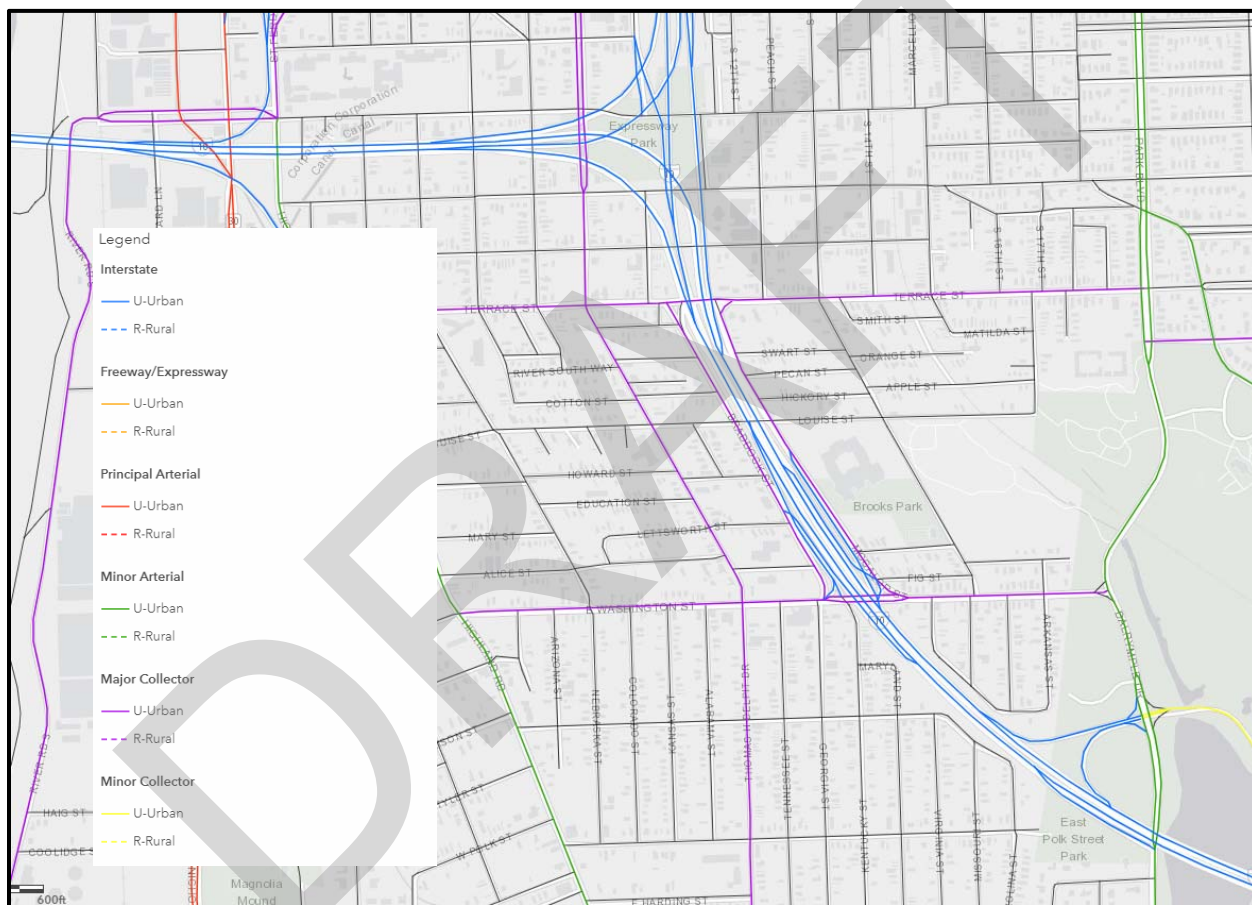


## Chapter 2. EXISTING AND NO BUILD ANALYSIS

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

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**Table 2.1**  
**Roadway Designations**

<b>Route</b>	<b>Number of Lanes (Bi-directional)</b>	<b>Functional Classification</b>	<b>Posted Speed Limit (mph)</b>
I-10	4-6	Interstate, Urban	60
Washington St	2	Major Collector, Urban	30
Dalrymple Dr	2-4	Minor Arterial, Urban	30
McCalop St	1-2	Major Collector, Urban	30
Braddock St	1-2	Major Collector, Urban	30

