Chapter 2. EXISTING AND NO BUILD ANALYSIS

This chapter outlines the results of a network analysis of the existing conditions. The information documents baseline operating conditions for use in comparing to future conditions. The following subsections summarize the existing road network characteristics, land use and demographics, operational conditions and safety concerns within the study area.

Existing Roadway Network

Roadway characteristic data was collected for each of the major road segments. **Figure 2.1** illustrates the LADOTD Functional Classification Map of the roadways in the vicinity of the study area.

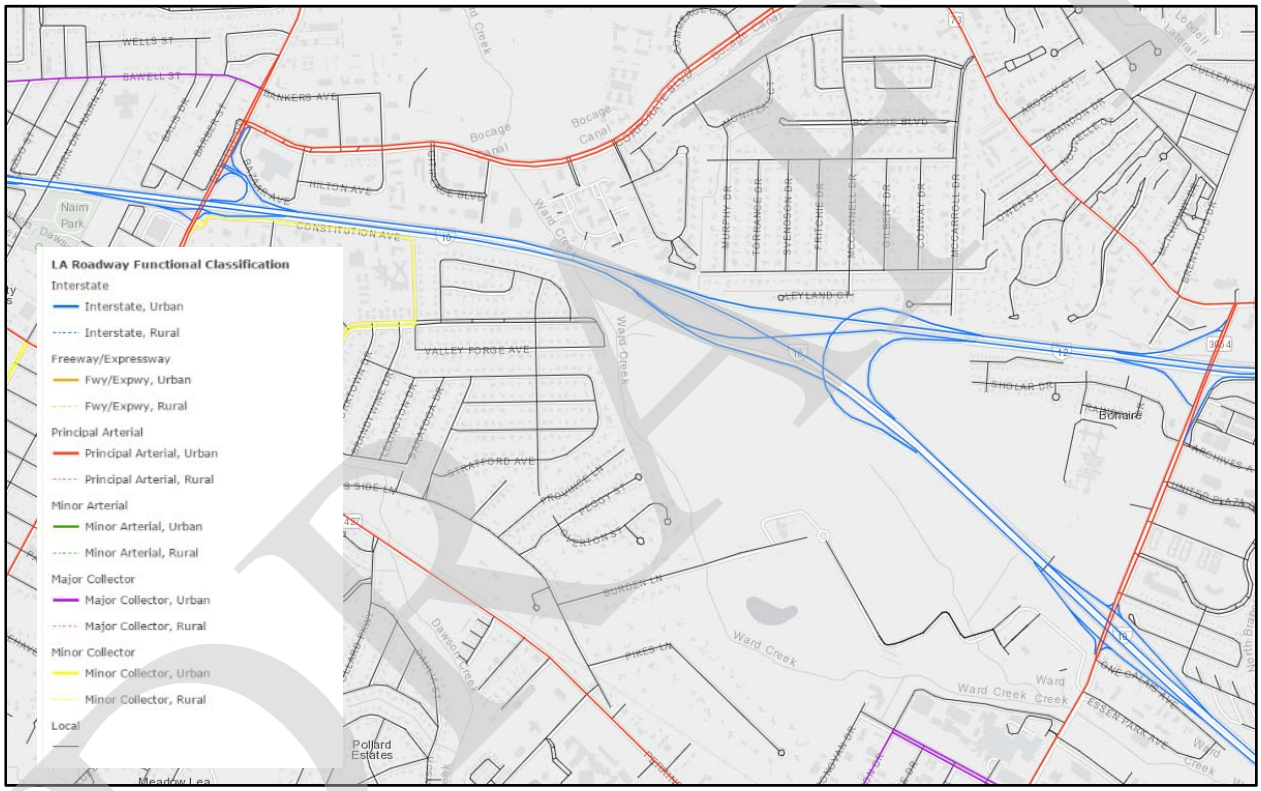

Figure 2.1
LADOTD Functional Classification Map
Source: LADOTD Website

Table 2.1 summarizes the number of lanes, functional classification and posted speed limit of each major roadway within the study area that may be affected by modifications to the existing network.

