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S Acadian Thruway/Perkins Road IMR Data Collection Report

Introduction

This Data Collection Report (DCR) details the data collection for the Interchange Modification Report (IMR) for the South Acadian Thruway (Acadian) and Perkins Road (Perkins) interchanges at Interstate 10 (I-10) in East Baton Rouge Parish, Louisiana. This IMR was conducted as a part of the I-10 LA 415 to Essen Stage 1 Environmental Assessment (Stage 1) project (S.P. H.004100.2). The overall project is to add a lane in both directions to the I-10 mainline with interchange improvements at locations selected in the Stage 0 Feasibility Study (Stage 0).

A high-level interchange analysis (Tier 1) was completed during the Stage 0 Study which determined feasible interchange alternatives. As a result, the only alternative moving forward for further analysis for the Perkins location is the removal of the interchange. The alternatives for the Acadian interchange moving forward from the Tier 1 analysis are a diamond interchange, a single-point urban interchange (SPUI), and a diverging diamond interchange (DDI). Documentation from the Tier 1 is included in **DCR Appendix A**.

The study limits for this IMR are listed below:

- I-10 EB and WB – 1000 feet west of the interchange at I-10 and Perkins Road to 1000 feet east of the interchange at I-10 and Acadian Thruway, measured from the gore
- Acadian Thruway – from Perkins Road to Bawell Street
- Perkins Road – the existing intersection with I-10 ramps to Acadian Thruway

The purpose and need of the interchange modifications is “to increase interchange spacing and improve the geometry of entrance ramps.” **DCR Figure 1** presents the study area.



DCR Figure 1: Vicinity Map
Aerial Source: Google Earth

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Existing Conditions

The existing lane configuration of I-10 in the study area is six lanes west of the Acadian interchange and eight lanes to the east. The distance between the Perkins Road and Acadian Thruway interchanges is approximately 2,400 feet. The Perkins Road interchange provides a signalized I-10 eastbound off-ramp and an I-10 westbound on-ramp only. The Acadian Thruway interchange is a tight diamond with signalized ramp terminals. Both interchange ramp terminals are within 500 feet of the nearest traffic signal and less than a quarter mile from the Perkins Road at Acadian Thruway / Stanford Avenue signalized intersection.

Existing Volumes

Count data including 7-day 24-hour, 48-hour, and peak period turning movement counts was collected in October and November 2017 and provided by LADOTD. The peak hours based on the signalized intersections and mainline volume data were 7:00-8:00 AM and 4:45-5:45 PM. The raw count data is included in **DCR Appendix B. DCR Figure 2** presents the resulting 2017 peak hour volumes including the data sources. The specific peak volume data used is presented in **DCR Appendix C**.

The data collected included vehicle classification which is needed for capacity analysis. **DCR Table 1** presents the heavy vehicle percentages for the study area. The heavy vehicle data used is also presented in **DCR Appendix C**.