**Table 2.2**  
**Average Daily Traffic (ADT)**

<b>Route/Location</b>	<b>ADT (veh/day)</b>	<b>Year</b>	<b>Source</b>
I-10 btw I-10/I-110 and Washington St	127,008	2017	Count Sites 24, 24A, 25, 26, 27
I-10 btw Washington/Dalrymple	168,267	2014	LADOTD (Sta #207181)
I-10 btw Dalrymple and City Park Lakes	131,350	2017	LADOTD (Sta #206331)
Washington St	2,383	2016	LADOTD (Sta #171250)
Dalrymple Drive	12,744	2017	Count Site 5

**Figures 2.2 and 2.3** present aerial images of the road network in the vicinity of the Washington and Dalrymple interchanges respectively.





**Figure 2.2 Washington Street Interchange**  
Source: Google Earth 2017



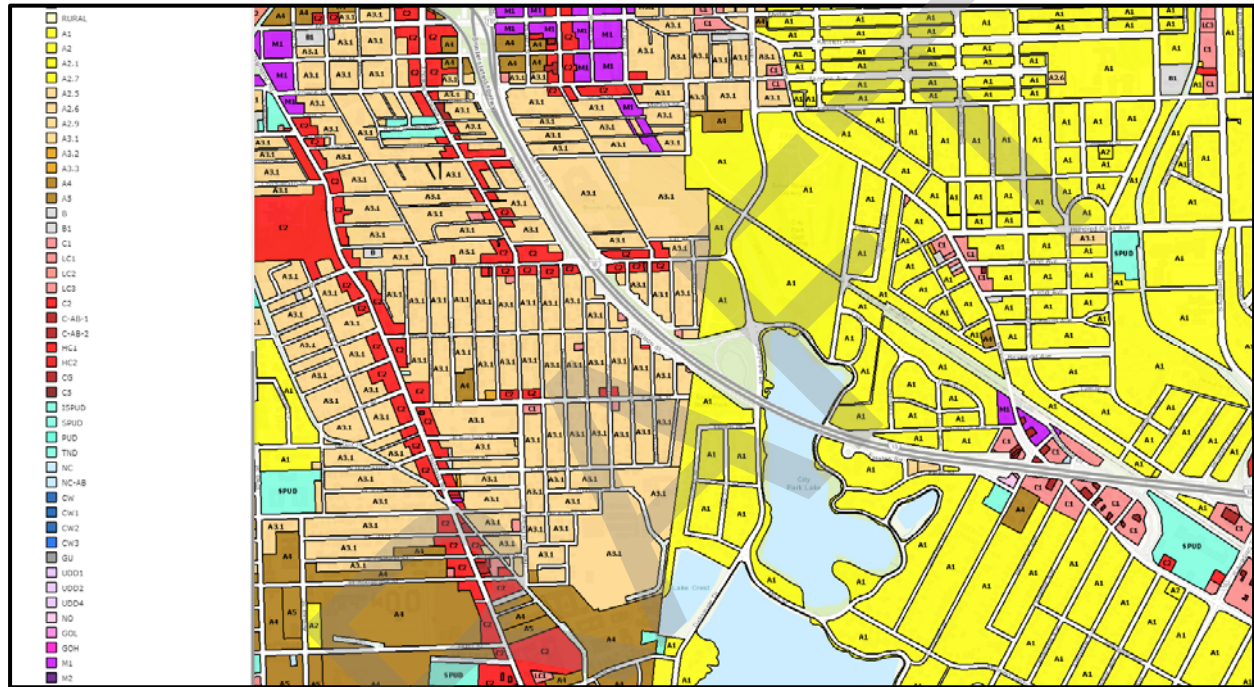
**Figure 2.3 Dalrymple Drive Interchange**  
Source: Google Earth 2017

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### Existing Land Use and Demographics