Table 2.1
Roadway Designations

Route	Number of Lanes	Functional Classification	Posted Speed Limit (mph)
I-10 WB (before merge)	2	Interstate, Urban	60
I-12 WB (before merge)	3	Interstate, Urban	60
College Dr	5	Principle Arterial, Urban	40
Essen Ln	6	Principle Arterial, Urban	45

Table 2.2 summarizes the Average Daily Traffic (ADT) data for the study area.

Table 2.2
Average Daily Traffic (ADT)

Route/Location	ADT (veh/day)	Year	Source
I-10 before merge with I-12 (WB)	50,175	2017	Count Site 10
I-12 before merge with I-10 (WB)	43,122	2017	Count Site 11
I-10 btwn merge with I-12 and College Dr (bi-directional)	155,500	2017	LADOTD Station 206261
College Dr (bi-directional)	26,659	2007	LADOTD Station 171067
Essen Ln (bi-directional)	30,881	2017	LADOTD Station 206191

Figure 2.2 presents an aerial image of the road network in the vicinity of the College Drive interchange.

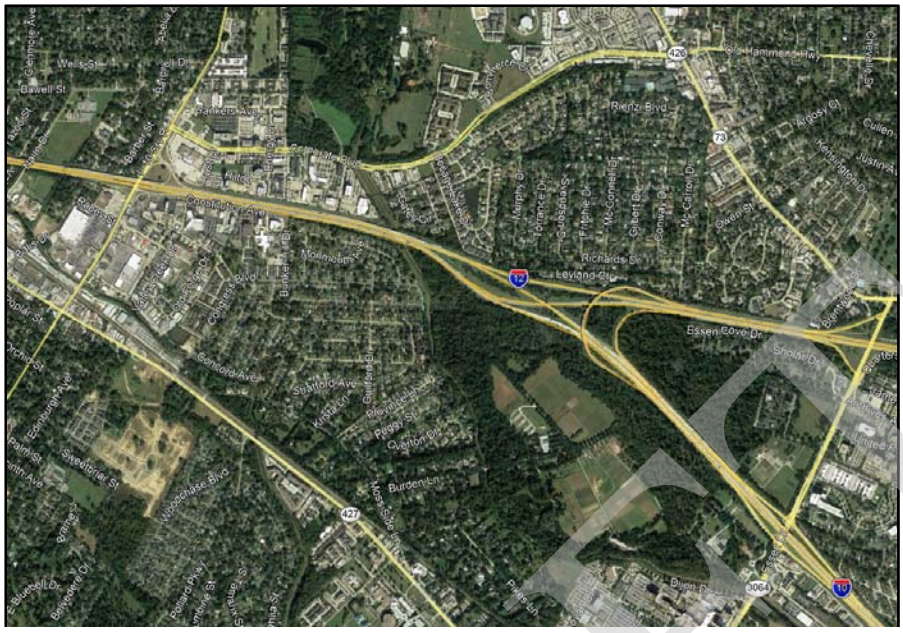

Figure 2.2
College Drive Interchange
Source: Google Earth 2017

Existing Land Use and Demographics

Land use in the study area consists of a mixture of residential (yellow and beige), commercial (red) and industrial (purple). Land use immediately adjacent to the College Drive interchange is commercial to the south and northeast and residential to the northwest. Land use to the east and south of the Essen Ln interchange is commercial. Land use to the west of Essen Ln is residential. **Figure 2.3** presents existing land uses within the defined study area.