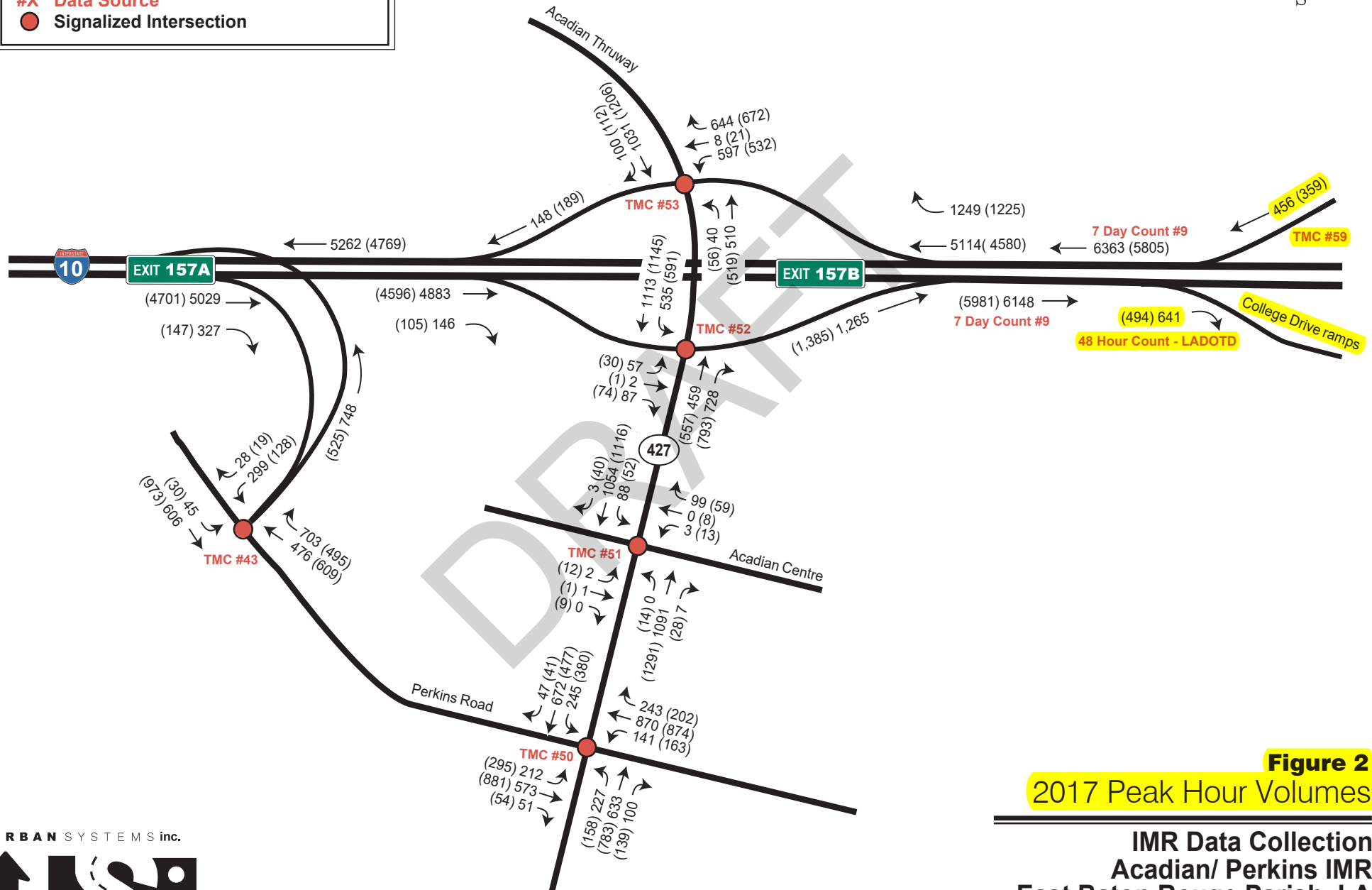
LEGEND:**X** AM Peak Hour Volume (7:00 - 8:00 AM)**(X)** PM Peak Hour Volume (4:45 - 5:45 PM)**#X** Data Source**●** Signalized Intersection

Figure 2
2017 Peak Hour Volumes

IMR Data Collection
Acadian/ Perkins IMR
East Baton Rouge Parish, LA

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DCR Table 1. - Heavy Vehicle Percentages

Intersection	Approach	Movement	Heavy Vehicle %	
			Base Conditions	
			AM	PM
I-10 EB	Eastbound	Thru	13.0%	11.0%
I-10 WB	Westbound	Thru	6.0%	8.0%
I-10 EB at Perkins Rd	Southbound	Left	2.0%	0.0%
		Thru	0.0%	0.0%
		Right	7.1%	0.0%
	Eastbound	Left	0.0%	2.6%
		Thru	1.0%	0.6%
	Westbound	Thru	2.1%	0.8%
		Right	2.0%	2.0%
Acadian at Perkins	Northbound	Left	3.8%	1.3%
		Thru	1.1%	0.8%
		Right	0.0%	0.0%
	Southbound	Left	2.3%	0.8%
		Thru	0.4%	0.2%
		Right	1.5%	0.0%
	Eastbound	Left	1.0%	0.0%
		Thru	0.4%	0.2%
		Right	4.5%	0.0%
	Westbound	Left	0.7%	0.0%
		Thru	2.0%	0.9%
		Right	3.2%	0.9%
Acadian at Acadian Centre	Northbound	Left	0.0%	0.0%
		Thru	1.5%	0.6%
		Right	14.3%	0.0%
	Southbound	Left	0.0%	0.0%
		Thru	0.8%	0.7%
		Right	25.0%	0.0%
	Eastbound	Left	50.0%	0.0%
		Thru	0.0%	0.0%
		Right	0.0%	0.0%
	Westbound	Left	0.0%	0.0%
		Thru	100.0%	0.0%
		Right	0.0%	1.7%
I-10 EB at Acadian	Northbound	Thru	3.7%	1.1%
		Right	0.1%	0.5%
	Southbound	Left	1.3%	0.5%
		Thru	0.9%	0.7%
	Eastbound	Left	0.0%	6.6%
		Thru	0.0%	0.0%
		Right	0.0%	1.2%