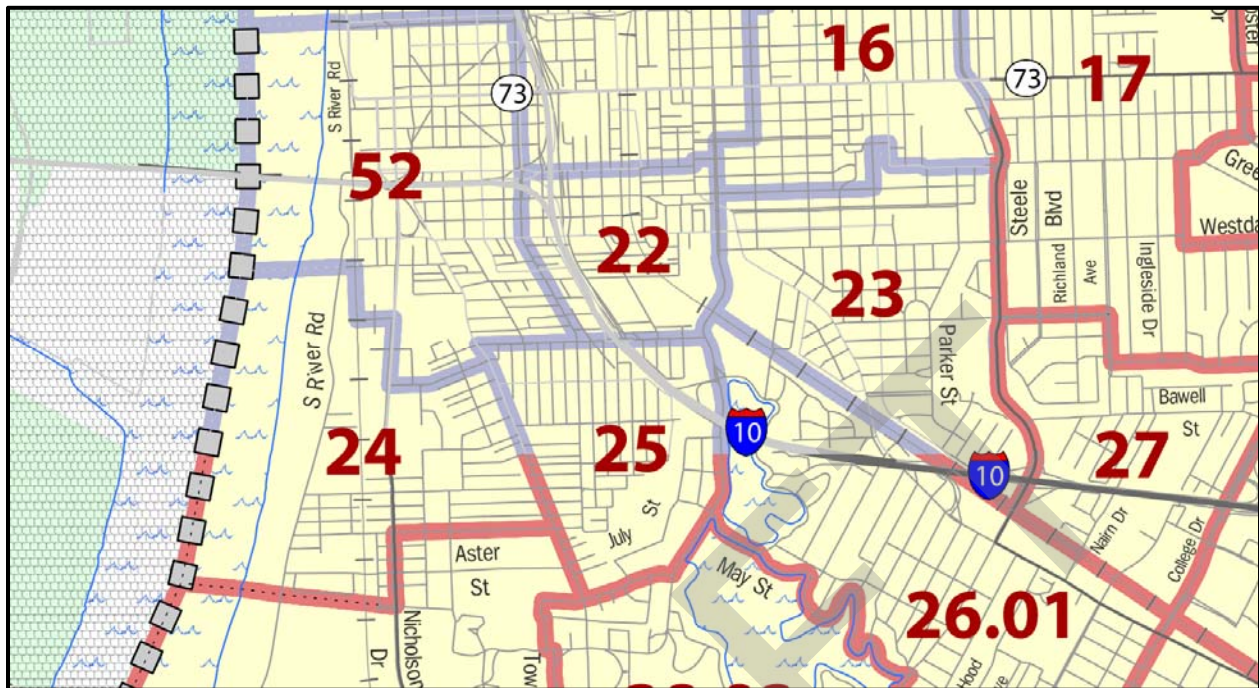
Land use in the study area consists mostly of residential (yellow and beige), with pockets of commercial (red) and industrial (purple). Land use immediately adjacent to the Washington St interchange is commercial and residential. Land use immediately adjacent to the Dalrymple Dr interchange is residential and includes public recreation. **Figure 2.4** presents existing land uses within the defined study area.



**Figure 2.4 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 22 and 25 as presented in **Figure 2.5**.



**Figure 2.5 Census Tract Map**

Source: [https://www2.census.gov/geo/maps/dc10map/tract/st22\\_la/c22033\\_east\\_baton\\_rouge/DC10CT\\_C22033\\_001.pdf](https://www2.census.gov/geo/maps/dc10map/tract/st22_la/c22033_east_baton_rouge/DC10CT_C22033_001.pdf)

The population by race reported was approximately 10.7% Caucasian, 86.4% African American and 2.9% other races in tract 22 and 37.4% Caucasian, 56.8% African American and 5.8% other races for tract 25 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**

##### ***AM Peak***

Interstate 10 is heavily congested in the WB direction with commuter traffic. Traffic is typically slowed or stop-and-go between Dalrymple Dr. and the split between I-10 WB and I-110 NB. Traffic begins to flow more easily west of the split. Most of the congestion can be attributed to the friction caused by the four consecutive ramp junctions within a 0.75-mile section: The four ramp junctions in the WB direction are Dalrymple Dr off-ramp, Dalrymple Dr on-ramp, McCalop St off-ramp, and Washington St on-ramp. The EB direction is less congested as this is not the main commuter route.

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## ***Washington / Dalrymple Interchange Modification Report***

### ***PM Peak***

Interstate 10 is congested in both the EB and WB directions; particularly the EB servicing evening commuter traffic. The EB traffic flows are slowed as I-10 EB and I-110 SB merge and approach the Washington Street off-ramp. The congestion remains through the study area.