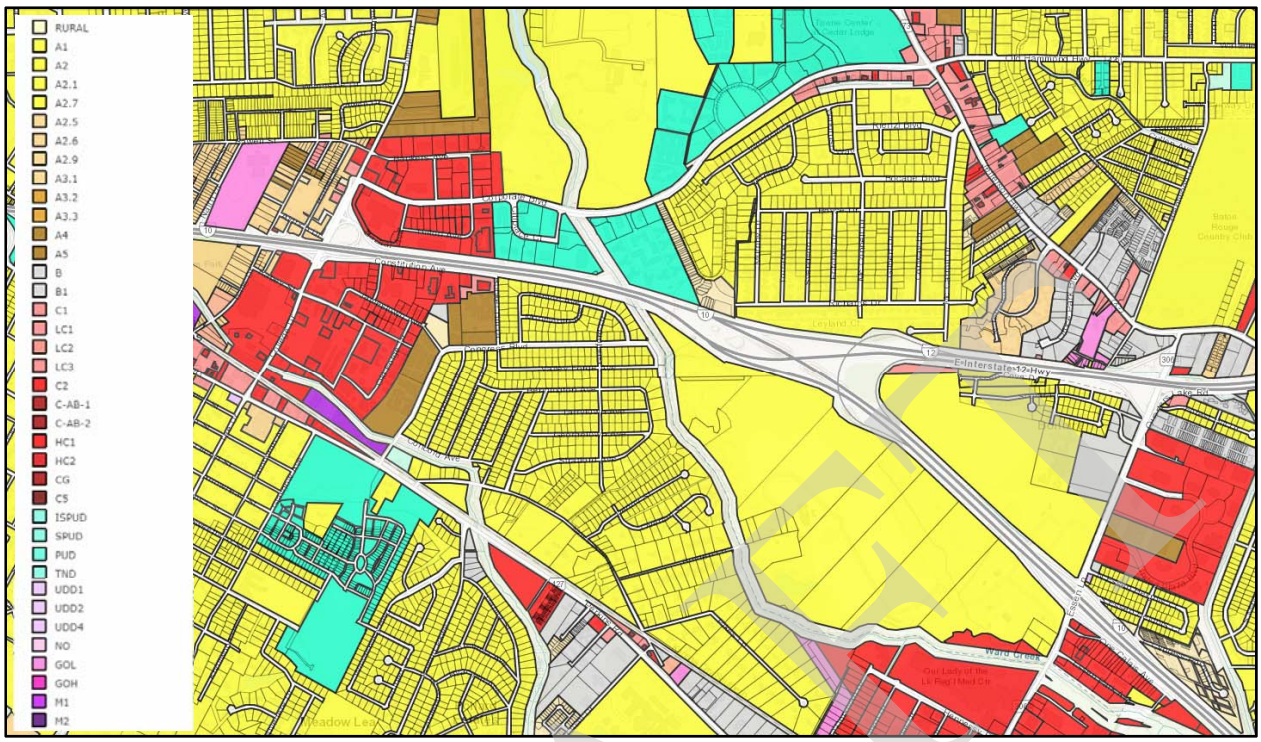

Figure 2.3
Land Use
Source: http://ebrgis.maps.arcgis.com/apps/webappviewer/index.html?id=71eea5e62ce84b1d94be194ad8f2ac2e

The demographics of the community surrounding the study area are included in EBR Tract 38.01 as presented in **Figure 2.4**.

