low		24,200	23,800	23,400	23,000	22,400	21,800
Medium		25,600	26,200	26,700	27,100	27,300	27,600
High		27,100	28,700	30,200	31,600	32,900	34,300
FLORIDA	20,484,142						
Low		20,889,600	22,026,300	22,890,500	23,553,900	24,063,200	24,466,400
Medium		21,526,500	23,061,900	24,357,000	25,485,600	26,492,000	27,423,600
High		22,152,200	24,075,600	25,790,600	27,374,200	28,870,500	30,327,400

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Appendix J: Synchro Reports

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Synchro HCM Signalized Intersection Reports

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	405	492	78	1053	245	1656	1377	75	241	729	84
Future Volume (veh/h)	67	405	492	78	1053	245	1656	1377	75	241	729	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	71	426	518	82	1108	258	1743	1449	79	254	767	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	93	875	1596	115	898	400	1127	1480	80	179	958	109
Arrive On Green	0.03	0.26	0.26	0.03	0.26	0.26	0.34	0.45	0.45	0.10	0.21	0.21
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	3292	179	1711	4465	509
Grp Volume(v), veh/h	71	426	518	82	1108	258	1743	749	779	254	560	295
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1764	1711	1635	1705
Q Serve(g_s), s	4.2	21.2	3.4	4.9	52.6	30.1	67.9	86.1	87.1	20.9	32.5	32.8
Cycle Q Clear(g_c), s	4.2	21.2	3.4	4.9	52.6	30.1	67.9	86.1	87.1	20.9	32.5	32.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.30
Lane Grp Cap(c), veh/h	93	875	1596	115	898	400	1127	767	793	179	701	366
V/C Ratio(X)	0.76	0.49	0.32	0.71	1.23	0.64	1.55	0.98	0.98	1.42	0.80	0.81
Avail Cap(c_a), veh/h	93	875	1596	159	898	400	1127	767	793	179	701	366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	96.5	63.2	8.7	95.6	73.7	65.4	66.1	54.0	54.3	89.6	74.5	74.6
Incr Delay (d2), s/veh	40.8	1.9	0.5	25.7	115.2	7.8	250.6	27.3	27.9	218.8	9.3	17.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	9.4	3.5	2.5	37.1	12.5	67.3	41.6	43.5	20.0	14.4	15.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	137.3	65.1	9.2	121.3	188.9	73.2	316.6	81.3	82.2	308.3	83.7	91.7
LnGrp LOS	F	E	A	F	F	E	F	F	F	F	F	F
Approach Vol, veh/h		1015			1448			3271			1109	
Approach Delay, s/veh		41.7			164.4			206.9			137.3	
Approach LOS		D			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	76.0	51.0	13.0	60.0	29.0	98.0	14.3	58.7
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 68	* 43	5.6	52.6	* 21	* 90	9.6	47.6
Max Q Clear Time (g_c+I1), s	69.9	34.8	6.2	54.6	22.9	89.1	6.9	23.2
Green Ext Time (p_c), s	0.0	6.3	0.0	0.0	0.0	0.8	0.1	16.4

Intersection Summary	
HCM 6th Ctrl Delay	162.1
HCM 6th LOS	F

Notes

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

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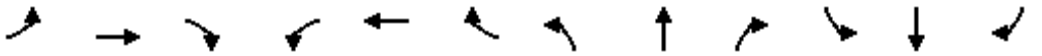

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	900	1566	118	498	259	483	576	125	307	1318	31
Future Volume (veh/h)	62	900	1566	118	498	259	483	576	125	307	1318	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	65	947	1648	124	524	273	508	606	132	323	1387	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	103	833	1110	124	854	381	565	927	202	307	1684	40
Arrive On Green	0.03	0.24	0.24	0.04	0.25	0.25	0.17	0.33	0.33	0.18	0.34	0.34
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	2788	606	1711	4927	117
Grp Volume(v), veh/h	65	947	1648	124	524	273	508	370	368	323	920	500
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1687	1711	1635	1775
Q Serve(g_s), s	2.9	36.6	36.6	5.6	20.4	15.3	22.5	27.8	27.9	26.9	38.7	38.7
Cycle Q Clear(g_c), s	2.9	36.6	36.6	5.6	20.4	15.3	22.5	27.8	27.9	26.9	38.7	38.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		0.07
Lane Grp Cap(c), veh/h	103	833	1110	124	854	381	565	568	561	307	1117	607
V/C Ratio(X)	0.63	1.14	1.48	1.00	0.61	0.72	0.90	0.65	0.65	1.05	0.82	0.82
Avail Cap(c_a), veh/h	146	833	1110	124	854	381	595	568	561	307	1117	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.8	56.7	22.1	72.2	49.8	19.9	61.0	42.7	42.7	61.5	45.2	45.2
Incr Delay (d2), s/veh	20.7	76.2	223.0	81.1	3.3	11.0	18.8	5.7	5.9	65.9	6.9	12.0
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	1.5	24.2	46.6	3.7	8.9	6.5	10.7	12.3	12.2	17.0	16.2	18.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.5	132.9	245.2	153.3	53.1	30.9	79.8	48.4	48.6	127.5	52.2	57.3
LnGrp LOS	F	F	F	F	D	C	E	D	D	F	D	E
Approach Vol, veh/h		2660			921			1246			1743	
Approach Delay, s/veh		201.5			60.0			61.2			67.6	
Approach LOS		F			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.6	59.4	12.1	44.9	35.0	58.0	13.0	44.0
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 27	* 50	6.6	35.6	* 27	* 50	5.6	36.6
Max Q Clear Time (g_c+I1), s	24.5	40.7	4.9	22.4	28.9	29.9	7.6	38.6
Green Ext Time (p_c), s	1.0	8.7	0.0	9.1	0.0	12.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	119.5
HCM 6th LOS	F

Notes

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

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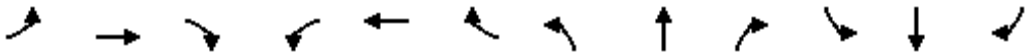

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	547	664	101	1368	318	2031	1688	92	282	852	98
Future Volume (veh/h)	91	547	664	101	1368	318	2031	1688	92	282	852	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	96	576	699	106	1440	335	2138	1777	97	297	897	103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	93	917	1562	141	966	431	1044	1447	78	162	980	112
Arrive On Green	0.03	0.27	0.27	0.04	0.28	0.28	0.31	0.44	0.44	0.09	0.22	0.22
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	3292	178	1711	4463	511
Grp Volume(v), veh/h	96	576	699	106	1440	335	2138	914	960	297	656	344
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1764	1711	1635	1704
Q Serve(g_s), s	5.6	29.7	5.6	6.3	56.6	40.5	62.9	87.9	87.9	18.9	39.2	39.4
Cycle Q Clear(g_c), s	5.6	29.7	5.6	6.3	56.6	40.5	62.9	87.9	87.9	18.9	39.2	39.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.30
Lane Grp Cap(c), veh/h	93	917	1562	141	966	431	1044	750	775	162	718	374
V/C Ratio(X)	1.03	0.63	0.45	0.75	1.49	0.78	2.05	1.22	1.24	1.84	0.91	0.92
Avail Cap(c_a), veh/h	93	917	1562	192	966	431	1044	750	775	162	718	374
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	97.2	64.4	10.0	94.7	71.7	65.9	68.5	56.0	56.1	90.6	76.2	76.3
Incr Delay (d2), s/veh	102.6	3.3	0.9	25.5	226.4	12.9	475.1	110.4	118.0	399.7	18.2	30.0
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	3.7	13.3	5.3	3.2	54.8	17.1	95.0	59.6	63.3	26.3	18.0	20.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	199.8	67.6	10.9	120.2	298.1	78.9	543.7	166.5	174.1	490.3	94.4	106.3
LnGrp LOS	F	E	B	F	F	E	F	F	F	F	F	F
Approach Vol, veh/h		1371			1881			4012			1297	
Approach Delay, s/veh		48.0			249.1			369.3			188.2	
Approach LOS		D			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	71.0	52.0	13.0	64.0	27.0	96.0	15.9	61.1
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 63	* 44	5.6	56.6	* 19	* 88	11.6	50.6
Max Q Clear Time (g_c+I1), s	64.9	41.4	7.6	58.6	20.9	89.9	8.3	31.7
Green Ext Time (p_c), s	0.0	2.2	0.0	0.0	0.0	0.0	0.2	16.1

Intersection Summary	
HCM 6th Ctrl Delay	264.0
HCM 6th LOS	F

Notes

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

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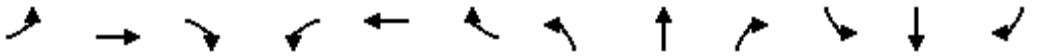

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1215	2115	153	648	337	593	707	154	359	1541	36
Future Volume (veh/h)	84	1215	2115	153	648	337	593	707	154	359	1541	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	88	1279	2226	161	682	355	624	744	162	378	1622	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	166	969	1116	124	926	413	440	983	214	204	1673	39
Arrive On Green	0.05	0.28	0.28	0.04	0.27	0.27	0.13	0.35	0.35	0.12	0.34	0.34
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	2787	607	1711	4929	115
Grp Volume(v), veh/h	88	1279	2226	161	682	355	624	456	450	378	1076	584
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1687	1711	1635	1775
Q Serve(g_s), s	3.9	42.6	42.1	5.6	27.3	33.2	19.9	35.4	35.4	17.9	48.6	48.6
Cycle Q Clear(g_c), s	3.9	42.6	42.1	5.6	27.3	33.2	19.9	35.4	35.4	17.9	48.6	48.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		0.07
Lane Grp Cap(c), veh/h	166	969	1116	124	926	413	440	602	595	204	1109	602
V/C Ratio(X)	0.53	1.32	1.99	1.30	0.74	0.86	1.42	0.76	0.76	1.85	0.97	0.97
Avail Cap(c_a), veh/h	166	969	1116	124	947	422	440	602	595	204	1109	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.5	53.7	20.9	72.2	49.8	51.9	65.1	42.9	42.9	66.1	48.8	48.8
Incr Delay (d2), s/veh	9.4	151.1	450.5	181.5	5.2	20.2	200.7	8.6	8.7	401.5	20.6	30.0
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	1.8	38.1	82.1	5.5	12.1	14.7	20.5	15.8	15.7	30.4	22.2	25.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.0	204.8	471.4	253.7	55.0	72.1	265.8	51.5	51.6	467.6	69.4	78.8
LnGrp LOS	E	F	F	F	D	E	F	D	D	F	E	E
Approach Vol, veh/h		3593			1198			1530			2038	
Approach Delay, s/veh		366.9			86.7			138.9			146.0	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	59.0	14.9	48.1	26.0	61.0	13.0	50.0
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 20	* 51	6.6	41.6	* 18	* 53	5.6	42.6
Max Q Clear Time (g_c+I1), s	21.9	50.6	5.9	35.2	19.9	37.4	7.6	44.6
Green Ext Time (p_c), s	0.0	0.3	0.0	5.5	0.0	11.8	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		231.1
HCM 6th LOS		F

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	687	835	124	1684	391	2406	2000	109	323	976	112
Future Volume (veh/h)	114	687	835	124	1684	391	2406	2000	109	323	976	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	120	723	879	131	1773	412	2533	2105	115	340	1027	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	93	944	1544	164	1017	454	994	1431	77	145	979	112
Arrive On Green	0.03	0.28	0.28	0.05	0.30	0.30	0.30	0.43	0.43	0.08	0.22	0.22
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	3292	178	1711	4462	512
Grp Volume(v), veh/h	120	723	879	131	1773	412	2533	1082	1138	340	752	393
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1764	1711	1635	1704
Q Serve(g_s), s	5.6	38.9	8.4	7.8	59.6	52.1	59.9	86.9	86.9	16.9	43.9	43.9
Cycle Q Clear(g_c), s	5.6	38.9	8.4	7.8	59.6	52.1	59.9	86.9	86.9	16.9	43.9	43.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.30
Lane Grp Cap(c), veh/h	93	944	1544	164	1017	454	994	741	767	145	718	374
V/C Ratio(X)	1.29	0.77	0.57	0.80	1.74	0.91	2.55	1.46	1.49	2.35	1.05	1.05
Avail Cap(c_a), veh/h	93	944	1544	176	1017	454	994	741	767	145	718	374
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	97.2	66.4	11.2	94.1	70.2	67.6	70.1	56.5	56.6	91.6	78.0	78.1
Incr Delay (d2), s/veh	190.3	5.9	1.5	29.4	338.6	24.6	699.7	213.9	225.3	629.4	46.9	60.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	17.6	7.4	4.0	73.5	23.1	121.5	80.3	85.4	32.7	22.9	25.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	287.5	72.3	12.7	123.5	408.8	92.2	769.8	270.4	281.9	720.9	124.9	138.4
LnGrp LOS	F	E	B	F	F	F	F	F	F	F	F	F
Approach Vol, veh/h		1722			2316			4753			1485	
Approach Delay, s/veh		56.9			336.3			539.3			264.9	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	68.0	52.0	13.0	67.0	25.0	95.0	17.3	62.7
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 60	* 44	5.6	59.6	* 17	* 87	10.6	54.6
Max Q Clear Time (g_c+I1), s	61.9	45.9	7.6	61.6	18.9	88.9	9.8	40.9
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	12.9

Intersection Summary	
HCM 6th Ctrl Delay	373.0
HCM 6th LOS	F

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	1528	2660	188	798	414	702	837	182	411	1764	41
Future Volume (veh/h)	106	1528	2660	188	798	414	702	837	182	411	1764	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	112	1608	2800	198	840	436	739	881	192	433	1857	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	168	1015	1081	124	969	432	352	983	214	181	1739	40
Arrive On Green	0.05	0.30	0.30	0.04	0.28	0.28	0.11	0.35	0.35	0.11	0.35	0.35
Sat Flow, veh/h	3319	3413	2679	3319	3413	1522	3319	2786	607	1711	4931	114
Grp Volume(v), veh/h	112	1608	2800	198	840	436	739	539	534	433	1231	669
Grp Sat Flow(s),veh/h/ln	1659	1706	1340	1659	1706	1522	1659	1706	1687	1711	1635	1776
Q Serve(g_s), s	5.0	44.6	41.2	5.6	35.1	42.6	15.9	44.9	44.9	15.9	52.9	52.9
Cycle Q Clear(g_c), s	5.0	44.6	41.2	5.6	35.1	42.6	15.9	44.9	44.9	15.9	52.9	52.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		0.06
Lane Grp Cap(c), veh/h	168	1015	1081	124	969	432	352	602	595	181	1153	626
V/C Ratio(X)	0.67	1.58	2.59	1.60	0.87	1.01	2.10	0.90	0.90	2.39	1.07	1.07
Avail Cap(c_a), veh/h	168	1015	1081	124	969	432	352	602	595	181	1153	626
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.0	52.7	21.7	72.2	51.0	53.7	67.1	46.0	46.0	67.1	48.5	48.6
Incr Delay (d2), s/veh	16.5	267.8	718.7	303.5	10.3	45.4	504.9	18.5	18.7	641.2	46.5	55.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	56.3	120.0	7.6	16.0	21.3	31.2	21.4	21.2	39.1	28.1	32.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.4	320.5	740.5	375.7	61.3	99.1	571.9	64.5	64.7	708.2	95.1	104.2
LnGrp LOS	F	F	F	F	E	F	F	E	E	F	F	F
Approach Vol, veh/h		4520			1474			1812			2333	
Approach Delay, s/veh		574.8			114.7			271.5			211.5	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	61.0	15.0	50.0	24.0	61.0	13.0	52.0
Change Period (Y+Rc), s	* 8.1	* 8.1	7.4	7.4	* 8.1	* 8.1	7.4	7.4
Max Green Setting (Gmax), s	* 16	* 53	7.6	42.6	* 16	* 53	5.6	44.6
Max Q Clear Time (g_c+I1), s	17.9	54.9	7.0	44.6	17.9	46.9	7.6	46.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	370.1
HCM 6th LOS	F

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	405	492	78	1053	245	5	5	75	241	729	84
Future Volume (veh/h)	67	405	492	78	1053	245	5	5	75	241	729	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	71	426	518	82	1108	258	5	5	79	254	767	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	125	1353	958	321	1642	510	205	477	404	306	1164	361
Arrive On Green	0.04	0.28	0.28	0.10	0.33	0.33	0.12	0.27	0.27	0.09	0.24	0.24
Sat Flow, veh/h	3319	4904	3471	3319	4904	1522	1711	1796	1522	3319	4904	1522
Grp Volume(v), veh/h	71	426	518	82	1108	258	5	5	79	254	767	88
Grp Sat Flow(s),veh/h/ln	1659	1635	1157	1659	1635	1522	1711	1796	1522	1659	1635	1522
Q Serve(g_s), s	2.5	8.3	15.2	2.7	23.3	10.7	0.3	0.2	3.3	9.0	17.0	5.6
Cycle Q Clear(g_c), s	2.5	8.3	15.2	2.7	23.3	10.7	0.3	0.2	3.3	9.0	17.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	125	1353	958	321	1642	510	205	477	404	306	1164	361
V/C Ratio(X)	0.57	0.31	0.54	0.26	0.67	0.51	0.02	0.01	0.20	0.83	0.66	0.24
Avail Cap(c_a), veh/h	218	1671	1183	321	1712	532	205	477	404	495	1304	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	34.4	37.0	50.2	34.3	13.9	46.6	32.5	16.0	53.6	41.4	37.0
Incr Delay (d2), s/veh	13.8	0.6	2.2	1.5	2.2	3.6	0.0	0.0	1.1	2.9	2.9	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	3.2	4.3	1.2	9.1	3.9	0.1	0.1	1.8	3.8	6.9	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.6	35.1	39.2	51.7	36.5	17.4	46.6	32.5	17.1	56.5	44.3	38.6
LnGrp LOS	E	D	D	D	D	B	D	C	B	E	D	D
Approach Vol, veh/h		1015			1448			89			1109	
Approach Delay, s/veh		39.6			34.0			19.6			46.6	
Approach LOS		D			C			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	36.6	12.6	48.3	19.2	39.9	19.7	41.2
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 5.9	* 32	* 7.9	* 42	* 18	* 20	* 8.9	* 41
Max Q Clear Time (g_c+I1), s	2.3	19.0	4.5	25.3	11.0	5.3	4.7	17.2
Green Ext Time (p_c), s	0.0	9.5	0.1	14.9	0.0	0.0	0.2	15.9

Intersection Summary	
HCM 6th Ctrl Delay	39.0
HCM 6th LOS	D

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	900	1566	118	498	259	5	5	125	307	1318	31
Future Volume (veh/h)	62	900	1566	118	498	259	5	5	125	307	1318	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	65	947	1648	124	524	273	5	5	132	323	1387	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	98	2149	1521	146	2220	689	57	174	148	799	1492	463
Arrive On Green	0.03	0.44	0.44	0.04	0.45	0.45	0.03	0.10	0.10	0.24	0.30	0.30
Sat Flow, veh/h	3319	4904	3471	3319	4904	1522	1711	1796	1522	3319	4904	1522
Grp Volume(v), veh/h	65	947	1648	124	524	273	5	5	132	323	1387	33
Grp Sat Flow(s),veh/h/ln	1659	1635	1157	1659	1635	1522	1711	1796	1522	1659	1635	1522
Q Serve(g_s), s	3.5	24.2	78.9	6.7	11.8	8.5	0.5	0.5	15.4	14.7	49.4	2.3
Cycle Q Clear(g_c), s	3.5	24.2	78.9	6.7	11.8	8.5	0.5	0.5	15.4	14.7	49.4	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	98	2149	1521	146	2220	689	57	174	148	799	1492	463
V/C Ratio(X)	0.66	0.44	1.08	0.85	0.24	0.40	0.09	0.03	0.89	0.40	0.93	0.07
Avail Cap(c_a), veh/h	127	2149	1521	146	2220	689	57	338	287	799	1496	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	86.5	35.2	50.5	85.5	30.2	5.1	84.3	73.6	80.4	57.5	60.7	30.5
Incr Delay (d2), s/veh	24.6	0.7	49.2	41.1	0.3	1.7	0.2	0.3	50.1	0.1	11.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.6	28.9	3.7	4.7	7.2	0.2	0.2	8.0	6.1	21.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.1	35.8	99.7	126.5	30.4	6.8	84.6	73.9	130.5	57.6	72.4	30.8
LnGrp LOS	F	D	F	F	C	A	F	E	F	E	E	C
Approach Vol, veh/h		2660			921			142			1743	
Approach Delay, s/veh		77.3			36.4			126.9			68.9	
Approach LOS		E			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	62.9	13.4	89.6	51.4	25.6	16.0	87.0
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 5.9	* 55	* 6.9	* 80	* 27	* 34	* 7.9	* 79
Max Q Clear Time (g_c+I1), s	2.5	51.4	5.5	13.8	16.7	17.4	8.7	80.9
Green Ext Time (p_c), s	0.0	3.4	0.0	24.2	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	69.0
HCM 6th LOS	E

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	547	664	101	1368	318	5	5	92	282	852	98
Future Volume (veh/h)	91	547	664	101	1368	318	5	5	92	282	852	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	96	576	699	106	1440	335	5	5	97	297	897	103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	146	1613	1141	287	1821	565	129	377	320	348	1175	365
Arrive On Green	0.04	0.33	0.33	0.09	0.37	0.37	0.08	0.21	0.21	0.10	0.24	0.24
Sat Flow, veh/h	3319	4904	3471	3319	4904	1522	1711	1796	1522	3319	4904	1522
Grp Volume(v), veh/h	96	576	699	106	1440	335	5	5	97	297	897	103
Grp Sat Flow(s),veh/h/ln	1659	1635	1157	1659	1635	1522	1711	1796	1522	1659	1635	1522
Q Serve(g_s), s	3.4	10.7	20.3	3.6	31.4	13.2	0.3	0.3	4.6	10.6	20.4	6.6
Cycle Q Clear(g_c), s	3.4	10.7	20.3	3.6	31.4	13.2	0.3	0.3	4.6	10.6	20.4	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	146	1613	1141	287	1821	565	129	377	320	348	1175	365
V/C Ratio(X)	0.66	0.36	0.61	0.37	0.79	0.59	0.04	0.01	0.30	0.85	0.76	0.28
Avail Cap(c_a), veh/h	191	1753	1241	287	1835	570	129	377	320	495	1222	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.5	30.6	33.8	51.7	33.6	11.6	51.5	37.6	20.7	52.8	42.5	37.2
Incr Delay (d2), s/veh	16.9	0.6	2.5	2.9	3.6	4.5	0.0	0.1	2.4	7.2	4.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.1	5.7	1.6	12.3	4.7	0.1	0.1	2.5	4.6	8.4	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.4	31.2	36.3	54.6	37.2	16.2	51.5	37.6	23.2	60.0	47.2	39.1
LnGrp LOS	E	C	D	D	D	B	D	D	C	E	D	D
Approach Vol, veh/h		1371			1881			107			1297	
Approach Delay, s/veh		36.8			34.4			25.2			49.5	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	36.8	13.4	52.7	20.7	33.3	18.5	47.6
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 5.9	* 30	* 6.9	* 45	* 18	* 18	* 8.9	* 43
Max Q Clear Time (g_c+I1), s	2.3	22.4	5.4	33.4	12.6	6.6	5.6	22.3
Green Ext Time (p_c), s	0.0	6.3	0.1	11.2	0.0	0.0	0.2	17.2

Intersection Summary	
HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1215	2115	153	648	337	5	5	154	359	1541	36
Future Volume (veh/h)	84	1215	2115	153	648	337	5	5	154	359	1541	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	88	1279	2226	161	682	355	5	5	162	378	1622	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	121	2424	1716	148	2463	765	51	316	268	408	1322	410
Arrive On Green	0.04	0.49	0.49	0.04	0.50	0.50	0.03	0.18	0.18	0.12	0.27	0.27
Sat Flow, veh/h	3319	4904	3471	3319	4904	1522	1711	1796	1522	3319	4904	1522
Grp Volume(v), veh/h	88	1279	2226	161	682	355	5	5	162	378	1622	38
Grp Sat Flow(s),veh/h/ln	1659	1635	1157	1659	1635	1522	1711	1796	1522	1659	1635	1522
Q Serve(g_s), s	5.2	35.7	77.2	8.9	16.1	30.3	0.6	0.5	19.6	22.5	53.9	3.1
Cycle Q Clear(g_c), s	5.2	35.7	77.2	8.9	16.1	30.3	0.6	0.5	19.6	22.5	53.9	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	2424	1716	148	2463	765	51	316	268	408	1322	410
V/C Ratio(X)	0.73	0.53	1.30	1.09	0.28	0.46	0.10	0.02	0.60	0.93	1.23	0.09
Avail Cap(c_a), veh/h	164	2425	1716	148	2463	765	51	316	268	529	1322	410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	95.3	34.6	30.9	95.5	28.8	32.3	94.4	68.1	76.0	86.8	73.1	38.5
Incr Delay (d2), s/veh	25.9	0.8	138.2	100.2	0.3	2.0	0.3	0.1	9.7	17.3	109.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	14.2	42.5	5.9	6.4	11.5	0.3	0.2	8.3	10.6	35.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	121.3	35.4	169.1	195.8	29.0	34.3	94.8	68.1	85.7	104.1	182.2	39.0
LnGrp LOS	F	D	F	F	C	C	F	E	F	F	F	D
Approach Vol, veh/h		3593			1198			172			2038	
Approach Delay, s/veh		120.3			53.0			85.4			165.1	
Approach LOS		F			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	62.0	15.4	108.6	32.7	43.3	17.0	107.0
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 5.9	* 54	* 9.9	* 97	* 32	* 28	* 8.9	* 99
Max Q Clear Time (g_c+I1), s	2.6	55.9	7.2	32.3	24.5	21.6	10.9	79.2
Green Ext Time (p_c), s	0.0	0.0	0.1	33.9	0.0	0.0	0.0	19.6

Intersection Summary	
HCM 6th Ctrl Delay	121.0
HCM 6th LOS	F

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	687	835	124	1684	391	5	5	109	323	976	112
Future Volume (veh/h)	114	687	835	124	1684	391	5	5	109	323	976	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	120	723	879	131	1773	412	5	5	115	340	1027	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	141	1804	1277	295	1835	570	73	280	237	390	1132	351
Arrive On Green	0.08	0.37	0.37	0.09	0.37	0.37	0.04	0.16	0.16	0.12	0.23	0.23
Sat Flow, veh/h	1711	4904	3471	3319	4904	1522	1711	1796	1522	3319	4904	1522
Grp Volume(v), veh/h	120	723	879	131	1773	412	5	5	115	340	1027	118
Grp Sat Flow(s),veh/h/ln	1711	1635	1157	1659	1635	1522	1711	1796	1522	1659	1635	1522
Q Serve(g_s), s	8.3	13.1	25.7	4.5	42.5	27.9	0.3	0.3	6.1	12.1	24.5	5.6
Cycle Q Clear(g_c), s	8.3	13.1	25.7	4.5	42.5	27.9	0.3	0.3	6.1	12.1	24.5	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	1804	1277	295	1835	570	73	280	237	390	1132	351
V/C Ratio(X)	0.85	0.40	0.69	0.44	0.97	0.72	0.07	0.02	0.49	0.87	0.91	0.34
Avail Cap(c_a), veh/h	141	1859	1316	295	1835	570	73	280	237	534	1136	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	28.1	32.1	51.9	36.8	32.2	55.2	42.9	25.0	52.0	44.9	19.8
Incr Delay (d2), s/veh	41.8	0.7	3.1	3.8	14.4	7.8	0.1	0.1	6.9	9.0	12.1	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.0	7.1	2.0	18.3	10.9	0.1	0.1	3.4	5.3	10.7	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.1	28.8	35.2	55.6	51.2	40.0	55.3	43.0	31.9	61.0	57.0	22.4
LnGrp LOS	F	C	D	E	D	D	E	D	C	E	E	C
Approach Vol, veh/h		1722			2316			125			1485	
Approach Delay, s/veh		36.7			49.5			33.3			55.1	
Approach LOS		D			D			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	35.8	18.0	53.0	22.2	26.8	18.8	52.2
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 5	* 28	* 9.9	* 45	* 19	* 14	* 9.3	* 46
Max Q Clear Time (g_c+I1), s	2.3	26.5	10.3	44.5	14.1	8.1	6.5	27.7
Green Ext Time (p_c), s	0.0	1.3	0.0	0.4	0.0	0.0	0.2	16.4

Intersection Summary	
HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	1528	2660	188	798	414	5	5	182	411	1764	41
Future Volume (veh/h)	106	1528	2660	188	798	414	5	5	182	411	1764	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	112	1608	2800	198	840	436	5	5	192	433	1857	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	147	2473	1750	148	2474	768	51	269	228	462	1273	395
Arrive On Green	0.04	0.50	0.50	0.04	0.50	0.50	0.03	0.15	0.15	0.14	0.26	0.26
Sat Flow, veh/h	3319	4904	3471	3319	4904	1522	1711	1796	1522	3319	4904	1522
Grp Volume(v), veh/h	112	1608	2800	198	840	436	5	5	192	433	1857	43
Grp Sat Flow(s),veh/h/ln	1659	1635	1157	1659	1635	1522	1711	1796	1522	1659	1635	1522
Q Serve(g_s), s	6.7	48.4	78.4	8.9	20.5	39.8	0.6	0.5	24.5	25.8	51.9	3.6
Cycle Q Clear(g_c), s	6.7	48.4	78.4	8.9	20.5	39.8	0.6	0.5	24.5	25.8	51.9	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	147	2473	1750	148	2474	768	51	269	228	462	1273	395
V/C Ratio(X)	0.76	0.65	1.60	1.34	0.34	0.57	0.10	0.02	0.84	0.94	1.46	0.11
Avail Cap(c_a), veh/h	197	2474	1751	148	2474	768	51	269	228	513	1273	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	94.5	36.6	29.9	95.5	29.6	34.4	94.4	72.5	82.7	85.2	74.1	38.9
Incr Delay (d2), s/veh	25.7	1.3	272.5	191.7	0.4	3.0	0.3	0.1	29.6	22.8	211.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	19.2	64.9	7.7	8.1	15.2	0.3	0.2	11.4	12.4	46.3	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	120.2	37.9	302.4	287.2	30.0	37.4	94.7	72.6	112.3	108.0	285.1	39.5
LnGrp LOS	F	D	F	F	C	D	F	E	F	F	F	D
Approach Vol, veh/h		4520			1474			202			2333	
Approach Delay, s/veh		203.8			66.7			110.9			247.7	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	60.0	17.0	109.0	36.0	38.1	17.0	109.0
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 5.9	* 52	* 12	* 98	* 31	* 27	* 8.9	* 1E2
Max Q Clear Time (g_c+I1), s	2.6	53.9	8.7	41.8	27.8	26.5	10.9	80.4
Green Ext Time (p_c), s	0.0	0.0	0.2	39.2	0.0	0.0	0.0	20.5

Intersection Summary	
HCM 6th Ctrl Delay	189.9
HCM 6th LOS	F

Notes

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

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	405	0	78	1053	245	0	1377	75	241	729	84
Future Volume (veh/h)	67	405	0	78	1053	245	0	1377	75	241	729	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	0	1796	1796	1796	0	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	71	426	0	82	1108	258	0	1449	79	254	767	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	0	7	7	7	0	7	7	7	7	7
Cap, veh/h	190	1384	0	129	1295	402	0	1547	480	310	2336	725
Arrive On Green	0.11	0.56	0.00	0.04	0.26	0.26	0.00	0.32	0.32	0.09	0.48	0.48
Sat Flow, veh/h	3319	5065	0	3319	4904	1522	0	5065	1522	3319	4904	1522
Grp Volume(v), veh/h	71	426	0	82	1108	258	0	1449	79	254	767	88
Grp Sat Flow(s),veh/h/ln	1659	1635	0	1659	1635	1522	0	1635	1522	1659	1635	1522
Q Serve(g_s), s	2.4	5.5	0.0	2.9	25.8	18.0	0.0	34.4	3.4	9.0	11.7	3.9
Cycle Q Clear(g_c), s	2.4	5.5	0.0	2.9	25.8	18.0	0.0	34.4	3.4	9.0	11.7	3.9
Prop In Lane	1.00		0.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	1384	0	129	1295	402	0	1547	480	310	2336	725
V/C Ratio(X)	0.37	0.31	0.00	0.63	0.86	0.64	0.00	0.94	0.16	0.82	0.33	0.12
Avail Cap(c_a), veh/h	190	1384	0	191	1304	405	0	1549	481	329	2366	734
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	20.0	0.0	56.8	42.0	39.1	0.0	39.9	16.5	53.4	19.5	17.5
Incr Delay (d2), s/veh	4.3	0.6	0.0	17.2	7.4	7.7	0.0	12.1	0.7	19.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.9	0.0	1.5	10.8	7.3	0.0	14.8	1.7	4.5	4.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	20.5	0.0	74.0	49.4	46.8	0.0	52.0	17.2	72.7	19.9	17.8
LnGrp LOS	E	C	A	E	D	D	A	D	B	E	B	B
Approach Vol, veh/h		497			1448			1528			1109	
Approach Delay, s/veh		25.5			50.3			50.2			31.8	
Approach LOS		C			D			D			C	

Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		65.3	15.0	39.8	19.3	46.0	12.8	42.0				
Change Period (Y+Rc), s		* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1				
Max Green Setting (Gmax), s		* 58	* 5.9	* 32	* 12	* 38	* 6.9	* 31				
Max Q Clear Time (g_c+I1), s		13.7	4.4	27.8	11.0	36.4	4.9	7.5				
Green Ext Time (p_c), s		23.3	0.1	3.9	0.2	1.4	0.1	8.3				

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

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

DRAFT

Movement	EBT	EBR	EBR2	WBL	WBT	NBL	NBR	NEL	NER
Lane Configurations									
Traffic Volume (veh/h)	472	0	492	0	1137	1656	0	0	0
Future Volume (veh/h)	472	0	492	0	1137	1656	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No				No	No			
Adj Sat Flow, veh/h/ln	1796	1796	1796	0	1796	1796	1796		
Adj Flow Rate, veh/h	497	0	0	0	1197	1743	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	7	7	7	0	7	7	7		
Cap, veh/h	1962			0	1962	2242	708		
Arrive On Green	0.40	0.00	0.00	0.00	0.80	0.46	0.00		
Sat Flow, veh/h	5065	2679	2679	0	5227	4824	1522		
Grp Volume(v), veh/h	497	0	0	0	1197	1743	0		
Grp Sat Flow(s),veh/h/ln	1635	1340	1340	0	1635	1608	1522		
Q Serve(g_s), s	8.1	0.0	0.0	0.0	11.4	36.3	0.0		
Cycle Q Clear(g_c), s	8.1	0.0	0.0	0.0	11.4	36.3	0.0		
Prop In Lane		1.00	1.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1962			0	1962	2242	708		
V/C Ratio(X)	0.25			0.00	0.61	0.78	0.00		
Avail Cap(c_a), veh/h	1962			0	1962	2408	760		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.54	1.00	0.00		
Uniform Delay (d), s/veh	24.0	0.0	0.0	0.0	8.3	26.9	0.0		
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.8	2.4	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.0	0.0	2.5	13.3	0.0		
Unsig. Movement Delay, s/veh									
LnGrp Delay(d),s/veh	24.3	0.0	0.0	0.0	9.1	29.3	0.0		
LnGrp LOS	C			A	A	C	A		
Approach Vol, veh/h	497	A	A		1197	1743			
Approach Delay, s/veh	24.3				9.1	29.3			
Approach LOS	C				A	C			

Timer - Assigned Phs				4		6		8	
Phs Duration (G+Y+Rc), s				56.1		63.9		56.1	
Change Period (Y+Rc), s				* 8.1		8.1		* 8.1	
Max Green Setting (Gmax), s				* 44		59.9		* 44	
Max Q Clear Time (g_c+I1), s				13.4		38.3		10.1	
Green Ext Time (p_c), s				24.4		17.4		11.7	

Intersection Summary		
HCM 6th Ctrl Delay	21.6	
HCM 6th LOS	C	

Notes

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

Unsignalized Delay for [EBR2] is excluded from calculations of the approach delay and intersection delay.

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	900	0	118	498	259	0	576	125	307	1318	31
Future Volume (veh/h)	62	900	0	118	498	259	0	576	125	307	1318	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	0	1796	1796	1796	0	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	65	947	0	124	524	273	0	606	132	323	1387	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	0	7	7	7	0	7	7	7	7	7
Cap, veh/h	485	1643	0	181	1194	371	0	1062	330	411	2000	621
Arrive On Green	0.05	0.11	0.00	0.05	0.24	0.24	0.00	0.22	0.22	0.12	0.41	0.41
Sat Flow, veh/h	3319	5065	0	3319	4904	1522	0	5065	1522	3319	4904	1522
Grp Volume(v), veh/h	65	947	0	124	524	273	0	606	132	323	1387	33
Grp Sat Flow(s),veh/h/ln	1659	1635	0	1659	1635	1522	0	1635	1522	1659	1635	1522
Q Serve(g_s), s	2.3	22.0	0.0	4.4	10.9	13.1	0.0	13.3	8.9	11.3	28.0	1.6
Cycle Q Clear(g_c), s	2.3	22.0	0.0	4.4	10.9	13.1	0.0	13.3	8.9	11.3	28.0	1.6
Prop In Lane	1.00		0.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	485	1643	0	181	1194	371	0	1062	330	411	2000	621
V/C Ratio(X)	0.13	0.58	0.00	0.68	0.44	0.74	0.00	0.57	0.40	0.79	0.69	0.05
Avail Cap(c_a), veh/h	485	1643	0	274	1590	493	0	1062	330	550	2080	646
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	45.3	0.0	55.7	38.4	18.1	0.0	42.0	40.3	51.0	29.3	21.5
Incr Delay (d2), s/veh	0.4	1.4	0.0	15.3	1.2	12.3	0.0	2.2	3.6	11.8	2.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	9.8	0.0	2.2	4.3	5.5	0.0	5.4	3.6	5.2	10.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	46.7	0.0	71.0	39.6	30.4	0.0	44.2	43.9	62.9	31.3	21.7
LnGrp LOS	D	D	A	E	D	C	A	D	D	E	C	C
Approach Vol, veh/h		1012			921			738			1743	
Approach Delay, s/veh		46.9			41.1			44.2			37.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	57.0	25.6	37.3	23.0	34.1	14.7	48.3
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 51	* 5.9	* 39	* 20	* 23	* 9.9	* 35
Max Q Clear Time (g_c+I1), s	30.0	4.3	15.1	13.3	15.3	6.4	24.0
Green Ext Time (p_c), s	18.9	0.0	14.2	1.5	5.5	0.3	8.8

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

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

DRAFT

Movement	EBT	EBR	EBR2	WBL	WBT	NBL	NBR	NEL	NER
Lane Configurations									
Traffic Volume (veh/h)	962	0	1566	0	529	483	0	0	0
Future Volume (veh/h)	962	0	1566	0	529	483	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No				No	No			
Adj Sat Flow, veh/h/ln	1796	1796	1796	0	1796	1796	1796		
Adj Flow Rate, veh/h	1013	0	0	0	557	508	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	7	7	7	0	7	7	7		
Cap, veh/h	3585			0	3585	646	204		
Arrive On Green	0.73	0.00	0.00	0.00	0.49	0.13	0.00		
Sat Flow, veh/h	5065	2679	2679	0	5227	4824	1522		
Grp Volume(v), veh/h	1013	0	0	0	557	508	0		
Grp Sat Flow(s),veh/h/ln	1635	1340	1340	0	1635	1608	1522		
Q Serve(g_s), s	8.4	0.0	0.0	0.0	7.5	12.2	0.0		
Cycle Q Clear(g_c), s	8.4	0.0	0.0	0.0	7.5	12.2	0.0		
Prop In Lane		1.00	1.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	3585			0	3585	646	204		
V/C Ratio(X)	0.28			0.00	0.16	0.79	0.00		
Avail Cap(c_a), veh/h	3585			0	3585	1564	493		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.67	1.00	1.00		
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.96	1.00	0.00		
Uniform Delay (d), s/veh	5.5	0.0	0.0	0.0	10.1	50.3	0.0		
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.0	0.1	2.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.0	2.4	4.9	0.0		
Unsig. Movement Delay, s/veh									
LnGrp Delay(d),s/veh	5.7	0.0	0.0	0.0	10.2	52.5	0.0		
LnGrp LOS	A			A	B	D	A		
Approach Vol, veh/h	1013	A	A		557	508			
Approach Delay, s/veh	5.7				10.2	52.5			
Approach LOS	A				B	D			

Timer - Assigned Phs				4		6		8	
Phs Duration (G+Y+Rc), s				95.8		24.2		95.8	
Change Period (Y+Rc), s				* 8.1		8.1		* 8.1	
Max Green Setting (Gmax), s				* 65		38.9		* 65	
Max Q Clear Time (g_c+I1), s				9.5		14.2		10.4	
Green Ext Time (p_c), s				3.7		1.8		7.8	

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

Notes

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

Unsignalized Delay for [EBR2] is excluded from calculations of the approach delay and intersection delay.