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DCR Table 1. - Heavy Vehicle Percentages (continued)

Intersection	Approach	Movement	Heavy Vehicle %	
			Base Conditions	
			AM	PM
I-10 WB at Acadian	Northbound	Left	7.9%	1.7%
		Thru	1.8%	1.4%
	Southbound	Thru	1.4%	0.5%
		Right	1.1%	0.7%
	Westbound	Left	0.6%	0.2%
		Thru	0.0%	0.0%
		Right	1.6%	0.4%
I-10 EB at College Off Ramp	Data not available			
I-10 WB at College On Ramp	Westbound on ramp	Southbound Left	1.6%	0.0%
		Northbound Right	0.8%	0.0%

Growth Rate

The Capitol Region Planning Commission's (CRPC) regional transportation model in TransCAD was used to estimate projected future growth in the study area. Output from the 2010 base condition and the 2037 no build condition models was used to calculate growth percentages for the I-10 mainline and surface streets within the study area based on the Average Daily Traffic (ADT) volumes. The growth rate factors are shown in **DCR Table 2**. The TransCAD output sheets and growth rate calculations are included in **DCR Appendix D**.

DCR Table 2 – Growth Rate Factor

Location	Percent Growth Rate per year	2017 - 2040
		Growth Factor over 23 years
I-10 Mainline	0.93%	1.24
Perkins Road	0.44%	1.11
Acadian Thruway	0.16%	1.04
College Drive	0.30%	1.07

Safety Analysis

A safety analysis was conducted of the crash history on the I-10 mainline to compare to similar roadway types in the state. The safety analysis included calculating the crash rate, presenting a summary of all crash types, comparing this data to the LADOTD statewide averages, and identifying conflict points.

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Crash Rate

Crash data on the I-10 mainline in the study area was used with the LADOTD Roadway Safety Triage to calculate crash rate and crash type percentages and is included in **DCR Appendix E**.

This section of I-10 varies between a six-lane and an eight-lane divided cross-section. LADOTD statewide averages are provided for four-lane and six-lane urban interstates; therefore, the statewide crash rate for a six-lane section was used for comparison to both sections. The statewide average crash rate for an urban six-lane interstate was 1.66 crashes per million vehicle-miles (MVM). **DCR Table 3** presents the crash rate calculation variables and result compared to the statewide average. As shown, the existing crash rate is above the statewide average for the six-lane segment.

DCR Table 3 – Interstate Mainline Crash Rate

Segment	Description	Number of Lanes	Number of Crashes	Segment Length (Miles)	AADT (Veh/Day)	Crash Rate (Crash/Million Veh-Miles) (R_{seg})	Statewide Average
1	1000' west of Perkins ramps to Acadian EB on/WB off ramp gores	6	453	0.99	153,500	2.71	1.66
2	Acadian EB on/WB off ramp gores to 1000' east on I-10	8	42	0.25	153,500	1.00	1.66

Mainline Crash Types

Crash type percentages were calculated using a three-year average (2013-2015) of the reported crash data. The data included corrections to the crash summaries that were made during the detailed crash report review process. **DCR Table 4 and Table 5** presents the crash type percentages and corresponding comparison to the statewide averages for a six-lane urban interstate segment. The highlights indicate the crash types that were above the statewide average.