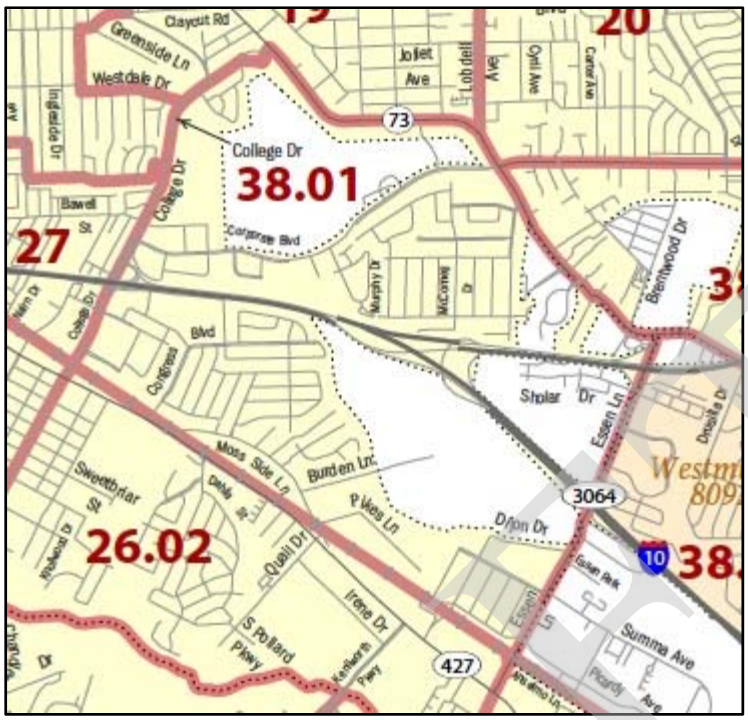

Figure 2.4
Census Tract Map
Source:https://www2.census.gov/geo/maps/dc10map/tract/st22_la/c22033_east_baton_rouge/DC10CT_C22033_001.pdf

The population by race reported for this specific tract was approximately 27% African American, 66% Caucasian and 7% other races/two or more races per the *USCB, 2010 Census Summary File 1 (DP-1) 100-Percent Data*.

Existing Operational Conditions

The following describes a typical weekday without incidents or inclement weather.

Interstate 10 and 12 WB

AM Peak

During the AM peak, in the vicinity of College Drive, I-10 and I-12 WB are heavily congested with commuter traffic. This is a result of both downstream bottlenecks and overall traffic volumes exceeding capacity.

PM Peak

During the PM peak, the heavy congestion upstream where I-10 EB and I-110 SB merge begins to dissipate in the vicinity of College Drive and speeds increase through the I-10/I-12 split.

College Drive

AM and PM Peak

College Drive has heavy congestion during both peaks in both directions. Congestion does not vary greatly between the AM and PM peaks and generally lasts all day.

Existing Network Analysis

Purpose and Goals

The purpose of the existing conditions analysis is to develop baseline data that will be compared to future conditions both with and without the proposed interchange modification. The existing peak hour volumes were presented in **Figure 1.2**.

Methodology

Capacity analysis was performed to determine operational conditions in the AM and PM peaks. This type of analysis is the industry standard and the methods are the widely accepted practice of evaluating impacts on traffic operations. The capacity analysis was performed using procedures developed by the Transportation Research Board and contained in the Hwy Capacity Manual Special Report 209. The Hwy Capacity Manual (HCM) procedures have been adapted to computer-based analysis packages. The input parameters for the existing conditions capacity analysis are included in **Appendix B**.

Capacity analysis was conducted using HCS version 7.5 for the freeway and merge analyses. The measure of effectiveness was density, which is the number of vehicles occupying a given length of a lane or roadway at an instant, in passenger cars per lane per mile (pc/mi/ln). A limitation of the HCS software is that density is not reported when thresholds are exceeded, such as a volume to capacity ratio greater than one.

Trafficware Synchro 8 was used to analyze the signalized intersection. For signalized intersections MOEs include delay in seconds, volume to capacity ratio (v/c) and 95th% queues. When the v/c is greater than 1.0, it is considered to be saturated conditions where the demand exceeds available capacity. The 95th% queue is essentially the maximum queue that may be experienced. If this exceeds available storage, spillback will occur into other lanes and/or through the upstream intersection. The highest v/c ratio and 95th percentile queue for each approach were reported. The queue results were reported in number of vehicles but then converted to feet by multiplying 25 feet/vehicle. A summary of the existing analysis results for freeway and merge segment locations is presented in **Table 2.3**.