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	547	0	101	1368	318	0	1688	92	282	852	98
Future Volume (veh/h)	91	547	0	101	1368	318	0	1688	92	282	852	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	0	1796	1796	1796	0	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	96	576	0	106	1440	335	0	1777	97	297	897	103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	0	7	7	7	0	7	7	7	7	7
Cap, veh/h	123	1460	0	148	1498	465	0	1775	551	309	2479	770
Arrive On Green	0.07	0.60	0.00	0.04	0.31	0.31	0.00	0.36	0.36	0.09	0.51	0.51
Sat Flow, veh/h	3319	5065	0	3319	4904	1522	0	5065	1522	3319	4904	1522
Grp Volume(v), veh/h	96	576	0	106	1440	335	0	1777	97	297	897	103
Grp Sat Flow(s),veh/h/ln	1659	1635	0	1659	1635	1522	0	1635	1522	1659	1635	1522
Q Serve(g_s), s	4.5	9.9	0.0	5.0	46.2	31.4	0.0	57.9	5.4	14.3	17.7	5.7
Cycle Q Clear(g_c), s	4.5	9.9	0.0	5.0	46.2	31.4	0.0	57.9	5.4	14.3	17.7	5.7
Prop In Lane	1.00		0.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	1460	0	148	1498	465	0	1775	551	309	2479	770
V/C Ratio(X)	0.78	0.39	0.00	0.71	0.96	0.72	0.00	1.00	0.18	0.96	0.36	0.13
Avail Cap(c_a), veh/h	123	1460	0	205	1499	465	0	1775	551	309	2479	770
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	73.5	24.7	0.0	75.4	54.6	49.5	0.0	51.1	20.7	72.3	23.9	21.0
Incr Delay (d2), s/veh	33.7	0.8	0.0	20.8	15.6	9.3	0.0	21.7	0.7	41.8	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	3.4	0.0	2.5	20.6	12.8	0.0	26.3	2.6	7.7	6.7	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	107.1	25.5	0.0	96.2	70.3	58.7	0.0	72.7	21.4	114.0	24.3	21.3
LnGrp LOS	F	C	A	F	E	E	A	F	C	F	C	C
Approach Vol, veh/h		672			1881			1874			1297	
Approach Delay, s/veh		37.1			69.7			70.1			44.6	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	89.0	14.0	57.0	23.0	66.0	15.2	55.8
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 81	* 5.9	* 49	* 15	* 58	* 9.9	* 45
Max Q Clear Time (g_c+I1), s	19.7	6.5	48.2	16.3	59.9	7.0	11.9
Green Ext Time (p_c), s	33.2	0.0	0.7	0.0	0.0	0.2	13.5

Intersection Summary	
HCM 6th Ctrl Delay	60.3
HCM 6th LOS	E

Notes

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

DRAFT

Movement	EBT	EBR	EBR2	WBL	WBT	NBL	NBR	NEL	NER
Lane Configurations									
Traffic Volume (veh/h)	638	0	664	0	1466	2031	0	0	0
Future Volume (veh/h)	638	0	664	0	1466	2031	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No				No	No			
Adj Sat Flow, veh/h/ln	1796	1796	1796	0	1796	1796	1796		
Adj Flow Rate, veh/h	672	0	0	0	1543	2138	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	7	7	7	0	7	7	7		
Cap, veh/h	1914			0	1914	2453	774		
Arrive On Green	0.39	0.00	0.00	0.00	0.78	0.51	0.00		
Sat Flow, veh/h	5065	2679	2679	0	5227	4824	1522		
Grp Volume(v), veh/h	672	0	0	0	1543	2138	0		
Grp Sat Flow(s),veh/h/ln	1635	1340	1340	0	1635	1608	1522		
Q Serve(g_s), s	15.5	0.0	0.0	0.0	29.8	62.6	0.0		
Cycle Q Clear(g_c), s	15.5	0.0	0.0	0.0	29.8	62.6	0.0		
Prop In Lane		1.00	1.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1914			0	1914	2453	774		
V/C Ratio(X)	0.35			0.00	0.81	0.87	0.00		
Avail Cap(c_a), veh/h	1914			0	1914	2500	789		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.28	1.00	0.00		
Uniform Delay (d), s/veh	34.5	0.0	0.0	0.0	14.0	34.7	0.0		
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	1.1	4.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.1	0.0	0.0	0.0	5.1	24.1	0.0		
Unsig. Movement Delay, s/veh									
LnGrp Delay(d),s/veh	35.0	0.0	0.0	0.0	15.1	39.1	0.0		
LnGrp LOS	C			A	B	D	A		
Approach Vol, veh/h	672	A	A		1543	2138			
Approach Delay, s/veh	35.0				15.1	39.1			
Approach LOS	C				B	D			

Timer - Assigned Phs				4		6		8	
Phs Duration (G+Y+Rc), s				70.5		89.5		70.5	
Change Period (Y+Rc), s				* 8.1		8.1		* 8.1	
Max Green Setting (Gmax), s				* 61		82.9		* 61	
Max Q Clear Time (g_c+I1), s				31.8		64.6		17.5	
Green Ext Time (p_c), s				26.6		16.8		18.3	

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

Notes

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

Unsignalized Delay for [EBR2] is excluded from calculations of the approach delay and intersection delay.

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1215	0	153	648	337	0	707	154	359	1541	36
Future Volume (veh/h)	84	1215	0	153	648	337	0	707	154	359	1541	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	0	1796	1796	1796	0	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	88	1279	0	161	682	355	0	744	162	378	1622	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	0	7	7	7	0	7	7	7	7	7
Cap, veh/h	400	1545	0	187	1490	463	0	862	267	431	1829	568
Arrive On Green	0.04	0.10	0.00	0.11	0.30	0.30	0.00	0.18	0.18	0.13	0.37	0.37
Sat Flow, veh/h	3319	5065	0	1711	4904	1522	0	5065	1522	3319	4904	1522
Grp Volume(v), veh/h	88	1279	0	161	682	355	0	744	162	378	1622	38
Grp Sat Flow(s),veh/h/ln	1659	1635	0	1711	1635	1522	0	1635	1522	1659	1635	1522
Q Serve(g_s), s	3.1	30.7	0.0	11.1	13.5	15.7	0.0	17.7	11.8	13.4	37.2	1.9
Cycle Q Clear(g_c), s	3.1	30.7	0.0	11.1	13.5	15.7	0.0	17.7	11.8	13.4	37.2	1.9
Prop In Lane	1.00		0.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	400	1545	0	187	1490	463	0	862	267	431	1829	568
V/C Ratio(X)	0.22	0.83	0.00	0.86	0.46	0.77	0.00	0.86	0.61	0.88	0.89	0.07
Avail Cap(c_a), veh/h	400	1545	0	198	1794	557	0	862	267	440	1835	570
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.1	50.6	0.0	52.5	33.8	14.6	0.0	48.1	45.6	51.3	35.2	24.2
Incr Delay (d2), s/veh	0.9	4.9	0.0	35.0	1.0	11.6	0.0	11.2	9.8	20.4	6.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	14.0	0.0	6.4	5.3	6.4	0.0	7.8	5.0	6.6	15.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	55.4	0.0	87.5	34.8	26.1	0.0	59.2	55.4	71.7	42.0	24.4
LnGrp LOS	D	E	A	F	C	C	A	E	E	E	D	C
Approach Vol, veh/h		1367			1198			906			2038	
Approach Delay, s/veh		55.3			39.3			58.6			47.2	
Approach LOS		E			D			E			D	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	52.9	22.6	44.6	23.7	29.2	21.2	45.9
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 45	* 6.9	* 44	* 16	* 21	* 14	* 37
Max Q Clear Time (g_c+I1), s	39.2	5.1	17.7	15.4	19.7	13.1	32.7
Green Ext Time (p_c), s	5.6	0.1	18.7	0.2	1.0	0.1	4.0

Intersection Summary	
HCM 6th Ctrl Delay	49.4
HCM 6th LOS	D

Notes

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

DRAFT

Movement	EBT	EBR	EBR2	WBL	WBT	NBL	NBR	NEL	NER
Lane Configurations									
Traffic Volume (veh/h)	1299	0	2115	0	684	593	0	0	0
Future Volume (veh/h)	1299	0	2115	0	684	593	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No				No	No			
Adj Sat Flow, veh/h/ln	1796	1796	1796	0	1796	1796	1796		
Adj Flow Rate, veh/h	1367	0	0	0	720	624	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	7	7	7	0	7	7	7		
Cap, veh/h	3458			0	3458	771	243		
Arrive On Green	0.71	0.00	0.00	0.00	0.94	0.16	0.00		
Sat Flow, veh/h	5065	2679	2679	0	5227	4824	1522		
Grp Volume(v), veh/h	1367	0	0	0	720	624	0		
Grp Sat Flow(s),veh/h/ln	1635	1340	1340	0	1635	1608	1522		
Q Serve(g_s), s	13.7	0.0	0.0	0.0	1.4	15.0	0.0		
Cycle Q Clear(g_c), s	13.7	0.0	0.0	0.0	1.4	15.0	0.0		
Prop In Lane		1.00	1.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	3458			0	3458	771	243		
V/C Ratio(X)	0.40			0.00	0.21	0.81	0.00		
Avail Cap(c_a), veh/h	3458			0	3458	1443	455		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.00	1.00		
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.94	1.00	0.00		
Uniform Delay (d), s/veh	7.2	0.0	0.0	0.0	1.1	48.7	0.0		
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.1	2.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.9	0.0	0.0	0.0	0.4	5.9	0.0		
Unsig. Movement Delay, s/veh									
LnGrp Delay(d),s/veh	7.6	0.0	0.0	0.0	1.3	50.7	0.0		
LnGrp LOS	A			A	A	D	A		
Approach Vol, veh/h	1367	A	A		720	624			
Approach Delay, s/veh	7.6				1.3	50.7			
Approach LOS	A				A	D			

Timer - Assigned Phs				4		6		8	
Phs Duration (G+Y+Rc), s				92.7		27.3		92.7	
Change Period (Y+Rc), s				* 8.1		8.1		* 8.1	
Max Green Setting (Gmax), s				* 68		35.9		* 68	
Max Q Clear Time (g_c+I1), s				3.4		17.0		15.7	
Green Ext Time (p_c), s				5.0		2.2		12.1	

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

Notes

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

Unsignalized Delay for [EBR2] is excluded from calculations of the approach delay and intersection delay.

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	687	0	124	1684	391	0	2000	109	323	976	112
Future Volume (veh/h)	114	687	0	124	1684	391	0	2000	109	323	976	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	0	1796	1796	1796	0	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	120	723	0	131	1773	412	0	2105	115	340	1027	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	0	7	7	7	0	7	7	7	7	7
Cap, veh/h	121	1340	0	152	1598	496	0	1830	568	313	2501	776
Arrive On Green	0.07	0.55	0.00	0.09	0.33	0.33	0.00	0.37	0.37	0.09	0.51	0.51
Sat Flow, veh/h	3319	5065	0	1711	4904	1522	0	5065	1522	3319	4904	1522
Grp Volume(v), veh/h	120	723	0	131	1773	412	0	2105	115	340	1027	118
Grp Sat Flow(s),veh/h/ln	1659	1635	0	1711	1635	1522	0	1635	1522	1659	1635	1522
Q Serve(g_s), s	6.9	18.0	0.0	14.4	61.9	47.5	0.0	70.9	7.0	17.9	24.7	7.8
Cycle Q Clear(g_c), s	6.9	18.0	0.0	14.4	61.9	47.5	0.0	70.9	7.0	17.9	24.7	7.8
Prop In Lane	1.00		0.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	1340	0	152	1598	496	0	1830	568	313	2501	776
V/C Ratio(X)	1.00	0.54	0.00	0.86	1.11	0.83	0.00	1.15	0.20	1.09	0.41	0.15
Avail Cap(c_a), veh/h	121	1340	0	224	1598	496	0	1830	568	313	2501	776
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	88.1	35.4	0.0	85.4	64.1	59.2	0.0	59.5	21.1	86.1	28.9	24.7
Incr Delay (d2), s/veh	76.1	1.4	0.0	37.7	58.9	14.9	0.0	74.5	0.8	76.3	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	5.9	0.0	7.9	33.8	20.0	0.0	41.1	3.7	10.9	9.7	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	164.2	36.8	0.0	123.1	123.0	74.1	0.0	134.0	21.9	162.3	29.4	25.1
LnGrp LOS	F	D	A	F	F	E	A	F	C	F	C	C
Approach Vol, veh/h		843			2316			2220			1485	
Approach Delay, s/veh		54.9			114.3			128.2			59.5	
Approach LOS		D			F			F			E	

Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		105.0	15.0	70.0	26.0	79.0	25.0	60.0				
Change Period (Y+Rc), s		* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1				
Max Green Setting (Gmax), s		* 97	* 6.9	* 62	* 18	* 71	* 25	* 44				
Max Q Clear Time (g_c+I1), s		26.7	8.9	63.9	19.9	72.9	16.4	20.0				
Green Ext Time (p_c), s		42.2	0.0	0.0	0.0	0.0	0.6	13.8				

Intersection Summary	
HCM 6th Ctrl Delay	99.7
HCM 6th LOS	F

Notes

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

DRAFT

Movement	EBT	EBR	EBR2	WBL	WBT	NBL	NBR	NEL	NER
Lane Configurations									
Traffic Volume (veh/h)	801	0	835	0	1796	2406	0	0	0
Future Volume (veh/h)	801	0	835	0	1796	2406	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No				No	No			
Adj Sat Flow, veh/h/ln	1796	1796	1796	0	1796	1796	1796		
Adj Flow Rate, veh/h	843	0	0	0	1891	2533	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	7	7	7	0	7	7	7		
Cap, veh/h	1907			0	1907	2537	800		
Arrive On Green	0.39	0.00	0.00	0.00	0.39	0.53	0.00		
Sat Flow, veh/h	5065	2679	2679	0	5227	4824	1522		
Grp Volume(v), veh/h	843	0	0	0	1891	2533	0		
Grp Sat Flow(s),veh/h/ln	1635	1340	1340	0	1635	1608	1522		
Q Serve(g_s), s	24.1	0.0	0.0	0.0	72.9	99.6	0.0		
Cycle Q Clear(g_c), s	24.1	0.0	0.0	0.0	72.9	99.6	0.0		
Prop In Lane		1.00	1.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1907			0	1907	2537	800		
V/C Ratio(X)	0.44			0.00	0.99	1.00	0.00		
Avail Cap(c_a), veh/h	1907			0	1907	2537	800		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.09	1.00	0.00		
Uniform Delay (d), s/veh	42.8	0.0	0.0	0.0	57.7	45.0	0.0		
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.0	4.5	17.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	9.8	0.0	0.0	0.0	30.0	41.9	0.0		
Unsig. Movement Delay, s/veh									
LnGrp Delay(d),s/veh	43.6	0.0	0.0	0.0	62.3	62.5	0.0		
LnGrp LOS	D			A	E	E	A		
Approach Vol, veh/h	843	A	A		1891	2533			
Approach Delay, s/veh	43.6				62.3	62.5			
Approach LOS	D				E	E			

Timer - Assigned Phs				4		6		8	
Phs Duration (G+Y+Rc), s				82.0		108.0		82.0	
Change Period (Y+Rc), s				* 8.1		8.1		* 8.1	
Max Green Setting (Gmax), s				* 74		99.9		* 74	
Max Q Clear Time (g_c+I1), s				74.9		101.6		26.1	
Green Ext Time (p_c), s				0.0		0.0		24.6	

Intersection Summary	
HCM 6th Ctrl Delay	59.4
HCM 6th LOS	E

Notes

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

Unsignalized Delay for [EBR2] is excluded from calculations of the approach delay and intersection delay.

DRAFT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	1528	0	188	798	414	0	837	182	411	1764	41
Future Volume (veh/h)	106	1528	0	188	798	414	0	837	182	411	1764	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	0	1796	1796	1796	0	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	112	1608	0	198	840	436	0	881	192	433	1857	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	0	7	7	7	0	7	7	7	7	7
Cap, veh/h	335	1766	0	240	1625	505	0	1021	317	476	1989	618
Arrive On Green	0.03	0.12	0.00	0.07	0.33	0.33	0.00	0.21	0.21	0.14	0.41	0.41
Sat Flow, veh/h	3319	5065	0	3319	4904	1522	0	5065	1522	3319	4904	1522
Grp Volume(v), veh/h	112	1608	0	198	840	436	0	881	192	433	1857	43
Grp Sat Flow(s),veh/h/ln	1659	1635	0	1659	1635	1522	0	1635	1522	1659	1635	1522
Q Serve(g_s), s	4.9	48.6	0.0	8.8	20.7	25.1	0.0	26.0	17.1	19.3	54.3	2.6
Cycle Q Clear(g_c), s	4.9	48.6	0.0	8.8	20.7	25.1	0.0	26.0	17.1	19.3	54.3	2.6
Prop In Lane	1.00		0.00	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	335	1766	0	240	1625	505	0	1021	317	476	1989	618
V/C Ratio(X)	0.33	0.91	0.00	0.83	0.52	0.86	0.00	0.86	0.61	0.91	0.93	0.07
Avail Cap(c_a), veh/h	335	1766	0	241	1795	557	0	1021	317	485	1991	618
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.6	63.7	0.0	68.6	40.5	18.3	0.0	57.3	53.8	63.3	42.6	27.3
Incr Delay (d2), s/veh	1.8	7.5	0.0	24.9	1.2	17.6	0.0	9.6	8.3	23.1	9.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	22.5	0.0	4.5	8.3	10.8	0.0	11.4	7.1	9.5	22.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	71.2	0.0	93.6	41.6	35.9	0.0	66.9	62.1	86.4	52.2	27.5
LnGrp LOS	E	E	A	F	D	D	A	E	E	F	D	C
Approach Vol, veh/h		1720			1474			1073			2333	
Approach Delay, s/veh		71.0			46.9			66.1			58.1	
Approach LOS		E			D			E			E	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	69.0	23.2	57.8	29.6	39.3	18.9	62.1
Change Period (Y+Rc), s	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1	* 8.1
Max Green Setting (Gmax), s	* 61	* 9.9	* 55	* 22	* 31	* 11	* 54
Max Q Clear Time (g_c+I1), s	56.3	6.9	27.1	21.3	28.0	10.8	50.6
Green Ext Time (p_c), s	4.5	0.2	22.6	0.2	2.6	0.0	3.2

Intersection Summary	
HCM 6th Ctrl Delay	60.3
HCM 6th LOS	E

Notes

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

DRAFT

Movement	EBT	EBR	EBR2	WBL	WBT	NBL	NBR	NEL	NER
Lane Configurations									
Traffic Volume (veh/h)	1634	0	2660	0	839	702	0	0	0
Future Volume (veh/h)	1634	0	2660	0	839	702	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No				No	No			
Adj Sat Flow, veh/h/ln	1796	1796	1796	0	1796	1796	1796		
Adj Flow Rate, veh/h	1720	0	0	0	883	739	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	7	7	7	0	7	7	7		
Cap, veh/h	3493			0	3493	866	273		
Arrive On Green	0.71	0.00	0.00	0.00	0.71	0.18	0.00		
Sat Flow, veh/h	5065	2679	2679	0	5227	4824	1522		
Grp Volume(v), veh/h	1720	0	0	0	883	739	0		
Grp Sat Flow(s),veh/h/ln	1635	1340	1340	0	1635	1608	1522		
Q Serve(g_s), s	23.3	0.0	0.0	0.0	9.5	22.3	0.0		
Cycle Q Clear(g_c), s	23.3	0.0	0.0	0.0	9.5	22.3	0.0		
Prop In Lane		1.00	1.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	3493			0	3493	866	273		
V/C Ratio(X)	0.49			0.00	0.25	0.85	0.00		
Avail Cap(c_a), veh/h	3493			0	3493	1412	446		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.88	1.00	0.00		
Uniform Delay (d), s/veh	9.6	0.0	0.0	0.0	7.6	59.6	0.0		
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.2	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	7.4	0.0	0.0	0.0	3.0	9.1	0.0		
Unsig. Movement Delay, s/veh									
LnGrp Delay(d),s/veh	10.1	0.0	0.0	0.0	7.7	62.5	0.0		
LnGrp LOS	B			A	A	E	A		
Approach Vol, veh/h	1720	A	A		883	739			
Approach Delay, s/veh	10.1				7.7	62.5			
Approach LOS	B				A	E			

Timer - Assigned Phs			4		6		8
Phs Duration (G+Y+Rc), s			115.0		35.0		115.0
Change Period (Y+Rc), s			* 8.1		8.1		* 8.1
Max Green Setting (Gmax), s			* 90		43.9		* 90
Max Q Clear Time (g_c+I1), s			11.5		24.3		25.3
Green Ext Time (p_c), s			6.5		2.7		18.7

Intersection Summary		
HCM 6th Ctrl Delay		21.0
HCM 6th LOS		C

Notes

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

Unsignalized Delay for [EBR2] is excluded from calculations of the approach delay and intersection delay.

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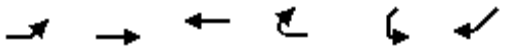

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations			↑↑↑↑			↱
Traffic Volume (vph)	0	0	2709	0	0	84
Future Volume (vph)	0	0	2709	0	0	84
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)			4.0			6.6
Lane Util. Factor			0.86			1.00
Frt			1.00			0.86
Flt Protected			1.00			1.00
Satd. Flow (prot)			6269			1576
Flt Permitted			1.00			1.00
Satd. Flow (perm)			6269			1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	2852	0	0	88
RTOR Reduction (vph)	0	0	0	0	0	48
Lane Group Flow (vph)	0	0	2852	0	0	40
Turn Type			NA			Prot
Protected Phases			Free!			2!
Permitted Phases						
Actuated Green, G (s)			90.0			18.3
Effective Green, g (s)			90.0			18.3
Actuated g/C Ratio			1.00			0.20
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)			6269			320
v/s Ratio Prot			0.45			0.03
v/s Ratio Perm						
v/c Ratio			0.45			0.13
Uniform Delay, d1			0.0			29.3
Progression Factor			1.00			1.00
Incremental Delay, d2			0.2			0.8
Delay (s)			0.2			30.1
Level of Service			A			C
Approach Delay (s)		0.0	0.2		30.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	1.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑									↑↑↑↑	
Traffic Volume (vph)	0	472	0	0	0	0	0	0	0	0	2709	0
Future Volume (vph)	0	472	0	0	0	0	0	0	0	0	2709	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)		6.6									6.6	
Lane Util. Factor		0.91									0.86	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		4975									6269	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		4975									6269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	497	0	0	0	0	0	0	0	0	2852	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	497	0	0	0	0	0	0	0	0	2852	0
Turn Type		NA									NA	
Protected Phases		2									4 3	
Permitted Phases												
Actuated Green, G (s)		18.3									58.5	
Effective Green, g (s)		18.3									58.5	
Actuated g/C Ratio		0.20									0.65	
Clearance Time (s)		6.6										
Vehicle Extension (s)		3.0										
Lane Grp Cap (vph)		1011									4074	
v/s Ratio Prot		c0.10									c0.45	
v/s Ratio Perm												
v/c Ratio		0.49									0.70	
Uniform Delay, d1		31.7									10.1	
Progression Factor		1.00									0.55	
Incremental Delay, d2		1.7									0.5	
Delay (s)		33.4									6.0	
Level of Service		C									A	
Approach Delay (s)		33.4			0.0			0.0			6.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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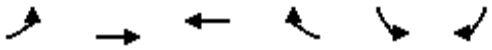

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑			↰	
Traffic Volume (vph)	0	472	0	0	241	0
Future Volume (vph)	0	472	0	0	241	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)		4.0			6.6	
Lane Util. Factor		0.91			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4975			1731	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4975			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	497	0	0	254	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	497	0	0	254	0
Turn Type		NA			Prot	
Protected Phases		Free!			4!	
Permitted Phases						
Actuated Green, G (s)		90.0			42.0	
Effective Green, g (s)		90.0			42.0	
Actuated g/C Ratio		1.00			0.47	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		4975			807	
v/s Ratio Prot		0.10			c0.15	
v/s Ratio Perm						
v/c Ratio		0.10			0.31	
Uniform Delay, d1		0.0			15.0	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.0			0.2	
Delay (s)		0.0			15.2	
Level of Service		A			B	
Approach Delay (s)		0.0	0.0		15.2	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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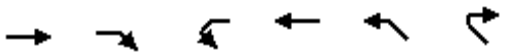

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑↑↑	↰↰↰	
Traffic Volume (vph)	0	0	0	1131	1656	0
Future Volume (vph)	0	0	0	1131	1656	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)				4.0	6.6	
Lane Util. Factor				0.86	0.94	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				6269	4882	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				6269	4882	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1191	1743	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1191	1743	0
Turn Type				NA	Prot	
Protected Phases				Free!	4!	
Permitted Phases						
Actuated Green, G (s)				90.0	39.6	
Effective Green, g (s)				90.0	39.6	
Actuated g/C Ratio				1.00	0.44	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)				6269	2148	
v/s Ratio Prot				0.19	c0.36	
v/s Ratio Perm						
v/c Ratio				0.19	0.81	
Uniform Delay, d1				0.0	21.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.0	2.4	
Delay (s)				0.0	24.4	
Level of Service				A	C	
Approach Delay (s)	0.0			0.0	24.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1131	0	0	646	0	0	0	0
Future Volume (vph)	0	0	0	0	1131	0	0	646	0	0	0	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)					6.6			6.6				
Lane Util. Factor					0.86			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					6269			4975				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					6269			4975				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	1191	0	0	680	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1191	0	0	680	0	0	0	0
Turn Type					NA			NA				
Protected Phases					2			4 3				
Permitted Phases												
Actuated Green, G (s)					23.4			53.4				
Effective Green, g (s)					23.4			53.4				
Actuated g/C Ratio					0.26			0.59				
Clearance Time (s)					6.6							
Vehicle Extension (s)					3.0							
Lane Grp Cap (vph)					1629			2951				
v/s Ratio Prot					c0.19			c0.14				
v/s Ratio Perm												
v/c Ratio					0.73			0.23				
Uniform Delay, d1					30.4			8.6				
Progression Factor					1.00			0.84				
Incremental Delay, d2					2.9			0.0				
Delay (s)					33.4			7.3				
Level of Service					C			A				
Approach Delay (s)		0.0			33.4			7.3			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	646	0	0	0	0	75
Future Volume (vph)	646	0	0	0	0	75
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)	4.0					6.6
Lane Util. Factor	0.91					1.00
Frt	1.00					0.86
Flt Protected	1.00					1.00
Satd. Flow (prot)	4975					1576
Flt Permitted	1.00					1.00
Satd. Flow (perm)	4975					1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	680	0	0	0	0	79
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	680	0	0	0	0	79
Turn Type	NA					Prot
Protected Phases	Free!					2!
Permitted Phases						
Actuated Green, G (s)	90.0					23.4
Effective Green, g (s)	90.0					23.4
Actuated g/C Ratio	1.00					0.26
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)	4975					409
v/s Ratio Prot	0.14					c0.05
v/s Ratio Perm						
v/c Ratio	0.14					0.19
Uniform Delay, d1	0.0					25.9
Progression Factor	1.00					1.00
Incremental Delay, d2	0.1					1.1
Delay (s)	0.1					27.0
Level of Service	A					C
Approach Delay (s)	0.1			0.0	27.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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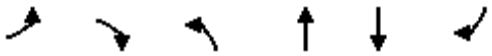

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	492	0	0	78	0
Future Volume (vph)	0	492	0	0	78	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6			6.6	
Lane Util. Factor		0.88			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			1.00	
Satd. Flow (prot)		2656			1776	
Flt Permitted		1.00			1.00	
Satd. Flow (perm)		2656			1776	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	518	0	0	82	0
RTOR Reduction (vph)	0	124	0	0	0	0
Lane Group Flow (vph)	0	394	0	0	82	0
Turn Type		Perm			NA	
Protected Phases					3	
Permitted Phases		2 4				
Actuated Green, G (s)		68.5			8.3	
Effective Green, g (s)		68.5			8.3	
Actuated g/C Ratio		0.76			0.09	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		2021			163	
v/s Ratio Prot					c0.05	
v/s Ratio Perm		c0.15				
v/c Ratio		0.20			0.50	
Uniform Delay, d1		3.0			38.9	
Progression Factor		1.00			0.16	
Incremental Delay, d2		0.0			2.4	
Delay (s)		3.1			8.8	
Level of Service		A			A	
Approach Delay (s)	3.1			0.0	8.8	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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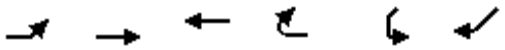

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations			↑↑↑↑			↱
Traffic Volume (vph)	0	0	981	0	0	31
Future Volume (vph)	0	0	981	0	0	31
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)			4.0			6.6
Lane Util. Factor			0.86			1.00
Frt			1.00			0.86
Flt Protected			1.00			1.00
Satd. Flow (prot)			6269			1576
Flt Permitted			1.00			1.00
Satd. Flow (perm)			6269			1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	1033	0	0	33
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	0	0	1033	0	0	12
Turn Type			NA			Prot
Protected Phases			Free!			2!
Permitted Phases						
Actuated Green, G (s)			90.0			33.7
Effective Green, g (s)			90.0			33.7
Actuated g/C Ratio			1.00			0.37
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)			6269			590
v/s Ratio Prot			0.16			0.01
v/s Ratio Perm						
v/c Ratio			0.16			0.02
Uniform Delay, d1			0.0			17.7
Progression Factor			1.00			1.00
Incremental Delay, d2			0.1			0.1
Delay (s)			0.1			17.8
Level of Service			A			B
Approach Delay (s)		0.0	0.1		17.8	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	0.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑									↑↑↑↑	
Traffic Volume (vph)	0	962	0	0	0	0	0	0	0	0	981	0
Future Volume (vph)	0	962	0	0	0	0	0	0	0	0	981	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)		6.6									6.6	
Lane Util. Factor		0.91									0.86	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		4975									6269	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		4975									6269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1013	0	0	0	0	0	0	0	0	1033	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1013	0	0	0	0	0	0	0	0	1033	0
Turn Type		NA									NA	
Protected Phases		2									4 3	
Permitted Phases												
Actuated Green, G (s)		33.7									43.1	
Effective Green, g (s)		33.7									43.1	
Actuated g/C Ratio		0.37									0.48	
Clearance Time (s)		6.6										
Vehicle Extension (s)		3.0										
Lane Grp Cap (vph)		1862									3002	
v/s Ratio Prot		c0.20									c0.16	
v/s Ratio Perm												
v/c Ratio		0.54									0.34	
Uniform Delay, d1		22.1									14.6	
Progression Factor		1.00									0.39	
Incremental Delay, d2		1.1									0.1	
Delay (s)		23.3									5.8	
Level of Service		C									A	
Approach Delay (s)		23.3			0.0			0.0			5.8	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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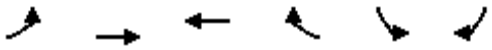

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑			↰	
Traffic Volume (vph)	0	962	0	0	307	0
Future Volume (vph)	0	962	0	0	307	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)		4.0			6.6	
Lane Util. Factor		0.91			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4975			1731	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4975			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1013	0	0	323	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1013	0	0	323	0
Turn Type		NA			Prot	
Protected Phases		Free!			4!	
Permitted Phases						
Actuated Green, G (s)		90.0			24.5	
Effective Green, g (s)		90.0			24.5	
Actuated g/C Ratio		1.00			0.27	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		4975			471	
v/s Ratio Prot		0.20			c0.19	
v/s Ratio Perm						
v/c Ratio		0.20			0.69	
Uniform Delay, d1		0.0			29.3	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.1			4.1	
Delay (s)		0.1			33.4	
Level of Service		A			C	
Approach Delay (s)		0.1	0.0		33.4	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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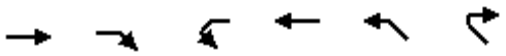

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑↑↑	↰↰↰	
Traffic Volume (vph)	0	0	0	616	483	0
Future Volume (vph)	0	0	0	616	483	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)				4.0	6.6	
Lane Util. Factor				0.86	0.94	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				6269	4882	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				6269	4882	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	648	508	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	648	508	0
Turn Type				NA	Prot	
Protected Phases				Free!	4!	
Permitted Phases						
Actuated Green, G (s)				90.0	20.2	
Effective Green, g (s)				90.0	20.2	
Actuated g/C Ratio				1.00	0.22	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)				6269	1095	
v/s Ratio Prot				0.10	c0.10	
v/s Ratio Perm						
v/c Ratio				0.10	0.46	
Uniform Delay, d1				0.0	30.2	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.0	0.3	
Delay (s)				0.0	30.5	
Level of Service				A	C	
Approach Delay (s)	0.0			0.0	30.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations					↑↑↑↑			↑↑↑				
Traffic Volume (vph)	0	0	0	0	616	0	0	1207	0	0	0	0
Future Volume (vph)	0	0	0	0	616	0	0	1207	0	0	0	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)					6.6			6.6				
Lane Util. Factor					0.86			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					6269			4975				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					6269			4975				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	648	0	0	1271	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	648	0	0	1271	0	0	0	0
Turn Type					NA			NA				
Protected Phases					2			4 3				
Permitted Phases												
Actuated Green, G (s)					32.1			44.7				
Effective Green, g (s)					32.1			44.7				
Actuated g/C Ratio					0.36			0.50				
Clearance Time (s)					6.6							
Vehicle Extension (s)					3.0							
Lane Grp Cap (vph)					2235			2470				
v/s Ratio Prot					c0.10			c0.26				
v/s Ratio Perm												
v/c Ratio					0.29			0.51				
Uniform Delay, d1					20.8			15.3				
Progression Factor					1.00			0.32				
Incremental Delay, d2					0.3			0.2				
Delay (s)					21.1			5.1				
Level of Service					C			A				
Approach Delay (s)		0.0			21.1			5.1			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑↑					↱
Traffic Volume (vph)	1207	0	0	0	0	125
Future Volume (vph)	1207	0	0	0	0	125
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)	4.0					6.6
Lane Util. Factor	0.91					1.00
Frt	1.00					0.86
Flt Protected	1.00					1.00
Satd. Flow (prot)	4975					1576
Flt Permitted	1.00					1.00
Satd. Flow (perm)	4975					1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1271	0	0	0	0	132
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1271	0	0	0	0	132
Turn Type	NA					Prot
Protected Phases	Free!					2!
Permitted Phases						
Actuated Green, G (s)	90.0					32.1
Effective Green, g (s)	90.0					32.1
Actuated g/C Ratio	1.00					0.36
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)	4975					562
v/s Ratio Prot	0.26					0.08
v/s Ratio Perm						
v/c Ratio	0.26					0.23
Uniform Delay, d1	0.0					20.3
Progression Factor	1.00					1.00
Incremental Delay, d2	0.1					1.0
Delay (s)	0.1					21.3
Level of Service	A					C
Approach Delay (s)	0.1			0.0	21.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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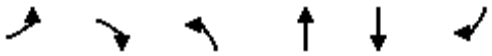

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1566	0	0	118	0
Future Volume (vph)	0	1566	0	0	118	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6			6.6	
Lane Util. Factor		0.88			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			1.00	
Satd. Flow (prot)		2656			1776	
Flt Permitted		1.00			1.00	
Satd. Flow (perm)		2656			1776	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1648	0	0	124	0
RTOR Reduction (vph)	0	139	0	0	0	0
Lane Group Flow (vph)	0	1509	0	0	124	0
Turn Type		Perm			NA	
Protected Phases					3	
Permitted Phases		2 4				
Actuated Green, G (s)		66.6			10.2	
Effective Green, g (s)		66.6			10.2	
Actuated g/C Ratio		0.74			0.11	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		1965			201	
v/s Ratio Prot					c0.07	
v/s Ratio Perm		c0.57				
v/c Ratio		0.77			0.62	
Uniform Delay, d1		7.0			38.0	
Progression Factor		1.00			0.45	
Incremental Delay, d2		1.9			5.5	
Delay (s)		8.9			22.7	
Level of Service		A			C	
Approach Delay (s)	8.9			0.0	22.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

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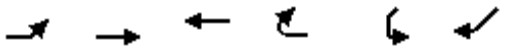

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations			↑↑↑↑			↱
Traffic Volume (vph)	0	0	3399	0	0	98
Future Volume (vph)	0	0	3399	0	0	98
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)			4.0			6.6
Lane Util. Factor			0.86			1.00
Frt			1.00			0.86
Flt Protected			1.00			1.00
Satd. Flow (prot)			6269			1576
Flt Permitted			1.00			1.00
Satd. Flow (perm)			6269			1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	3578	0	0	103
RTOR Reduction (vph)	0	0	0	0	0	49
Lane Group Flow (vph)	0	0	3578	0	0	54
Turn Type			NA			Prot
Protected Phases			Free!			2!
Permitted Phases						
Actuated Green, G (s)			100.0			18.7
Effective Green, g (s)			100.0			18.7
Actuated g/C Ratio			1.00			0.19
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)			6269			294
v/s Ratio Prot			0.57			0.03
v/s Ratio Perm						
v/c Ratio			0.57			0.18
Uniform Delay, d1			0.0			34.2
Progression Factor			1.00			1.00
Incremental Delay, d2			0.2			1.4
Delay (s)			0.2			35.6
Level of Service			A			D
Approach Delay (s)		0.0	0.2		35.6	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	1.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑									↑↑↑↑	
Traffic Volume (vph)	0	638	0	0	0	0	0	0	0	0	3399	0
Future Volume (vph)	0	638	0	0	0	0	0	0	0	0	3399	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)		6.6									6.6	
Lane Util. Factor		0.91									0.86	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		4975									6269	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		4975									6269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	672	0	0	0	0	0	0	0	0	3578	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	672	0	0	0	0	0	0	0	0	3578	0
Turn Type		NA									NA	
Protected Phases		2									4 3	
Permitted Phases												
Actuated Green, G (s)		18.7									68.1	
Effective Green, g (s)		18.7									68.1	
Actuated g/C Ratio		0.19									0.68	
Clearance Time (s)		6.6										
Vehicle Extension (s)		3.0										
Lane Grp Cap (vph)		930									4269	
v/s Ratio Prot		c0.14									c0.57	
v/s Ratio Perm												
v/c Ratio		0.72									0.84	
Uniform Delay, d1		38.2									11.9	
Progression Factor		1.00									0.68	
Incremental Delay, d2		4.9									1.2	
Delay (s)		43.1									9.3	
Level of Service		D									A	
Approach Delay (s)		43.1			0.0			0.0			9.3	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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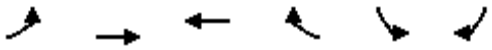