**DCR Table 4 – Crash Type Comparison
I-10 in vicinity of Perkins and Acadian – Segment 1**

Crash Type	Study Area	Statewide Average
A: Non-collision w/ Motor Vehicle	9.93%	9.72%
B: Rear-end	70.86%	61.98%
C: Head-on	0.00%	0.12%
D: Right angle	0.00%	1.41%
E: Left Turn Angle	0.00%	0.12%
F: Left Turn Opp Dir	0.00%	0.12%
G: Left Turn Same Dir	0.00%	0.18%
H: Right Same Dir	0.00%	0.06%
I: Right turn Opp Dir	0.00%	0.00%
J: Side Swipe Same Dir	18.76%	22.85%
K: Side Swipe Opp Dir	0.00%	0.18%
Z: Other	0.44%	3.22%

**DCR Table 5 – Crash Type Comparison
I-10 in vicinity of Perkins and Acadian – Segment 2**

Crash Type	Study Area	Statewide Average
A: Non-collision w/ Motor Vehicle	21.43%	9.72%
B: Rear-end	54.76%	61.98%
C: Head-on	0.00%	0.12%
D: Right angle	0.00%	1.41%
E: Left Turn Angle	0.00%	0.12%
F: Left Turn Opp Dir	0.00%	0.12%
G: Left Turn Same Dir	0.00%	0.18%
H: Right Same Dir	0.00%	0.06%
I: Right turn Opp Dir	0.00%	0.00%
J: Side Swipe Same Dir	21.43%	22.85%
K: Side Swipe Opp Dir	0.00%	0.18%
Z: Other	2.38%	3.22%

A review of **DCR Table 4 and 5** indicates non-collision with motor-vehicles were higher than the statewide averages. Additionally, rear end crashes were higher than the statewide average for I-10 Segment 1 as shown in **DCR Table 4**. Review of the non-collision and rear end crash reports indicated congestion was the main contributing factor.

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Intersection Safety Triage

The Intersection Safety Triage was used to calculate crash type percentages for a three-year average (2013-2015) of the reported crash data for each intersection in the IMR study area that may be impacted by the proposed interchange modifications. The crash data is included in **DCR Appendix F. DCR Tables 6-9** present the crash type percentages and corresponding comparison to the statewide averages. The highlights indicate the crash types that were above the statewide average.

**DCR Table 6 - Perkins Road at I-10 EB Off Ramp
Crash Type Comparison**

Category	Observed	Statewide Average
Non Collision	33.33%	7.56%
Rear End	50.00%	56.17%
Head On	0.00%	0.41%
Right Angle	0.00%	5.58%
Left Turn-e	0.00%	0.76%
Left Turn-f	0.00%	1.48%
Left Turn-g	0.00%	0.86%
Right Turn-h	0.00%	0.74%
Right Turn-i	0.00%	0.07%
S Swipe(sd)	16.67%	16.70%
S Swipe(od)	0.00%	0.14%
Other	0.00%	9.52%

**DCR Table 7 - Perkins Road at Acadian Thruway
Crash Type Comparison**

Category	Observed	Statewide Average
Non Collision	0.00%	2.51%
Rear End	47.37%	39.08%
Head On	0.00%	0.73%
Right Angle	10.53%	20.06%
Left Turn-e	0.00%	3.11%
Left Turn-f	17.54%	11.43%
Left Turn-g	1.75%	2.57%
Right Turn-h	3.51%	2.64%
Right Turn-i	0.00%	0.36%
S Swipe(sd)	15.79%	9.37%
S Swipe(od)	0.00%	0.38%
Other	3.51%	7.75%

**DCR Table 8 - Acadian Thruway at Acadian Centre
Crash Type Comparison**

Category	Observed	Statewide Average
Non Collision	0.00%	2.51%
Rear End	14.29%	39.08%
Head On	0.00%	0.73%
Right Angle	14.29%	20.06%
Left Turn-e	14.29%	3.11%
Left Turn-f	42.86%	11.43%
Left Turn-g	0.00%	2.57%
Right Turn-h	0.00%	2.64%
Right Turn-i	0.00%	0.36%
S Swipe(sd)	14.29%	9.37%
S Swipe(od)	0.00%	0.38%
Other	0.00%	7.75%

**DCR Table 9 - I-10 Ramps at Acadian Thruway
Crash Type Comparison**

Category	Observed	Statewide Average
Non Collision	4.24%	2.51%
Rear End	29.66%	39.08%
Head On	0.42%	0.73%
Right Angle	16.95%	20.06%
Left Turn-e	5.08%	3.11%
Left Turn-f	25.85%	11.43%
Left Turn-g	0.42%	2.57%
Right Turn-h	0.00%	2.64%
Right Turn-i	0.00%	0.36%
S Swipe(sd)	13.56%	9.37%
S Swipe(od)	0.00%	0.38%
Other	3.81%	7.75%

Conflict Points

The number and type of conflict points were determined for the existing condition for the locations within the study area that may be impacted by the proposed interchange modifications. This will be compared to the conflict points in the proposed interchange modifications. **DCR Figures 3-5** presents the existing conflict points.