### **Washington Street**

#### ***AM and PM Peaks***

Washington Street is a major collector roadway that services both residential and commuter traffic. Both the AM and PM peaks have little to no congestion.

### **Dalrymple Drive**

#### ***AM Peak and PM Peaks***

Dalrymple Drive is a minor arterial roadway that services both residential and commuter traffic. Both the AM and PM peaks have little to no congestion.

## **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 ramp junctions. The Measures of Effectiveness (MOE) was density in passenger cars per mile per lane (pc/mi/ln).

Trafficware Synchro 8 was used to analyze the signalized and unsignalized intersections. For the intersections, MOEs include delay in seconds, volume to capacity ratio (v/c) and 95<sup>th</sup> queues. When the v/c is greater than 1.0, it is considered to be saturated conditions/demand exceeds available capacity. The 95<sup>th</sup> queue essentially is the maximum queue that may be experienced.

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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 conditions analysis results for ramp junction locations is presented in **Table 2.3**.

**Table 2.3**  
**Existing Conditions Ramp Junctions**  
**HCS Merge/Diverge**

Location	AM	PM
	Density (pc/mi/ln)	Density (pc/mi/ln)
<i>I-10 Eastbound Diverge to Washington St</i>	36.7	29.2
<i>I-10 Eastbound Merge from Braddock St</i>	--	24.4
<i>I-10 Eastbound Diverge to Dalrymple Dr</i>	39.9	27.0
<i>I-10 Westbound Diverge to Dalrymple Dr</i>	39.5	39.9
<i>I-10 Westbound Merge from Dalrymple Dr</i>	40.5	41.6
<i>I-10 Westbound Merge from Washington St</i>	38.4	37.6
<i>I-10 Westbound Diverge to Louise St</i>	38.1	40.1

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

**Table 2.4** presents the results of the existing conditions intersection analysis.

**Table 2.4**  
**Existing Conditions Intersections**  
**Synchro Analysis**

Location	AM			PM		
	Delay (sec)	V/C Ratio	95 <sup>th</sup> % Queues	Delay (sec)	V/C Ratio	95 <sup>th</sup> % Queues
<b>I-10 WB ramps at Dalrymple Dr</b>	<b>6.9</b>	<b>-</b>	<b>-</b>	<b>5.9</b>	<b>-</b>	<b>-</b>
<i>I-10 off-ramp Eastbound</i>	27.3	0.23	40	27.7	0.27	45
<i>E Lakeshore Dr Westbound</i>	27.4	0.25	40	27.1	0.17	28
<i>Dalrymple Dr Northbound</i>	2.7	0.26	55	2.5	0.27	55
<i>Dalrymple Dr Southbound</i>	5.9	0.15	58	5.9	0.17	65
<b>I-10 EB off-ramp at Dalrymple Dr</b>	<b>7.3</b>	<b>-</b>	<b>-</b>	<b>4.0</b>	<b>-</b>	<b>-</b>
<i>I-10 off-ramp Eastbound</i>	27.0	0.81	150	32.9	0.79	68
<i>Dalrymple Dr Northbound</i>	3.7	0.19	63	2.1	0.24	70
<i>Dalrymple Dr Southbound</i>	4.2	0.31	118	2.1	0.22	63
<b>I-10 WB on-ramp at Washington St</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<i>Washington St Eastbound</i>	4.7	0.26	25	5.4	0.27	28
<b>I-10 EB off-ramp at Washington St</b>	<b>12.1</b>	<b>-</b>	<b>-</b>	<b>12.5</b>	<b>-</b>	<b>-</b>
<i>Washington St Eastbound</i>	14.2	0.52	195	14.4	0.55	213
<i>Washington St Westbound</i>	10.7	0.23	58	10.5	0.21	53
<i>Kentucky St Northbound</i>	10.8	0.24	65	10.4	0.20	55
<i>I-10 off-ramp Southbound</i>	10.4	0.18	55	9.2	0.02	8

-Output not reported

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.