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑			↰	
Traffic Volume (vph)	0	638	0	0	282	0
Future Volume (vph)	0	638	0	0	282	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)		4.0			6.6	
Lane Util. Factor		0.91			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4975			1731	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4975			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	672	0	0	297	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	672	0	0	297	0
Turn Type		NA			Prot	
Protected Phases		Free!			4!	
Permitted Phases						
Actuated Green, G (s)		100.0			53.4	
Effective Green, g (s)		100.0			53.4	
Actuated g/C Ratio		1.00			0.53	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		4975			924	
v/s Ratio Prot		0.14			c0.17	
v/s Ratio Perm						
v/c Ratio		0.14			0.32	
Uniform Delay, d1		0.0			13.1	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.0			0.2	
Delay (s)		0.0			13.3	
Level of Service		A			B	
Approach Delay (s)		0.0	0.0		13.3	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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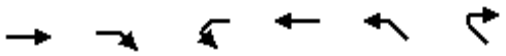

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑↑↑	↰↰↰↰	
Traffic Volume (vph)	0	0	0	1469	2031	0
Future Volume (vph)	0	0	0	1469	2031	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)				4.0	6.6	
Lane Util. Factor				0.86	0.94	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				6269	4882	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				6269	4882	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1546	2138	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1546	2138	0
Turn Type				NA	Prot	
Protected Phases				Free!	4!	
Permitted Phases						
Actuated Green, G (s)				100.0	46.4	
Effective Green, g (s)				100.0	46.4	
Actuated g/C Ratio				1.00	0.46	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)				6269	2265	
v/s Ratio Prot				0.25	c0.44	
v/s Ratio Perm						
v/c Ratio				0.25	0.94	
Uniform Delay, d1				0.0	25.6	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.0	8.9	
Delay (s)				0.0	34.5	
Level of Service				A	C	
Approach Delay (s)	0.0			0.0	34.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1469	0	0	829	0	0	0	0
Future Volume (vph)	0	0	0	0	1469	0	0	829	0	0	0	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)					6.6			6.6				
Lane Util. Factor					0.86			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					6269			4975				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					6269			4975				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	1546	0	0	873	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1546	0	0	873	0	0	0	0
Turn Type					NA			NA				
Protected Phases					2			4 3				
Permitted Phases												
Actuated Green, G (s)					27.4			59.4				
Effective Green, g (s)					27.4			59.4				
Actuated g/C Ratio					0.27			0.59				
Clearance Time (s)					6.6							
Vehicle Extension (s)					3.0							
Lane Grp Cap (vph)					1717			2955				
v/s Ratio Prot					c0.25			c0.18				
v/s Ratio Perm												
v/c Ratio					0.90			0.30				
Uniform Delay, d1					35.0			10.0				
Progression Factor					1.00			0.91				
Incremental Delay, d2					8.0			0.1				
Delay (s)					43.0			9.1				
Level of Service					D			A				
Approach Delay (s)		0.0			43.0			9.1			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	829	0	0	0	0	92
Future Volume (vph)	829	0	0	0	0	92
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)	4.0					6.6
Lane Util. Factor	0.91					1.00
Frt	1.00					0.86
Flt Protected	1.00					1.00
Satd. Flow (prot)	4975					1576
Flt Permitted	1.00					1.00
Satd. Flow (perm)	4975					1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	873	0	0	0	0	97
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	873	0	0	0	0	97
Turn Type	NA					Prot
Protected Phases	Free!					2!
Permitted Phases						
Actuated Green, G (s)	100.0					27.4
Effective Green, g (s)	100.0					27.4
Actuated g/C Ratio	1.00					0.27
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)	4975					431
v/s Ratio Prot	0.18					c0.06
v/s Ratio Perm						
v/c Ratio	0.18					0.23
Uniform Delay, d1	0.0					28.1
Progression Factor	1.00					1.00
Incremental Delay, d2	0.1					1.2
Delay (s)	0.1					29.3
Level of Service	A					C
Approach Delay (s)	0.1			0.0	29.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	3.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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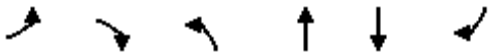

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	664	0	0	101	0
Future Volume (vph)	0	664	0	0	101	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6			6.6	
Lane Util. Factor		0.88			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			1.00	
Satd. Flow (prot)		2656			1776	
Flt Permitted		1.00			1.00	
Satd. Flow (perm)		2656			1776	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	699	0	0	106	0
RTOR Reduction (vph)	0	171	0	0	0	0
Lane Group Flow (vph)	0	528	0	0	106	0
Turn Type		Perm			NA	
Protected Phases					3	
Permitted Phases		2 4				
Actuated Green, G (s)		75.5			11.3	
Effective Green, g (s)		75.5			11.3	
Actuated g/C Ratio		0.76			0.11	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		2005			200	
v/s Ratio Prot					c0.06	
v/s Ratio Perm		c0.20				
v/c Ratio		0.26			0.53	
Uniform Delay, d1		3.7			41.8	
Progression Factor		1.00			0.18	
Incremental Delay, d2		0.1			2.6	
Delay (s)		3.8			10.2	
Level of Service		A			B	
Approach Delay (s)	3.8			0.0	10.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

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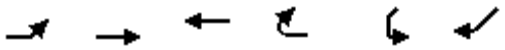

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations			↑↑↑↑			↱
Traffic Volume (vph)	0	0	1241	0	0	36
Future Volume (vph)	0	0	1241	0	0	36
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)			4.0			6.6
Lane Util. Factor			0.86			1.00
Frt			1.00			0.86
Flt Protected			1.00			1.00
Satd. Flow (prot)			6269			1576
Flt Permitted			1.00			1.00
Satd. Flow (perm)			6269			1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	1306	0	0	38
RTOR Reduction (vph)	0	0	0	0	0	22
Lane Group Flow (vph)	0	0	1306	0	0	16
Turn Type			NA			Prot
Protected Phases			Free!			2!
Permitted Phases						
Actuated Green, G (s)			110.0			44.9
Effective Green, g (s)			110.0			44.9
Actuated g/C Ratio			1.00			0.41
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)			6269			643
v/s Ratio Prot			0.21			0.01
v/s Ratio Perm						
v/c Ratio			0.21			0.02
Uniform Delay, d1			0.0			19.5
Progression Factor			1.00			1.00
Incremental Delay, d2			0.1			0.1
Delay (s)			0.1			19.5
Level of Service			A			B
Approach Delay (s)		0.0	0.1		19.5	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	0.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑									↑↑↑↑	
Traffic Volume (vph)	0	1299	0	0	0	0	0	0	0	0	1241	0
Future Volume (vph)	0	1299	0	0	0	0	0	0	0	0	1241	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)		6.6									6.6	
Lane Util. Factor		0.91									0.86	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		4975									6269	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		4975									6269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1367	0	0	0	0	0	0	0	0	1306	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1367	0	0	0	0	0	0	0	0	1306	0
Turn Type		NA									NA	
Protected Phases		2									4 3	
Permitted Phases												
Actuated Green, G (s)		44.9									51.9	
Effective Green, g (s)		44.9									51.9	
Actuated g/C Ratio		0.41									0.47	
Clearance Time (s)		6.6										
Vehicle Extension (s)		3.0										
Lane Grp Cap (vph)		2030									2957	
v/s Ratio Prot		c0.27									c0.21	
v/s Ratio Perm												
v/c Ratio		0.67									0.44	
Uniform Delay, d1		26.6									19.4	
Progression Factor		1.00									0.61	
Incremental Delay, d2		1.8									0.1	
Delay (s)		28.4									11.9	
Level of Service		C									B	
Approach Delay (s)		28.4			0.0			0.0			11.9	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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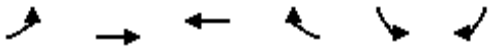

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑			↰	
Traffic Volume (vph)	0	1299	0	0	359	0
Future Volume (vph)	0	1299	0	0	359	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)		4.0			6.6	
Lane Util. Factor		0.91			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4975			1731	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4975			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1367	0	0	378	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1367	0	0	378	0
Turn Type		NA			Prot	
Protected Phases		Free!			4!	
Permitted Phases						
Actuated Green, G (s)		110.0			32.9	
Effective Green, g (s)		110.0			32.9	
Actuated g/C Ratio		1.00			0.30	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		4975			517	
v/s Ratio Prot		0.27			c0.22	
v/s Ratio Perm						
v/c Ratio		0.27			0.73	
Uniform Delay, d1		0.0			34.6	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.1			5.3	
Delay (s)		0.1			39.9	
Level of Service		A			D	
Approach Delay (s)		0.1	0.0		39.9	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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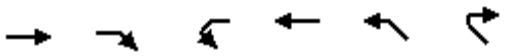

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	801	593	0
Future Volume (vph)	0	0	0	801	593	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)				4.0	6.6	
Lane Util. Factor				0.86	0.94	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				6269	4882	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				6269	4882	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	843	624	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	843	624	0
Turn Type				NA	Prot	
Protected Phases				Free!	4!	
Permitted Phases						
Actuated Green, G (s)				110.0	32.9	
Effective Green, g (s)				110.0	32.9	
Actuated g/C Ratio				1.00	0.30	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)				6269	1460	
v/s Ratio Prot				0.13	c0.13	
v/s Ratio Perm						
v/c Ratio				0.13	0.43	
Uniform Delay, d1				0.0	31.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.0	0.2	
Delay (s)				0.0	31.2	
Level of Service				A	C	
Approach Delay (s)	0.0			0.0	31.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	801	0	0	1574	0	0	0	0
Future Volume (vph)	0	0	0	0	801	0	0	1574	0	0	0	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)					6.6			6.6				
Lane Util. Factor					0.86			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					6269			4975				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					6269			4975				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	843	0	0	1657	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	843	0	0	1657	0	0	0	0
Turn Type					NA			NA				
Protected Phases					2			4 3				
Permitted Phases												
Actuated Green, G (s)					41.2			55.6				
Effective Green, g (s)					41.2			55.6				
Actuated g/C Ratio					0.37			0.51				
Clearance Time (s)					6.6							
Vehicle Extension (s)					3.0							
Lane Grp Cap (vph)					2348			2514				
v/s Ratio Prot					c0.13			c0.33				
v/s Ratio Perm												
v/c Ratio					0.36			0.66				
Uniform Delay, d1					24.9			20.2				
Progression Factor					1.00			0.35				
Incremental Delay, d2					0.4			0.6				
Delay (s)					25.3			7.6				
Level of Service					C			A				
Approach Delay (s)		0.0			25.3			7.6			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	1574	0	0	0	0	154
Future Volume (vph)	1574	0	0	0	0	154
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)	4.0					6.6
Lane Util. Factor	0.91					1.00
Frt	1.00					0.86
Flt Protected	1.00					1.00
Satd. Flow (prot)	4975					1576
Flt Permitted	1.00					1.00
Satd. Flow (perm)	4975					1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1657	0	0	0	0	162
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1657	0	0	0	0	162
Turn Type	NA					Prot
Protected Phases	Free!					2!
Permitted Phases						
Actuated Green, G (s)	110.0					41.2
Effective Green, g (s)	110.0					41.2
Actuated g/C Ratio	1.00					0.37
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)	4975					590
v/s Ratio Prot	0.33					0.10
v/s Ratio Perm						
v/c Ratio	0.33					0.27
Uniform Delay, d1	0.0					24.0
Progression Factor	1.00					1.00
Incremental Delay, d2	0.2					1.2
Delay (s)	0.2					25.1
Level of Service	A					C
Approach Delay (s)	0.2			0.0	25.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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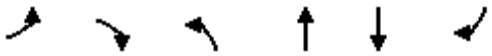

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2115	0	0	153	0
Future Volume (vph)	0	2115	0	0	153	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6			6.6	
Lane Util. Factor		0.88			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			1.00	
Satd. Flow (prot)		2656			1776	
Flt Permitted		1.00			1.00	
Satd. Flow (perm)		2656			1776	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2226	0	0	161	0
RTOR Reduction (vph)	0	43	0	0	0	0
Lane Group Flow (vph)	0	2183	0	0	161	0
Turn Type		Perm			NA	
Protected Phases					3	
Permitted Phases		2 4				
Actuated Green, G (s)		86.4			10.4	
Effective Green, g (s)		86.4			10.4	
Actuated g/C Ratio		0.79			0.09	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		2086			167	
v/s Ratio Prot					c0.09	
v/s Ratio Perm		c0.82				
v/c Ratio		1.05			0.96	
Uniform Delay, d1		11.8			49.6	
Progression Factor		1.00			0.49	
Incremental Delay, d2		33.2			58.4	
Delay (s)		45.0			82.7	
Level of Service		D			F	
Approach Delay (s)	45.0			0.0	82.7	
Approach LOS	D			A	F	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

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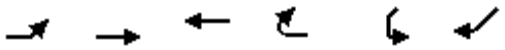

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations			↑↑↑↑			↱
Traffic Volume (vph)	0	0	4090	0	0	112
Future Volume (vph)	0	0	4090	0	0	112
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)			4.0			6.6
Lane Util. Factor			0.86			1.00
Frt			1.00			0.86
Flt Protected			1.00			1.00
Satd. Flow (prot)			6269			1576
Flt Permitted			1.00			1.00
Satd. Flow (perm)			6269			1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	4305	0	0	118
RTOR Reduction (vph)	0	0	0	0	0	48
Lane Group Flow (vph)	0	0	4305	0	0	70
Turn Type			NA			Prot
Protected Phases			Free!			2!
Permitted Phases						
Actuated Green, G (s)			150.0			29.0
Effective Green, g (s)			150.0			29.0
Actuated g/C Ratio			1.00			0.19
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)			6269			304
v/s Ratio Prot			0.69			0.04
v/s Ratio Perm						
v/c Ratio			0.69			0.23
Uniform Delay, d1			0.0			51.1
Progression Factor			1.00			1.00
Incremental Delay, d2			0.2			1.7
Delay (s)			0.2			52.8
Level of Service			A			D
Approach Delay (s)		0.0	0.2		52.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑									↑↑↑↑	
Traffic Volume (vph)	0	801	0	0	0	0	0	0	0	0	4090	0
Future Volume (vph)	0	801	0	0	0	0	0	0	0	0	4090	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)		6.6									6.6	
Lane Util. Factor		0.91									0.86	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		4975									6269	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		4975									6269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	843	0	0	0	0	0	0	0	0	4305	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	843	0	0	0	0	0	0	0	0	4305	0
Turn Type		NA									NA	
Protected Phases		2									4 3	
Permitted Phases												
Actuated Green, G (s)		29.0									107.8	
Effective Green, g (s)		29.0									107.8	
Actuated g/C Ratio		0.19									0.72	
Clearance Time (s)		6.6										
Vehicle Extension (s)		3.0										
Lane Grp Cap (vph)		961									4505	
v/s Ratio Prot		c0.17									c0.69	
v/s Ratio Perm												
v/c Ratio		0.88									0.96	
Uniform Delay, d1		58.8									19.0	
Progression Factor		1.00									0.80	
Incremental Delay, d2		11.1									4.4	
Delay (s)		69.9									19.5	
Level of Service		E									B	
Approach Delay (s)		69.9			0.0			0.0			19.5	
Approach LOS		E			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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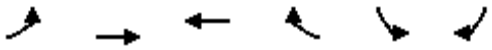

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑			↰	
Traffic Volume (vph)	0	801	0	0	323	0
Future Volume (vph)	0	801	0	0	323	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)		4.0			6.6	
Lane Util. Factor		0.91			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4975			1731	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4975			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	843	0	0	340	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	843	0	0	340	0
Turn Type		NA			Prot	
Protected Phases		Free!			4!	
Permitted Phases						
Actuated Green, G (s)		150.0			94.4	
Effective Green, g (s)		150.0			94.4	
Actuated g/C Ratio		1.00			0.63	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		4975			1089	
v/s Ratio Prot		0.17			c0.20	
v/s Ratio Perm						
v/c Ratio		0.17			0.31	
Uniform Delay, d1		0.0			12.8	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.0			0.2	
Delay (s)		0.0			13.0	
Level of Service		A			B	
Approach Delay (s)		0.0	0.0		13.0	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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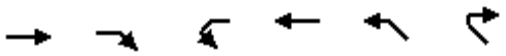

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑↑↑	↰↰↰	
Traffic Volume (vph)	0	0	0	1808	2406	0
Future Volume (vph)	0	0	0	1808	2406	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)				4.0	6.6	
Lane Util. Factor				0.86	0.94	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				6269	4882	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				6269	4882	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1903	2533	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1903	2533	0
Turn Type				NA	Prot	
Protected Phases				Free!	4!	
Permitted Phases						
Actuated Green, G (s)				150.0	77.4	
Effective Green, g (s)				150.0	77.4	
Actuated g/C Ratio				1.00	0.52	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)				6269	2519	
v/s Ratio Prot				0.30	c0.52	
v/s Ratio Perm						
v/c Ratio				0.30	1.01	
Uniform Delay, d1				0.0	36.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.0	19.3	
Delay (s)				0.0	55.6	
Level of Service				A	E	
Approach Delay (s)	0.0			0.0	55.6	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1808	0	0	1010	0	0	0	0
Future Volume (vph)	0	0	0	0	1808	0	0	1010	0	0	0	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)					6.6			6.6				
Lane Util. Factor					0.86			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					6269			4975				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					6269			4975				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	1903	0	0	1063	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1903	0	0	1063	0	0	0	0
Turn Type					NA			NA				
Protected Phases					2			4 3				
Permitted Phases												
Actuated Green, G (s)					46.4			90.4				
Effective Green, g (s)					46.4			90.4				
Actuated g/C Ratio					0.31			0.60				
Clearance Time (s)					6.6							
Vehicle Extension (s)					3.0							
Lane Grp Cap (vph)					1939			2998				
v/s Ratio Prot					c0.30			c0.21				
v/s Ratio Perm												
v/c Ratio					0.98			0.35				
Uniform Delay, d1					51.4			15.1				
Progression Factor					1.00			1.88				
Incremental Delay, d2					16.5			0.1				
Delay (s)					67.9			28.4				
Level of Service					E			C				
Approach Delay (s)		0.0			67.9			28.4			0.0	
Approach LOS		A			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	1010	0	0	0	0	109
Future Volume (vph)	1010	0	0	0	0	109
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)	4.0					6.6
Lane Util. Factor	0.91					1.00
Frt	1.00					0.86
Flt Protected	1.00					1.00
Satd. Flow (prot)	4975					1576
Flt Permitted	1.00					1.00
Satd. Flow (perm)	4975					1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1063	0	0	0	0	115
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1063	0	0	0	0	115
Turn Type	NA					Prot
Protected Phases	Free!					2!
Permitted Phases						
Actuated Green, G (s)	150.0					46.4
Effective Green, g (s)	150.0					46.4
Actuated g/C Ratio	1.00					0.31
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)	4975					487
v/s Ratio Prot	0.21					0.07
v/s Ratio Perm						
v/c Ratio	0.21					0.24
Uniform Delay, d1	0.0					38.6
Progression Factor	1.00					1.00
Incremental Delay, d2	0.1					1.1
Delay (s)	0.1					39.7
Level of Service	A					D
Approach Delay (s)	0.1			0.0	39.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	4.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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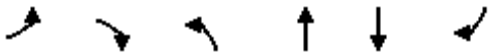

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	835	0	0	124	0
Future Volume (vph)	0	835	0	0	124	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6			6.6	
Lane Util. Factor		0.88			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			1.00	
Satd. Flow (prot)		2656			1776	
Flt Permitted		1.00			1.00	
Satd. Flow (perm)		2656			1776	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	879	0	0	131	0
RTOR Reduction (vph)	0	173	0	0	0	0
Lane Group Flow (vph)	0	706	0	0	131	0
Turn Type		Perm			NA	
Protected Phases					3	
Permitted Phases		2 4				
Actuated Green, G (s)		120.4			16.4	
Effective Green, g (s)		120.4			16.4	
Actuated g/C Ratio		0.80			0.11	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		2131			194	
v/s Ratio Prot					c0.07	
v/s Ratio Perm		c0.27				
v/c Ratio		0.33			0.68	
Uniform Delay, d1		4.0			64.2	
Progression Factor		1.00			0.25	
Incremental Delay, d2		0.1			8.6	
Delay (s)		4.1			24.5	
Level of Service		A			C	
Approach Delay (s)	4.1			0.0	24.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

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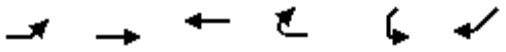

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations			↑↑↑↑			↱
Traffic Volume (vph)	0	0	1500	0	0	41
Future Volume (vph)	0	0	1500	0	0	41
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)			4.0			6.6
Lane Util. Factor			0.86			1.00
Frt			1.00			0.86
Flt Protected			1.00			1.00
Satd. Flow (prot)			6269			1576
Flt Permitted			1.00			1.00
Satd. Flow (perm)			6269			1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	1579	0	0	43
RTOR Reduction (vph)	0	0	0	0	0	24
Lane Group Flow (vph)	0	0	1579	0	0	19
Turn Type			NA			Prot
Protected Phases			Free!			2!
Permitted Phases						
Actuated Green, G (s)			140.0			62.5
Effective Green, g (s)			140.0			62.5
Actuated g/C Ratio			1.00			0.45
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)			6269			703
v/s Ratio Prot			0.25			0.01
v/s Ratio Perm						
v/c Ratio			0.25			0.03
Uniform Delay, d1			0.0			21.7
Progression Factor			1.00			1.00
Incremental Delay, d2			0.1			0.1
Delay (s)			0.1			21.8
Level of Service			A			C
Approach Delay (s)		0.0	0.1		21.8	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	0.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑									↑↑↑↑	
Traffic Volume (vph)	0	1634	0	0	0	0	0	0	0	0	1500	0
Future Volume (vph)	0	1634	0	0	0	0	0	0	0	0	1500	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)		6.6									6.6	
Lane Util. Factor		0.91									0.86	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		4975									6269	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		4975									6269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1720	0	0	0	0	0	0	0	0	1579	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1720	0	0	0	0	0	0	0	0	1579	0
Turn Type		NA									NA	
Protected Phases		2									4 3	
Permitted Phases												
Actuated Green, G (s)		62.5									64.3	
Effective Green, g (s)		62.5									64.3	
Actuated g/C Ratio		0.45									0.46	
Clearance Time (s)		6.6										
Vehicle Extension (s)		3.0										
Lane Grp Cap (vph)		2220									2879	
v/s Ratio Prot		c0.35									c0.25	
v/s Ratio Perm												
v/c Ratio		0.77									0.55	
Uniform Delay, d1		32.8									27.4	
Progression Factor		1.00									0.70	
Incremental Delay, d2		2.7									0.2	
Delay (s)		35.5									19.3	
Level of Service		D									B	
Approach Delay (s)		35.5			0.0			0.0			19.3	
Approach LOS		D			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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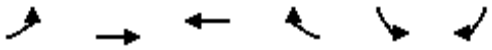

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑			↰	
Traffic Volume (vph)	0	1634	0	0	411	0
Future Volume (vph)	0	1634	0	0	411	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)		4.0			6.6	
Lane Util. Factor		0.91			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4975			1731	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4975			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1720	0	0	433	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1720	0	0	433	0
Turn Type		NA			Prot	
Protected Phases		Free!			4!	
Permitted Phases						
Actuated Green, G (s)		140.0			45.1	
Effective Green, g (s)		140.0			45.1	
Actuated g/C Ratio		1.00			0.32	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		4975			557	
v/s Ratio Prot		0.35			c0.25	
v/s Ratio Perm						
v/c Ratio		0.35			0.78	
Uniform Delay, d1		0.0			42.9	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.1			6.7	
Delay (s)		0.1			49.7	
Level of Service		A			D	
Approach Delay (s)		0.1	0.0		49.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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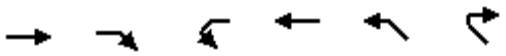

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	986	702	0
Future Volume (vph)	0	0	0	986	702	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)				4.0	6.6	
Lane Util. Factor				0.86	0.94	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				6269	4882	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				6269	4882	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1038	739	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1038	739	0
Turn Type				NA	Prot	
Protected Phases				Free!	4!	
Permitted Phases						
Actuated Green, G (s)				140.0	56.2	
Effective Green, g (s)				140.0	56.2	
Actuated g/C Ratio				1.00	0.40	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)				6269	1959	
v/s Ratio Prot				0.17	c0.15	
v/s Ratio Perm						
v/c Ratio				0.17	0.38	
Uniform Delay, d1				0.0	29.6	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.1	0.1	
Delay (s)				0.1	29.7	
Level of Service				A	C	
Approach Delay (s)	0.0			0.1	29.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	986	0	0	1939	0	0	0	0
Future Volume (vph)	0	0	0	0	986	0	0	1939	0	0	0	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)					6.6			6.6				
Lane Util. Factor					0.86			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					6269			4975				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					6269			4975				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	1038	0	0	2041	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1038	0	0	2041	0	0	0	0
Turn Type					NA			NA				
Protected Phases					2			4 3				
Permitted Phases												
Actuated Green, G (s)					49.4			77.4				
Effective Green, g (s)					49.4			77.4				
Actuated g/C Ratio					0.35			0.55				
Clearance Time (s)					6.6							
Vehicle Extension (s)					3.0							
Lane Grp Cap (vph)					2212			2750				
v/s Ratio Prot					c0.17			c0.41				
v/s Ratio Perm												
v/c Ratio					0.47			0.74				
Uniform Delay, d1					35.1			23.7				
Progression Factor					1.00			0.32				
Incremental Delay, d2					0.7			1.0				
Delay (s)					35.9			8.7				
Level of Service					D			A				
Approach Delay (s)		0.0			35.9			8.7			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑↑					↱
Traffic Volume (vph)	1939	0	0	0	0	182
Future Volume (vph)	1939	0	0	0	0	182
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950
Total Lost time (s)	4.0					6.6
Lane Util. Factor	0.91					1.00
Frt	1.00					0.86
Flt Protected	1.00					1.00
Satd. Flow (prot)	4975					1576
Flt Permitted	1.00					1.00
Satd. Flow (perm)	4975					1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2041	0	0	0	0	192
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2041	0	0	0	0	192
Turn Type	NA					Prot
Protected Phases	Free!					2!
Permitted Phases						
Actuated Green, G (s)	140.0					49.4
Effective Green, g (s)	140.0					49.4
Actuated g/C Ratio	1.00					0.35
Clearance Time (s)						6.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)	4975					556
v/s Ratio Prot	0.41					0.12
v/s Ratio Perm						
v/c Ratio	0.41					0.35
Uniform Delay, d1	0.0					33.4
Progression Factor	1.00					1.00
Incremental Delay, d2	0.2					1.7
Delay (s)	0.2					35.1
Level of Service	A					D
Approach Delay (s)	0.2			0.0	35.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

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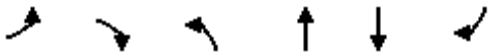

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2660	0	0	188	0
Future Volume (vph)	0	2660	0	0	188	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6			6.6	
Lane Util. Factor		0.88			1.00	
Frt		0.85			1.00	
Flt Protected		1.00			1.00	
Satd. Flow (prot)		2656			1776	
Flt Permitted		1.00			1.00	
Satd. Flow (perm)		2656			1776	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2800	0	0	198	0
RTOR Reduction (vph)	0	23	0	0	0	0
Lane Group Flow (vph)	0	2777	0	0	198	0
Turn Type		Perm			NA	
Protected Phases					3	
Permitted Phases		2 4				
Actuated Green, G (s)		113.4			13.4	
Effective Green, g (s)		113.4			13.4	
Actuated g/C Ratio		0.81			0.10	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)		2151			169	
v/s Ratio Prot					c0.11	
v/s Ratio Perm		c1.05				
v/c Ratio		1.29			1.17	
Uniform Delay, d1		13.3			63.3	
Progression Factor		1.00			0.44	
Incremental Delay, d2		134.7			122.7	
Delay (s)		148.0			150.3	
Level of Service		F			F	
Approach Delay (s)	148.0			0.0	150.3	
Approach LOS	F			A	F	

Intersection Summary			
HCM 2000 Control Delay	148.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	123.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	405	492	78	1053	245	1656	0	75	241	0	84
Future Volume (veh/h)	67	405	492	78	1053	245	1656	0	75	241	0	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	71	426	518	82	1108	258	1743	0	79	254	0	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	125	1320	1992	129	1326	411	1859	597	506	379	111	94
Arrive On Green	0.04	0.27	0.27	0.04	0.27	0.27	0.39	0.00	0.33	0.11	0.00	0.06
Sat Flow, veh/h	3319	4904	3045	3319	4904	1522	4824	1796	1522	3319	1796	1522
Grp Volume(v), veh/h	71	426	518	82	1108	258	1743	0	79	254	0	88
Grp Sat Flow(s),veh/h/ln	1659	1635	1522	1659	1635	1522	1608	1796	1522	1659	1796	1522
Q Serve(g_s), s	2.5	8.3	8.5	2.9	25.6	17.9	41.7	0.0	4.4	8.8	0.0	6.9
Cycle Q Clear(g_c), s	2.5	8.3	8.5	2.9	25.6	17.9	41.7	0.0	4.4	8.8	0.0	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	125	1320	1992	129	1326	411	1859	597	506	379	111	94
V/C Ratio(X)	0.57	0.32	0.26	0.63	0.84	0.63	0.94	0.00	0.16	0.67	0.00	0.94
Avail Cap(c_a), veh/h	163	1320	1992	191	1326	411	1865	597	506	1283	111	94
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.8	35.1	8.6	56.8	41.3	38.5	35.5	0.0	28.2	51.0	0.0	56.1
Incr Delay (d2), s/veh	13.8	0.6	0.3	17.2	6.4	7.1	10.4	0.0	0.1	7.2	0.0	71.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	3.3	2.7	1.5	10.6	7.4	17.6	0.0	1.6	4.0	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.6	35.8	9.0	74.0	47.6	45.5	45.9	0.0	28.2	58.2	0.0	127.8
LnGrp LOS	E	D	A	E	D	D	D	A	C	E	A	F
Approach Vol, veh/h		1015			1448			1822			342	
Approach Delay, s/veh		24.5			48.8			45.1			76.1	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	40.4	52.8	14.0	12.6	40.5	20.3	46.5
Change Period (Y+Rc), s	* 8.1	* 8.1	6.6	6.6	* 8.1	* 8.1	6.6	6.6
Max Green Setting (Gmax), s	* 6.9	* 30	46.4	7.4	* 5.9	* 31	46.4	7.4
Max Q Clear Time (g_c+I1), s	4.9	10.5	43.7	8.9	4.5	27.6	10.8	6.4
Green Ext Time (p_c), s	0.1	13.6	2.5	0.0	0.0	3.2	2.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	44.0
HCM 6th LOS	D

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	900	1566	118	498	259	483	0	125	307	0	31
Future Volume (veh/h)	62	900	1566	118	498	259	483	0	125	307	0	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	65	947	1648	124	524	273	508	0	132	323	0	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	122	2431	2007	179	2516	781	789	119	101	460	75	63
Arrive On Green	0.04	0.50	0.50	0.05	0.51	0.51	0.16	0.00	0.07	0.14	0.00	0.04
Sat Flow, veh/h	3319	4904	3045	3319	4904	1522	4824	1796	1522	3319	1796	1522
Grp Volume(v), veh/h	65	947	1648	124	524	273	508	0	132	323	0	33
Grp Sat Flow(s),veh/h/ln	1659	1635	1522	1659	1635	1522	1608	1796	1522	1659	1796	1522
Q Serve(g_s), s	2.3	14.5	48.3	4.4	7.0	12.8	11.8	0.0	8.0	11.1	0.0	2.5
Cycle Q Clear(g_c), s	2.3	14.5	48.3	4.4	7.0	12.8	11.8	0.0	8.0	11.1	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	122	2431	2007	179	2516	781	789	119	101	460	75	63
V/C Ratio(X)	0.53	0.39	0.82	0.69	0.21	0.35	0.64	0.00	1.31	0.70	0.00	0.52
Avail Cap(c_a), veh/h	163	2431	2007	246	2516	781	1584	119	101	1090	111	94
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.8	18.9	15.2	55.8	15.9	17.3	46.9	0.0	56.0	49.3	0.0	56.3
Incr Delay (d2), s/veh	12.4	0.5	3.9	15.9	0.2	1.2	3.2	0.0	191.9	6.9	0.0	2.4
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	1.1	5.2	15.9	2.2	2.5	4.6	4.9	0.0	8.4	5.0	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.1	19.4	19.1	71.6	16.1	18.6	50.1	0.0	247.9	56.2	0.0	58.8
LnGrp LOS	E	B	B	E	B	B	D	A	F	E	A	E
Approach Vol, veh/h		2660			921			640			356	
Approach Delay, s/veh		20.4			24.3			90.9			56.4	
Approach LOS		C			C			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	67.6	26.2	11.6	12.5	69.7	23.2	14.6
Change Period (Y+Rc), s	* 8.1	* 8.1	6.6	6.6	* 8.1	* 8.1	6.6	6.6
Max Green Setting (Gmax), s	* 8.9	* 35	39.4	7.4	* 5.9	* 38	39.4	7.4
Max Q Clear Time (g_c+I1), s	6.4	50.3	13.8	4.5	4.3	14.8	13.1	10.0
Green Ext Time (p_c), s	0.2	0.0	5.8	0.0	0.0	13.9	3.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	547	664	101	1368	318	2031	0	92	282	0	98
Future Volume (veh/h)	91	547	664	101	1368	318	2031	0	92	282	0	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	96	576	699	106	1440	335	2138	0	97	297	0	103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	131	1405	2159	151	1435	446	2039	626	530	411	89	75
Arrive On Green	0.04	0.29	0.29	0.05	0.29	0.29	0.42	0.00	0.35	0.12	0.00	0.05
Sat Flow, veh/h	3319	4904	3045	3319	4904	1522	4824	1796	1522	3319	1796	1522
Grp Volume(v), veh/h	96	576	699	106	1440	335	2138	0	97	297	0	103
Grp Sat Flow(s),veh/h/ln	1659	1635	1522	1659	1635	1522	1608	1796	1522	1659	1796	1522
Q Serve(g_s), s	4.3	14.2	13.0	4.7	43.9	29.9	63.4	0.0	6.7	12.9	0.0	7.4
Cycle Q Clear(g_c), s	4.3	14.2	13.0	4.7	43.9	29.9	63.4	0.0	6.7	12.9	0.0	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	131	1405	2159	151	1435	446	2039	626	530	411	89	75
V/C Ratio(X)	0.74	0.41	0.32	0.70	1.00	0.75	1.05	0.00	0.18	0.72	0.00	1.37
Avail Cap(c_a), veh/h	131	1405	2159	219	1435	446	2039	626	530	1403	89	75
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	71.3	43.3	8.2	70.6	53.0	48.1	43.3	0.0	34.0	63.2	0.0	71.3
Incr Delay (d2), s/veh	27.6	0.9	0.4	19.3	24.6	11.1	34.1	0.0	0.1	8.4	0.0	231.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	5.8	4.2	2.4	20.6	12.7	31.1	0.0	2.5	5.9	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.9	44.2	8.6	89.9	77.6	59.2	77.4	0.0	34.1	71.7	0.0	302.5
LnGrp LOS	F	D	A	F	F	E	F	A	C	E	A	F
Approach Vol, veh/h		1371			1881			2235			400	
Approach Delay, s/veh		29.9			75.0			75.5			131.1	
Approach LOS		C			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	51.1	70.0	14.0	14.0	52.0	25.2	58.8
Change Period (Y+Rc), s	* 8.1	* 8.1	6.6	6.6	* 8.1	* 8.1	6.6	6.6
Max Green Setting (Gmax), s	* 9.9	* 40	63.4	7.4	* 5.9	* 44	63.4	7.4
Max Q Clear Time (g_c+I1), s	6.7	16.2	65.4	9.4	6.3	45.9	14.9	8.7
Green Ext Time (p_c), s	0.2	19.4	0.0	0.0	0.0	0.0	3.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	68.5
HCM 6th LOS	E

Notes

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

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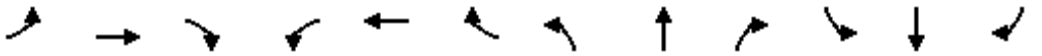

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1215	2115	153	648	337	593	0	154	359	0	36
Future Volume (veh/h)	84	1215	2115	153	648	337	593	0	154	359	0	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	88	1279	2226	161	682	355	624	0	162	378	0	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	137	2263	1997	191	2343	727	937	139	118	527	75	63
Arrive On Green	0.04	0.46	0.46	0.06	0.48	0.48	0.19	0.00	0.08	0.16	0.00	0.04
Sat Flow, veh/h	3319	4904	3045	3319	4904	1522	4824	1796	1522	3319	1796	1522
Grp Volume(v), veh/h	88	1279	2226	161	682	355	624	0	162	378	0	38
Grp Sat Flow(s),veh/h/ln	1659	1635	1522	1659	1635	1522	1608	1796	1522	1659	1796	1522
Q Serve(g_s), s	3.1	22.8	55.4	5.8	10.1	19.1	14.4	0.0	9.3	13.0	0.0	2.9
Cycle Q Clear(g_c), s	3.1	22.8	55.4	5.8	10.1	19.1	14.4	0.0	9.3	13.0	0.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	137	2263	1997	191	2343	727	937	139	118	527	75	63
V/C Ratio(X)	0.64	0.57	1.11	0.84	0.29	0.49	0.67	0.00	1.38	0.72	0.00	0.60
Avail Cap(c_a), veh/h	191	2263	1997	191	2343	727	1584	139	118	1090	111	94
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.7	23.5	20.7	56.0	19.0	21.3	44.7	0.0	55.4	47.9	0.0	56.5
Incr Delay (d2), s/veh	17.0	1.0	59.3	32.5	0.3	2.3	2.9	0.0	214.3	6.5	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	8.4	40.7	3.2	3.7	7.1	5.9	0.0	10.5	5.8	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.6	24.6	80.0	88.5	19.3	23.7	47.7	0.0	269.7	54.4	0.0	59.8
LnGrp LOS	E	C	F	F	B	C	D	A	F	D	A	E
Approach Vol, veh/h		3593			1198			786			416	
Approach Delay, s/veh		60.1			29.9			93.4			54.9	
Approach LOS		E			C			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	63.5	29.9	11.6	13.0	65.4	25.6	15.9
Change Period (Y+Rc), s	* 8.1	* 8.1	6.6	6.6	* 8.1	* 8.1	6.6	6.6
Max Green Setting (Gmax), s	* 6.9	* 37	39.4	7.4	* 6.9	* 37	39.4	7.4
Max Q Clear Time (g_c+I1), s	7.8	57.4	16.4	4.9	5.1	21.1	15.0	11.3
Green Ext Time (p_c), s	0.0	0.0	7.0	0.0	0.1	12.4	4.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	58.1
HCM 6th LOS	E