● Diverging Conflict	6
● Merging Conflict	8
● Crossing Conflict	20
TOTAL Conflicts	34

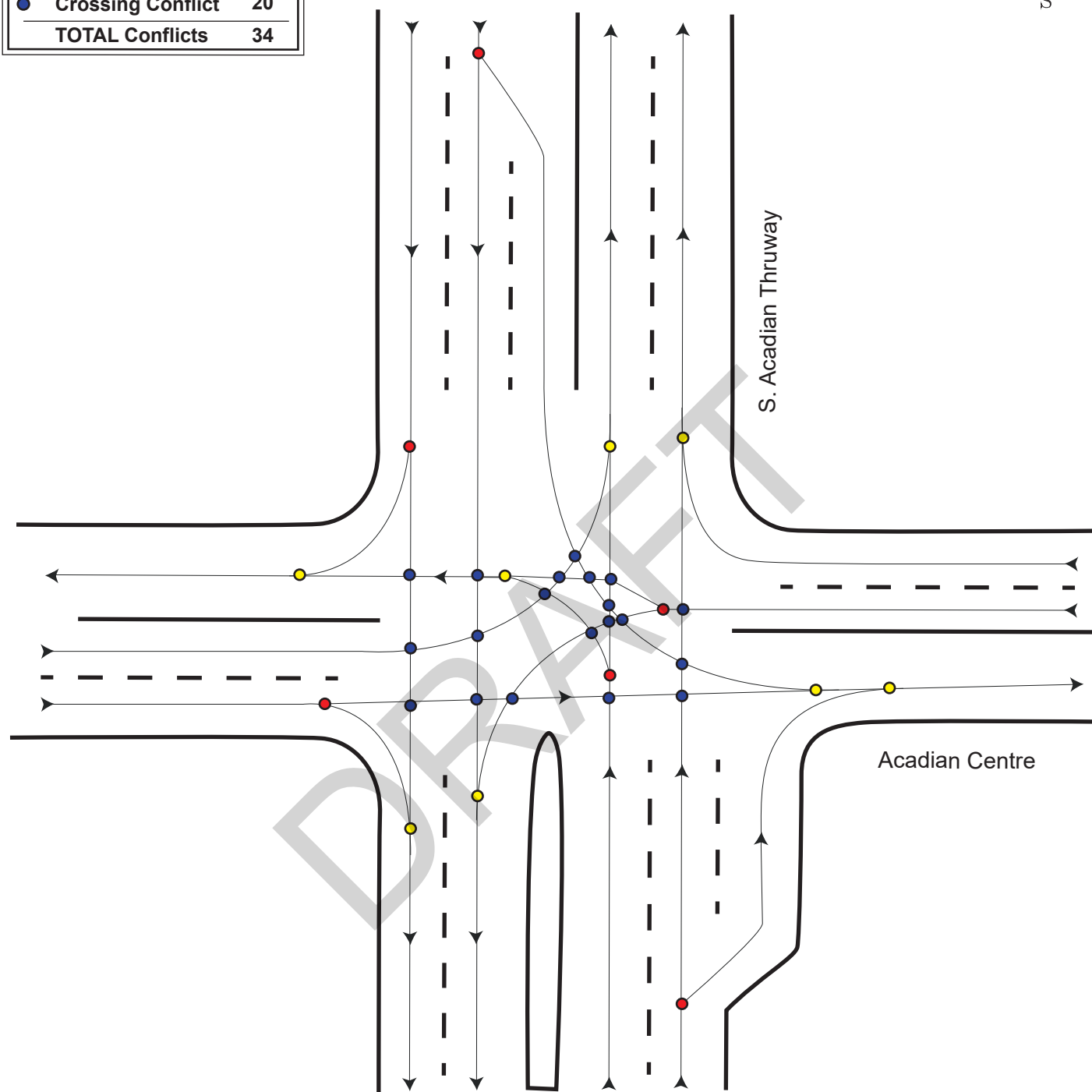
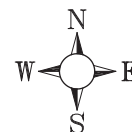