Table 2.3
Existing Conditions Freeway and Merge Analysis
HCS Freeway and Merge Segments

Location	AM	PM
	Density (pc/mi/ln)	Density (pc/mi/ln)
I-10 WB On Ramp from Essen Ln Merge	27.6	28.7
I-10 WB between On Ramp from Essen Ln and Off Ramp to I-12 EB	27.4	28.6
I-10 WB between Off Ramp to I-12 EB and merge with I-12 WB	37.5	37.5
I-12 WB between Off Ramp to I-10 EB and merge with I-10 WB	22.5	18.3
I-10 WB between merge with I-12 WB and Off Ramp to College Dr	27.8	26.0
I-10 WB between College Dr On and Off Ramps	28.3	24.9

A summary of the existing analysis results for the subject intersection is presented in **Table 2.4**.

Table 2.4
Existing Conditions Intersections
Synchro Analysis

Location	AM			PM		
	Delay (sec)	V/C Ratio	95th % Queues (ft)	Delay (sec)	V/C Ratio	95th % Queues (ft)
College Dr at I-10 WB Ramps	**31.7**			**33.7**		
I-10 Ramp WB	55.3	0.87	385	83.2	0.95	548
College Dr Northbound	34.1	0.76	583	28.1	0.68	690
College Dr Southbound	19.5	0.81	450	18.6	0.77	630

The documentation of the existing analysis is included in **Appendix B**.

Design Year 2040 No Build Analysis

Purpose and Goals

The purpose of the No Build analysis is to provide data for comparison to existing conditions and to future conditions with the proposed interchange modification. The existing lane configurations at the time of this report were used for the No Build scenario analysis.

Methodology

No Build analysis was conducted with only changes to volume inputs to provide a comparison of the existing network to the projected conditions. The No Build volumes are presented in **Figure 2.5**. The methodology for the No Build analysis was the same as for the existing conditions. The TSI for the College Dr at I-10 WB off ramp intersection was included in **Appendix B**. The input parameters for the No Build capacity analysis are included in **Appendix B**. **Table 2.5** presents the results of the No Build freeway and merge segment analysis.

Table 2.5
No Build Conditions Freeway and Merge Analysis
HCS Freeway and Merge Segments

Location	AM	PM
	Density (pc/mi/ln)	Density (pc/mi/ln)
I-10 WB On Ramp from Essen Ln Merge	36.7	38.0
I-10 WB between On Ramp from Essen Ln and Off Ramp to I-12 EB	35.7	37.4
I-10 WB between Off Ramp to I-12 EB and merge with I-12 WB	--	--
I-12 WB between Off Ramp to I-10 EB and merge with I-10 WB	24.3	19.8
I-10 WB between merge with I-12 WB and Off Ramp to College Dr	33.3	31.6
I-10 WB between College Dr On and Off Ramps	34.8	31.2

-- When v/c is greater than 1, the HCS software does not report density.

Table 2.6 presents the results of the No Build intersection analysis.

Table 2.6
No Build Conditions Intersections
Synchro Analysis

Location	AM			PM		
	Delay (sec)	V/C Ratio	95th % Queues (ft)	Delay (sec)	V/C Ratio	95th % Queues (ft)
College Dr at I-10 WB Ramps	**32.6**			**36.6**		
I-10 Ramp WB	56.0	0.88	413	99.8	1.02	798
College Dr Northbound	35.3	0.81	630	28.0	0.71	738
College Dr Southbound	20.3	0.89	483	18.6	0.85	668

The No Build analysis documentation and a comparison of the results to the existing conditions analysis results in tabular format are included in **Appendix C**.