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	687	835	124	1684	391	2406	0	109	323	0	112
Future Volume (veh/h)	114	687	835	124	1684	391	2406	0	109	323	0	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	120	723	879	131	1773	412	2533	0	115	340	0	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	131	1501	2178	131	1501	466	1975	573	486	463	89	75
Arrive On Green	0.04	0.31	0.31	0.04	0.31	0.31	0.41	0.00	0.32	0.14	0.00	0.05
Sat Flow, veh/h	3319	4904	3045	3319	4904	1522	4824	1796	1522	3319	1796	1522
Grp Volume(v), veh/h	120	723	879	131	1773	412	2533	0	115	340	0	118
Grp Sat Flow(s),veh/h/ln	1659	1635	1522	1659	1635	1522	1608	1796	1522	1659	1796	1522
Q Serve(g_s), s	5.4	18.0	17.3	5.9	45.9	38.6	61.4	0.0	8.3	14.7	0.0	7.4
Cycle Q Clear(g_c), s	5.4	18.0	17.3	5.9	45.9	38.6	61.4	0.0	8.3	14.7	0.0	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	131	1501	2178	131	1501	466	1975	573	486	463	89	75
V/C Ratio(X)	0.92	0.48	0.40	1.00	1.18	0.88	1.28	0.00	0.24	0.73	0.00	1.57
Avail Cap(c_a), veh/h	131	1501	2178	131	1501	466	1975	573	486	1358	89	75
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	71.8	42.4	8.5	72.1	52.0	49.5	44.3	0.0	37.6	61.9	0.0	71.3
Incr Delay (d2), s/veh	58.2	1.1	0.6	79.7	88.9	21.1	131.2	0.0	0.1	7.9	0.0	311.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	7.3	5.6	3.9	30.5	17.3	47.9	0.0	3.2	6.7	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.0	43.5	9.1	151.8	140.9	70.6	175.5	0.0	37.7	69.8	0.0	382.8
LnGrp LOS	F	D	A	F	F	E	F	A	D	E	A	F
Approach Vol, veh/h		1722			2316			2648			458	
Approach Delay, s/veh		32.0			129.0			169.5			150.4	
Approach LOS		C			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	54.0	68.0	14.0	14.0	54.0	27.5	54.5
Change Period (Y+Rc), s	* 8.1	* 8.1	6.6	6.6	* 8.1	* 8.1	6.6	6.6
Max Green Setting (Gmax), s	* 5.9	* 46	61.4	7.4	* 5.9	* 46	61.4	7.4
Max Q Clear Time (g_c+I1), s	7.9	20.0	63.4	9.4	7.4	47.9	16.7	10.3
Green Ext Time (p_c), s	0.0	23.4	0.0	0.0	0.0	0.0	4.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	122.0
HCM 6th LOS	F

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	1528	2660	188	798	414	702	0	182	411	0	41
Future Volume (veh/h)	106	1528	2660	188	798	414	702	0	182	411	0	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	112	1608	2800	198	840	436	739	0	192	433	0	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	163	2226	2063	176	2245	697	1079	161	137	588	78	66
Arrive On Green	0.05	0.45	0.45	0.05	0.46	0.46	0.22	0.00	0.09	0.18	0.00	0.04
Sat Flow, veh/h	3319	4904	3045	3319	4904	1522	4824	1796	1522	3319	1796	1522
Grp Volume(v), veh/h	112	1608	2800	198	840	436	739	0	192	433	0	43
Grp Sat Flow(s),veh/h/ln	1659	1635	1522	1659	1635	1522	1608	1796	1522	1659	1796	1522
Q Serve(g_s), s	4.3	34.6	59.0	6.9	14.6	28.3	18.3	0.0	11.7	16.0	0.0	3.6
Cycle Q Clear(g_c), s	4.3	34.6	59.0	6.9	14.6	28.3	18.3	0.0	11.7	16.0	0.0	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	2226	2063	176	2245	697	1079	161	137	588	78	66
V/C Ratio(X)	0.69	0.72	1.36	1.12	0.37	0.63	0.68	0.00	1.41	0.74	0.00	0.65
Avail Cap(c_a), veh/h	227	2226	2063	176	2245	697	1722	161	137	1185	102	87
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	60.8	28.8	21.0	61.5	23.1	26.8	46.3	0.0	59.2	50.6	0.0	61.2
Incr Delay (d2), s/veh	17.1	2.1	164.1	105.0	0.5	4.2	2.8	0.0	220.7	6.4	0.0	4.0
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	2.2	13.1	74.3	5.4	5.4	10.9	7.5	0.0	12.8	7.1	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.0	30.9	185.0	166.6	23.5	31.0	49.0	0.0	279.8	57.0	0.0	65.3
LnGrp LOS	E	C	F	F	C	C	D	A	F	E	A	E
Approach Vol, veh/h		4520			1474			931			476	
Approach Delay, s/veh		127.5			44.9			96.6			57.7	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	67.1	35.7	12.2	14.5	67.6	29.6	18.3
Change Period (Y+Rc), s	* 8.1	* 8.1	6.6	6.6	* 8.1	* 8.1	6.6	6.6
Max Green Setting (Gmax), s	* 6.9	* 40	46.4	7.4	* 8.9	* 38	46.4	7.4
Max Q Clear Time (g_c+I1), s	8.9	61.0	20.3	5.6	6.3	30.3	18.0	13.7
Green Ext Time (p_c), s	0.0	0.0	8.8	0.0	0.2	6.9	5.0	0.0

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

Notes

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

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Synchro Queue and HCM Unsignalized Intersection Reports

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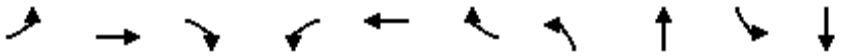

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	723	879	131	1773	412	2533	2220	340	1145
v/c Ratio	1.32	0.79	0.56	0.76	1.76	0.71	2.58	1.53	2.39	1.09
Control Delay	267.0	74.4	15.1	118.8	385.2	41.3	740.8	277.9	679.1	123.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	267.0	74.4	15.1	118.8	385.2	41.3	740.8	277.9	679.1	123.3
Queue Length 50th (ft)	~104	468	240	89	~1820	284	~2867	~2147	~732	~613
Queue Length 95th (ft)	#182	552	288	#144	#1945	430	#2955	#2255	#955	#712
Internal Link Dist (ft)		5200			1301			1399		5200
Turn Bay Length (ft)	450		525	300		450	925		150	
Base Capacity (vph)	91	921	1559	173	1005	578	980	1455	142	1055
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.79	0.56	0.76	1.76	0.71	2.58	1.53	2.39	1.09

Intersection Summary

Description: Based on existing timings with optimized splits

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

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

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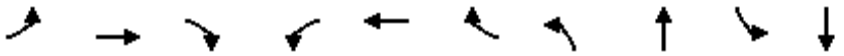

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	1608	2800	198	840	436	739	1073	433	1900
v/c Ratio	0.68	1.60	2.44	1.62	0.88	0.68	2.14	0.92	2.43	1.11
Control Delay	90.3	310.7	668.1	356.1	62.6	21.1	550.4	58.5	687.2	104.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.3	310.7	668.1	356.1	62.6	21.1	550.4	58.5	687.2	104.7
Queue Length 50th (ft)	56	~1181	~2578	~143	414	126	~591	521	~697	~779
Queue Length 95th (ft)	#98	#1320	#2698	#228	#508	259	#720	#653	#916	#874
Internal Link Dist (ft)		5200			1301			1399		5200
Turn Bay Length (ft)	450		525	300		450	925		150	
Base Capacity (vph)	165	1003	1149	122	958	637	346	1170	178	1705
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.60	2.44	1.62	0.88	0.68	2.14	0.92	2.43	1.11

Intersection Summary

Description: Based on existing timings with optimized splits

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

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

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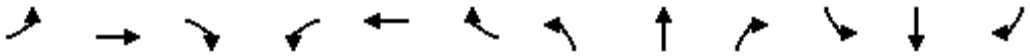

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	120	723	879	131	1773	412	5	5	115	340	1027	118
v/c Ratio	0.56	0.34	0.59	0.52	0.95	0.49	0.07	0.03	0.30	0.83	0.81	0.20
Control Delay	60.5	23.4	28.1	61.0	47.6	4.6	57.6	50.4	2.0	68.3	47.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	23.4	28.1	61.0	47.6	4.6	57.6	50.4	2.0	68.3	47.5	0.8
Queue Length 50th (ft)	86	129	215	51	490	0	4	4	0	134	270	0
Queue Length 95th (ft)	#205	184	307	84	#608	66	18	16	0	178	#367	0
Internal Link Dist (ft)		539			1301			677			608	
Turn Bay Length (ft)	450			450		400			535			515
Base Capacity (vph)	213	2112	1499	253	1874	836	70	200	407	526	1271	592
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.34	0.59	0.52	0.95	0.49	0.07	0.03	0.28	0.65	0.81	0.20

Intersection Summary

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

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	2406	2000	0	0	0	0
Future Volume (Veh/h)	2406	2000	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2533	2105	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				6118	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				6118	0
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	0				0	100
cM capacity (veh/h)	1586				0	1068

Direction, Lane #	NB 1	NB 2	NB 3
Volume Total	1689	1546	1403
Volume Left	1689	844	0
Volume Right	0	0	0
cSH	1586	1586	1700
Volume to Capacity	1.60	1.60	0.83
Queue Length 95th (ft)	3148	3148	0
Control Delay (s)	281.9	281.9	0.0
Lane LOS	F	F	
Approach Delay (s)	196.6		
Approach LOS			

Intersection Summary			
Average Delay	196.6		
Intersection Capacity Utilization	177.7%	ICU Level of Service	H
Analysis Period (min)	15		

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Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	4406	119	0	0	0	0
Future Volume (Veh/h)	4406	119	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4638	125	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				9401	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				9401	0
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	0				0	100
cM capacity (veh/h)	1591				0	1070

Direction, Lane #	NB 1	NB 2	NB 3
Volume Total	1855	1855	1053
Volume Left	1855	1855	928
Volume Right	0	0	0
cSH	1591	1591	1591
Volume to Capacity	2.92	2.92	2.92
Queue Length 95th (ft)	9635	9635	9635
Control Delay (s)	872.7	872.7	872.7
Lane LOS	F	F	F
Approach Delay (s)	872.7		
Approach LOS			

Intersection Summary			
Average Delay	872.7		
Intersection Capacity Utilization	121.4%	ICU Level of Service	H
Analysis Period (min)	15		

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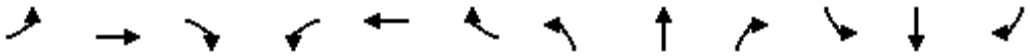

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1608	2800	198	840	436	5	5	192	433	1857	43
v/c Ratio	0.49	0.66	1.61	0.63	0.33	0.43	0.12	0.03	0.77	0.94	1.44	0.09
Control Delay	97.1	38.4	312.1	93.1	27.7	3.4	101.4	80.4	54.6	112.8	252.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.1	38.4	312.1	93.1	27.7	3.4	101.4	80.4	54.6	112.8	252.2	0.4
Queue Length 50th (ft)	74	569	~2307	129	221	0	7	6	103	293	~1217	0
Queue Length 95th (ft)	113	619	#2369	#260	284	63	25	22	197	#374	#1309	0
Internal Link Dist (ft)		539			1301			677			608	
Turn Bay Length (ft)	450			450		400			535			515
Base Capacity (vph)	229	2445	1735	312	2570	1004	49	238	303	505	1286	485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.66	1.61	0.63	0.33	0.43	0.10	0.02	0.63	0.86	1.44	0.09

Intersection Summary

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

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

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

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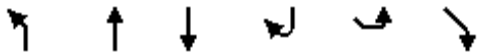

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	702	837	0	0	0	0
Future Volume (Veh/h)	702	837	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	739	881	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				1918	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				1918	0
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	53				100	100
cM capacity (veh/h)	1586				30	1068

Direction, Lane #	NB 1	NB 2	NB 3
Volume Total	493	540	587
Volume Left	493	246	0
Volume Right	0	0	0
cSH	1586	1586	1700
Volume to Capacity	0.47	0.47	0.35
Queue Length 95th (ft)	64	64	0
Control Delay (s)	9.2	7.0	0.0
Lane LOS	A	A	
Approach Delay (s)	5.2		
Approach LOS			

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	177.7%	ICU Level of Service	H
Analysis Period (min)	15		

DRAFT

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	1539	192	0	0	0	0
Future Volume (Veh/h)	1539	192	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1620	202	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				3442	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				3442	0
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	0				0	100
cM capacity (veh/h)	1591				0	1070

Direction, Lane #	NB 1	NB 2	NB 3
Volume Total	648	648	526
Volume Left	648	648	324
Volume Right	0	0	0
cSH	1591	1591	1591
Volume to Capacity	1.02	1.02	1.02
Queue Length 95th (ft)	663	663	663
Control Delay (s)	43.9	43.9	43.9
Lane LOS	E	E	E
Approach Delay (s)	43.9		
Approach LOS			

Intersection Summary			
Average Delay	43.9		
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

DRAFT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	120	723	131	1773	412	2105	115	340	1027	118
v/c Ratio	1.02	0.60	0.68	1.12	0.66	1.16	0.17	1.10	0.42	0.14
Control Delay	132.8	27.7	98.4	120.7	31.8	131.3	0.9	156.4	29.6	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	132.8	27.7	98.4	120.7	31.8	131.3	0.9	156.4	29.6	3.5
Queue Length 50th (ft)	~79	70	159	~930	230	~1136	0	~247	288	0
Queue Length 95th (ft)	#158	80	239	#1020	363	#1217	3	#360	326	34
Internal Link Dist (ft)		1553		1304		971			1708	
Turn Bay Length (ft)	580		660		400		385	810		520
Base Capacity (vph)	118	1202	221	1579	629	1809	669	308	2472	829
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.60	0.59	1.12	0.66	1.16	0.17	1.10	0.42	0.14

Intersection Summary

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

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

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Lane Group	EBT	EBR2	WBT	NBL
Lane Group Flow (vph)	843	879	1891	2533
v/c Ratio	0.45	0.33	1.00	1.01
Control Delay	43.9	0.3	15.0	65.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.9	0.3	15.0	65.2
Queue Length 50th (ft)	286	0	~117	~1175
Queue Length 95th (ft)	329	0	m37	#1240
Internal Link Dist (ft)	6210		1553	1048
Turn Bay Length (ft)		845		500
Base Capacity (vph)	1885	2656	1885	2501
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.33	1.00	1.01

Intersection Summary

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

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

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

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	2406	2109	0	0	0	0
Future Volume (Veh/h)	2406	2109	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2533	2220	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			4753		2533	1266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			4753		2533	1266
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.4
p0 queue free %			100		100	100
cM capacity (veh/h)			19		21	153

Direction, Lane #	NB 1	NB 2	NB 3
Volume Total	1689	1584	1480
Volume Left	0	0	0
Volume Right	0	740	1480
cSH	1700	1700	1700
Volume to Capacity	0.99	0.93	0.87
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0		
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

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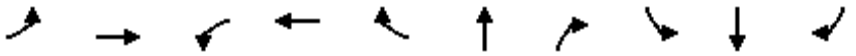

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1608	198	840	436	881	192	433	1857	43
v/c Ratio	0.44	0.92	0.84	0.49	0.55	0.88	0.40	0.91	0.94	0.06
Control Delay	60.9	44.0	96.2	38.7	7.3	69.0	6.5	86.4	53.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	44.0	96.2	38.7	7.3	69.0	6.5	86.4	53.7	0.2
Queue Length 50th (ft)	55	551	100	230	22	309	0	218	636	0
Queue Length 95th (ft)	89	621	#168	273	112	#370	49	#315	#720	0
Internal Link Dist (ft)		1553		1304		971			1708	
Turn Bay Length (ft)	580		660		400		385	810		520
Base Capacity (vph)	253	1742	237	1774	806	998	480	477	1968	704
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.92	0.84	0.47	0.54	0.88	0.40	0.91	0.94	0.06

Intersection Summary

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

DRAFT

Lane Group	EBT	EBR2	WBT	NBL
Lane Group Flow (vph)	1720	2800	883	739
v/c Ratio	0.51	1.05	0.26	0.80
Control Delay	11.6	37.6	0.8	64.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.6	37.6	0.8	64.6
Queue Length 50th (ft)	264	~165	4	248
Queue Length 95th (ft)	343	#284	5	282
Internal Link Dist (ft)	6210		1553	1048
Turn Bay Length (ft)		845		710
Base Capacity (vph)	3383	2656	3383	1392
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	1.05	0.26	0.53

Intersection Summary

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

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

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

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Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	702	1019	0	0	0	0
Future Volume (Veh/h)	702	1019	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	739	1073	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1812		739	370
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1812		739	370
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.4
p0 queue free %			100		100	100
cM capacity (veh/h)			315		342	613

Direction, Lane #	NB 1	NB 2	NB 3
Volume Total	493	604	715
Volume Left	0	0	0
Volume Right	0	358	715
cSH	1700	1700	1700
Volume to Capacity	0.29	0.36	0.42
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0		
Approach LOS			

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		45.4%	ICU Level of Service
Analysis Period (min)		15	

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Lane Group	WBT	SWR
Lane Group Flow (vph)	4305	118
v/c Ratio	0.69	0.34
Control Delay	0.8	28.8
Queue Delay	0.0	0.0
Total Delay	0.8	28.8
Queue Length 50th (ft)	0	48
Queue Length 95th (ft)	0	110
Internal Link Dist (ft)	65	
Turn Bay Length (ft)		
Base Capacity (vph)	6269	357
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	0.33

Intersection Summary

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Lane Group	EBT	NWT
Lane Group Flow (vph)	843	4305
v/c Ratio	0.88	0.96
Control Delay	70.0	20.2
Queue Delay	0.0	0.1
Total Delay	70.0	20.4
Queue Length 50th (ft)	295	833
Queue Length 95th (ft)	350	m837
Internal Link Dist (ft)	95	184
Turn Bay Length (ft)		
Base Capacity (vph)	975	4506
Starvation Cap Reductn	0	14
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.86	0.96

Intersection Summary

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

DRAFT

Lane Group	EBT	SBL
Lane Group Flow (vph)	843	340
v/c Ratio	0.17	0.31
Control Delay	0.2	13.8
Queue Delay	0.0	0.0
Total Delay	0.2	13.8
Queue Length 50th (ft)	0	146
Queue Length 95th (ft)	0	203
Internal Link Dist (ft)	95	27
Turn Bay Length (ft)		
Base Capacity (vph)	4975	1089
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.17	0.31

Intersection Summary

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Lane Group	WBT	NWL
Lane Group Flow (vph)	1903	2533
v/c Ratio	0.30	1.01
Control Delay	0.9	55.2
Queue Delay	0.0	0.0
Total Delay	0.9	55.2
Queue Length 50th (ft)	0	~874
Queue Length 95th (ft)	m0	#996
Internal Link Dist (ft)	158	91
Turn Bay Length (ft)		
Base Capacity (vph)	6269	2519
Starvation Cap Reductn	0	0
Spillback Cap Reductn	1115	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.37	1.01

Intersection Summary

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

DRAFT

Lane Group	WBT	SET
Lane Group Flow (vph)	1903	1063
v/c Ratio	0.98	0.35
Control Delay	67.5	28.8
Queue Delay	0.0	0.0
Total Delay	67.5	28.8
Queue Length 50th (ft)	538	346
Queue Length 95th (ft)	#625	384
Internal Link Dist (ft)	105	160
Turn Bay Length (ft)		
Base Capacity (vph)	1939	2998
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.98	0.35

Intersection Summary

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

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Lane Group	EBT	NER
Lane Group Flow (vph)	1063	115
v/c Ratio	0.21	0.24
Control Delay	0.1	40.2
Queue Delay	0.0	0.0
Total Delay	0.1	40.2
Queue Length 50th (ft)	0	84
Queue Length 95th (ft)	0	139
Internal Link Dist (ft)	138	
Turn Bay Length (ft)		
Base Capacity (vph)	4975	487
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.21	0.24

Intersection Summary

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Lane Group	EBR	SBT
Lane Group Flow (vph)	879	131
v/c Ratio	0.38	0.68
Control Delay	0.6	32.3
Queue Delay	0.0	0.0
Total Delay	0.6	32.3
Queue Length 50th (ft)	0	93
Queue Length 95th (ft)	3	m157
Internal Link Dist (ft)		91
Turn Bay Length (ft)		
Base Capacity (vph)	2277	442
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.30

Intersection Summary

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

DRAFT

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

DRAFT

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DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Lane Group	WBT	SWR
Lane Group Flow (vph)	1579	43
v/c Ratio	0.25	0.06
Control Delay	0.1	2.8
Queue Delay	0.0	0.0
Total Delay	0.1	2.8
Queue Length 50th (ft)	0	0
Queue Length 95th (ft)	0	14
Internal Link Dist (ft)	65	
Turn Bay Length (ft)		
Base Capacity (vph)	6269	738
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.25	0.06

Intersection Summary

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Lane Group	EBT	NWT
Lane Group Flow (vph)	1720	1579
v/c Ratio	0.77	0.55
Control Delay	35.8	19.9
Queue Delay	0.0	0.3
Total Delay	35.8	20.2
Queue Length 50th (ft)	470	223
Queue Length 95th (ft)	540	227
Internal Link Dist (ft)	95	184
Turn Bay Length (ft)		
Base Capacity (vph)	2226	3160
Starvation Cap Reductn	0	806
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.77	0.67

Intersection Summary

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Lane Group	EBT	SBL
Lane Group Flow (vph)	1720	433
v/c Ratio	0.35	0.78
Control Delay	0.1	52.6
Queue Delay	0.0	0.0
Total Delay	0.1	52.6
Queue Length 50th (ft)	0	349
Queue Length 95th (ft)	0	458
Internal Link Dist (ft)	95	27
Turn Bay Length (ft)		
Base Capacity (vph)	4975	635
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.35	0.68

Intersection Summary

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Lane Group	WBT	NWL
Lane Group Flow (vph)	1038	739
v/c Ratio	0.17	0.38
Control Delay	0.1	29.2
Queue Delay	0.0	0.0
Total Delay	0.1	29.2
Queue Length 50th (ft)	0	165
Queue Length 95th (ft)	0	155
Internal Link Dist (ft)	158	91
Turn Bay Length (ft)		
Base Capacity (vph)	6269	2594
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.17	0.28

Intersection Summary

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Lane Group	WBT	SET
Lane Group Flow (vph)	1038	2041
v/c Ratio	0.47	0.74
Control Delay	37.3	9.3
Queue Delay	0.0	0.0
Total Delay	37.3	9.3
Queue Length 50th (ft)	214	169
Queue Length 95th (ft)	276	164
Internal Link Dist (ft)	105	160
Turn Bay Length (ft)		
Base Capacity (vph)	2213	3396
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.60

Intersection Summary

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Lane Group	EBT	NER
Lane Group Flow (vph)	2041	192
v/c Ratio	0.41	0.35
Control Delay	0.2	38.1
Queue Delay	0.0	0.0
Total Delay	0.2	38.1
Queue Length 50th (ft)	0	130
Queue Length 95th (ft)	0	221
Internal Link Dist (ft)	138	
Turn Bay Length (ft)		
Base Capacity (vph)	4975	556
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.41	0.35

Intersection Summary

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

DRAFT

Intersection Sign configuration not allowed in HCM analysis.

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Lane Group	EBR	SBT
Lane Group Flow (vph)	2800	198
v/c Ratio	1.29	1.17
Control Delay	151.4	152.1
Queue Delay	0.0	0.0
Total Delay	151.4	152.1
Queue Length 50th (ft)	~1836	~212
Queue Length 95th (ft)	#1963	#344
Internal Link Dist (ft)		91
Turn Bay Length (ft)		
Base Capacity (vph)	2173	169
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.29	1.17

Intersection Summary

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

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

DRAFT

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DRAFT

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DRAFT

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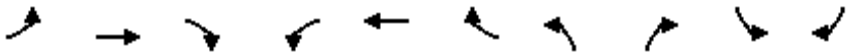
Intersection Sign configuration not allowed in HCM analysis.

DRAFT



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	120	723	879	131	1773	412	2533	115	340	118
v/c Ratio	0.37	0.45	0.34	0.38	1.08	0.52	1.30	0.15	0.25	0.15
Control Delay	66.4	40.5	0.6	65.6	92.1	5.7	176.1	0.4	29.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	40.5	0.6	65.6	92.1	5.7	176.1	0.4	29.8	0.4
Queue Length 50th (ft)	57	203	0	62	~707	0	~1121	0	112	0
Queue Length 95th (ft)	90	249	12	96	#823	80	#1202	0	150	0
Internal Link Dist (ft)		10468			1325					
Turn Bay Length (ft)	515		1000	480		930	970	515	600	375
Base Capacity (vph)	322	1611	2581	347	1648	785	1947	783	1339	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.45	0.34	0.38	1.08	0.52	1.30	0.15	0.25	0.15

Intersection Summary

Description: Clearance intervals based on approach speed and FDOT TEM

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

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

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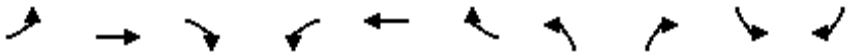

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	112	1608	2800	198	840	436	739	192	433	43
v/c Ratio	0.35	1.03	1.11	0.41	0.47	0.52	0.44	0.26	0.37	0.06
Control Delay	57.4	74.6	67.3	53.5	32.6	5.1	32.8	0.9	32.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	74.6	67.3	53.5	32.6	5.1	32.8	0.9	32.1	0.1
Queue Length 50th (ft)	46	~509	~1212	79	196	0	167	0	138	0
Queue Length 95th (ft)	75	#633	#1332	118	246	74	205	0	184	0
Internal Link Dist (ft)		10468			1325					
Turn Bay Length (ft)	515		1000	480		930	970	515	600	375
Base Capacity (vph)	319	1558	2530	478	1793	833	1697	730	1168	741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	1.03	1.11	0.41	0.47	0.52	0.44	0.26	0.37	0.06

Intersection Summary

Description: Clearance intervals based on approach speed and FDOT TEM

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

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

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SimTraffic Queueing and Blocking Reports

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	R	R	L	L	T	T	R	L
Maximum Queue (ft)	251	297	473	465	266	260	115	350	1297	1310	500	975
Average Queue (ft)	147	169	313	320	120	138	44	140	1283	1285	386	968
95th Queue (ft)	297	317	450	455	221	234	95	371	1293	1299	698	993
Link Distance (ft)			5216	5216					1278	1278		
Upstream Blk Time (%)									41	43		
Queuing Penalty (veh)									446	468		
Storage Bay Dist (ft)	450	450			525	525	300	300			450	925
Storage Blk Time (%)			1		0				66	65	0	38
Queuing Penalty (veh)			1		0				82	252	0	461

Intersection: 1: US 41 & Causeway Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	TR
Maximum Queue (ft)	1411	1433	1360	200	5187	5150	4533
Average Queue (ft)	1376	1312	544	195	3225	3074	2105
95th Queue (ft)	1396	1615	1283	207	5276	5349	3830
Link Distance (ft)	1363	1363	1363		5214	5214	5214
Upstream Blk Time (%)	53	22	0		4	2	1
Queuing Penalty (veh)	793	325	2		0	0	0
Storage Bay Dist (ft)				150			
Storage Blk Time (%)	62			92	68		
Queuing Penalty (veh)	750			300	219		

Intersection: 2: US 41 & RR South

Movement	NB	NB	NB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	6100	6100	6099	140
Average Queue (ft)	6042	6046	6046	5
95th Queue (ft)	6366	6304	6311	143
Link Distance (ft)	6038	6038	6038	1363
Upstream Blk Time (%)	95	95	94	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 3: RR East & Causeway Blvd

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	5556	5555
Average Queue (ft)	4988	4987
95th Queue (ft)	6691	6681
Link Distance (ft)	5495	5495
Upstream Blk Time (%)	71	71
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 4100

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	R	R	L	L	T	T	R	L
Maximum Queue (ft)	57	133	5270	5277	575	550	325	350	830	845	393	975
Average Queue (ft)	13	47	4985	5073	574	546	275	301	541	526	110	972
95th Queue (ft)	43	110	6271	6055	582	584	377	413	1111	1096	283	984
Link Distance (ft)			5216	5216					1278	1278		
Upstream Blk Time (%)			19	52					3	0		
Queuing Penalty (veh)			0	0					20	2		
Storage Bay Dist (ft)	450	450			525	525	300	300			450	925
Storage Blk Time (%)			1	1	24	15	20	49	6	2		46
Queuing Penalty (veh)			2	14	185	114	81	197	12	9		161

Intersection: 1: US 41 & Causeway Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	TR
Maximum Queue (ft)	1384	1384	1372	200	5265	5268	5264
Average Queue (ft)	1369	1290	585	199	3939	3913	3792
95th Queue (ft)	1399	1546	1384	202	6084	6073	5961
Link Distance (ft)	1363	1363	1363		5214	5214	5214
Upstream Blk Time (%)	78	23	0		32	28	21
Queuing Penalty (veh)	446	136	1		0	0	0
Storage Bay Dist (ft)				150			
Storage Blk Time (%)	95			91	55		
Queuing Penalty (veh)	332			533	228		

Intersection: 2: US 41 & RR South

Movement	NB	NB	NB
Directions Served	T	T	T
Maximum Queue (ft)	1960	1958	1957
Average Queue (ft)	1561	1553	1531
95th Queue (ft)	2567	2580	2579
Link Distance (ft)	1904	1904	1904
Upstream Blk Time (%)	64	64	52
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 3: RR East & Causeway Blvd

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	82	65
Average Queue (ft)	13	10
95th Queue (ft)	102	92
Link Distance (ft)	1994	1994
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2473

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	R	R	R	L	L	T	T	T
Maximum Queue (ft)	208	153	178	196	207	223	224	93	350	519	548	534
Average Queue (ft)	94	88	106	114	121	148	128	40	72	333	349	316
95th Queue (ft)	171	141	161	174	194	210	210	81	194	481	507	480
Link Distance (ft)		499	499	499	499	499	499			1265	1265	1265
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450							450	450			
Storage Blk Time (%)										2		2
Queuing Penalty (veh)										2		9

Intersection: 1: US 41 & Causeway Blvd

Movement	WB	NB	NB	NB	SB	SB	SB	SB	SB	SB
Directions Served	R	L	T	R	L	L	T	T	T	R
Maximum Queue (ft)	409	29	28	51	230	227	319	313	284	104
Average Queue (ft)	83	3	3	5	138	131	218	216	180	18
95th Queue (ft)	274	17	18	31	206	204	293	295	260	68
Link Distance (ft)		646	646	646	581	581	581	581	581	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	400									515
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 3: Ramp from NB US 41 to WB Causeway Blvd & Causeway Blvd

Movement	WB	WB	B4	B4
Directions Served	T	T	T	
Maximum Queue (ft)	6	170	2302	2301
Average Queue (ft)	0	6	2268	2139
95th Queue (ft)	6	158	2389	2637
Link Distance (ft)	1568	1568	1905	1905
Upstream Blk Time (%)			95	58
Queuing Penalty (veh)			1149	700
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 8: US 41 NB Queue Jump & US 41

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 12: US 41/US 41 NB Queue Jump & Ramp from NB US 41 to WB Causeway Blvd

Movement	NB	NB	NB
Directions Served	L	LT	T
Maximum Queue (ft)	1430	1435	1422
Average Queue (ft)	1241	1256	1127
95th Queue (ft)	1839	1849	1795
Link Distance (ft)	1123	1123	1123
Upstream Blk Time (%)	49	55	26
Queuing Penalty (veh)	723	812	384
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: US 41

Movement	NB	NB	NB
Directions Served	L	L	LT
Maximum Queue (ft)	7748	7749	7747
Average Queue (ft)	5721	5939	5693
95th Queue (ft)	10045	9858	10082
Link Distance (ft)	7687	7687	7687
Upstream Blk Time (%)	46	49	50
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 3779

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	104	107	310	327	345	518	538	539	226	249	259	277
Average Queue (ft)	41	49	172	180	204	397	426	428	106	132	144	155
95th Queue (ft)	87	97	284	295	326	552	558	558	194	222	236	248
Link Distance (ft)			499	499	499	499	499	499			1265	1265
Upstream Blk Time (%)						2	3	3				
Queuing Penalty (veh)						12	20	20				
Storage Bay Dist (ft)	450	450							450	450		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: US 41 & Causeway Blvd

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB	SB	SB	
Directions Served	T	R	L	T	R	L	L	T	T	T	R	
Maximum Queue (ft)	250	189	31	33	158	386	408	690	693	690	565	
Average Queue (ft)	116	45	6	5	42	213	223	657	660	658	149	
95th Queue (ft)	221	137	24	21	122	349	362	676	683	679	559	
Link Distance (ft)	1265		646	646	646	581	581	581	581	581		
Upstream Blk Time (%)								78	80	79	0	
Queuing Penalty (veh)								347	355	350	0	
Storage Bay Dist (ft)		400									515	
Storage Blk Time (%)		0								79	0	
Queuing Penalty (veh)		0								32	0	

Intersection: 3: Ramp from NB US 41 to WB Causeway Blvd & Causeway Blvd

Movement	WB
Directions Served	T
Maximum Queue (ft)	2
Average Queue (ft)	0
95th Queue (ft)	2
Link Distance (ft)	1568
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

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Intersection: 8: US 41 NB Queue Jump & US 41

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 12: US 41/US 41 NB Queue Jump & Ramp from NB US 41 to WB Causeway Blvd

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 14: US 41

Movement	NB	NB
Directions Served	L	LT
Maximum Queue (ft)	10	5
Average Queue (ft)	0	0
95th Queue (ft)	11	5
Link Distance (ft)	7687	7687
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 1137

DRAFT

Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	L	T	T	T	R	T	T
Maximum Queue (ft)	143	154	162	187	183	710	1300	1309	1302	450	887	925
Average Queue (ft)	55	75	77	87	85	370	1073	1086	1095	406	642	679
95th Queue (ft)	123	143	136	156	158	842	1528	1523	1521	573	955	977
Link Distance (ft)			1522	1522	1522		1275	1275	1275		957	957
Upstream Blk Time (%)							15	17	18		5	5
Queuing Penalty (veh)							112	123	129		33	37
Storage Bay Dist (ft)	580	580				660				400		
Storage Blk Time (%)						0	48		58	2		
Queuing Penalty (veh)						0	59		227	13		

Intersection: 1: US 41 & Causeway Blvd

Movement	NB	NB	SB	SB	SB	SB	SB	SB
Directions Served	T	R	L	L	T	T	T	R
Maximum Queue (ft)	919	435	425	452	335	312	271	121
Average Queue (ft)	707	214	276	306	207	192	147	21
95th Queue (ft)	989	559	443	471	310	292	259	81
Link Distance (ft)	957				1724	1724	1724	
Upstream Blk Time (%)	5							
Queuing Penalty (veh)	38							
Storage Bay Dist (ft)		385	810	810				520
Storage Blk Time (%)	45	0						
Queuing Penalty (veh)	49	0						

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Intersection: 2: EB Ramp to US 41 SB & NB Ramp to Causeway Blvd WB & Causeway Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B20	B20	B19
Directions Served	T	T	T	T	T	T	L	L	L	T	T	T
Maximum Queue (ft)	300	322	299	297	335	208	550	979	1006	196	210	33
Average Queue (ft)	189	185	168	105	136	139	483	669	685	68	78	3
95th Queue (ft)	280	286	271	246	288	197	640	1082	1089	356	392	33
Link Distance (ft)	6243	6243	6243	1522	1522	1522		1012	1012	564	564	1673
Upstream Blk Time (%)					0			5	7	1	2	
Queuing Penalty (veh)					0			60	83	9	20	
Storage Bay Dist (ft)							500					
Storage Blk Time (%)							9	16	47			
Queuing Penalty (veh)							76	129	0			

Intersection: 2: EB Ramp to US 41 SB & NB Ramp to Causeway Blvd WB & Causeway Blvd

Movement	B19
Directions Served	T
Maximum Queue (ft)	39
Average Queue (ft)	4
95th Queue (ft)	42
Link Distance (ft)	1673
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: US 41 & EB Ramp to US 41 SB

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

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Intersection: 18: US 41 & NB Ramp to Causeway Blvd WB

Movement	NB	NB	NB
Directions Served	T	TR	R
Maximum Queue (ft)	6553	6637	6745
Average Queue (ft)	2476	3212	2637
95th Queue (ft)	6347	7111	6676
Link Distance (ft)	6883	6883	6883
Upstream Blk Time (%)	0	1	1
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 1196

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	L	L	T	T	T	R	T
Maximum Queue (ft)	91	107	305	307	322	180	193	275	276	244	275	326
Average Queue (ft)	25	50	147	162	164	94	113	175	167	134	101	218
95th Queue (ft)	66	95	261	274	288	169	183	246	244	214	214	303
Link Distance (ft)			1522	1522	1522			1275	1275	1275		957
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	580	580				660	660				400	
Storage Blk Time (%)											0	
Queuing Penalty (veh)											0	

Intersection: 1: US 41 & Causeway Blvd

Movement	NB	NB	NB	SB	SB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	T	R
Maximum Queue (ft)	348	338	170	313	396	628	620	596	238
Average Queue (ft)	229	223	45	185	222	417	407	375	13
95th Queue (ft)	321	318	126	277	377	600	591	567	150
Link Distance (ft)	957	957				1724	1724	1724	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			385	810	810				520
Storage Blk Time (%)		0				0		2	0
Queuing Penalty (veh)		0				1		1	0

Intersection: 2: EB Ramp to US 41 SB & NB Ramp to Causeway Blvd WB & Causeway Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	T	L	L	L
Maximum Queue (ft)	6296	6307	6306	99	223	92	260	286	298
Average Queue (ft)	6265	6280	6283	27	38	27	145	175	187
95th Queue (ft)	6292	6304	6303	75	171	73	229	264	275
Link Distance (ft)	6244	6244	6244	1522	1522	1522		1012	1012
Upstream Blk Time (%)	22	71	93						
Queuing Penalty (veh)	0	0	0						
Storage Bay Dist (ft)							710		
Storage Blk Time (%)									56
Queuing Penalty (veh)									0

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Intersection: 11: US 41 & EB Ramp to US 41 SB

Movement	B7
Directions Served	T
Maximum Queue (ft)	69
Average Queue (ft)	14
95th Queue (ft)	170
Link Distance (ft)	1439
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: US 41 & NB Ramp to Causeway Blvd WB

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 2

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Intersection: 1: Causeway Blvd/Causeway Blvd - Western Node & SBR ramp

Movement	WB	WB	WB	WB	SW
Directions Served	T	T	T	T	R
Maximum Queue (ft)	11	21	53	69	203
Average Queue (ft)	0	1	2	7	96
95th Queue (ft)	8	12	26	37	174
Link Distance (ft)	79	79	79	79	180
Upstream Blk Time (%)			0	0	1
Queuing Penalty (veh)			0	0	2
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Causeway Blvd - Western Node

Movement	EB	EB	EB	NW	NW	NW	NW
Directions Served	T	T	T	T	T	T	T
Maximum Queue (ft)	224	233	233	254	260	266	253
Average Queue (ft)	189	194	174	201	216	229	194
95th Queue (ft)	239	244	247	282	283	269	275
Link Distance (ft)	89	89	89	169	169	169	169
Upstream Blk Time (%)	50	50	41	13	16	19	11
Queuing Penalty (veh)	134	134	109	137	162	199	110
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Causeway Blvd - Western Node/Causeway Blvd & SBL ramp