Figure 3
Ramp Terminal Conflict Points
Acadian at Acadian Centre Existing Conditions



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● Diverging Conflict	2
● Merging Conflict	2
● Crossing Conflict	0
I-10 Mainline Conflicts	4

● Diverging Conflict	9
● Merging Conflict	9
● Crossing Conflict	18
Intersection Conflicts	36

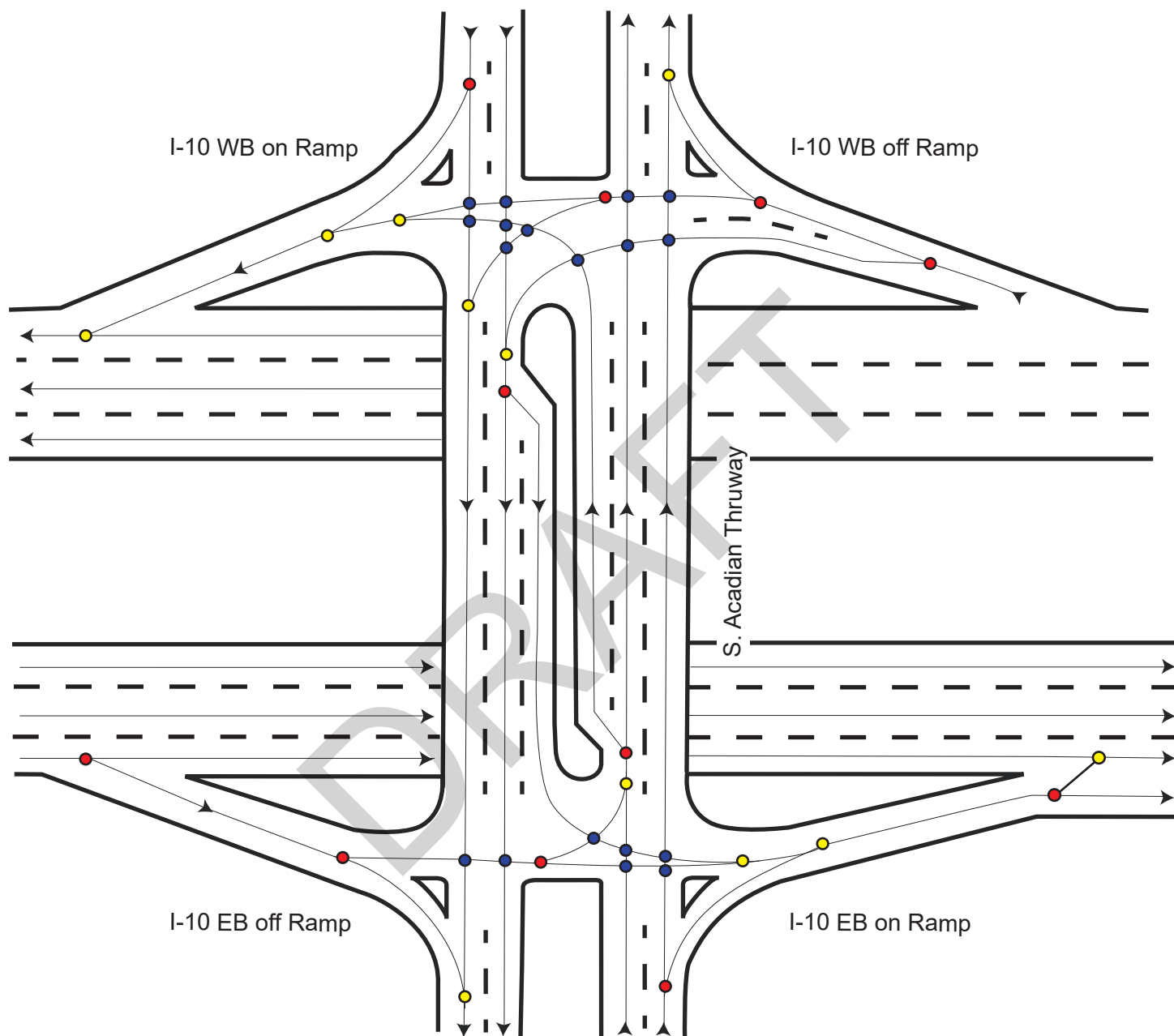
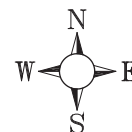