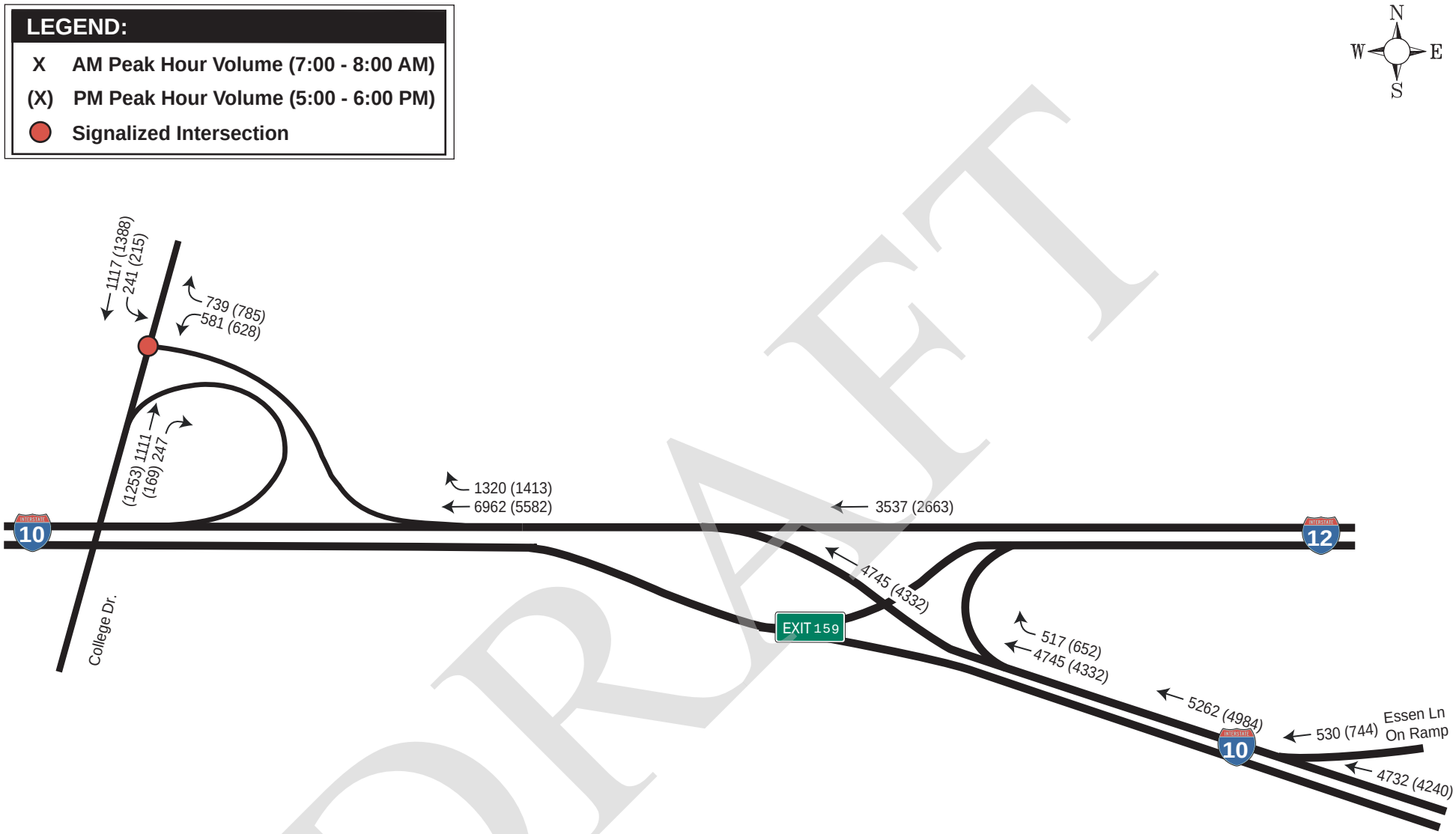

Figure 2.5

2040 No Build Volumes

IMR Data Collection
Directional Ramp from I-10 WB to College Drive
East Baton Rouge Parish, LA

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Safety Concerns

The safety concerns in the study area were identified in a detailed evaluation of the existing data that was presented in Chapter 1. One of the main safety concerns in the study area is the weaving movements required between the I-10 and I-12 merge and the College Drive off ramp. To exit at College Drive, vehicles traveling on I-10 WB prior to the I-12 merge must cross two to four lanes of traffic. To continue on I-10 WB, vehicles traveling on I-12 WB may be required to weave one lane over. The distance for these lane changes is less than a mile.