Movement	SB
Directions Served	L
Maximum Queue (ft)	147
Average Queue (ft)	101
95th Queue (ft)	158
Link Distance (ft)	100
Upstream Blk Time (%)	17
Queuing Penalty (veh)	54
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

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Intersection: 4: NBL ramp & Causeway Blvd/Causeway Blvd - Eastern Node

Movement	WB	WB	WB	WB	NW	NW	NW
Directions Served	T	T	T	T	L	L	L
Maximum Queue (ft)	207	194	199	181	222	224	232
Average Queue (ft)	23	27	29	17	190	197	198
95th Queue (ft)	123	126	129	102	207	215	227
Link Distance (ft)	166	166	166	166	162	162	162
Upstream Blk Time (%)	2	2	2	1	32	38	26
Queuing Penalty (veh)	8	7	7	4	254	303	205
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Causeway Blvd - Eastern Node

Movement	WB	WB	WB	WB	SE	SE	SE
Directions Served	T	T	T	T	T	T	T
Maximum Queue (ft)	246	246	253	231	234	235	238
Average Queue (ft)	215	217	218	142	177	192	193
95th Queue (ft)	235	233	242	220	262	267	270
Link Distance (ft)	110	110	110	110	118	118	118
Upstream Blk Time (%)	55	56	51	19	16	18	19
Queuing Penalty (veh)	249	255	229	85	54	62	65
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: NBR ramp & Causeway Blvd - Eastern Node/Causeway Blvd

Movement	NE
Directions Served	R
Maximum Queue (ft)	131
Average Queue (ft)	48
95th Queue (ft)	103
Link Distance (ft)	219
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

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Intersection: 7: WBL ramp & Causeway Blvd - Western Node/Causeway Blvd

Movement	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T
Maximum Queue (ft)	40	277	290	293	280
Average Queue (ft)	2	105	141	175	118
95th Queue (ft)	18	261	295	317	269
Link Distance (ft)	200	200	200	200	200
Upstream Blk Time (%)		3	5	7	3
Queuing Penalty (veh)		28	39	63	29
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: SBR ramp & SBL ramp/Ramp from US 41 SB

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	238	16
Average Queue (ft)	42	1
95th Queue (ft)	144	11
Link Distance (ft)	1193	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 10: Ramp to US 41 SB/WBL ramp & EBR ramp

Movement	EB	EB	SB
Directions Served	R	R	T
Maximum Queue (ft)	83	106	177
Average Queue (ft)	36	51	85
95th Queue (ft)	74	91	160
Link Distance (ft)	286	286	135
Upstream Blk Time (%)			2
Queuing Penalty (veh)			3
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 12: Causeway Blvd - Eastern Node/Causeway Blvd & WBR ramp

Movement	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	525	541	509	312	185
Average Queue (ft)	242	248	217	122	8
95th Queue (ft)	437	447	421	294	87
Link Distance (ft)	774	774	774		
Upstream Blk Time (%)	0	0	0		
Queuing Penalty (veh)	0	1	0		
Storage Bay Dist (ft)				300	300
Storage Blk Time (%)			2	0	0
Queuing Penalty (veh)			17	1	0

Intersection: 15: EBL ramp/Ramp to US 41 NB & WBR ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 16: Causeway Blvd/Causeway Blvd - Eastern Node & EBL ramp

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (ft)	143	169	149
Average Queue (ft)	31	49	51
95th Queue (ft)	100	127	125
Link Distance (ft)	305	305	305
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 17: EBR ramp & Causeway Blvd/Causeway Blvd - Western Node

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (ft)	136	134	117
Average Queue (ft)	37	40	23
95th Queue (ft)	102	106	82
Link Distance (ft)	975	975	975
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Ramp from US 41 NB/NBL ramp & NBR ramp

Movement	NB	NB	NB
Directions Served	T	T	T
Maximum Queue (ft)	289	301	268
Average Queue (ft)	154	187	124
95th Queue (ft)	250	274	240
Link Distance (ft)	423	423	423
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 22: US 41 & Ramp to US 41 SB

Movement	NB	NB	NB
Directions Served	T	T	TR
Maximum Queue (ft)	2749	2753	2754
Average Queue (ft)	2714	2725	2729
95th Queue (ft)	2743	2754	2753
Link Distance (ft)	2692	2692	2692
Upstream Blk Time (%)	20	64	85
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 26: Ramp from US 41 SB & US 41

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 3009

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Intersection: 1: Causeway Blvd/Causeway Blvd - Western Node & SBR ramp

Movement	WB	WB	SW
Directions Served	T	T	R
Maximum Queue (ft)	10	11	90
Average Queue (ft)	0	0	29
95th Queue (ft)	7	7	73
Link Distance (ft)	79	79	180
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Causeway Blvd - Western Node

Movement	EB	EB	EB	NW	NW	NW	NW
Directions Served	T	T	T	T	T	T	T
Maximum Queue (ft)	232	236	250	232	236	256	231
Average Queue (ft)	199	206	210	137	159	194	149
95th Queue (ft)	233	233	244	223	238	273	230
Link Distance (ft)	89	89	89	169	169	169	169
Upstream Blk Time (%)	39	41	40	6	9	17	5
Queuing Penalty (veh)	210	222	218	21	32	65	18
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Causeway Blvd - Western Node/Causeway Blvd & SBL ramp

Movement	EB	EB	SB
Directions Served	T	T	L
Maximum Queue (ft)	11	2	152
Average Queue (ft)	1	0	127
95th Queue (ft)	10	2	142
Link Distance (ft)	110	110	100
Upstream Blk Time (%)			45
Queuing Penalty (veh)			184
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 4: NBL ramp & Causeway Blvd/Causeway Blvd - Eastern Node

Movement	WB	WB	WB	NW	NW	NW
Directions Served	T	T	T	L	L	L
Maximum Queue (ft)	146	125	79	194	210	193
Average Queue (ft)	48	23	6	134	150	112
95th Queue (ft)	174	119	53	193	212	184
Link Distance (ft)	166	166	166	162	162	162
Upstream Blk Time (%)	4	0	0	5	8	2
Queuing Penalty (veh)	10	1	0	11	20	5
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Causeway Blvd - Eastern Node

Movement	WB	WB	WB	WB	SE	SE	SE
Directions Served	T	T	T	T	T	T	T
Maximum Queue (ft)	246	241	219	112	221	219	195
Average Queue (ft)	203	199	141	72	140	156	71
95th Queue (ft)	240	245	210	141	220	229	162
Link Distance (ft)	110	110	110	110	118	118	118
Upstream Blk Time (%)	45	39	19	1	10	12	1
Queuing Penalty (veh)	111	96	46	3	67	81	8
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: NBR ramp & Causeway Blvd - Eastern Node/Causeway Blvd

Movement	EB	NE
Directions Served	T	R
Maximum Queue (ft)	10	252
Average Queue (ft)	0	124
95th Queue (ft)	7	222
Link Distance (ft)	136	219
Upstream Blk Time (%)		2
Queuing Penalty (veh)		4
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 7: WBL ramp & Causeway Blvd - Western Node/Causeway Blvd

Movement	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T
Maximum Queue (ft)	209	121	144	191	143
Average Queue (ft)	113	9	14	29	11
95th Queue (ft)	249	59	77	119	73
Link Distance (ft)	200	200	200	200	200
Upstream Blk Time (%)	16		0	0	0
Queuing Penalty (veh)	53		0	1	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: SBR ramp & SBL ramp/Ramp from US 41 SB

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	369	79
Average Queue (ft)	158	3
95th Queue (ft)	303	58
Link Distance (ft)	1193	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)	1	
Queuing Penalty (veh)	0	

Intersection: 10: Ramp to US 41 SB/WBL ramp & EBR ramp

Movement	EB	EB	SB
Directions Served	R	R	T
Maximum Queue (ft)	310	334	207
Average Queue (ft)	149	166	163
95th Queue (ft)	275	296	228
Link Distance (ft)	286	286	135
Upstream Blk Time (%)	0	1	60
Queuing Penalty (veh)	6	8	114
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 12: Causeway Blvd - Eastern Node/Causeway Blvd & WBR ramp

Movement	WB	WB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (ft)	174	175	131	22
Average Queue (ft)	50	45	15	1
95th Queue (ft)	135	128	74	16
Link Distance (ft)	774	774	774	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Bend

Movement	WB
Directions Served	T
Maximum Queue (ft)	115
Average Queue (ft)	7
95th Queue (ft)	153
Link Distance (ft)	1274
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 15: EBL ramp/Ramp to US 41 NB & WBR ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

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Intersection: 16: Causeway Blvd/Causeway Blvd - Eastern Node & EBL ramp

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (ft)	98	116	74
Average Queue (ft)	8	12	3
95th Queue (ft)	51	61	35
Link Distance (ft)	305	305	305
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: EBR ramp & Causeway Blvd/Causeway Blvd - Western Node

Movement	EB	EB	EB	EB	EB	B32	B32	B32
Directions Served	T	T	T	R	R	T	T	T
Maximum Queue (ft)	226	282	251	59	50	3802	4436	3908
Average Queue (ft)	82	108	101	3	2	1298	1742	1154
95th Queue (ft)	178	220	213	41	40	3524	4164	3401
Link Distance (ft)	975	975	975	975	975	5888	5888	5888
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 18: Ramp from US 41 NB/NBL ramp & NBR ramp

Movement	NB	NB	NB	NB
Directions Served	T	T	T	R
Maximum Queue (ft)	72	95	56	10
Average Queue (ft)	6	11	2	0
95th Queue (ft)	35	53	25	7
Link Distance (ft)	423	423	423	423
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 22: US 41 & Ramp to US 41 SB

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: RR East & Causeway Blvd

Movement	EB
Directions Served	T
Maximum Queue (ft)	5
Average Queue (ft)	0
95th Queue (ft)	0
Link Distance (ft)	756
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 25: Causeway Blvd & RR East

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

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Intersection: 26: Ramp from US 41 SB & US 41

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1615

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	104	114	223	224	241	84	133	114	504	788	802	791
Average Queue (ft)	43	55	128	141	148	10	26	49	191	548	564	545
95th Queue (ft)	86	98	194	207	225	48	89	98	517	886	900	892
Link Distance (ft)			10459	10459	10459					1272	1272	1272
Upstream Blk Time (%)										0	0	0
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)	515	515				1000	1000	480	480			
Storage Blk Time (%)									0	20		2
Queuing Penalty (veh)									0	24		6

Intersection: 1: US 41 & Causeway Blvd

Movement	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	R	L	L	T	R
Maximum Queue (ft)	224	947	995	3412	3411	377	230	625	3186	400
Average Queue (ft)	49	871	993	3386	3380	27	47	221	1935	372
95th Queue (ft)	392	944	997	3411	3467	221	161	669	4057	494
Link Distance (ft)				3349	3349				3349	
Upstream Blk Time (%)				94	72				33	
Queuing Penalty (veh)				0	0				0	
Storage Bay Dist (ft)	930	970	970			515	600	600		375
Storage Blk Time (%)	0	0	18	23	0	0		0	2	87
Queuing Penalty (veh)	0	0	146	366	0	0		0	9	280

Intersection: 5: RR East & Causeway Blvd

Movement	WB	WB	WB
Directions Served	T	T	T
Maximum Queue (ft)	9	3	7
Average Queue (ft)	0	0	0
95th Queue (ft)	0	0	0
Link Distance (ft)	2245	2245	2245
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 833

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Intersection: 1: US 41 & Causeway Blvd

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	75	101	10522	10522	10522	225	270	151	156	223	244	210
Average Queue (ft)	22	37	9871	9981	10006	97	151	74	85	130	136	105
95th Queue (ft)	56	76	12219	11877	11755	187	245	130	137	197	213	182
Link Distance (ft)			10459	10459	10459					1272	1272	1272
Upstream Blk Time (%)			69	76	76							
Queuing Penalty (veh)			0	0	0							
Storage Bay Dist (ft)	515	515				1000	1000	480	480			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: US 41 & Causeway Blvd

Movement	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	T	R	L	L	R
Maximum Queue (ft)	244	282	288	8	7	230	244	19
Average Queue (ft)	129	191	203	0	0	131	144	1
95th Queue (ft)	241	270	271	6	5	209	218	20
Link Distance (ft)			3349	3349				
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	970	970			515	600	600	375
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: RR East & Causeway Blvd

Movement	EB
Directions Served	T
Maximum Queue (ft)	102
Average Queue (ft)	0
95th Queue (ft)	0
Link Distance (ft)	1272
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

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Appendix B: Conceptual Plans for Build Alternative 1F – At-Grade Intersection Option

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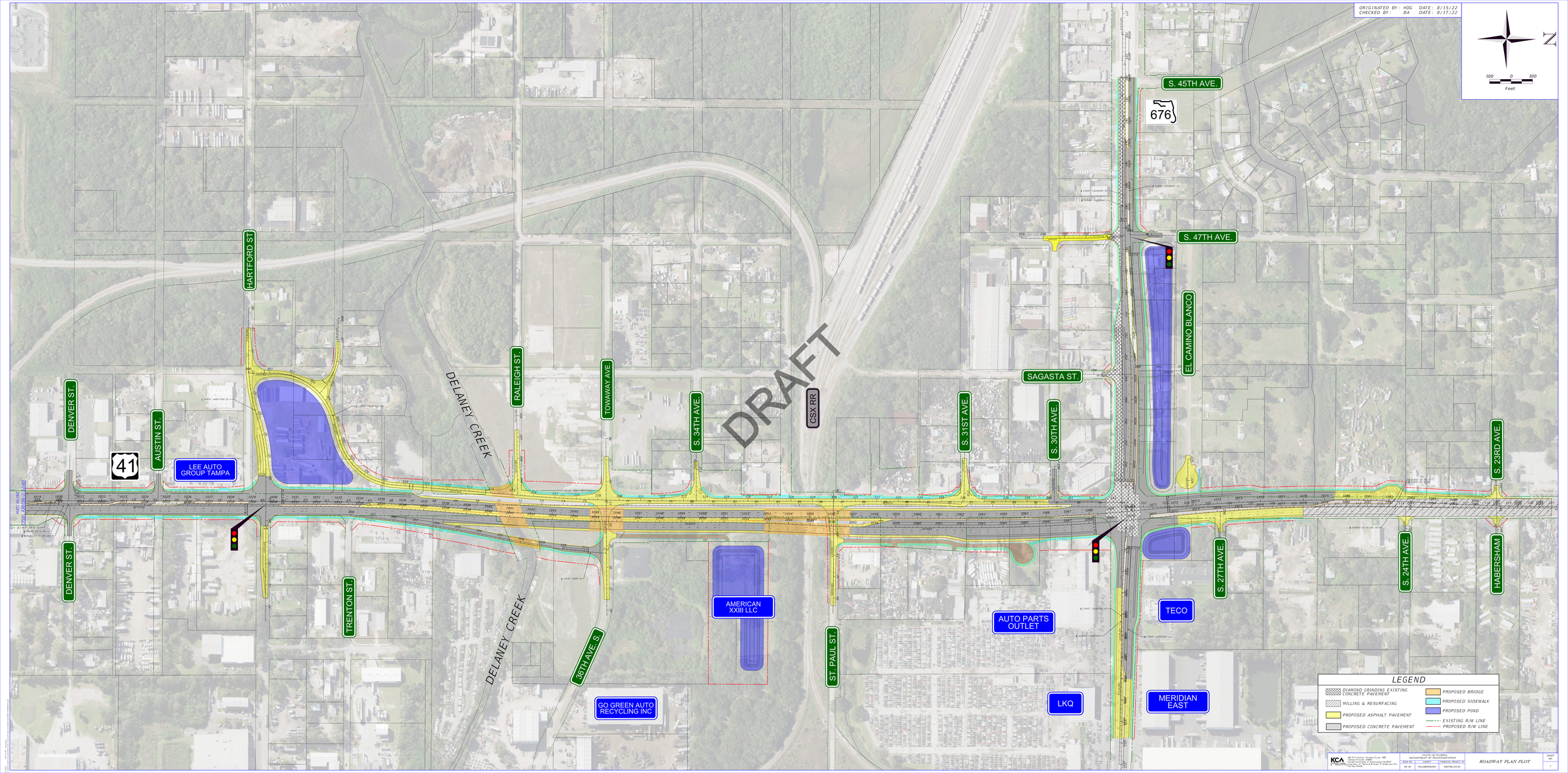
ORIGINATED BY: HDG DATE: 8/15/22
CHECKED BY: BA DATE: 8/17/22
N
100 0 100
Feet
S. 45TH AVE.
676
S. 47TH AVE.
EL CAMINO BLANCO
SAGASTA ST.
HARTFORD ST.
DENVER ST.
AUSTIN ST.
41
LEE AUTO GROUP TAMPA
DELANEY CREEK
RALEIGH ST.
TOWAWAY AVE.
S. 34TH AVE.
DRAFT
CSX RR
S. 31ST AVE.
S. 30TH AVE.
S. 23RD AVE.
DENVER ST.
TRENTON ST.
DELANEY CREEK
36TH AVE. S.
AMERICAN XXIII LLC
ST. PAUL ST.
AUTO PARTS OUTLET
TECO
S. 27TH AVE.
S. 24TH AVE.
HABERSHAM
GO GREEN AUTO RECYCLING INC
LKQ
MERIDIAN EAST
LEGEND
DIAMOND GRINDING EXISTING CONCRETE PAVEMENT
MILLING & RESURFACING
PROPOSED ASPHALT PAVEMENT
PROPOSED CONCRETE PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
PROPOSED POND
EXISTING R/W LINE
PROPOSED R/W LINE
KCA
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
ROADWAY PLAN PLOT
SHEET NO.
1

Appendix C: Volume Development Memo

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MEMORANDUM

14055 Riveredge Drive
Suite 130
Tampa, FL 33637
Phone 813.386.1315
Fax 877.407.0803
www.rkk.com

Date: April 11, 2022

To: Florida DOT District 7 (Craig Fox)

From: RK&K Stuart Samberg

CC: File

Re: FPID 440749-1-22-01: US 41/SR 45/South 50th Street at CSX Grade Separation – **Revised Alternative Traffic Volumes**

As part of the evaluation of a revised Alternative for the US 41 at Causeway Blvd (Business US 41 / SR 676), new signalized intersections are proposed along US 41 at Hartford Street, and along Causeway Blvd at 47th Street. To maintain a consistent set of volumes with the previously developed PTAR, RK&K held the intersection volumes at the intersection of US 41 and Causeway Blvd from the PTAR and performed Trip Generation (based on the *ITE Trip Generation 9th Edition Excel workbook*), and distribution based on existing counts for the adjacent land uses to estimate the traffic volumes for the new intersections. All intersections were then balanced using methodologies consistent with NCHRP 765. The future year, 2046, AM (PM) volume network for these three intersections are provided in on the following page. Also provided on the subsequent pages, is information pertaining to the trip generation and distribution for Hartford Street, 47th Street and the intermediate street connections. This information, along with the process used to develop the volumes and assumptions are shown in this information package.

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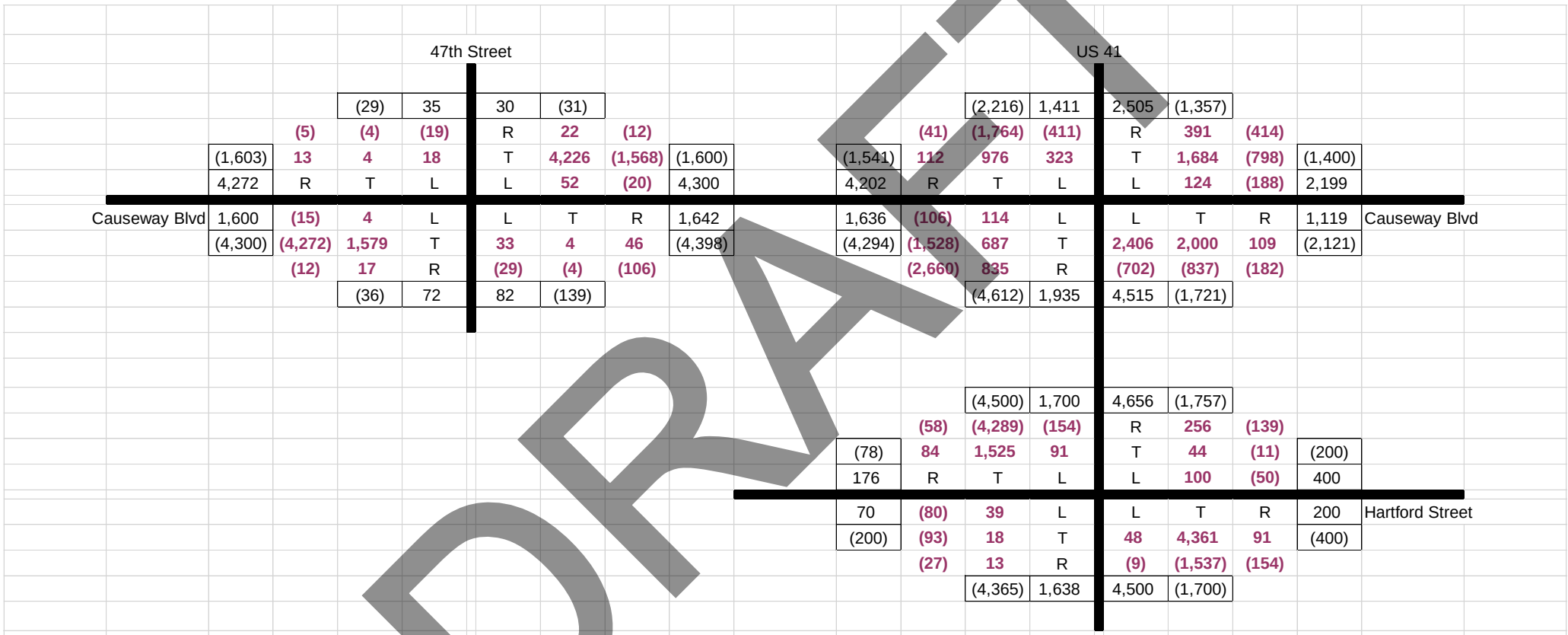
Developed Volumes



Trip Generation

Area 1		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Truck Repair Building	8,000 SF	942	12	6	12	13	190
Auto Repair Building	4,000 SF	942	6	3	6	6	95
TOTAL			18	9	18	19	285

Area 2		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Auto Service Repair	8,000 SF	942	12	6	12	13	190
Auto Service Repair	1,000 SF	942	1	1	1	2	24
Auto Service Repair	7,000 SF	942	10	5	10	11	166
Auto Service Repair	1,000 SF	942	1	1	1	2	24
TOTAL			24	13	24	28	404

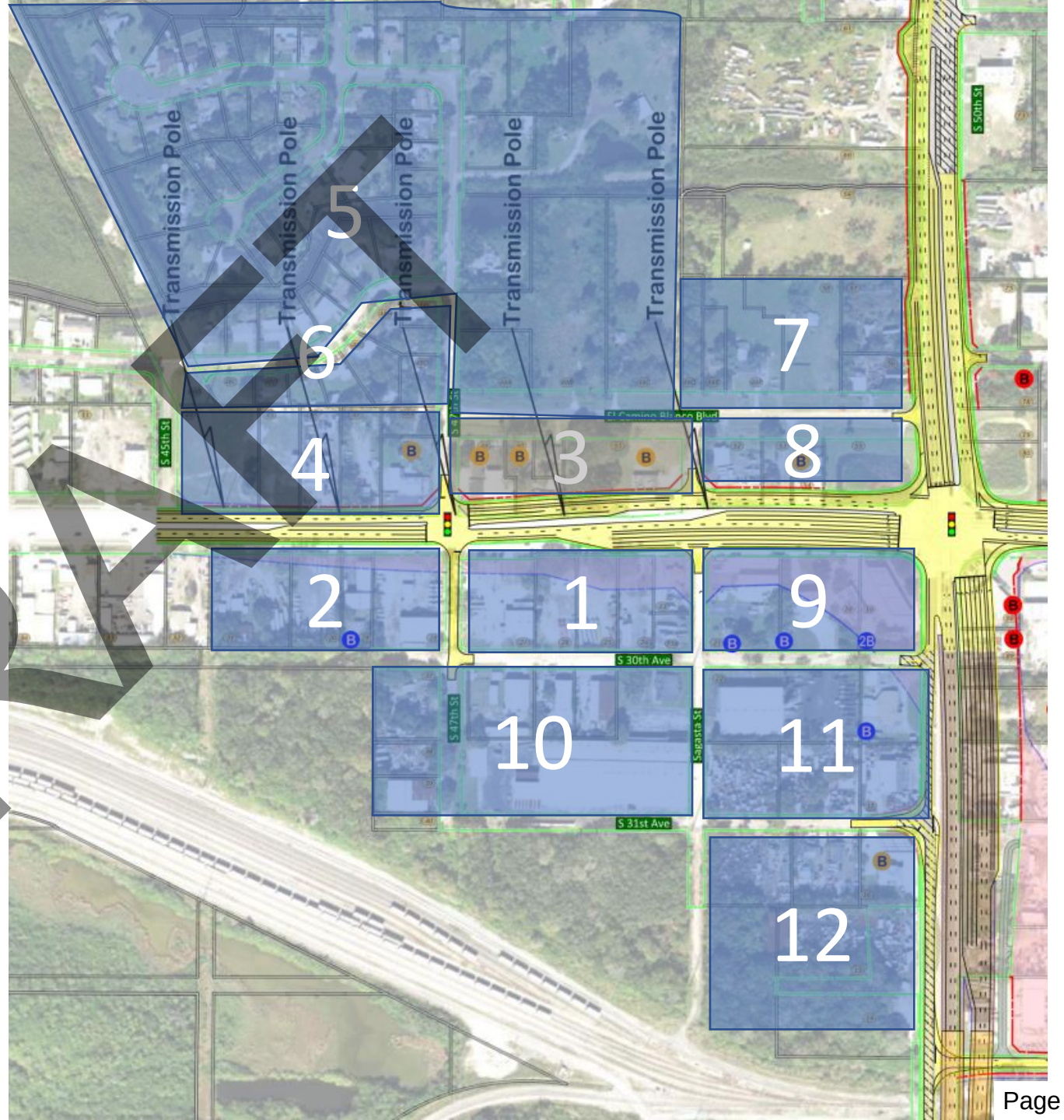
Area 3 businesses will be relocated. Trips from area 3 are not included in this analysis.

Area 4		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Auto Service/Upholstery	4,000 SF	140	2	1	1	2	15
Junk Yard/Storage	.67 acres	150	5	2	2	4	38
Truck Service	3,000 SF	942	4	2	4	5	71
TOTAL			11	5	7	11	124

Area 5		ITE Cat.	AM in	AM out	PM in	PM out	Daily
SF Residential	40 DU	210	8	23	25	15	381

Area 6		ITE Cat.	AM in	AM out	PM in	PM out	Daily
SF Residential	18 DU	210	3	10	11	7	171

Area 7		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Warehouse/Open storage	.44 acres	150	3	1	1	2	25
SF Residential	4 DU	210	1	2	3	1	38
TOTAL			4	3	4	3	63



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Trip Generation

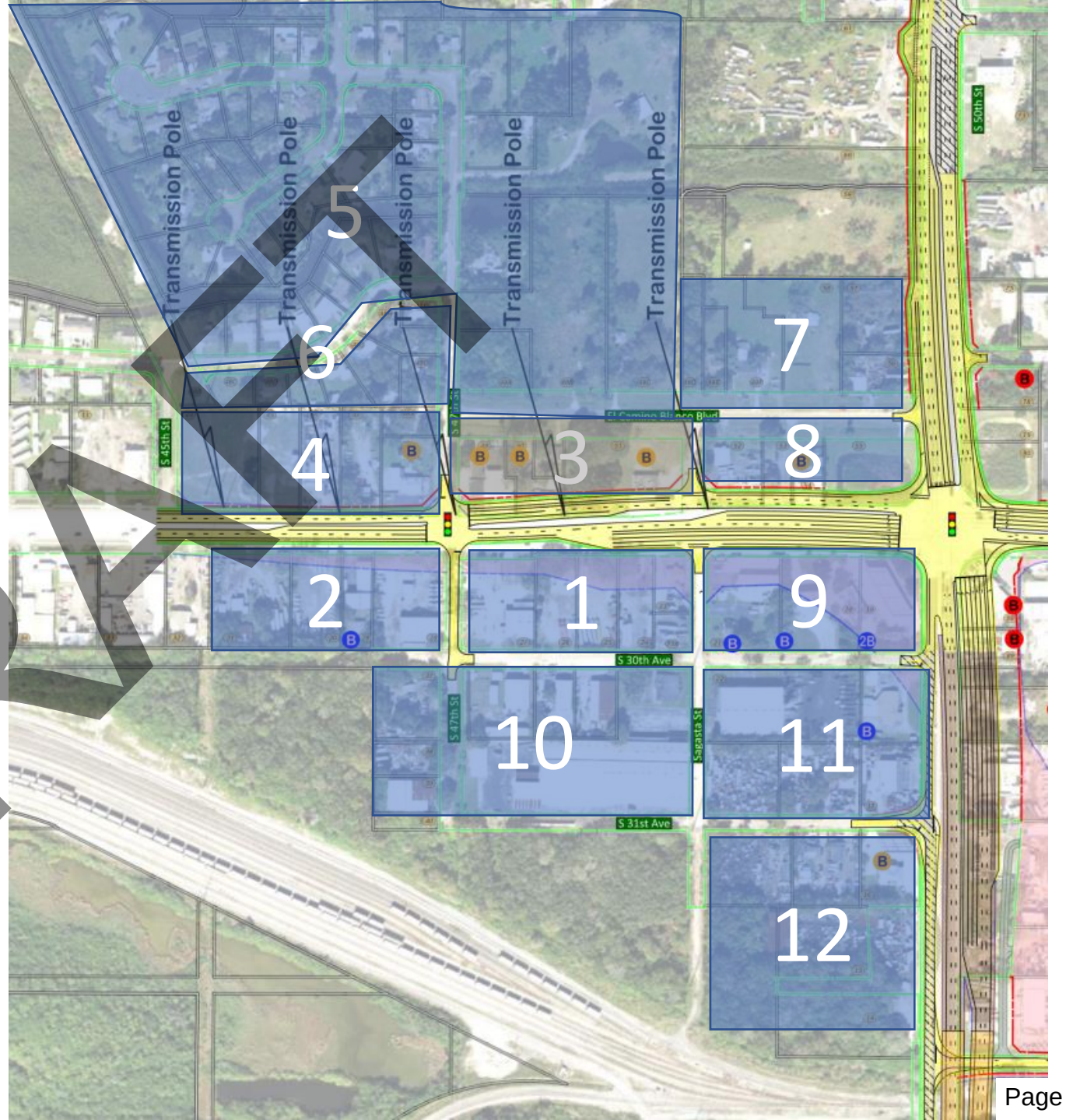
Area 8		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Auto Repair / Tires	5,000 SF	848	7	4	6	9	124
Outdoor Storage	.61 acres	150	4	2	2	3	35
TOTAL			11	6	8	12	159

Area 9		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Gas/Convenience Store	5,000 SF	853	35	35	43	43	4,228
Truck Repair	4,000 SF	942	6	3	6	6	95
TOTAL			41	38	49	49	4,323

Area 10		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Warehouse	9,000 SF	140	2	1	1	2	32
Warehouse	1.01 acres	140	7	3	3	6	58
Warehouse	7,000 SF	140	2	0	1	2	25
Warehouse	.42 acres	140	3	1	1	2	23
Warehouse	7,000 SF	140	2	0	1	2	25
Light Industrial	78,000 SF	110	63	9	9	67	544
TOTAL			79	14	16	81	707

Area 11		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Warehouse	21,000 SF	140	5	1	2	5	75
Motel	5 rooms	320	1	1	1	1	28
Salvage Yard	2 acres	150	14	6	6	11	114
TOTAL			20	8	9	17	217

Area 12		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Salvage Yard	3.1 acres	150	22	9	9	18	177



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Trip Generation

Area 13		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Auto Repair	4 bays	942	4	2	2	4	50
Manufacturing	2,000 SF	140	1	1	1	1	8
RV Sales	6,000 SF	842	na	na	4	11	na
TOTAL			5	3	7	16	58

Area 14		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Salvage Yard/Warehouse	3.65 acres	150	26	10	11	21	75
Salvage Yard/Warehouse	7,000 SF	150	2	0	1	2	25
TOTAL			28	10	12	23	100

Area 15		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Warehouse	30,000 SF						
Warehouse	40,000 SF						
Warehouse	34,000 SF						
Warehouse	2,000 SF						
Warehouse	15,000 SF						
TOTAL	121,000 SF	150	36	9	12	36	534

Area 16		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Lt. Manufacturing	62,000 SF	140	35	10	16	29	237

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Trip Generation

Area 17		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Construction Eq. Rental Store	4,723 SF	811	na	na	1	4	na
Auto Care Cntr	1,800 SF	942	3	1	3	3	42
Residential SF Home	1 DU	210	0	1	1	0	10
Residential Mobile Home	2 DU	240	0	1	1	0	10
TOTAL			3	3	5	7	61

Area 18		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Residential SF Home	6 DU	210	1	3	4	2	57
Residential Mobile Home	7 DU	240	1	2	3	2	35
TOTAL			2	5	7	4	92

Area 19		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Mini Warehouse	2,600 SF	151	0	0	0	0	7
Residential SF Home	3 DU	210	1	2	2	1	29
Residential Mobile Home	1 DU	240	0	0	0	0	5
TOTAL			1	2	2	2	40

Area 20		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Tire Store	3,096 SF	848	4	2	4	5	75

Area 21		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Mini Warehouse	15,200 SF	151	1	1	2	2	38
Manufacturing	17,400 SF	140	10	3	5	8	66
Mini Warehouse	5,000 SF	151	0	0	1	1	13
TOTAL			11	4	7	11	117

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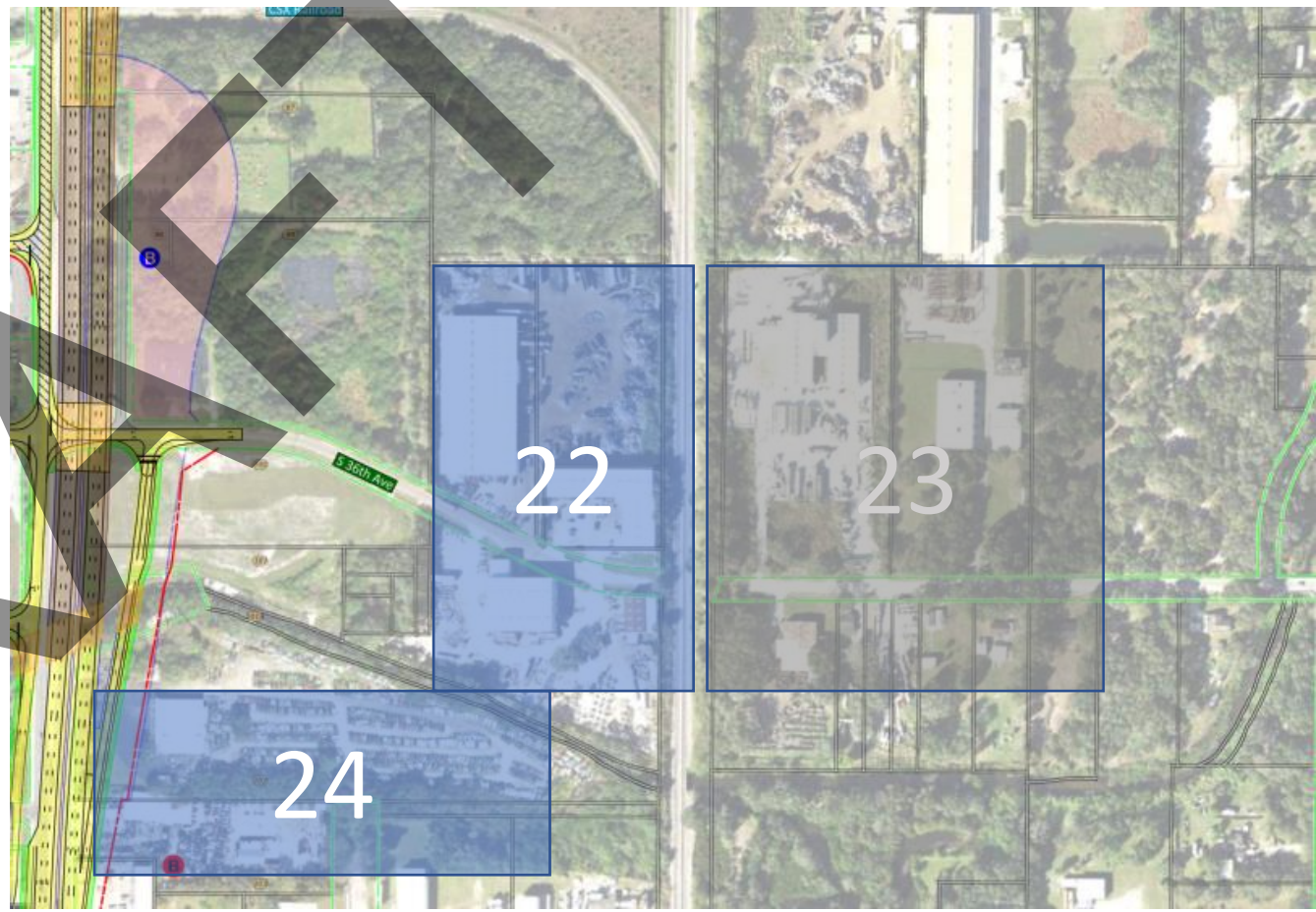
Trip Generation

Area 22		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Warehousing	51,696 SF	150	12	3	4	12	185
Mini Warehouse	58,321 SF	151	4	4	8	8	145
TOTAL			16	7	12	20	330

Area 23 does not have access to 30th Avenue and is not included in the analysis.