Figure 4
Ramp Terminal Conflict Points
I-10 at Acadian Thwy Existing Conditions

●	Diverging Conflict	1
●	Merging Conflict	1
●	Crossing Conflict	0
	I-10 Mainline Conflicts	2

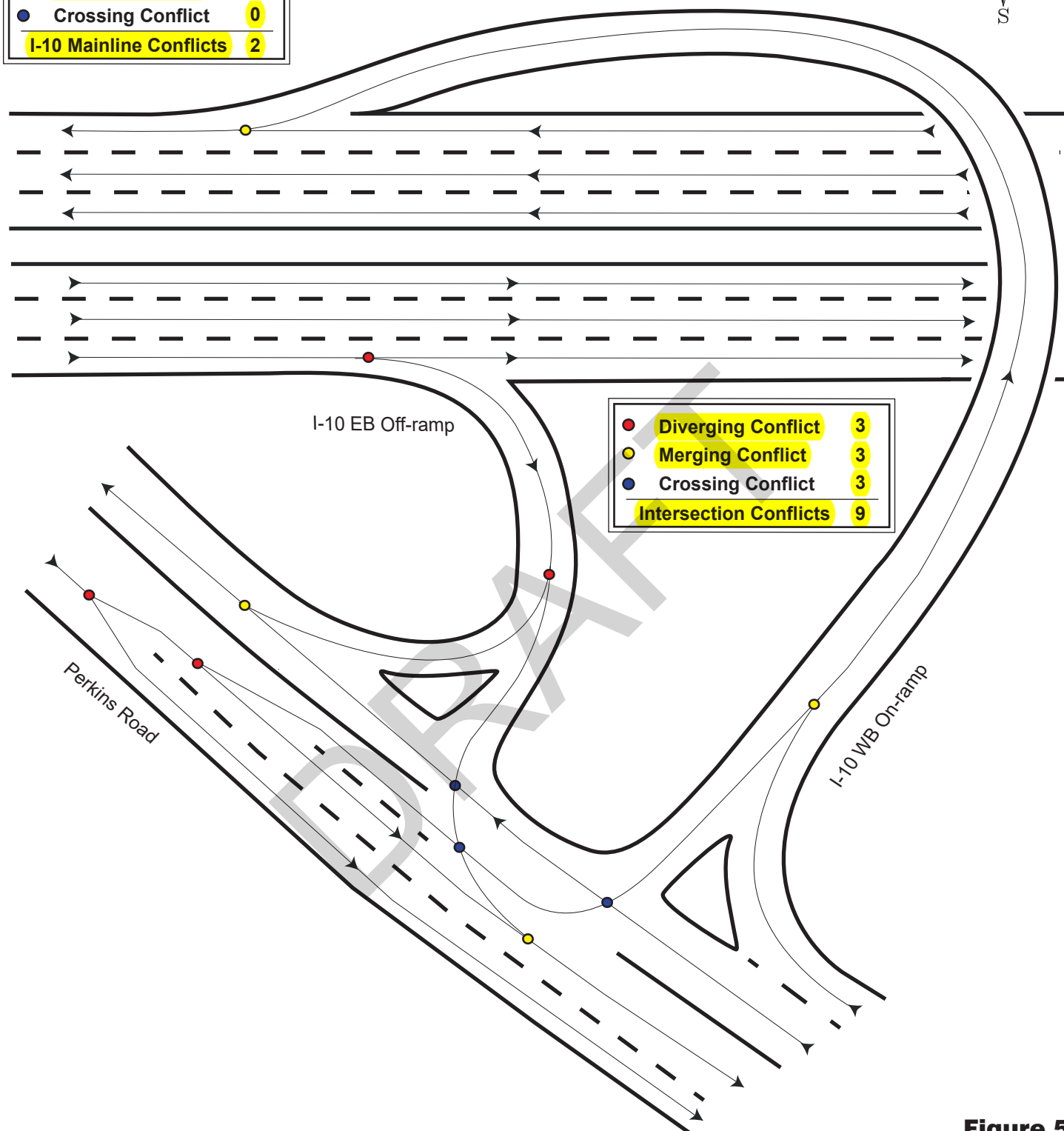
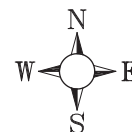


Figure 5
Ramp Terminal Conflict Points
I-10 at Perkins Rd Existing Conditions

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