Area 24		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Mini Warehouse	40,887 SF	151	3	3	5	5	103
Mini Warehouse	17,529 SF	151	1	1	2	2	45
TOTAL			4	4	7	7	148



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Trip Generation

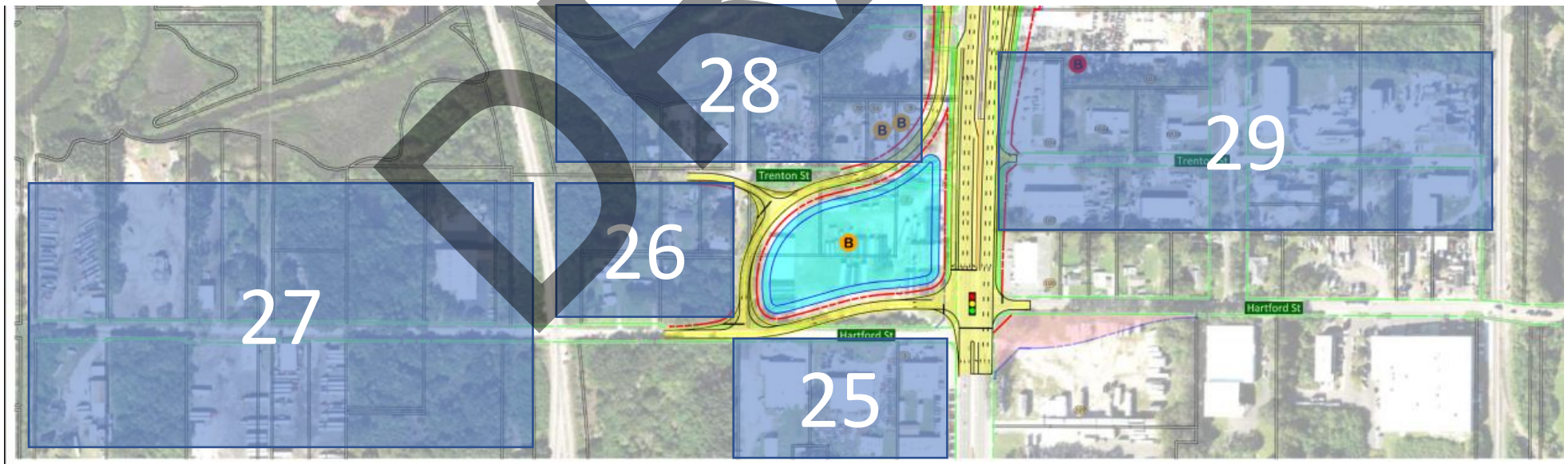
Area 25		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Manufacturing	13,000						
Manufacturing	3,000						
Manufacturing	10,000						
Manufacturing	16,000						
Manufacturing	3,000						
TOTAL	45,000	140	26	7	12	21	172

Area 26		ITE Cat.	AM in	AM out	PM in	PM out	Daily
SF Residential	.9 acres	210	1	1	2	1	22

Area 27		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Manufacturing Bldg.	16,000 SF	140	9	3	4	7	61
SF Residential	1.11 acres	210	1	2	2	1	29
Warehouse	1.07 acres	150	8	3	3	6	61
Warehouse	4.28 acres	150	31	12	13	24	245
Warehouse	1.45 acres	150	10	4	4	8	83
Warehouse	1.6 acres	150	12	4	5	9	92
Truck Rep. building	7,000 SF	942	10	5	10	11	166
TOTAL			81	33	41	66	737

Area 28		ITE Cat.	AM in	AM out	PM in	PM out	Daily
SF Res	3 DU	210	1	2	2	1	29
Storage/Warehouse	3.22 acres	150	23	9	10	18	183
TOTAL			24	11	12	19	212

Area 29		ITE Cat.	AM in	AM out	PM in	PM out	Daily
Warehouse	7,000 SF	150	2	0	1	2	25
Warehouse	4,000 SF	150	1	0	0	1	14
Mixed Use Office	7,000 SF	710	10	1	2	9	77
Warehouse	14,000 SF	150	3	1	1	3	50
Warehouse	2.58 acres	150	19	7	8	15	149
Warehouse	14,000 SF	150	3	1	1	3	50
Auto Repair	5 bays	942	5	2			62
Manufacturing	4,000 SF	140	2	1	1	2	15
SF Residential	1 DU	210		1	1		10
Warehouse	.38 acres	150	3	1	1	2	22
Warehouse	12,000 SF	150	3	1	1	3	43
TOTAL			51	16	17	40	517



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Trip Generation Summary

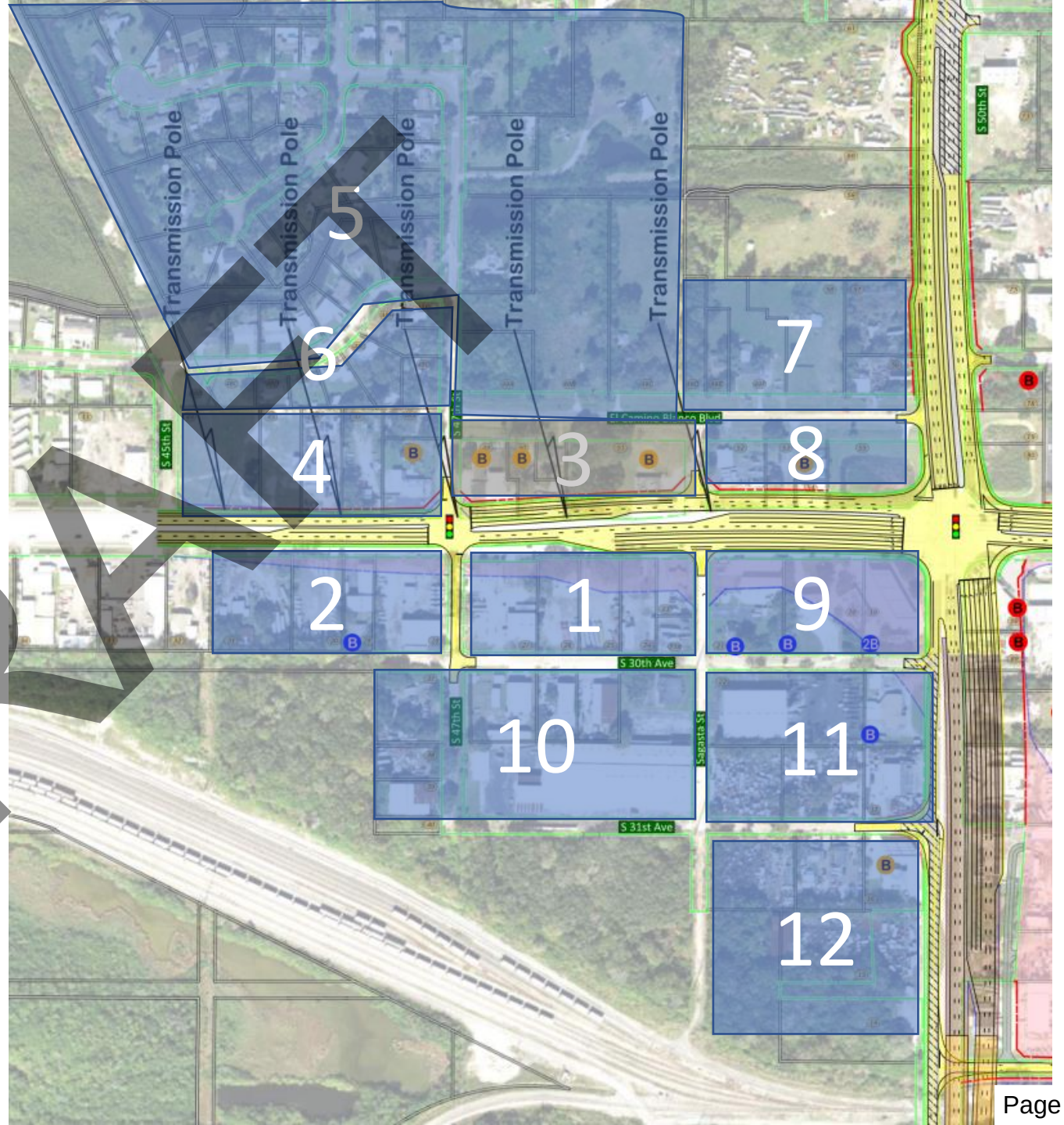
For all trip calculations:

- Assume 50% of trips in the tables are NB/SB trips and 50% are EB/WB trips.
- D factor = 72.4% with AM peak directions NB & WB
- Apply directionality to the NB/SB trips to get NB and SB trips.
- Apply directionality to the EB/WB trips to get EB and WB trips.

47th Street Trips

Area	AM in	AM out	PM in	PM out	Daily
1	18	9	18	19	285
2	24	13	24	28	404
~~3*~~	~~24~~	~~24~~	~~30~~	~~29~~	~~2643~~
4	11	5	7	11	124
5	8	23	25	15	381
6	3	10	11	7	171
7	4	3	4	3	63
8	11	6	8	12	159
9	41	38	49	49	4323
10	79	14	16	81	707
11	20	8	9	17	217
12	22	9	9	18	177

*Area 3 businesses will be relocated. Trips from area 3 are not included in this analysis.



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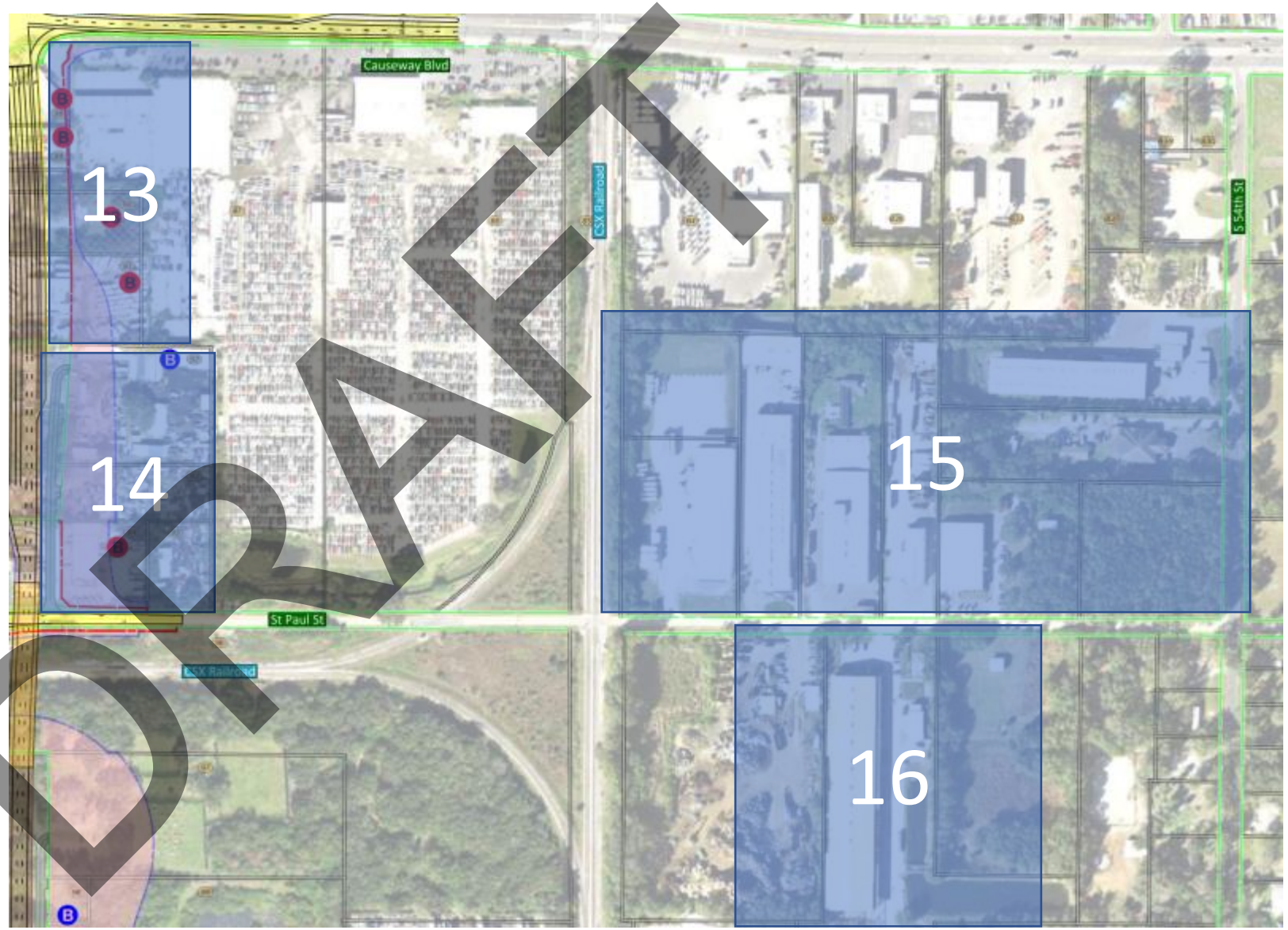
St. Paul Street Trips

Area	AM in	AM out	PM in	PM out	Daily
13	5	3	7	16	58
14	28	10	12	23	100
15	36	9	12	36	534
16	35	10	16	29	237



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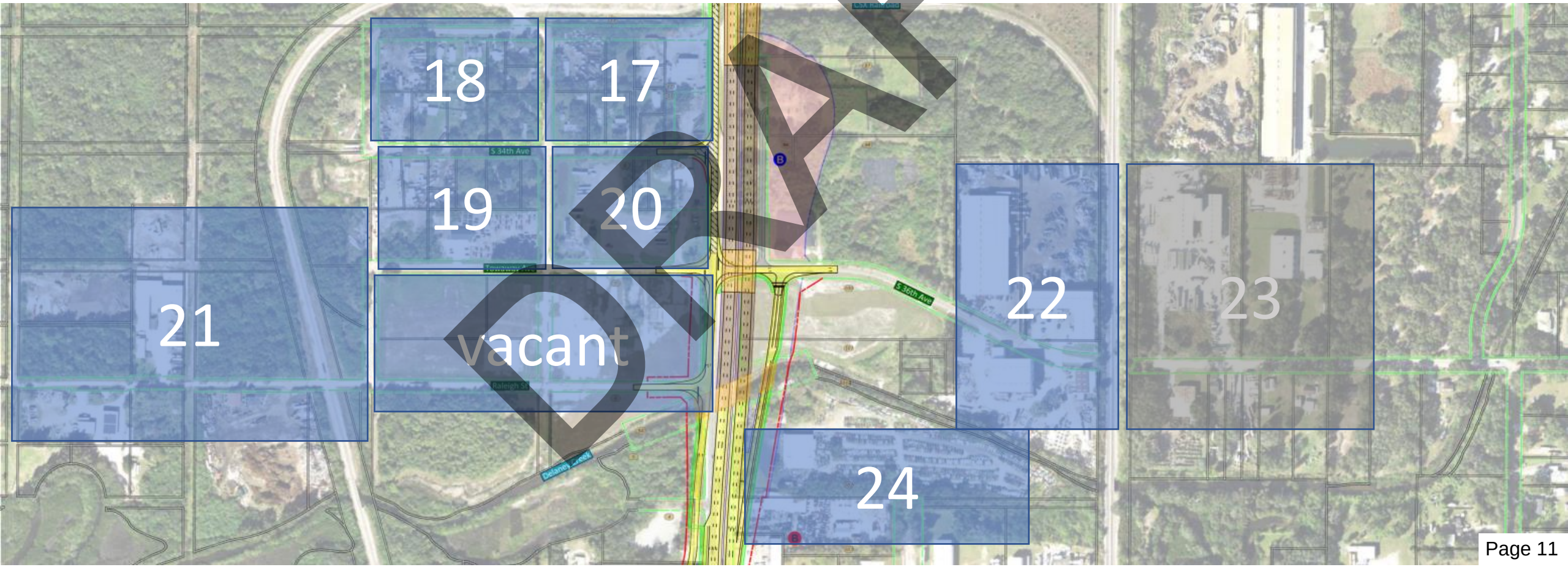
36th Street Trips

Area	AM in	AM out	PM in	PM out	Daily
17	3	3	5	7	61
18	2	5	7	4	92
19	1	2	2	2	40
20	4	2	4	5	75
21	11	4	7	11	117
22	16	7	12	20	330
~~23*~~	~~44~~	~~17~~	~~21~~	~~36~~	~~355~~
24	4	4	7	7	148

*Area 23 cannot access US 41 and is not included in this analysis.



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Trenton Hartford Street Trips

Area	AM in	AM out	PM in	PM out	Daily
25	26	7	12	21	172
26	1	1	2	1	22
27	81	33	41	66	737
28	24	11	12	19	212
29	51	16	17	40	517

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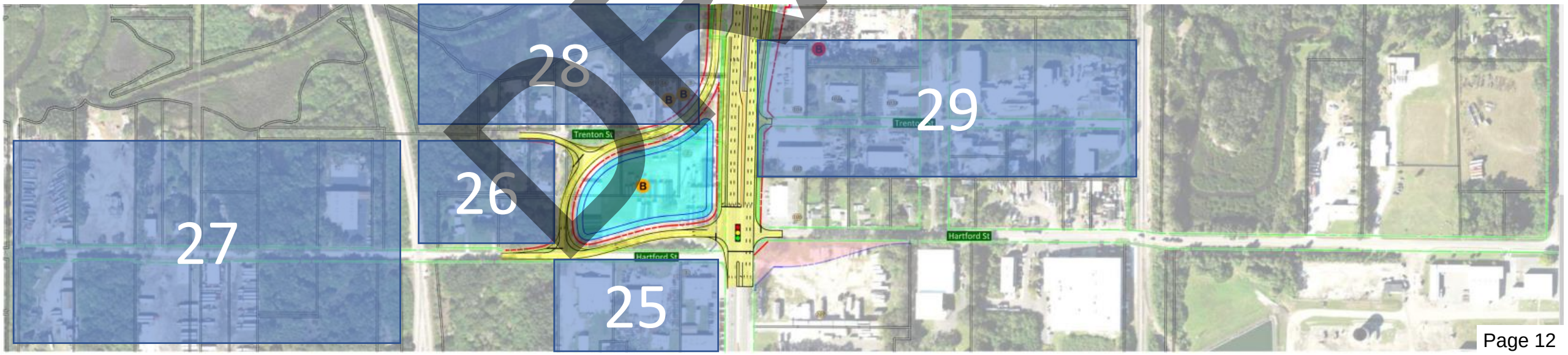
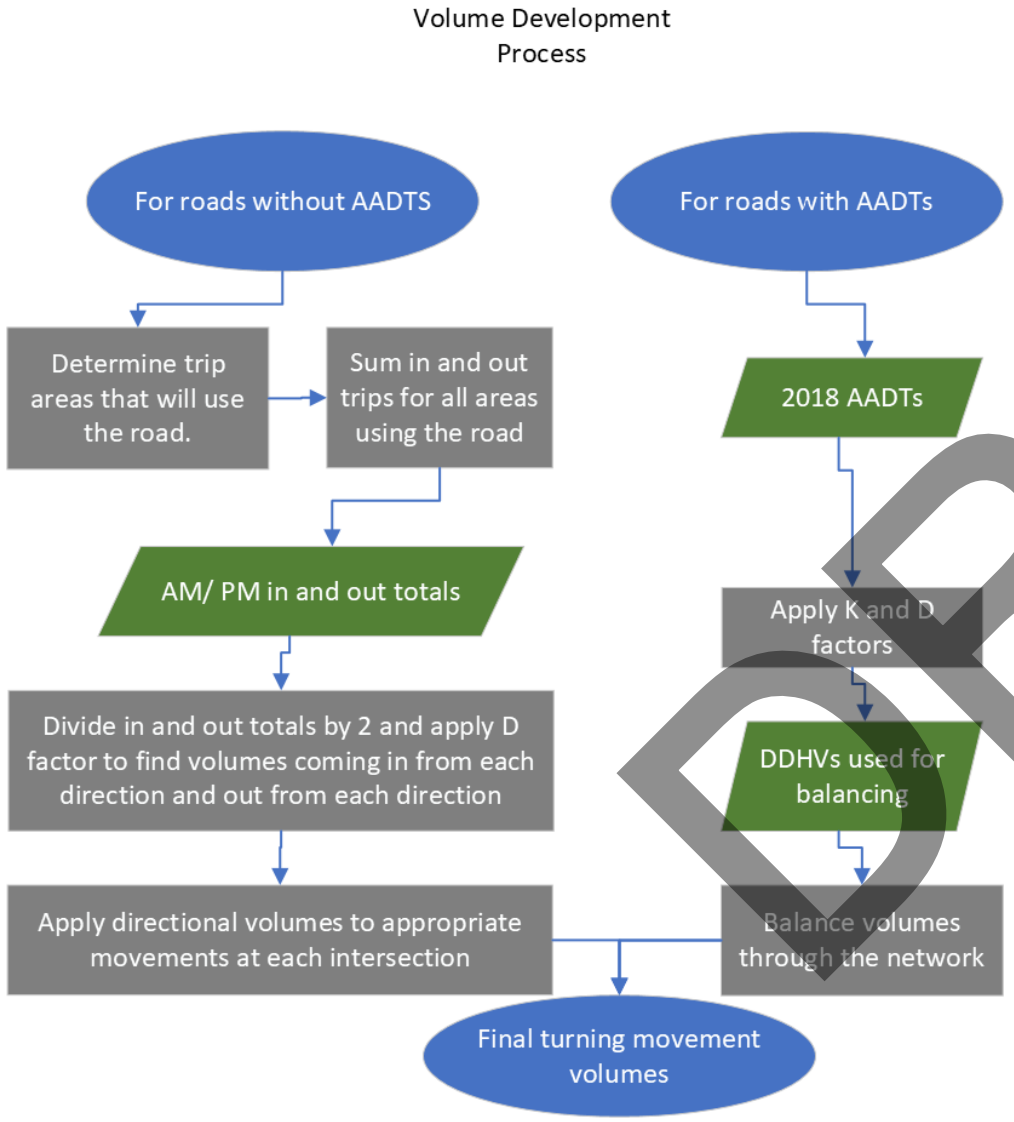


Trip Generation Application Method



1. Acquire 2018 AADTs from PTAR Table 6.2 for main road sections of Causeway Blvd, US 41. For Hartford Street east of US 41, use cosite 109047 (similar type of roadway) to get 2018 AADT.
2. Apply K and D factors to obtain DDHVs on those roadways (K=9%, D=72.4%, from PTAR Table 5.2) The DDHVs are the controls for balancing.
3. For each side street, determine which areas will use that side street. Add the area volumes as necessary to get total AM and PM in and out volumes.
4. Because the AM and PM total ins and outs are for all directions. Divide the volumes in half to get a total N/S and E/W volume. Assume that the same number of vehicles will go N/S and E/W.
5. Apply D factor to the halved volumes to determine the number of vehicles going N and S from the N/S total and E and W from the E/W total.
6. Apply appropriate directional volumes to the turning volumes at each intersection and balance through the network.

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Example of TGAM

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An example showing the calculation of IN volumes to Areas 25-28 via Hartford Street.

In general, it was assumed that the origin and destination for all vehicles was US 41 or Causeway Boulevard. Assumptions were made for each numbered area about the routes taken to get to and from SB and NB US 41 and EB and WB Causeway Blvd.

For vehicles coming into areas 25-28 it was assumed that NB vehicles would come in from NB US 41, SB vehicles would come in from SB US 41, and EB and WB vehicles on Causeway Boulevard would come south on US 41 and turn on Hartford rather than using the new access road.

For areas 25-28, the total number of IN trips from trip generation is 132 for AM and 67 for PM. These values come directly from the trip gen 9th edition workbook. (See page 8 of this memo for details on these trips.)

Area	AM in	PM in
25	26	12
26	1	2
27	81	41
28	24	12
Total	132	67

The total was divided in half to find the number of vehicles coming in from the north and south. Similarly, for east and west. The D factor was applied to the north-south volumes to determine the AM and PM volumes coming in from the north and south. Similarly for the east-west volumes. The AM peak travel directions are north and west, and the PM directions are south and east.

AM/PM	N/S volume (1/2 of IN volume)	D factor	Peak Direction Volume (apply D)	Off-Peak Direction Volume (apply 1-D)
AM	66	0.724	48	18
PM	34	0.724	25	9

The directional trip volumes were assigned to the appropriate intersection turning movement for the travel assumptions made for areas 25-28:

- NB vehicles are coming NB on US 41, assign NB trips to NBL movement (For AM, 48 trips because peak direction is NB in AM.)
- Assume SB vehicles are coming SB on US 41, assign SB volume to SBR movement (For AM, 18 trips because SB is off-peak direction in AM.)
- Assume EB and WB vehicles on Causeway Blvd will turn south on US 41 and enter these areas via Hartford Street, assign EB and WB volumes to SBR movement (48 + 18 for AM since WB is peak direction and EB is off-peak.)

Thus, NBL will have 48 vehicles in AM and SBR will have 48+18+18 = 84 vehicles in AM. Therefore 132 is the total number of AM in trips. Use similar process for PM volumes.

Note: For this intersection, additional in volume is coming from the WBT movement. Hartford Street was not considered a route for WB Causeway Boulevard vehicles to enter areas 25-28 so it was not factored into the AM-in calculations. Instead, the Hartford WBT volume was manually entered after all other calculations were complete to balance the intersection to the Hartford Street FTI control volumes. Similar balancing operations were done to keep the US 41 and Causeway Boulevard volumes consistent with the volumes in the PTAR.

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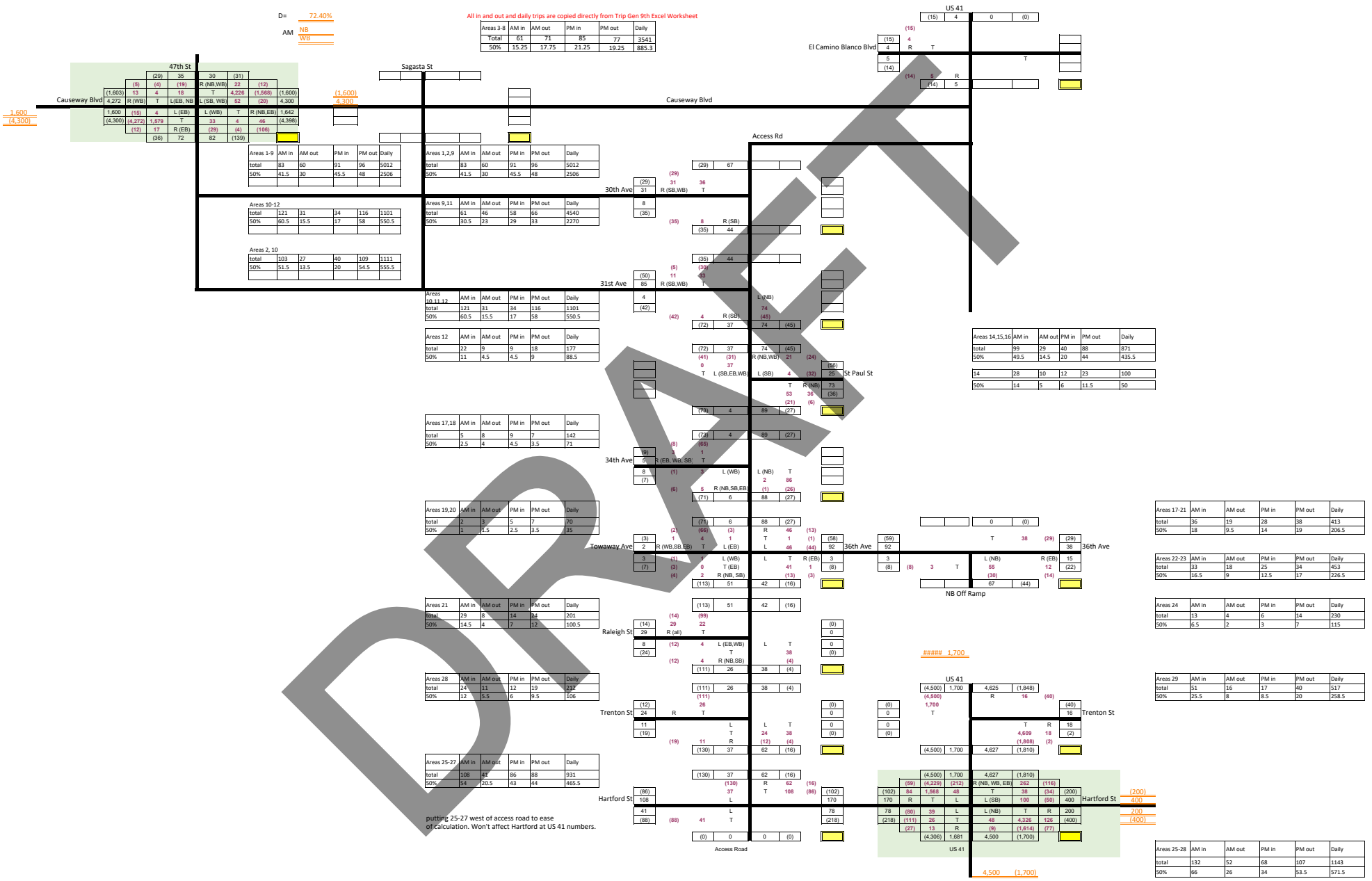
D= 72.40%
AM NB WB
All in and out and daily trips are copied directly from Trip Gen 9th Excel Worksheet
Areas 3-8 AM in AM out PM in PM out Daily
Total 61 71 85 77 3541
50% 15.25 17.75 21.25 19.25 885.3
US 41
El Camino Blanco Blvd
47th St
Sagasta St
Causeway Blvd
Causeway Blvd
Access Rd
30th Ave
31st Ave
34th Ave
Towaway Ave
Raleigh St
Trenton St
Hartford St
St Paul St
36th Ave
36th Ave
NB Off Ramp
US 41
Trenton St
Hartford St
Access Road
US 41
Areas 1-9 AM in AM out PM in PM out Daily
total 83 60 91 96 5012
50% 41.5 30 45.5 48 2506
Areas 1,2,9 AM in AM out PM in PM out Daily
total 83 60 91 96 5012
50% 41.5 30 45.5 48 2506
Areas 10-12
total 121 31 34 116 1101
50% 60.5 15.5 17 58 550.5
Areas 9,11 AM in AM out PM in PM out Daily
total 61 46 58 66 4540
50% 30.5 23 29 33 2270
Areas 2, 10
total 103 27 40 109 1111
50% 51.5 13.5 20 54.5 555.5
Areas 10,11,12 AM in AM out PM in PM out Daily
total 121 31 34 116 1101
50% 60.5 15.5 17 58 550.5
Areas 12 AM in AM out PM in PM out Daily
total 22 9 9 18 177
50% 11 4.5 4.5 9 88.5
Areas 14,15,16 AM in AM out PM in PM out Daily
total 99 29 40 88 871
50% 49.5 14.5 20 44 435.5
14 28 10 12 23 100
50% 14 5 6 11.5 50
Areas 17,18 AM in AM out PM in PM out Daily
total 5 8 9 7 142
50% 2.5 4 4.5 3.5 71
Areas 17-21 AM in AM out PM in PM out Daily
total 36 19 28 38 413
50% 18 9.5 14 19 206.5
Areas 19,20 AM in AM out PM in PM out Daily
total 2 3 5 7 70
50% 1 1.5 2.5 3.5 35
Areas 22-23 AM in AM out PM in PM out Daily
total 33 18 25 34 453
50% 16.5 9 12.5 17 226.5
Areas 21 AM in AM out PM in PM out Daily
total 29 8 14 24 201
50% 14.5 4 7 12 100.5
Areas 24 AM in AM out PM in PM out Daily
total 13 4 6 14 230
50% 6.5 2 3 7 115
Areas 28 AM in AM out PM in PM out Daily
total 24 11 12 19 212
50% 12 5.5 6 9.5 106
Areas 29 AM in AM out PM in PM out Daily
total 51 16 17 40 517
50% 25.5 8 8.5 20 258.5
Areas 25-27 AM in AM out PM in PM out Daily
total 108 41 86 88 931
50% 54 20.5 43 44 465.5
Areas 25-28 AM in AM out PM in PM out Daily
total 132 52 68 107 1143
50% 66 26 34 53.5 571.5
putting 25-27 west of access road to ease
of calculation. Won't affect Hartford at US 41 numbers.
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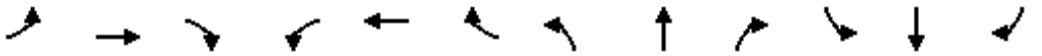
Appendix D: Synchro Reports

DRAFT



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	17	9	67	25	174	32	2915	84	32	1200	56
Future Volume (veh/h)	26	17	9	67	25	174	32	2915	84	32	1200	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	27	18	9	71	26	183	34	3068	88	34	1263	59
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	97	303	257	266	33	229	46	3150	90	46	3152	978
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.03	0.64	0.64	0.03	0.64	0.64
Sat Flow, veh/h	1126	1796	1522	1329	193	1359	1711	4901	139	1711	4904	1522
Grp Volume(v), veh/h	27	18	9	71	0	209	34	2037	1119	34	1263	59
Grp Sat Flow(s),veh/h/ln	1126	1796	1522	1329	0	1552	1711	1635	1771	1711	1635	1522
Q Serve(g_s), s	3.2	1.1	0.7	6.4	0.0	17.5	2.7	79.8	82.9	2.7	16.8	1.9
Cycle Q Clear(g_c), s	20.7	1.1	0.7	7.5	0.0	17.5	2.7	79.8	82.9	2.7	16.8	1.9
Prop In Lane	1.00		1.00	1.00		0.88	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	97	303	257	266	0	262	46	2101	1138	46	3152	978
V/C Ratio(X)	0.28	0.06	0.04	0.27	0.00	0.80	0.75	0.97	0.98	0.75	0.40	0.06
Avail Cap(c_a), veh/h	202	469	397	394	0	411	100	2101	1138	75	3152	978
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.9	47.2	47.0	50.4	0.0	54.0	65.3	22.9	23.4	65.3	11.6	9.0
Incr Delay (d2), s/veh	1.5	0.1	0.1	0.5	0.0	5.9	21.1	13.6	22.9	21.1	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.5	0.3	2.2	0.0	7.3	1.4	30.0	36.5	1.4	5.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.5	47.3	47.1	50.9	0.0	59.9	86.4	36.5	46.3	86.4	12.0	9.1
LnGrp LOS	E	D	D	D	A	E	F	D	D	F	B	A
Approach Vol, veh/h		54			280			3190			1356	
Approach Delay, s/veh		56.3			57.6			40.5			13.7	
Approach LOS		E			E			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.7	94.0		30.5	10.7	94.0		30.5				
Change Period (Y+Rc), s	7.1	7.1		* 7.7	7.1	7.1		* 7.7				
Max Green Setting (Gmax), s	5.9	86.9		* 35	7.9	84.9		* 36				
Max Q Clear Time (g_c+I1), s	4.7	84.9		22.7	4.7	18.8		19.5				
Green Ext Time (p_c), s	0.0	2.0		0.1	0.0	48.1		1.3				

Intersection Summary	
HCM 6th Ctrl Delay	34.2
HCM 6th LOS	C

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	403	485	77	1102	242	1644	1397	74	240	726	84
Future Volume (veh/h)	66	403	485	77	1102	242	1644	1397	74	240	726	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	69	424	511	81	1160	255	1731	1471	78	253	764	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	92	884	1992	94	884	540	1519	2203	727	318	1136	395
Arrive On Green	0.03	0.26	0.26	0.03	0.26	0.26	0.31	0.45	0.45	0.10	0.23	0.23
Sat Flow, veh/h	3319	3413	3471	3319	3413	1522	4824	4904	1522	3319	4904	1522
Grp Volume(v), veh/h	69	424	511	81	1160	255	1731	1471	78	253	764	88
Grp Sat Flow(s),veh/h/ln	1659	1706	1157	1659	1706	1522	1608	1635	1522	1659	1635	1522
Q Serve(g_s), s	3.9	20.0	14.0	4.6	49.3	24.7	59.9	44.9	5.4	14.2	27.0	8.6
Cycle Q Clear(g_c), s	3.9	20.0	14.0	4.6	49.3	24.7	59.9	44.9	5.4	14.2	27.0	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	92	884	1992	94	884	540	1519	2203	727	318	1136	395
V/C Ratio(X)	0.75	0.48	0.26	0.86	1.31	0.47	1.14	0.67	0.11	0.80	0.67	0.22
Avail Cap(c_a), veh/h	92	884	1992	94	884	540	1519	2203	727	551	1136	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	91.8	59.6	20.3	92.1	70.5	47.6	65.2	41.2	27.4	84.2	66.5	55.4
Incr Delay (d2), s/veh	38.3	1.9	0.3	57.7	148.5	2.9	71.5	1.6	0.3	14.9	3.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.9	3.8	2.7	39.5	9.8	34.0	18.1	2.0	6.7	11.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.1	61.5	20.6	149.7	219.0	50.5	136.7	42.9	27.7	99.2	69.7	56.7
LnGrp LOS	F	E	C	F	F	D	F	D	C	F	E	E
Approach Vol, veh/h		1004			1496			3280			1105	
Approach Delay, s/veh		45.4			186.5			92.0			75.4	
Approach LOS		D			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	68.0	52.0	13.0	57.3	26.6	93.4	13.0	57.3
Change Period (Y+Rc), s	* 8.1	* 7.9	* 7.7	* 8	* 8.4	* 7.9	* 7.6	* 8
Max Green Setting (Gmax), s	* 60	* 44	* 5.3	* 49	* 32	* 72	* 5.4	* 49
Max Q Clear Time (g_c+I1), s	61.9	29.0	5.9	51.3	16.2	46.9	6.6	22.0
Green Ext Time (p_c), s	0.0	10.8	0.0	0.0	2.0	23.2	0.0	17.5

Intersection Summary	
HCM 6th Ctrl Delay	103.1
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	912	11	34	2781	15	22	3	30	12	3	8
Future Volume (veh/h)	3	912	11	34	2781	15	22	3	30	12	3	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	3	960	12	36	2927	16	23	3	32	13	3	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	66	2600	32	66	2571	1147	64	10	43	78	22	28
Arrive On Green	0.04	0.75	0.75	0.04	0.75	0.75	0.05	0.05	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1711	3452	43	1711	3413	1522	494	186	837	676	422	549
Grp Volume(v), veh/h	3	475	497	36	2927	16	58	0	0	24	0	0
Grp Sat Flow(s),veh/h/ln	1711	1706	1788	1711	1706	1522	1517	0	0	1647	0	0
Q Serve(g_s), s	0.2	12.3	12.3	2.7	97.2	0.3	3.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	12.3	12.3	2.7	97.2	0.3	4.8	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	0.40		0.55	0.54		0.33
Lane Grp Cap(c), veh/h	66	1285	1347	66	2571	1147	117	0	0	128	0	0
V/C Ratio(X)	0.05	0.37	0.37	0.54	1.14	0.01	0.49	0.00	0.00	0.19	0.00	0.00
Avail Cap(c_a), veh/h	69	1285	1347	215	2571	1147	352	0	0	361	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	59.7	5.4	5.4	60.9	15.9	4.0	60.2	0.0	0.0	58.9	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.8	0.8	22.9	67.7	0.0	3.2	0.0	0.0	0.7	0.0	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	0.1	3.8	3.9	1.6	51.7	0.1	2.0	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	6.3	6.2	83.8	83.6	4.0	63.5	0.0	0.0	59.6	0.0	0.0
LnGrp LOS	E	A	A	F	F	A	E	A	A	E	A	A
Approach Vol, veh/h		975			2979			58			24	
Approach Delay, s/veh		6.4			83.2			63.5			59.6	
Approach LOS		A			F			E			E	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.3	11.8	104.0		13.3	11.8	104.0				
Change Period (Y+Rc), s		* 6.6	6.8	6.8		* 6.6	6.8	6.8				
Max Green Setting (Gmax), s		* 28	5.2	97.2		* 27	16.2	86.2				
Max Q Clear Time (g_c+I1), s		3.8	2.2	99.2		6.8	4.7	14.3				
Green Ext Time (p_c), s		0.1	0.0	0.0		0.2	0.1	37.1				

Intersection Summary	
HCM 6th Ctrl Delay	64.2
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

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

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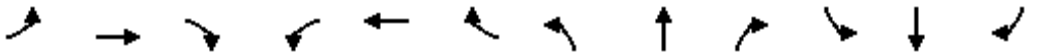

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	72	17	50	23	75	6	1105	50	137	2797	38
Future Volume (veh/h)	52	72	17	50	23	75	6	1105	50	137	2797	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	55	76	18	53	24	79	6	1163	53	144	2944	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	156	232	197	184	48	157	13	2658	121	175	3176	986
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.01	0.55	0.55	0.10	0.65	0.65
Sat Flow, veh/h	1240	1796	1522	1250	368	1211	1711	4807	219	1711	4904	1522
Grp Volume(v), veh/h	55	76	18	53	0	103	6	791	425	144	2944	40
Grp Sat Flow(s),veh/h/ln	1240	1796	1522	1250	0	1578	1711	1635	1757	1711	1635	1522
Q Serve(g_s), s	4.4	3.9	1.1	4.1	0.0	6.2	0.4	14.5	14.5	8.4	53.8	1.0
Cycle Q Clear(g_c), s	10.6	3.9	1.1	8.0	0.0	6.2	0.4	14.5	14.5	8.4	53.8	1.0
Prop In Lane	1.00		1.00	1.00		0.77	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	156	232	197	184	0	204	13	1807	971	175	3176	986
V/C Ratio(X)	0.35	0.33	0.09	0.29	0.00	0.50	0.46	0.44	0.44	0.82	0.93	0.04
Avail Cap(c_a), veh/h	426	623	528	463	0	555	116	1807	971	335	3176	986
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.2	40.3	39.0	43.9	0.0	41.3	50.3	13.4	13.4	44.7	15.8	6.5
Incr Delay (d2), s/veh	1.4	0.8	0.2	0.8	0.0	1.9	22.9	0.8	1.4	9.1	6.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.8	0.4	1.3	0.0	2.5	0.2	4.8	5.3	3.8	16.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	41.1	39.2	44.8	0.0	43.2	73.1	14.2	14.9	53.9	21.9	6.6
LnGrp LOS	D	D	D	D	A	D	E	B	B	D	C	A
Approach Vol, veh/h		149			156			1222			3128	
Approach Delay, s/veh		43.2			43.7			14.7			23.1	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	63.3		20.9	7.9	73.0		20.9				
Change Period (Y+Rc), s	7.1	7.1		* 7.7	7.1	7.1		* 7.7				
Max Green Setting (Gmax), s	19.9	52.9		* 35	6.9	65.9		* 36				
Max Q Clear Time (g_c+I1), s	10.4	16.5		12.6	2.4	55.8		10.0				
Green Ext Time (p_c), s	0.2	28.4		0.6	0.0	10.0		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		22.3	
HCM 6th LOS		C	

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	947	1543	117	528	256	480	628	124	306	1312	31
Future Volume (veh/h)	61	947	1543	117	528	256	480	628	124	306	1312	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	64	997	1624	123	556	269	505	661	131	322	1381	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	97	872	1579	155	930	598	962	1961	680	400	1583	536
Arrive On Green	0.03	0.26	0.26	0.05	0.27	0.27	0.20	0.40	0.40	0.12	0.32	0.32
Sat Flow, veh/h	3319	3413	3471	3319	3413	1522	4824	4904	1522	3319	4904	1522
Grp Volume(v), veh/h	64	997	1624	123	556	269	505	661	131	322	1381	33
Grp Sat Flow(s),veh/h/ln	1659	1706	1157	1659	1706	1522	1608	1635	1522	1659	1635	1522
Q Serve(g_s), s	3.4	46.0	46.0	6.6	25.5	23.4	16.8	16.8	9.4	17.0	47.8	2.6
Cycle Q Clear(g_c), s	3.4	46.0	46.0	6.6	25.5	23.4	16.8	16.8	9.4	17.0	47.8	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	872	1579	155	930	598	962	1961	680	400	1583	536
V/C Ratio(X)	0.66	1.14	1.03	0.79	0.60	0.45	0.52	0.34	0.19	0.80	0.87	0.06
Avail Cap(c_a), veh/h	116	872	1579	155	930	598	962	1961	680	638	1583	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	86.5	67.0	49.0	84.9	56.9	40.3	64.4	37.5	30.2	77.1	57.5	38.6
Incr Delay (d2), s/veh	25.3	78.0	30.2	30.7	2.8	2.4	2.0	0.5	0.6	12.7	6.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	29.2	27.3	3.5	11.3	9.1	7.0	6.8	3.6	7.9	20.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.9	145.0	79.3	115.7	59.7	42.7	66.5	37.9	30.8	89.8	64.4	38.9
LnGrp LOS	F	F	F	F	E	D	E	D	C	F	E	D
Approach Vol, veh/h		2685			948			1297			1736	
Approach Delay, s/veh		104.5			62.1			48.3			68.6	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	44.0	66.0	12.9	57.1	30.1	79.9	16.0	54.0
Change Period (Y+Rc), s	* 8.1	* 7.9	* 7.7	* 8	* 8.4	* 7.9	* 7.6	* 8
Max Green Setting (Gmax), s	* 36	* 58	* 6.3	* 48	* 35	* 59	* 8.4	* 46
Max Q Clear Time (g_c+I1), s	18.8	49.8	5.4	27.5	19.0	18.8	8.6	48.0
Green Ext Time (p_c), s	4.7	7.9	0.0	13.4	2.7	20.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	78.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	2469	8	13	1018	8	19	3	69	13	3	3
Future Volume (veh/h)	10	2469	8	13	1018	8	19	3	69	13	3	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	11	2599	8	14	1072	8	20	3	73	14	3	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	64	2552	8	64	2496	1113	50	12	91	107	23	15
Arrive On Green	0.04	0.73	0.73	0.04	0.73	0.73	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1711	3490	11	1711	3413	1522	217	146	1154	767	285	186
Grp Volume(v), veh/h	11	1270	1337	14	1072	8	96	0	0	20	0	0
Grp Sat Flow(s),veh/h/ln	1711	1706	1794	1711	1706	1522	1518	0	0	1238	0	0
Q Serve(g_s), s	0.8	97.2	97.2	1.1	16.4	0.2	5.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	97.2	97.2	1.1	16.4	0.2	8.2	0.0	0.0	1.7	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.21		0.76	0.70		0.15
Lane Grp Cap(c), veh/h	64	1248	1312	64	2496	1113	153	0	0	144	0	0
V/C Ratio(X)	0.17	1.02	1.02	0.22	0.43	0.01	0.63	0.00	0.00	0.14	0.00	0.00
Avail Cap(c_a), veh/h	67	1248	1312	157	2496	1113	342	0	0	320	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	61.9	17.9	17.9	62.1	7.0	4.8	60.1	0.0	0.0	57.1	0.0	0.0
Incr Delay (d2), s/veh	4.5	30.0	29.7	6.0	0.5	0.0	4.2	0.0	0.0	0.4	0.0	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	0.4	40.0	42.0	0.6	5.2	0.1	3.4	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	47.8	47.5	68.1	7.5	4.8	64.3	0.0	0.0	57.5	0.0	0.0
LnGrp LOS	E	F	F	E	A	A	E	A	A	E	A	A
Approach Vol, veh/h		2618			1094			96			20	
Approach Delay, s/veh		47.7			8.3			64.3			57.5	
Approach LOS		D			A			E			E	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		17.1	11.8	104.0		17.1	11.8	104.0				
Change Period (Y+Rc), s		* 6.6	6.8	6.8		* 6.6	6.8	6.8				
Max Green Setting (Gmax), s		* 28	5.2	97.2		* 27	12.2	90.2				
Max Q Clear Time (g_c+I1), s		3.7	2.8	18.4		10.2	3.1	99.2				
Green Ext Time (p_c), s		0.1	0.0	46.0		0.4	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	36.9
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

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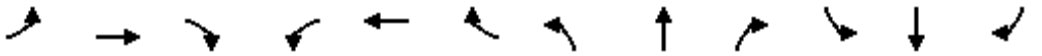

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	22	11	83	32	218	40	3586	105	40	1501	70
Future Volume (veh/h)	32	22	11	83	32	218	40	3586	105	40	1501	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	34	23	12	87	34	229	42	3775	111	42	1580	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	100	373	316	310	42	280	53	2978	87	53	2982	926
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.03	0.61	0.61	0.03	0.61	0.61
Sat Flow, veh/h	1072	1796	1522	1319	201	1352	1711	4897	143	1711	4904	1522
Grp Volume(v), veh/h	34	23	12	87	0	263	42	2508	1378	42	1580	74
Grp Sat Flow(s),veh/h/ln	1072	1796	1522	1319	0	1553	1711	1635	1771	1711	1635	1522
Q Serve(g_s), s	4.5	1.5	0.9	8.1	0.0	23.1	3.5	86.9	86.9	3.5	26.6	2.9
Cycle Q Clear(g_c), s	27.6	1.5	0.9	9.6	0.0	23.1	3.5	86.9	86.9	3.5	26.6	2.9
Prop In Lane	1.00		1.00	1.00		0.87	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	100	373	316	310	0	322	53	1988	1077	53	2982	926
V/C Ratio(X)	0.34	0.06	0.04	0.28	0.00	0.82	0.79	1.26	1.28	0.79	0.53	0.08
Avail Cap(c_a), veh/h	142	444	376	367	0	389	119	1988	1077	71	2982	926
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.2	45.5	45.2	49.3	0.0	54.0	68.7	28.0	28.0	68.8	16.2	11.5
Incr Delay (d2), s/veh	2.0	0.1	0.0	0.5	0.0	10.8	21.8	121.9	133.1	33.8	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.7	0.3	2.7	0.0	10.0	1.8	63.5	72.2	2.0	9.4	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.2	45.5	45.3	49.8	0.0	64.8	90.5	149.9	161.1	102.6	16.9	11.7
LnGrp LOS	E	D	D	D	A	E	F	F	F	F	B	B
Approach Vol, veh/h		69			350			3928			1696	
Approach Delay, s/veh		57.1			61.1			153.2			18.8	
Approach LOS		E			E			F			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	94.0		37.3	11.6	94.0		37.3				
Change Period (Y+Rc), s	7.1	7.1		* 7.7	7.1	7.1		* 7.7				
Max Green Setting (Gmax), s	5.9	86.9		* 35	9.9	82.9		* 36				
Max Q Clear Time (g_c+I1), s	5.5	88.9		29.6	5.5	28.6		25.1				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	48.2		1.4				

Intersection Summary	
HCM 6th Ctrl Delay	109.0
HCM 6th LOS	F

Notes

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

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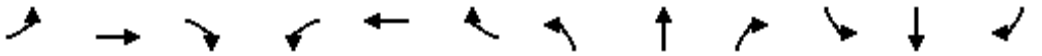

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	549	660	101	1441	317	2025	1719	92	281	850	98
Future Volume (veh/h)	91	549	660	101	1441	317	2025	1719	92	281	850	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	96	578	695	106	1517	334	2132	1809	97	296	895	103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	92	884	1992	94	884	561	1519	2136	706	363	1136	395
Arrive On Green	0.03	0.26	0.26	0.03	0.26	0.26	0.31	0.44	0.44	0.11	0.23	0.23
Sat Flow, veh/h	3319	3413	3471	3319	3413	1522	4824	4904	1522	3319	4904	1522
Grp Volume(v), veh/h	96	578	695	106	1517	334	2132	1809	97	296	895	103
Grp Sat Flow(s),veh/h/ln	1659	1706	1157	1659	1706	1522	1608	1635	1522	1659	1635	1522
Q Serve(g_s), s	5.3	28.7	20.3	5.4	49.3	33.8	59.9	62.8	6.9	16.6	32.6	10.2
Cycle Q Clear(g_c), s	5.3	28.7	20.3	5.4	49.3	33.8	59.9	62.8	6.9	16.6	32.6	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	92	884	1992	94	884	561	1519	2136	706	363	1136	395
V/C Ratio(X)	1.04	0.65	0.35	1.13	1.72	0.60	1.40	0.85	0.14	0.82	0.79	0.26
Avail Cap(c_a), veh/h	92	884	1992	94	884	561	1519	2136	706	551	1136	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	92.5	62.9	21.6	92.5	70.5	48.6	65.2	48.0	29.2	82.9	68.7	55.9
Incr Delay (d2), s/veh	104.5	3.8	0.5	130.6	326.9	4.6	185.8	4.4	0.4	14.9	5.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	12.8	5.6	4.0	61.4	13.5	50.1	25.8	2.6	7.8	14.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	197.0	66.6	22.1	223.1	397.4	53.2	251.0	52.4	29.6	97.8	74.2	57.5
LnGrp LOS	F	E	C	F	F	D	F	D	C	F	E	E
Approach Vol, veh/h		1369			1957			4038			1294	
Approach Delay, s/veh		53.2			329.2			156.7			78.3	
Approach LOS		D			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	68.0	52.0	13.0	57.3	29.2	90.8	13.0	57.3
Change Period (Y+Rc), s	* 8.1	* 7.9	* 7.7	* 8	* 8.4	* 7.9	* 7.6	* 8
Max Green Setting (Gmax), s	* 60	* 44	* 5.3	* 49	* 32	* 72	* 5.4	* 49
Max Q Clear Time (g_c+I1), s	61.9	34.6	7.3	51.3	18.6	64.8	7.4	30.7
Green Ext Time (p_c), s	0.0	7.8	0.0	0.0	2.2	7.3	0.0	15.5

Intersection Summary	
HCM 6th Ctrl Delay	167.6
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1247	14	43	3503	18	27	3	38	15	3	11
Future Volume (veh/h)	3	1247	14	43	3503	18	27	3	38	15	3	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	3	1313	15	45	3687	19	28	3	40	16	3	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	66	2563	29	72	2544	1135	69	11	53	81	21	39
Arrive On Green	0.04	0.74	0.74	0.04	0.75	0.75	0.06	0.06	0.06	0.06	0.06	0.06
Sat Flow, veh/h	1711	3456	39	1711	3413	1522	491	173	857	646	349	628
Grp Volume(v), veh/h	3	648	680	45	3687	19	71	0	0	31	0	0
Grp Sat Flow(s),veh/h/ln	1711	1706	1789	1711	1706	1522	1521	0	0	1623	0	0
Q Serve(g_s), s	0.2	20.6	20.7	3.4	97.2	0.4	3.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	20.6	20.7	3.4	97.2	0.4	5.9	0.0	0.0	2.3	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	0.39		0.56	0.52		0.39
Lane Grp Cap(c), veh/h	66	1265	1327	72	2544	1135	132	0	0	141	0	0
V/C Ratio(X)	0.05	0.51	0.51	0.62	1.45	0.02	0.54	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	68	1265	1327	213	2544	1135	348	0	0	357	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	60.4	7.0	7.0	61.4	16.6	4.3	60.1	0.0	0.0	58.5	0.0	0.0
Incr Delay (d2), s/veh	1.0	1.5	1.4	27.7	204.4	0.0	3.4	0.0	0.0	0.8	0.0	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	0.1	6.6	6.9	2.0	100.5	0.1	2.5	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	8.5	8.4	89.1	221.0	4.3	63.5	0.0	0.0	59.3	0.0	0.0
LnGrp LOS	E	A	A	F	F	A	E	A	A	E	A	A
Approach Vol, veh/h		1331			3751			71			31	
Approach Delay, s/veh		8.6			218.3			63.5			59.3	
Approach LOS		A			F			E			E	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.6	11.8	104.0		14.6	12.3	103.5				
Change Period (Y+Rc), s		* 6.6	6.8	6.8		* 6.6	6.8	6.8				
Max Green Setting (Gmax), s		* 28	5.2	97.2		* 27	16.2	86.2				
Max Q Clear Time (g_c+I1), s		4.3	2.2	99.2		7.9	5.4	22.7				
Green Ext Time (p_c), s		0.1	0.0	0.0		0.3	0.1	49.8				

Intersection Summary	
HCM 6th Ctrl Delay	161.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

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

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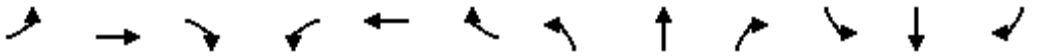

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	91	22	50	28	95	8	1358	63	174	3572	48
Future Volume (veh/h)	66	91	22	50	28	95	8	1358	63	174	3572	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	69	96	23	53	29	100	8	1429	66	183	3760	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	152	275	233	187	54	187	17	2627	121	211	3240	1006
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.01	0.55	0.55	0.12	0.66	0.66
Sat Flow, veh/h	1211	1796	1522	1222	354	1222	1711	4804	222	1711	4904	1522
Grp Volume(v), veh/h	69	96	23	53	0	129	8	973	522	183	3760	51
Grp Sat Flow(s),veh/h/ln	1211	1796	1522	1222	0	1576	1711	1635	1756	1711	1635	1522
Q Serve(g_s), s	6.9	5.9	1.6	5.0	0.0	9.4	0.6	23.8	23.8	13.0	81.9	1.5
Cycle Q Clear(g_c), s	16.3	5.9	1.6	11.0	0.0	9.4	0.6	23.8	23.8	13.0	81.9	1.5
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	152	275	233	187	0	241	17	1788	960	211	3240	1006
V/C Ratio(X)	0.45	0.35	0.10	0.28	0.00	0.53	0.48	0.54	0.54	0.87	1.16	0.05
Avail Cap(c_a), veh/h	312	511	433	353	0	455	81	1788	960	357	3240	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.9	47.0	45.2	51.9	0.0	48.4	61.1	18.1	18.1	53.3	21.0	7.4
Incr Delay (d2), s/veh	2.1	0.8	0.2	0.8	0.0	1.8	20.0	1.2	2.2	10.9	76.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.7	0.6	1.6	0.0	3.8	0.3	8.5	9.4	6.0	48.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	47.7	45.3	52.7	0.0	50.3	81.1	19.3	20.3	64.2	97.1	7.5
LnGrp LOS	E	D	D	D	A	D	F	B	C	E	F	A
Approach Vol, veh/h		188			182			1503			3994	
Approach Delay, s/veh		51.2			51.0			20.0			94.5	
Approach LOS		D			D			C			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.4	74.9		26.7	8.3	89.0		26.7				
Change Period (Y+Rc), s	7.1	7.1		* 7.7	7.1	7.1		* 7.7				
Max Green Setting (Gmax), s	25.9	61.9		* 35	5.9	81.9		* 36				
Max Q Clear Time (g_c+I1), s	15.0	25.8		18.3	2.6	83.9		13.0				
Green Ext Time (p_c), s	0.3	31.9		0.7	0.0	0.0		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		72.7	
HCM 6th LOS		E	

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1290	2104	152	693	336	591	774	154	358	1538	36
Future Volume (veh/h)	84	1290	2104	152	693	336	591	774	154	358	1538	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	88	1358	2215	160	729	354	622	815	162	377	1619	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	116	872	1579	155	910	615	962	1878	654	457	1583	545
Arrive On Green	0.04	0.26	0.26	0.05	0.27	0.27	0.20	0.38	0.38	0.14	0.32	0.32
Sat Flow, veh/h	3319	3413	3471	3319	3413	1522	4824	4904	1522	3319	4904	1522
Grp Volume(v), veh/h	88	1358	2215	160	729	354	622	815	162	377	1619	38
Grp Sat Flow(s),veh/h/ln	1659	1706	1157	1659	1706	1522	1608	1635	1522	1659	1635	1522
Q Serve(g_s), s	4.7	46.0	46.0	8.4	35.9	32.5	21.3	22.1	12.2	19.9	58.1	3.0
Cycle Q Clear(g_c), s	4.7	46.0	46.0	8.4	35.9	32.5	21.3	22.1	12.2	19.9	58.1	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	872	1579	155	910	615	962	1878	654	457	1583	545
V/C Ratio(X)	0.76	1.56	1.40	1.03	0.80	0.58	0.65	0.43	0.25	0.83	1.02	0.07
Avail Cap(c_a), veh/h	116	872	1579	155	916	618	962	1878	654	638	1583	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	86.1	67.0	49.0	85.8	61.5	41.6	66.2	41.1	32.8	75.5	60.9	38.1
Incr Delay (d2), s/veh	33.3	256.3	185.1	81.3	7.4	3.9	3.4	0.7	0.9	13.2	28.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	50.8	49.9	5.3	16.3	12.8	8.9	8.9	4.7	9.2	27.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	119.4	323.3	234.1	167.1	68.9	45.5	69.6	41.8	33.7	88.7	89.5	38.3
LnGrp LOS	F	F	F	F	E	D	E	D	C	F	F	D
Approach Vol, veh/h		3661			1243			1599			2034	
Approach Delay, s/veh		264.4			74.9			51.8			88.4	
Approach LOS		F			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	44.0	66.0	14.0	56.0	33.2	76.8	16.0	54.0
Change Period (Y+Rc), s	* 8.1	* 7.9	* 7.7	* 8	* 8.4	* 7.9	* 7.6	* 8
Max Green Setting (Gmax), s	* 36	* 58	* 6.3	* 48	* 35	* 59	* 8.4	* 46
Max Q Clear Time (g_c+I1), s	23.3	60.1	6.7	37.9	21.9	24.1	10.4	48.0
Green Ext Time (p_c), s	4.9	0.0	0.0	8.9	2.9	22.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	155.1
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	3375	10	17	1293	10	24	3	87	16	3	4
Future Volume (veh/h)	13	3375	10	17	1293	10	24	3	87	16	3	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	14	3553	11	18	1361	11	25	3	92	17	3	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	63	2506	8	63	2451	1093	53	13	111	111	20	17
Arrive On Green	0.04	0.72	0.72	0.04	0.72	0.72	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1711	3490	11	1711	3413	1522	222	131	1161	687	214	180
Grp Volume(v), veh/h	14	1736	1828	18	1361	11	120	0	0	24	0	0
Grp Sat Flow(s),veh/h/ln	1711	1706	1794	1711	1706	1522	1514	0	0	1081	0	0
Q Serve(g_s), s	1.1	97.2	97.2	1.4	25.3	0.3	6.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.1	97.2	97.2	1.4	25.3	0.3	10.5	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.21		0.77	0.71		0.17
Lane Grp Cap(c), veh/h	63	1225	1288	63	2451	1093	177	0	0	149	0	0
V/C Ratio(X)	0.22	1.42	1.42	0.28	0.56	0.01	0.68	0.00	0.00	0.16	0.00	0.00
Avail Cap(c_a), veh/h	66	1225	1288	154	2451	1093	336	0	0	295	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	63.3	19.1	19.1	63.4	8.9	5.4	60.0	0.0	0.0	56.3	0.0	0.0
Incr Delay (d2), s/veh	6.3	192.5	193.0	8.7	0.9	0.0	4.5	0.0	0.0	0.5	0.0	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	0.6	96.1	101.2	0.7	8.3	0.1	4.3	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	211.6	212.0	72.1	9.9	5.4	64.5	0.0	0.0	56.8	0.0	0.0
LnGrp LOS	E	F	F	E	A	A	E	A	A	E	A	A
Approach Vol, veh/h		3578			1390			120			24	
Approach Delay, s/veh		211.3			10.6			64.5			56.8	
Approach LOS		F			B			E			E	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.6	11.8	104.0		19.6	11.8	104.0				
Change Period (Y+Rc), s		* 6.6	6.8	6.8		* 6.6	6.8	6.8				
Max Green Setting (Gmax), s		* 28	5.2	97.2		* 27	12.2	90.2				
Max Q Clear Time (g_c+I1), s		4.5	3.1	27.3		12.5	3.4	99.2				
Green Ext Time (p_c), s		0.1	0.0	55.2		0.5	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	152.5
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

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

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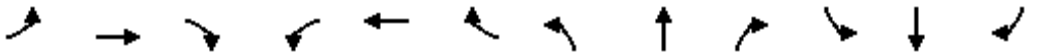

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	26	13	100	38	262	48	4257	126	48	1803	84
Future Volume (veh/h)	39	26	13	100	38	262	48	4257	126	48	1803	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	41	27	14	105	40	276	51	4481	133	51	1898	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	89	423	359	342	46	320	65	2841	84	65	2845	883
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.04	0.58	0.58	0.04	0.58	0.58
Sat Flow, veh/h	1021	1796	1522	1312	196	1356	1711	4896	144	1711	4904	1522
Grp Volume(v), veh/h	41	27	14	105	0	316	51	2978	1636	51	1898	88
Grp Sat Flow(s),veh/h/ln	1021	1796	1522	1312	0	1552	1711	1635	1770	1711	1635	1522
Q Serve(g_s), s	6.0	1.7	1.1	10.1	0.0	29.3	4.4	86.9	86.9	4.4	39.7	3.9
Cycle Q Clear(g_c), s	35.3	1.7	1.1	11.9	0.0	29.3	4.4	86.9	86.9	4.4	39.7	3.9
Prop In Lane	1.00		1.00	1.00		0.87	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	89	423	359	342	0	366	65	1897	1027	65	2845	883
V/C Ratio(X)	0.46	0.06	0.04	0.31	0.00	0.86	0.79	1.57	1.59	0.79	0.67	0.10
Avail Cap(c_a), veh/h	89	423	359	346	0	371	113	1897	1027	67	2845	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.8	44.4	44.1	49.0	0.0	54.9	71.4	31.4	31.4	71.5	21.5	14.0
Incr Delay (d2), s/veh	3.6	0.1	0.0	0.5	0.0	18.4	18.6	259.0	271.3	44.0	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.8	0.4	3.4	0.0	13.3	2.2	99.1	110.9	2.7	14.4	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.5	44.5	44.2	49.5	0.0	73.3	90.0	290.4	302.8	115.5	22.8	14.2
LnGrp LOS	E	D	D	D	A	E	F	F	F	F	C	B
Approach Vol, veh/h		82			421			4665			2037	
Approach Delay, s/veh		59.9			67.4			292.6			24.7	
Approach LOS		E			E			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.8	94.0		43.0	12.8	94.0		43.0				
Change Period (Y+Rc), s	7.1	7.1		* 7.7	7.1	7.1		* 7.7				
Max Green Setting (Gmax), s	5.9	86.9		* 35	9.9	82.9		* 36				
Max Q Clear Time (g_c+I1), s	6.4	88.9		37.3	6.4	41.7		31.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	39.7		1.0				

Intersection Summary		
HCM 6th Ctrl Delay		201.0
HCM 6th LOS		F

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	693	835	124	1782	391	2406	2043	109	323	976	112
Future Volume (veh/h)	114	693	835	124	1782	391	2406	2043	109	323	976	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	120	729	879	131	1876	412	2533	2151	115	340	1027	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	92	884	1992	94	884	581	1519	2071	686	407	1136	395
Arrive On Green	0.03	0.26	0.26	0.03	0.26	0.26	0.31	0.42	0.42	0.12	0.23	0.23
Sat Flow, veh/h	3319	3413	3471	3319	3413	1522	4824	4904	1522	3319	4904	1522
Grp Volume(v), veh/h	120	729	879	131	1876	412	2533	2151	115	340	1027	118
Grp Sat Flow(s),veh/h/ln	1659	1706	1157	1659	1706	1522	1608	1635	1522	1659	1635	1522
Q Serve(g_s), s	5.3	38.3	27.5	5.4	49.3	43.7	59.9	80.4	8.5	19.1	38.7	11.8
Cycle Q Clear(g_c), s	5.3	38.3	27.5	5.4	49.3	43.7	59.9	80.4	8.5	19.1	38.7	11.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	92	884	1992	94	884	581	1519	2071	686	407	1136	395
V/C Ratio(X)	1.30	0.82	0.44	1.39	2.12	0.71	1.67	1.04	0.17	0.84	0.90	0.30
Avail Cap(c_a), veh/h	92	884	1992	94	884	581	1519	2071	686	551	1136	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	92.5	66.4	23.1	92.5	70.5	49.9	65.2	55.0	31.1	81.6	71.0	56.5
Incr Delay (d2), s/veh	193.1	8.6	0.7	228.4	508.6	7.2	303.6	30.6	0.5	15.6	11.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	17.6	7.6	5.3	83.7	17.6	66.6	37.8	3.3	8.9	17.2	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	285.6	75.0	23.9	320.8	579.1	57.0	368.8	85.6	31.6	97.2	82.7	58.5
LnGrp LOS	F	E	C	F	F	E	F	F	C	F	F	E
Approach Vol, veh/h		1728			2419			4799			1485	
Approach Delay, s/veh		63.6			476.2			233.8			84.1	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	68.0	52.0	13.0	57.3	31.7	88.3	13.0	57.3
Change Period (Y+Rc), s	* 8.1	* 7.9	* 7.7	* 8	* 8.4	* 7.9	* 7.6	* 8
Max Green Setting (Gmax), s	* 60	* 44	* 5.3	* 49	* 32	* 72	* 5.4	* 49
Max Q Clear Time (g_c+I1), s	61.9	40.7	7.3	51.3	21.1	82.4	7.4	40.3
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	2.3	0.0	0.0	8.3

Intersection Summary	
HCM 6th Ctrl Delay	240.5
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1578	17	52	4226	22	33	4	46	18	4	13
Future Volume (veh/h)	4	1578	17	52	4226	22	33	4	46	18	4	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	4	1661	18	55	4448	23	35	4	48	19	4	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	65	2512	27	82	2514	1121	75	13	61	86	24	42
Arrive On Green	0.04	0.73	0.73	0.05	0.74	0.74	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	1711	3459	37	1711	3413	1522	510	173	841	620	331	579
Grp Volume(v), veh/h	4	819	860	55	4448	23	87	0	0	37	0	0
Grp Sat Flow(s),veh/h/ln	1711	1706	1790	1711	1706	1522	1525	0	0	1530	0	0
Q Serve(g_s), s	0.3	33.3	33.4	4.2	97.2	0.5	4.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	33.3	33.4	4.2	97.2	0.5	7.3	0.0	0.0	2.9	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	0.40		0.55	0.51		0.38
Lane Grp Cap(c), veh/h	65	1239	1300	82	2514	1121	149	0	0	152	0	0
V/C Ratio(X)	0.06	0.66	0.66	0.67	1.77	0.02	0.58	0.00	0.00	0.24	0.00	0.00
Avail Cap(c_a), veh/h	67	1239	1300	210	2514	1121	345	0	0	347	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	61.2	9.5	9.5	61.8	17.4	4.7	60.0	0.0	0.0	58.1	0.0	0.0
Incr Delay (d2), s/veh	1.4	2.8	2.7	29.0	347.9	0.0	3.6	0.0	0.0	0.8	0.0	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	0.2	11.2	11.7	2.4	150.6	0.2	3.0	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.7	12.3	12.2	90.7	365.3	4.7	63.6	0.0	0.0	58.9	0.0	0.0
LnGrp LOS	E	B	B	F	F	A	E	A	A	E	A	A
Approach Vol, veh/h		1683			4526			87			37	
Approach Delay, s/veh		12.4			360.1			63.6			58.9	
Approach LOS		B			F			E			E	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.2	11.8	104.0		16.2	13.2	102.6				
Change Period (Y+Rc), s		* 6.6	6.8	6.8		* 6.6	6.8	6.8				
Max Green Setting (Gmax), s		* 28	5.2	97.2		* 27	16.2	86.2				
Max Q Clear Time (g_c+I1), s		4.9	2.3	99.2		9.3	6.2	35.4				
Green Ext Time (p_c), s		0.1	0.0	0.0		0.4	0.2	47.6				

Intersection Summary	
HCM 6th Ctrl Delay	261.9
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

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

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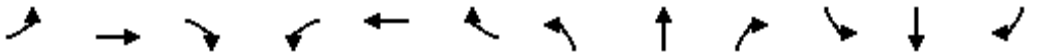

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	111	27	50	34	116	9	1607	77	212	4341	59
Future Volume (veh/h)	80	111	27	50	34	116	9	1607	77	212	4341	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	84	117	28	53	36	122	9	1692	81	223	4569	62
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	164	327	278	206	66	222	18	2406	115	249	3122	969
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.50	0.50	0.15	0.64	0.64
Sat Flow, veh/h	1180	1796	1522	1194	359	1218	1711	4795	229	1711	4904	1522
Grp Volume(v), veh/h	84	117	28	53	0	158	9	1153	620	223	4569	62
Grp Sat Flow(s),veh/h/ln	1180	1796	1522	1194	0	1577	1711	1635	1755	1711	1635	1522
Q Serve(g_s), s	9.0	7.3	2.0	5.2	0.0	11.7	0.7	34.9	35.0	16.5	81.9	2.0
Cycle Q Clear(g_c), s	20.7	7.3	2.0	12.6	0.0	11.7	0.7	34.9	35.0	16.5	81.9	2.0
Prop In Lane	1.00		1.00	1.00		0.77	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	164	327	278	206	0	288	18	1640	881	249	3122	969
V/C Ratio(X)	0.51	0.36	0.10	0.26	0.00	0.55	0.49	0.70	0.70	0.89	1.46	0.06
Avail Cap(c_a), veh/h	272	493	418	320	0	439	78	1640	881	318	3122	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	46.0	43.8	51.5	0.0	47.8	63.3	24.7	24.7	54.0	23.4	8.8
Incr Delay (d2), s/veh	2.5	0.7	0.2	0.7	0.0	1.6	19.0	2.6	4.7	22.2	210.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.4	0.8	1.6	0.0	4.8	0.4	13.1	14.6	8.4	87.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.7	46.7	44.0	52.1	0.0	49.4	82.3	27.2	29.4	76.2	233.7	9.0
LnGrp LOS	E	D	D	D	A	D	F	C	C	E	F	A
Approach Vol, veh/h		229			211			1782			4854	
Approach Delay, s/veh		51.1			50.1			28.2			223.6	
Approach LOS		D			D			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.8	71.6		31.2	8.5	89.0		31.2				
Change Period (Y+Rc), s	7.1	7.1		* 7.7	7.1	7.1		* 7.7				
Max Green Setting (Gmax), s	23.9	63.9		* 35	5.9	81.9		* 36				
Max Q Clear Time (g_c+I1), s	18.5	37.0		22.7	2.7	83.9		14.6				
Green Ext Time (p_c), s	0.3	25.7		0.8	0.0	0.0		1.1				

Intersection Summary	
HCM 6th Ctrl Delay	163.6
HCM 6th LOS	F

Notes

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	1631	2660	188	857	414	702	919	182	411	1764	41
Future Volume (veh/h)	106	1631	2660	188	857	414	702	919	182	411	1764	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	112	1717	2800	198	902	436	739	967	192	433	1857	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	116	876	1582	155	914	642	961	1795	628	510	1580	544
Arrive On Green	0.03	0.26	0.26	0.05	0.27	0.27	0.20	0.37	0.37	0.15	0.32	0.32
Sat Flow, veh/h	3319	3413	3471	3319	3413	1522	4824	4904	1522	3319	4904	1522
Grp Volume(v), veh/h	112	1717	2800	198	902	436	739	967	192	433	1857	43
Grp Sat Flow(s),veh/h/ln	1659	1706	1157	1659	1706	1522	1608	1635	1522	1659	1635	1522
Q Serve(g_s), s	6.1	46.3	46.3	8.4	47.4	41.9	26.1	28.1	15.3	22.9	58.1	3.4
Cycle Q Clear(g_c), s	6.1	46.3	46.3	8.4	47.4	41.9	26.1	28.1	15.3	22.9	58.1	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	876	1582	155	914	642	961	1795	628	510	1580	544
V/C Ratio(X)	0.97	1.96	1.77	1.28	0.99	0.68	0.77	0.54	0.31	0.85	1.18	0.08
Avail Cap(c_a), veh/h	116	876	1582	155	914	642	961	1795	628	637	1580	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	86.9	67.0	49.1	86.0	65.7	42.3	68.3	45.1	35.6	74.3	61.1	38.3
Incr Delay (d2), s/veh	74.2	435.8	348.9	166.5	26.7	5.7	5.9	1.2	1.3	14.2	85.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	72.9	74.1	7.2	23.7	16.5	11.1	11.4	5.9	10.6	36.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	161.1	502.8	397.9	252.5	92.4	48.0	74.2	46.3	36.8	88.5	146.9	38.6
LnGrp LOS	F	F	F	F	F	D	E	D	D	F	F	D
Approach Vol, veh/h		4629			1536			1898			2333	
Approach Delay, s/veh		431.1			100.4			56.2			134.1	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	44.0	66.0	14.0	56.3	36.1	73.9	16.0	54.3
Change Period (Y+Rc), s	* 8.1	* 7.9	* 7.7	* 8	* 8.4	* 7.9	* 7.6	* 8
Max Green Setting (Gmax), s	* 36	* 58	* 6.3	* 48	* 35	* 59	* 8.4	* 46
Max Q Clear Time (g_c+I1), s	28.1	60.1	8.1	49.4	24.9	30.1	10.4	48.3
Green Ext Time (p_c), s	4.0	0.0	0.0	0.0	2.8	22.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	247.1
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	4272	12	20	1568	12	29	4	106	19	4	5
Future Volume (veh/h)	15	4272	12	20	1568	12	29	4	106	19	4	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	16	4497	13	21	1651	13	31	4	112	20	4	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	62	2456	7	62	2401	1071	58	14	131	113	23	19
Arrive On Green	0.04	0.70	0.70	0.04	0.70	0.70	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1711	3491	10	1711	3413	1522	233	126	1152	606	204	169
Grp Volume(v), veh/h	16	2197	2313	21	1651	13	147	0	0	29	0	0
Grp Sat Flow(s),veh/h/ln	1711	1706	1794	1711	1706	1522	1512	0	0	978	0	0
Q Serve(g_s), s	1.3	97.2	97.2	1.7	38.4	0.4	9.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	97.2	97.2	1.7	38.4	0.4	13.1	0.0	0.0	3.4	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	0.21		0.76	0.69		0.17
Lane Grp Cap(c), veh/h	62	1201	1263	62	2401	1071	204	0	0	156	0	0
V/C Ratio(X)	0.26	1.83	1.83	0.34	0.69	0.01	0.72	0.00	0.00	0.19	0.00	0.00
Avail Cap(c_a), veh/h	64	1201	1263	151	2401	1071	329	0	0	271	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	64.8	20.5	20.5	65.0	11.8	6.1	60.0	0.0	0.0	55.5	0.0	0.0
Incr Delay (d2), s/veh	7.8	376.7	377.4	11.3	1.6	0.0	4.8	0.0	0.0	0.6	0.0	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	0.7	157.3	165.7	0.9	13.0	0.1	5.4	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.6	397.2	397.9	76.3	13.4	6.1	64.7	0.0	0.0	56.0	0.0	0.0
LnGrp LOS	E	F	F	E	B	A	E	A	A	E	A	A
Approach Vol, veh/h		4526			1685			147			29	
Approach Delay, s/veh		396.4			14.1			64.7			56.0	
Approach LOS		F			B			E			E	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	22.3	11.8	104.0	22.3	11.8	104.0
Change Period (Y+Rc), s	* 6.6	6.8	6.8	* 6.6	6.8	6.8
Max Green Setting (Gmax), s	* 28	5.2	97.2	* 27	12.2	90.2
Max Q Clear Time (g_c+I1), s	5.4	3.3	40.4	15.1	3.7	99.2
Green Ext Time (p_c), s	0.1	0.0	52.2	0.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	286.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

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

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Appendix E: Synchro Queue Reports

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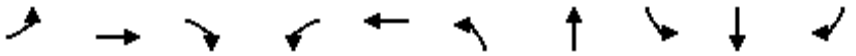

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	27	18	9	71	209	34	3156	34	1263	59
v/c Ratio	0.36	0.08	0.03	0.40	0.78	0.37	0.96	0.45	0.38	0.06
Control Delay	64.9	49.6	0.2	58.3	55.8	73.3	30.8	82.3	10.5	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.9	49.6	0.2	58.3	55.8	73.3	30.8	82.3	10.5	1.0
Queue Length 50th (ft)	21	14	0	56	117	28	898	29	177	0
Queue Length 95th (ft)	53	37	0	106	206	68	#1239	#74	252	9
Internal Link Dist (ft)		1028			3511		3866		3998	
Turn Bay Length (ft)			200	200		290		360		595
Base Capacity (vph)	160	486	472	368	480	103	3273	77	3340	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.04	0.02	0.19	0.44	0.33	0.96	0.44	0.38	0.06

Intersection Summary

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

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	69	424	511	81	1160	255	1731	1471	78	253	764	88
v/c Ratio	0.76	0.49	0.24	0.87	1.33	0.36	1.15	0.71	0.10	0.65	0.68	0.16
Control Delay	133.8	62.1	16.9	150.9	205.6	20.3	133.4	47.6	5.0	87.4	70.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.8	62.1	16.9	150.9	205.6	20.3	133.4	47.6	5.0	87.4	70.1	2.5
Queue Length 50th (ft)	45	238	122	53	~982	113	~898	552	0	158	322	0
Queue Length 95th (ft)	#92	298	150	#112	#1123	182	#986	638	33	205	375	15
Internal Link Dist (ft)		1162			5330			3998			2637	
Turn Bay Length (ft)	430		715	520		330	940		730	680		395
Base Capacity (vph)	91	870	2117	93	875	767	1499	2068	788	544	1125	540
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.49	0.24	0.87	1.33	0.33	1.15	0.71	0.10	0.47	0.68	0.16

Intersection Summary

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Queue shown is maximum after two cycles.

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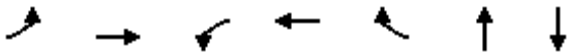

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	3	972	36	2927	16	58	24
v/c Ratio	0.04	0.37	0.24	1.03	0.01	0.48	0.23
Control Delay	62.3	7.7	58.5	39.1	0.0	43.9	47.4
Queue Delay	0.0	0.0	0.0	1.9	0.0	0.0	0.0
Total Delay	62.3	7.7	58.5	40.9	0.0	43.9	47.4
Queue Length 50th (ft)	2	164	28	~1350	0	21	13
Queue Length 95th (ft)	14	246	65	#1754	0	68	43
Internal Link Dist (ft)		2926		1162		665	652
Turn Bay Length (ft)	335		335				
Base Capacity (vph)	70	2596	218	2841	1283	334	329
Starvation Cap Reductn	0	0	0	14	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.37	0.17	1.04	0.01	0.17	0.07

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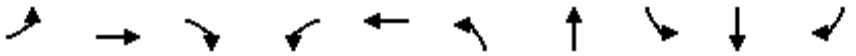

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	55	76	18	53	103	6	1216	144	2944	40
v/c Ratio	0.45	0.42	0.06	0.40	0.43	0.06	0.47	0.62	0.84	0.04
Control Delay	54.5	50.0	0.4	51.4	20.7	48.2	15.6	52.5	14.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	50.0	0.4	51.4	20.7	48.2	15.6	52.5	14.4	0.1
Queue Length 50th (ft)	33	45	0	31	14	4	161	86	355	0
Queue Length 95th (ft)	77	95	0	74	65	18	247	156	#883	0
Internal Link Dist (ft)		1028			3511		3866		3998	
Turn Bay Length (ft)			200	200		290		360		595
Base Capacity (vph)	439	637	640	457	621	118	2593	341	3505	1118
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.12	0.03	0.12	0.17	0.05	0.47	0.42	0.84	0.04

Intersection Summary

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Queue shown is maximum after two cycles.

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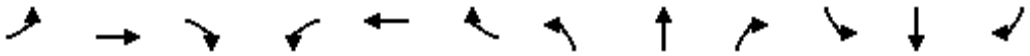

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	997	1624	123	556	269	505	661	131	322	1381	33
v/c Ratio	0.56	1.16	0.95	0.81	0.61	0.37	0.53	0.36	0.18	0.69	0.88	0.05
Control Delay	104.4	140.3	54.9	119.2	61.2	23.3	66.9	41.6	12.3	80.7	65.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.4	140.3	54.9	119.2	61.2	23.3	66.9	41.6	12.3	80.7	65.5	0.2
Queue Length 50th (ft)	39	~728	788	75	305	146	192	206	32	189	569	0
Queue Length 95th (ft)	69	#868	#899	#137	374	209	234	259	83	237	633	0
Internal Link Dist (ft)		1162			5330			3998			2637	
Turn Bay Length (ft)	430		715	520		330	940		730	680		395
Base Capacity (vph)	114	862	1718	152	905	797	948	1830	748	629	1564	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.16	0.95	0.81	0.61	0.34	0.53	0.36	0.18	0.51	0.88	0.05

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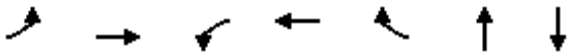

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	11	2607	14	1072	8	96	20
v/c Ratio	0.16	1.00	0.11	0.40	0.01	0.60	0.25
Control Delay	66.9	34.3	58.6	5.6	0.0	38.6	57.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	34.3	58.6	5.6	0.0	38.6	57.4
Queue Length 50th (ft)	8	652	10	88	0	24	13
Queue Length 95th (ft)	31	#1564	35	233	0	85	41
Internal Link Dist (ft)		2926		1162		665	652
Turn Bay Length (ft)	335		335				
Base Capacity (vph)	70	2603	163	2660	1205	370	241
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	1.00	0.09	0.40	0.01	0.26	0.08

Intersection Summary

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Queue shown is maximum after two cycles.

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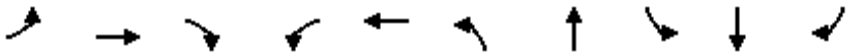

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	34	23	12	87	263	42	3886	42	1580	74
v/c Ratio	0.44	0.08	0.04	0.39	0.82	0.41	1.24	0.57	0.52	0.08
Control Delay	68.4	47.5	0.2	55.1	59.5	76.4	134.3	94.8	16.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.4	47.5	0.2	55.1	59.5	76.4	134.3	94.8	16.2	2.3
Queue Length 50th (ft)	28	18	0	70	168	37	~1601	37	280	0
Queue Length 95th (ft)	65	44	0	123	271	83	#1897	#105	408	19
Internal Link Dist (ft)		1028			3511		3866		3998	
Turn Bay Length (ft)			200	200		290		360		595
Base Capacity (vph)	125	469	457	353	466	124	3141	74	3067	986
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.05	0.03	0.25	0.56	0.34	1.24	0.57	0.52	0.08

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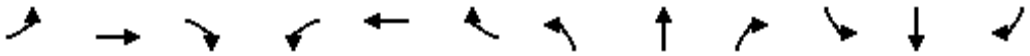

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	96	578	695	106	1517	334	2132	1809	97	296	895	103
v/c Ratio	1.05	0.66	0.33	1.14	1.73	0.46	1.42	0.90	0.13	0.68	0.80	0.19
Control Delay	191.5	67.5	18.1	210.3	373.0	25.3	238.7	59.5	8.5	86.3	74.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.5	67.5	18.1	210.3	373.0	25.3	238.7	59.5	8.5	86.3	74.8	4.5
Queue Length 50th (ft)	~67	344	178	~79	~1467	189	~1266	774	13	185	390	0
Queue Length 95th (ft)	#137	416	211	#153	#1602	269	#1344	#927	53	232	447	32
Internal Link Dist (ft)		1162			5330			3998			2637	
Turn Bay Length (ft)	430		715	520		330	940		730	680		395
Base Capacity (vph)	91	870	2117	93	875	767	1499	2002	768	544	1125	540
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.66	0.33	1.14	1.73	0.44	1.42	0.90	0.13	0.54	0.80	0.19

Intersection Summary

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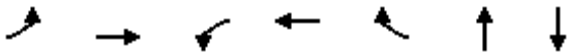
DRAFT



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	3	1328	45	3687	19	71	31
v/c Ratio	0.04	0.54	0.29	1.30	0.01	0.54	0.29
Control Delay	63.0	11.2	59.7	155.4	0.0	45.6	46.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	11.2	59.7	155.4	0.0	45.6	46.2
Queue Length 50th (ft)	2	274	35	~2052	0	26	15
Queue Length 95th (ft)	14	410	78	#2491	0	78	49
Internal Link Dist (ft)		2926		1162		665	652
Turn Bay Length (ft)	335		335				
Base Capacity (vph)	69	2482	215	2831	1278	333	309
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.54	0.21	1.30	0.01	0.21	0.10

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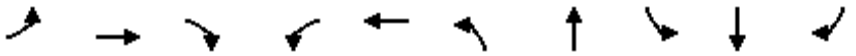
DRAFT



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	69	96	23	53	129	8	1495	183	3760	51
v/c Ratio	0.59	0.51	0.08	0.38	0.49	0.10	0.57	0.71	1.05	0.04
Control Delay	70.2	58.4	0.5	56.4	21.4	58.8	19.2	61.8	45.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	58.4	0.5	56.4	21.4	58.8	19.2	61.8	45.0	0.4
Queue Length 50th (ft)	49	67	0	36	20	6	250	128	~970	0
Queue Length 95th (ft)	104	129	0	81	82	25	381	218	#1468	4
Internal Link Dist (ft)		1028			3511		3866		3998	
Turn Bay Length (ft)			200	200		290		360		595
Base Capacity (vph)	337	549	562	387	561	87	2635	383	3598	1143
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.17	0.04	0.14	0.23	0.09	0.57	0.48	1.05	0.04

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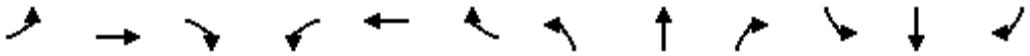


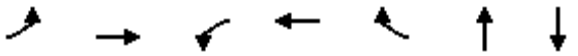
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	1358	2215	160	729	354	622	815	162	377	1619	38
v/c Ratio	0.77	1.58	1.29	1.05	0.81	0.47	0.66	0.47	0.22	0.72	1.04	0.06
Control Delay	123.4	305.4	172.2	165.0	69.5	26.5	70.2	45.8	16.2	79.6	90.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.4	305.4	172.2	165.0	69.5	26.5	70.2	45.8	16.2	79.6	90.5	0.2
Queue Length 50th (ft)	54	~1192	~1453	~105	427	221	243	271	55	221	~749	0
Queue Length 95th (ft)	#105	#1331	#1550	#191	510	297	290	332	116	272	#843	0
Internal Link Dist (ft)		1162			5330			3998			2637	
Turn Bay Length (ft)	430		715	520		330	940		730	680		395
Base Capacity (vph)	114	862	1718	152	905	797	948	1750	725	629	1564	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.58	1.29	1.05	0.81	0.44	0.66	0.47	0.22	0.60	1.04	0.06

Intersection Summary

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

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

DRAFT



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	14	3564	18	1361	11	120	24
v/c Ratio	0.20	1.40	0.14	0.52	0.01	0.66	0.29
Control Delay	70.0	200.5	59.9	7.6	0.0	46.7	56.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.0	200.5	59.9	7.6	0.0	46.7	56.8
Queue Length 50th (ft)	11	~1897	13	151	0	44	15
Queue Length 95th (ft)	38	#2559	42	367	0	116	47
Internal Link Dist (ft)		2926		1162		665	652
Turn Bay Length (ft)	335		335				
Base Capacity (vph)	69	2553	162	2613	1186	364	205
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	1.40	0.11	0.52	0.01	0.33	0.12

Intersection Summary

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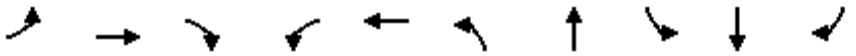
DRAFT



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	41	27	14	105	316	51	4614	51	1898	88
v/c Ratio	0.56	0.08	0.04	0.40	0.87	0.49	1.52	0.72	0.64	0.09
Control Delay	80.9	46.2	0.2	53.8	65.5	82.6	262.4	114.8	21.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.9	46.2	0.2	53.8	65.5	82.6	262.4	114.8	21.0	3.2
Queue Length 50th (ft)	35	21	0	86	227	47	~2241	48	427	0
Queue Length 95th (ft)	82	49	0	146	346	97	#2429	#132	540	27
Internal Link Dist (ft)		1028			3511		3866		3998	
Turn Bay Length (ft)			200	200		290		360		595
Base Capacity (vph)	96	451	444	339	451	120	3027	71	2944	950
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.06	0.03	0.31	0.70	0.42	1.52	0.72	0.64	0.09

Intersection Summary

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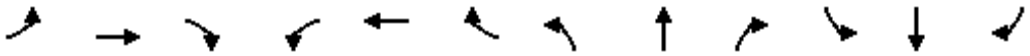
Queue shown is maximum after two cycles.

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

DRAFT



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	120	729	879	131	1876	412	2533	2151	115	340	1027	118
v/c Ratio	1.32	0.84	0.42	1.41	2.14	0.56	1.69	1.10	0.15	0.72	0.91	0.22
Control Delay	264.3	76.6	19.6	293.8	548.9	29.5	350.6	106.3	11.3	86.5	83.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	264.3	76.6	19.6	293.8	548.9	29.5	350.6	106.3	11.3	86.5	83.5	7.1
Queue Length 50th (ft)	~98	458	241	~112	~1956	272	~1634	~1115	26	212	463	0
Queue Length 95th (ft)	#176	543	280	#193	#2080	372	#1698	#1243	71	266	#527	48
Internal Link Dist (ft)		1162			5330			3998			2637	
Turn Bay Length (ft)	430		715	520		330	940		730	680		395
Base Capacity (vph)	91	870	2117	93	875	767	1499	1948	752	544	1125	540
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.84	0.42	1.41	2.14	0.54	1.69	1.10	0.15	0.63	0.91	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
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95th percentile volume exceeds capacity, queue may be longer.
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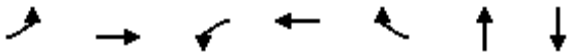

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	4	1679	55	4448	23	87	37
v/c Ratio	0.06	0.72	0.34	1.65	0.02	0.60	0.31
Control Delay	65.0	16.5	61.4	313.1	0.0	53.0	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.0	16.5	61.4	313.1	0.0	53.0	46.3
Queue Length 50th (ft)	3	450	44	~2804	0	42	18
Queue Length 95th (ft)	17	675	91	#3277	0	101	55
Internal Link Dist (ft)		2926		1162		665	652
Turn Bay Length (ft)	335		335				
Base Capacity (vph)	68	2336	211	2696	1221	326	288
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.72	0.26	1.65	0.02	0.27	0.13

Intersection Summary

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

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	84	117	28	53	158	9	1773	223	4569	62
v/c Ratio	0.76	0.53	0.09	0.35	0.53	0.11	0.70	0.79	1.28	0.05
Control Delay	91.8	59.4	0.6	55.1	23.4	62.8	24.5	69.3	149.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.8	59.4	0.6	55.1	23.4	62.8	24.5	69.3	149.8	0.9
Queue Length 50th (ft)	66	89	0	39	33	7	378	169	~1657	0
Queue Length 95th (ft)	127	152	0	82	102	27	509	#293	#2054	9
Internal Link Dist (ft)		1028			3511		3866		3998	
Turn Bay Length (ft)			200	200		290		360		595
Base Capacity (vph)	259	517	537	355	543	82	2541	332	3560	1131
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.23	0.05	0.15	0.29	0.11	0.70	0.67	1.28	0.05

Intersection Summary

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1717	2800	198	902	436	739	967	192	433	1857	43
v/c Ratio	0.98	1.99	1.63	1.30	1.00	0.57	0.78	0.57	0.27	0.76	1.19	0.07
Control Delay	162.3	482.4	317.3	236.1	93.6	29.4	74.9	50.1	19.8	79.8	142.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	162.3	482.4	317.3	236.1	93.6	29.4	74.9	50.1	19.8	79.8	142.2	0.2
Queue Length 50th (ft)	69	~1654	~2081	~153	565	297	297	346	81	253	~962	0
Queue Length 95th (ft)	#143	#1787	#2156	#246	#718	402	349	404	149	313	#1052	1
Internal Link Dist (ft)		1162			5330			3998			2637	
Turn Bay Length (ft)	430		715	520		330	940		730	680		395
Base Capacity (vph)	114	862	1718	152	905	797	948	1682	705	629	1564	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	1.99	1.63	1.30	1.00	0.55	0.78	0.57	0.27	0.69	1.19	0.07

Intersection Summary

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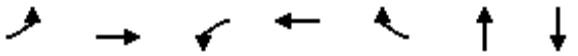

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	16	4510	21	1651	13	147	29
v/c Ratio	0.24	1.86	0.16	0.64	0.01	0.73	0.32
Control Delay	74.2	407.4	62.7	10.4	0.0	53.4	56.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	407.4	62.7	10.4	0.0	53.4	56.8
Queue Length 50th (ft)	14	~3197	17	244	0	72	20
Queue Length 95th (ft)	42	#3585	48	568	0	150	53
Internal Link Dist (ft)		2926		1162		665	652
Turn Bay Length (ft)	335		335				
Base Capacity (vph)	67	2428	157	2575	1169	355	185
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	1.86	0.13	0.64	0.01	0.41	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
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Appendix F: Signal Four Analytics Crash Data

Provided as a separate attachment

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Appendix G: Train Related Crash Data

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **040012020**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **040012020**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**04/13/00**	**09:05 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
TAMPA	**FLORIDA BU**	**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)* **TAMPA** | 12. Highway Name or No. **SR 45. HWY 41** | ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **A**

14. Vehicle Speed *(est. mph at impact)*: **5**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **1**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **0**

20c. State the name and quantity of the hazardous material released, if any: **0**

21. Temperature *(specify if minus)*: **73** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **4**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **MAIN**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code	31. Time Table Direction	Code
1	**2**	**25**	R. Recorded / E. Estimated **7** mph	**E**	1. North 2. South 3. East 4. West	**1**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None

Code(s): **01** **02** **03** **06**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code: **2**

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **1**

38. Driver's Age: **21**

39. Driver's Gender — 1. Male, 2. Female — Code: **1**

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **1**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **1**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**2**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **2**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$2,000**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **2**

50. Total Number of People on Train *(include passengers and crew)*: **3**

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

VEHICLE WENT AROUND WORKING CROSSING GATES AND WAS STRUCK BY TRAIN SHOVIN INTO ROCKPORT.

55. Typed Name and Title	56. Signature	57. Date

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FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **119012040**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **119012040**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**11/27/90**	**12:50 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12** / **FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**HIGHWAY 41**	☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **H**

14. Vehicle Speed *(est. mph at impact)*: **40**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **2**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **1**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **1**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)*	23. Weather *(single entry)*
80 °F	1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **3**

26. Track Number or Name: **LEAD RKPT YARD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code	31. Time Table Direction	Code
1	**3**	**96**	R. Recorded / E. Estimated **5** mph	**E**	1. North 2. South 3. East 4. West	**2**

32. Type of Crossing Warning	33. Signaled Crossing Warning	34. Whistle Ban	Code
1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None	**20 sec warn min (1);**	1. Yes 2. No 3. Unknown	
Code(s): **01** **02**			

35. Location of Warning	Code	36. Crossing Warning Interconnected with Highway Signals	Code	37. Crossing Illuminated by Street Lights or Special Lights	Code
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	**1**	1. Yes 2. No 3. Unknown	**2**	1. Yes 2. No 3. Unknown	**1**

38. Driver's Age	39. Driver's Gender	Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train	Code	41. Driver	Code
	1. Male 2. Female		1. Yes 2. No 3. Unknown	**2**	1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)*	**1**

42. Driver Passed Standing Highway Vehicle	Code	43. View of Track Obscured by *(primary obstruction)*	Code
1. Yes 2. No 3. Unknown	**3**	1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed	**8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was	Code	45. Was Driver in the Vehicle?	Code
1. Killed 2. Injured 3. Uninjured	**3**	1. Yes 2. No	**1**

47. Highway Vehicle Property Damage *(est. dollar damage)*	48. Total Number of Highway-Rail Crossing Users *(include driver)*
$1,750	**1**

50. Total Number of People on Train *(include passengers and crew)*	51. Is a Rail Equipment Accident / Incident Report Being Filed	Code
	1. Yes 2. No	**2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **098912008**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **098912008**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**09/06/89**	**05:35 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12** / **FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**HWY 41**	☑ Public ☐ Private

Highway User Involved

13. Type — Code: **B**
A. Auto; B. Truck; C. Truck-trailer; D. Pick-up truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(specify)*

14. Vehicle Speed *(est. mph at impact)*: **10**

15. Direction *(geographical)* — Code: **1**
1. North 2. South 3. East 4. West

16. Position — Code: **3**
1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: **4**
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

17. Equipment — Code: **2**
1. Train *(units pulling)*; 2. Train *(units pushing)*; 3. Train *(standing)*; 4. Car(s) *(moving)*; 5. Car(s) *(standing)*; 6. Light loco(s) *(moving)*; 7. Light loco(s) *(standing)*; 8. Other *(specify)*
A. Train pulling- RCL; B. Train pushing- RCL; C. Train standing- RCL

18. Position of Car Unit in Train: **1**

19. Circumstance — Code: **2**
1. Rail equipment struck highway user 2. Rail equipment struck by highway user

20b. Was there a hazardous materials release by — Code:
1. Highway User 2. Rail Equipment 3. Both 4. Neither

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)* — Code	23. Weather *(single entry)* — Code
78 °F	1. Dawn 2. Day 3. Dusk 4. Dark — **4**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — **1**

24. Type of Equipment Consist *(single entry)* — Code: **7**
1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/Switching 8. Light loco(s) 9. Main./inspect. car A. Spec. MoW Equip.

25. Track Type Used by Rail Equipment Involved — Code: **2**
1. Main 2. Yard 3. Siding 4. Industry

26. Track Number or Name: **LEAD FROM ROCKPORT**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)* — Code	31. Time Table Direction — Code
2	**3**	**55**	R. Recorded / E. Estimated **3** mph **E**	1. North 2. South 3. East 4. West — **2**

32. Type of Crossing Warning — Code(s): **01**
1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — Code:
1. Yes 2. No 3. Unknown

35. Location of Warning — Code	36. Crossing Warning Interconnected with Highway Signals — Code	37. Crossing Illuminated by Street Lights or Special Lights — Code
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — **1**	1. Yes 2. No 3. Unknown — **2**	1. Yes 2. No 3. Unknown — **2**

38. Driver's Age	39. Driver's Gender — Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code	41. Driver — Code
	1. Male 2. Female	1. Yes 2. No 3. Unknown — **2**	1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)* — **1**

42. Driver Passed Standing Highway Vehicle — Code	43. View of Track Obscured by *(primary obstruction)* — Code
1. Yes 2. No 3. Unknown — **2**	1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed — **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — Code	45. Was Driver in the Vehicle? — Code
1. Killed 2. Injured 3. Uninjured — **3**	1. Yes 2. No — **1**
47. Highway Vehicle Property Damage *(est. dollar damage)*: **$6,000**	48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**
50. Total Number of People on Train *(include passengers and crew)*	51. Is a Rail Equipment Accident / Incident Report Being Filed — Code: **2** (1. Yes 2. No)

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **108812009**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **108812009**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**10/06/88**	**10:45 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
SUTTON		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**U S HWY 41**	☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **C**

14. Vehicle Speed *(est. mph at impact)*: **3**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **2**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **80** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **ROCKPORT**

27. FRA Track Class: **2**

28. Number of Locomotive Units: **2**

29. Number of Cars: **25**

30. Consist Speed *(Recorded if available)* — R. Recorded, E. Estimated: **3** mph — Code: **E**

31. Time Table Direction — 1. North 2. South 3. East 4. West — Code: **2**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None — Code(s): **01** **02** **10**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **2**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **2**

38. Driver's Age:

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **1**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **3**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$0**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title

56. Signature

57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **CSX Transportation [CSX]**	1a. **CSX**	1b. **108812005**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **CSX Transportation [CSX]**	3a. **CSX**	3b. **108812005**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**10/02/88**	**06:34 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
ROCKPORT		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)* **TAMPA**
12. Highway Name or No. **U S HIGHWAY 41** ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **A**

14. Vehicle Speed *(est. mph at impact)*: **3**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **1**

18. Position of Car Unit in Train: **80**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **72** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **4**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **ROCKPORT**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code
2	**3**	**127**	R. Recorded / E. Estimated **5** mph	**E**

31. Time Table Direction — 1. North 2. South 3. East 4. West — Code: **1**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None

Code(s): **01** **02** **07**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **1**

38. Driver's Age

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **1**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$2,000**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title

56. Signature

57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **128108481**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **Seaboard Coast Line Railroad [SCL]**	3a. **SCL**	3b. **128108481**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**12/04/81**	**09:15 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12 / FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**US 41**	☑ Public ☐ Private

Highway User Involved

13. Type — Code: **A**
A. Auto; B. Truck; C. Truck-trailer; D. Pick-up truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(specify)*

14. Vehicle Speed *(est. mph at impact)*: **10**

15. Direction *(geographical)* — Code: **1**
1. North 2. South 3. East 4. West

16. Position — Code: **3**
1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: **4**
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

17. Equipment — Code: **2**
1. Train *(units pulling)*; 2. Train *(units pushing)*; 3. Train *(standing)*; 4. Car(s) *(moving)*; 5. Car(s) *(standing)*; 6. Light loco(s) *(moving)*; 7. Light loco(s) *(standing)*; 8. Other *(specify)*
A. Train pulling- RCL; B. Train pushing- RCL; C. Train standing- RCL

18. Position of Car Unit in Train: **27**

19. Circumstance — Code: **2**
1. Rail equipment struck highway user 2. Rail equipment struck by highway user

20b. Was there a hazardous materials release by — Code:
1. Highway User 2. Rail Equipment 3. Both 4. Neither

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)* — Code	23. Weather *(single entry)* — Code
80 °F	1. Dawn 2. Day 3. Dusk 4. Dark — **2**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — **1**

24. Type of Equipment Consist *(single entry)* — Code: **1**
1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/Switching; 8. Light loco(s); 9. Main./inspect. car; A. Spec. MoW Equip.

25. Track Type Used by Rail Equipment Involved — Code: **2**
1. Main 2. Yard 3. Siding 4. Industry

26. Track Number or Name: **EAST LEAD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)* — Code	31. Time Table Direction — Code
2	**2**	**107**	R. Recorded / E. Estimated **10** mph **E**	1. North 2. South 3. East 4. West — **1**

32. Type of Crossing Warning	33. Signaled Crossing Warning	34. Whistle Ban — Code
1. Gates; 2. Cantilever FLS; 3. Standard FLS; 4. Wig wags; 5. Hwy. traffic signals; 6. Audible; 7. Crossbucks; 8. Stop signs; 9. Watchman; 10. Flagged by crew; 11. Other *(specify)*; 12. None	**20 sec warn min (1);**	1. Yes 2. No 3. Unknown
Code(s): **02**		

35. Location of Warning — Code	36. Crossing Warning Interconnected with Highway Signals — Code	37. Crossing Illuminated by Street Lights or Special Lights — Code
1. Both Sides; 2. Side of Vehicle Approach; 3. Opposite Side of Vehicle Approach — **1**	1. Yes 2. No 3. Unknown — **2**	1. Yes 2. No 3. Unknown — **2**

38. Driver's Age	39. Driver's Gender — Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code	41. Driver — Code
	1. Male; 2. Female	1. Yes 2. No 3. Unknown — **2**	1. Drove around or thru the gate; 2. Stopped and then proceeded; 3. Did not stop; 4. Stopped on crossing; 5. Other *(specify)* — **3**

42. Driver Passed Standing Highway Vehicle — Code	43. View of Track Obscured by *(primary obstruction)* — Code
1. Yes 2. No 3. Unknown — **2**	1. Permanent Structure; 2. Standing railroad equipment; 3. Passing Train; 4. Topography; 5. Vegetation; 6. Highway Vehicles; 7. Other *(specify)*; 8. Not Obstructed — **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — Code	45. Was Driver in the Vehicle? — Code
1. Killed 2. Injured 3. Uninjured — **3**	1. Yes 2. No — **1**
47. Highway Vehicle Property Damage *(est. dollar damage)*: **$23,000**	**48. Total Number of Highway-Rail Crossing Users** *(include driver)*: **1**
50. Total Number of People on Train *(include passengers and crew)*	**51. Is a Rail Equipment Accident / Incident Report Being Filed** — Code: **2** (1. Yes 2. No)

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **048008409**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **Seaboard Coast Line Railroad [SCL]**	3a. **SCL**	3b. **048008409**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**04/25/80**	**02:25 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
SUTTON		**HILLSBOROUGH**	**12 / FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**US 41**	☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto; B. Truck; C. Truck-trailer; D. Pick-up truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(specify)* — Code: **C**

14. Vehicle Speed *(est. mph at impact)*: **0**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped — Code: **2**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*; 2. Train *(units pushing)*; 3. Train *(standing)*; 4. Car(s) *(moving)*; 5. Car(s) *(standing)*; 6. Light loco(s) *(moving)*; 7. Light loco(s) *(standing)*; 8. Other *(specify)*; A. Train pulling- RCL; B. Train pushing- RCL; C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **1**

19. Circumstance — 1. Rail equipment struck highway user 2. Rail equipment struck by highway user — Code: **1**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)*	23. Weather *(single entry)*
80 °F	1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**	1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/Switching 8. Light loco(s) 9. Main./inspect. car A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **2**

26. Track Number or Name: **STEM OF WYE**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	31. Time Table Direction
1	**2**	**102**	R. Recorded / E. Estimated **3** mph **E** — Code:	1. North 2. South 3. East 4. West — Code: **2**

32. Type of Crossing Warning — 1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None — Code(s): **01**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **2**

38. Driver's Age

39. Driver's Gender — 1. Male 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)* — Code: **4**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$600**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block

53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **047808403**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance: **Seaboard Coast Line Railroad [SCL]**	3a. **SCL**	3b. **047808403**

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**04/05/78**	**06:30 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr. / Code
ROCKPORT		**HILLSBOROUGH**	**12 / FL**

11. City *(if in a city)* **TAMPA** | 12. Highway Name or No. **US 41** | ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **A**

14. Vehicle Speed *(est. mph at impact)*: **1**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **1**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **1**

18. Position of Car Unit in Train: **15**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **80** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **3**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **1**

26. Track Number or Name: **MAIN LINE**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code
2	**3**	**102**	R. Recorded / E. Estimated **4** mph	**E**

31. Time Table Direction — 1. North 2. South 3. East 4. West — Code: **2**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None — Code(s): **02**

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code: **2**

38. Driver's Age

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **2**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$500**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title | 56. Signature | 57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **1830807225**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance	3a.	3b.

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**08/11/76**	**09:05 PM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
ROCKPORT		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)*	12. Highway Name or No.	
TAMPA	**US 41**	☑ Public ☐ Private

Highway User Involved

13. Type (A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)*)	Code
	A

14. Vehicle Speed *(est. mph at impact)*	15. Direction *(geographical)* (1. North 2. South 3. East 4. West)	Code
1	**1**	**1**

16. Position (1. Stalled on crossing 2. Stopped on Crossing 3. Moving over crossing 4. Trapped)	Code
	3

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? (1. Highway User 2. Rail Equipment 3. Both 4. Neither)	Code
	4

Rail Equipment Involved

17. Equipment (1. Train *(units pulling)* 2. Train *(units pushing)* 3. Train *(standing)* 4. Car(s) *(moving)* 5. Car(s) *(standing)* 6. Light loco(s) *(moving)* 7. Light loco(s) *(standing)* 8. Other *(specify)* A. Train pulling- RCL B. Train pushing- RCL C. Train standing- RCL)	Code
	1

18. Position of Car Unit in Train
1

19. Circumstance (1. Rail equipment struck highway user 2. Rail equipment struck by highway user)	Code
	2

20b. Was there a hazardous materials release by (1. Highway User 2. Rail Equipment 3. Both 4. Neither)	Code

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*	22. Visibility *(single entry)* (1. Dawn 2. Day 3. Dusk 4. Dark)	Code	23. Weather *(single entry)* (1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow)	Code
73 °F		**4**		**1**

24. Type of Equipment Consist *(single entry)* (1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/Switching 8. Light loco(s) 9. Main./inspect. car A. Spec. MoW Equip.)	Code	25. Track Type Used by Rail Equipment Involved (1. Main 2. Yard 3. Siding 4. Industry)	Code	26. Track Number or Name
	1		**4**	**INDUSTRIAL LEAD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)* R. Recorded E. Estimated	Code	31. Time Table Direction (1. North 2. South 3. East 4. West)	Code
2	**2**	**1**	**5** mph	**E**		**1**

32. Type of Crossing Warning (1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig wags 5. Hwy. traffic signals 6. Audible 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other *(specify)* 12. None)		33. Signaled Crossing Warning	34. Whistle Ban (1. Yes 2. No 3. Unknown)	Code
Code(s)	**03**	**20 sec warn min (1);**		

35. Location of Warning (1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach)	Code	36. Crossing Warning Interconnected with Highway Signals (1. Yes 2. No 3. Unknown)	Code	37. Crossing Illuminated by Street Lights or Special Lights (1. Yes 2. No 3. Unknown)	Code
	1		**1**		**2**

38. Driver's Age	39. Driver's Gender (1. Male 2. Female)	Code	40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train (1. Yes 2. No 3. Unknown)	Code	41. Driver (1. Drove around or thru the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing 5. Other *(specify)*)	Code
			2			**2**

42. Driver Passed Standing Highway Vehicle (1. Yes 2. No 3. Unknown)	Code	43. View of Track Obscured by *(primary obstruction)* (1. Permanent Structure 2. Standing railroad equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicles 7. Other *(specify)* 8. Not Obstructed)	Code
	2		**8**

Casualties to:	Killed	Injured	44. Driver was (1. Killed 2. Injured 3. Uninjured)	Code	45. Was Driver in the Vehicle? (1. Yes 2. No)	Code
				3		**1**
46. Highway-Rail Crossing Users	**0**	**0**	47. Highway Vehicle Property Damage *(est. dollar damage)*	**$400**	48. Total Number of Highway-Rail Crossing Users *(include driver)*	**2**
49. Railroad Employees	**0**	**0**	50. Total Number of People on Train *(include passengers and crew)*		51. Is a Rail Equipment Accident / Incident Report Being Filed (1. Yes 2. No)	Code
52. Passengers on Train	**0**	**0**				**2**

53a. Special Study Block	53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

HIGHWAY-RAIL GRADE CROSSING ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of	Alphabetic Code	RR Accident/Incident No.
1. Reporting Railroad: **Seaboard Coast Line Railroad [SCL]**	1a. **SCL**	1b. **1830206803**
2. Other Railroad Involved in Train Accident/Incident	2a.	2b.
3. Railroad Responsible for Track Maintenance	3a.	3b.

4. U.S. DOT-AAR Grade Crossing ID No.	5. Date of Accident/Incident	6. Time of Accident/Incident
624802A	**02/09/76**	**10:00 AM**

7. Nearest Railroad Station	8. Division	9. County	10. State Abbr.	Code
ROCKPORT		**HILLSBOROUGH**	**12**	**FL**

11. City *(if in a city)* **ROCKPORT** | 12. Highway Name or No. **US 41** | ☑ Public ☐ Private

Highway User Involved

13. Type — A. Auto, B. Truck, C. Truck-trailer, D. Pick-up truck, E. Van, F. Bus, G. School Bus, H. Motorcycle, J. Other Motor Vehicle, K. Pedestrian, M. Other *(specify)* — Code: **B**

14. Vehicle Speed *(est. mph at impact)*: **30**

15. Direction *(geographical)* — 1. North 2. South 3. East 4. West — Code: **4**

16. Position — 1. Stalled on crossing, 2. Stopped on Crossing, 3. Moving over crossing, 4. Trapped — Code: **3**

20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: **4**

Rail Equipment Involved

17. Equipment — 1. Train *(units pulling)*, 2. Train *(units pushing)*, 3. Train *(standing)*, 4. Car(s) *(moving)*, 5. Car(s) *(standing)*, 6. Light loco(s) *(moving)*, 7. Light loco(s) *(standing)*, 8. Other *(specify)*, A. Train pulling- RCL, B. Train pushing- RCL, C. Train standing- RCL — Code: **2**

18. Position of Car Unit in Train: **3**

19. Circumstance — 1. Rail equipment struck highway user, 2. Rail equipment struck by highway user — Code: **2**

20b. Was there a hazardous materials release by — 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code:

20c. State the name and quantity of the hazardous material released, if any

21. Temperature *(specify if minus)*: **70** °F

22. Visibility *(single entry)* — 1. Dawn 2. Day 3. Dusk 4. Dark — Code: **2**

23. Weather *(single entry)* — 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow — Code: **1**

24. Type of Equipment Consist *(single entry)* — 1. Freight train, 2. Passenger train, 3. Commuter train, 4. Work train, 5. Single car, 6. Cut of cars, 7. Yard/Switching, 8. Light loco(s), 9. Main./inspect. car, A. Spec. MoW Equip. — Code: **1**

25. Track Type Used by Rail Equipment Involved — 1. Main 2. Yard 3. Siding 4. Industry — Code: **2**

26. Track Number or Name: **YARD LEAD**

27. FRA Track Class	28. Number of Locomotive Units	29. Number of Cars	30. Consist Speed *(Recorded if available)*	Code	31. Time Table Direction	Code
4	**2**	**50**	R. Recorded / E. Estimated **5** mph	**E**	1. North 2. South 3. East 4. West	**2**

32. Type of Crossing Warning — 1. Gates, 2. Cantilever FLS, 3. Standard FLS, 4. Wig wags, 5. Hwy. traffic signals, 6. Audible, 7. Crossbucks, 8. Stop signs, 9. Watchman, 10. Flagged by crew, 11. Other *(specify)*, 12. None

Code(s)							
	03	**10**	**03**	**10**			

33. Signaled Crossing Warning: **20 sec warn min (1);**

34. Whistle Ban — 1. Yes 2. No 3. Unknown — Code:

35. Location of Warning — 1. Both Sides, 2. Side of Vehicle Approach, 3. Opposite Side of Vehicle Approach — Code: **1**

36. Crossing Warning Interconnected with Highway Signals — 1. Yes 2. No 3. Unknown — Code: **2**

37. Crossing Illuminated by Street Lights or Special Lights — 1. Yes 2. No 3. Unknown — Code:

38. Driver's Age

39. Driver's Gender — 1. Male, 2. Female — Code:

40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — 1. Yes 2. No 3. Unknown — Code: **2**

41. Driver — 1. Drove around or thru the gate, 2. Stopped and then proceeded, 3. Did not stop, 4. Stopped on crossing, 5. Other *(specify)* — Code: **3**

42. Driver Passed Standing Highway Vehicle — 1. Yes 2. No 3. Unknown — Code: **2**

43. View of Track Obscured by *(primary obstruction)* — 1. Permanent Structure, 2. Standing railroad equipment, 3. Passing Train, 4. Topography, 5. Vegetation, 6. Highway Vehicles, 7. Other *(specify)*, 8. Not Obstructed — Code: **8**

Casualties to:	Killed	Injured
46. Highway-Rail Crossing Users	**0**	**0**
49. Railroad Employees	**0**	**0**
52. Passengers on Train	**0**	**0**

44. Driver was — 1. Killed 2. Injured 3. Uninjured — Code: **3**

45. Was Driver in the Vehicle? — 1. Yes 2. No — Code: **1**

47. Highway Vehicle Property Damage *(est. dollar damage)*: **$500**

48. Total Number of Highway-Rail Crossing Users *(include driver)*: **1**

50. Total Number of People on Train *(include passengers and crew)*:

51. Is a Rail Equipment Accident / Incident Report Being Filed — 1. Yes 2. No — Code: **2**

53a. Special Study Block | 53b. Special Study Block

54. Narrative Description

55. Typed Name and Title	56. Signature	57. Date

DRAFT

FORM FRA F 6180.57

* NOTE THAT ALL CASUALTIES MUST BE REPORTED ON FORM FRA F 6180.55A