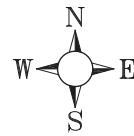
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Methodology

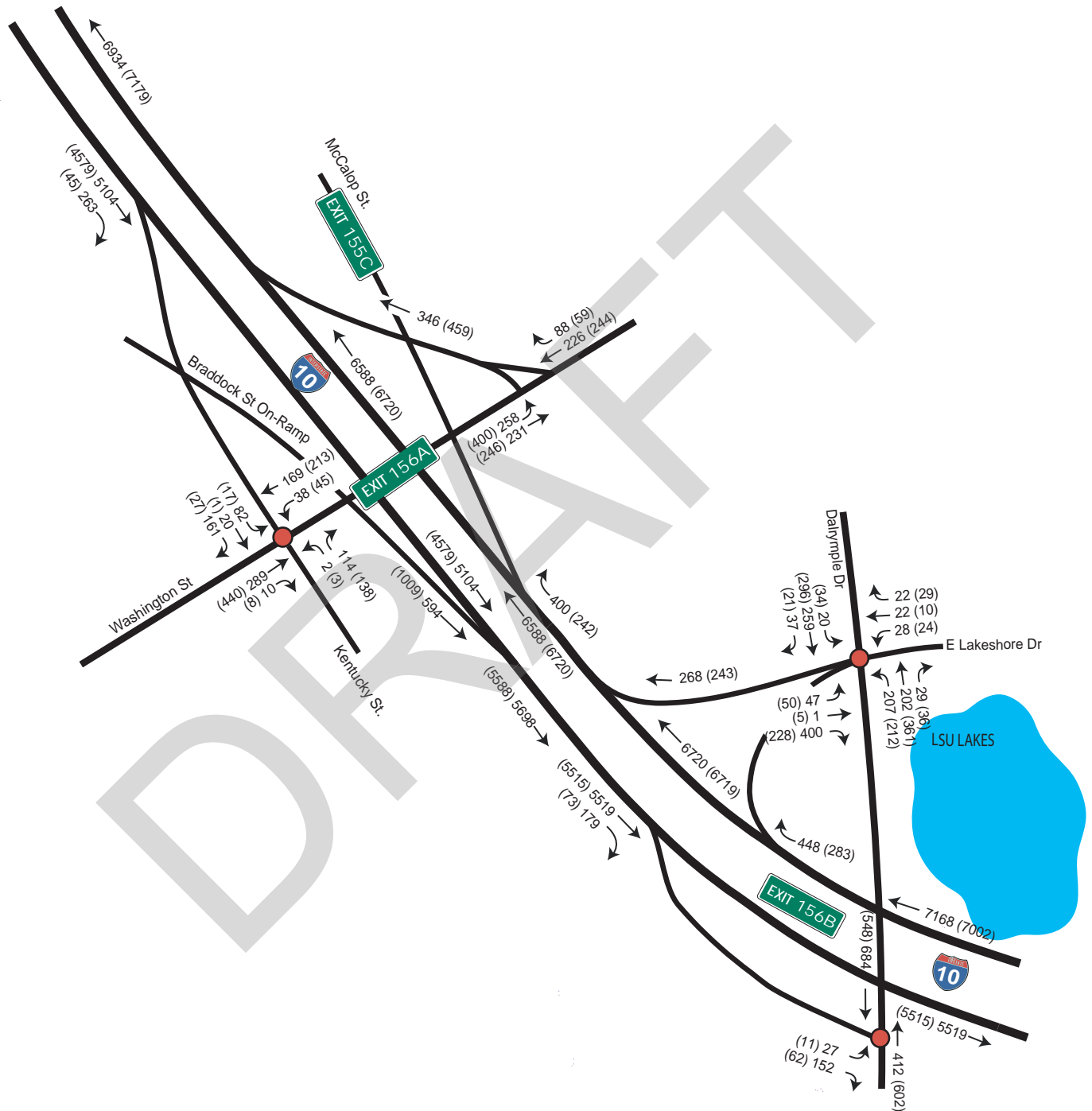
No Build analysis was conducted with only changes to volume inputs to provide a comparison of the existing network to the projected conditions. The 2040 No Build peak hour volumes are presented in **Figure 2.6**. The methodology for the No Build analysis was the same as for the existing conditions. The TSIs used in the signalized intersection analyses are included in **Appendix B**. The input parameters for the No Build capacity analysis are included in **Appendix C**.

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### LEGEND:

- X 7:00 AM - 8:00 AM Volume
- (X) 4:30 PM - 5:30 PM Volume
- Signalized Intersection



**Figure 2.6**

2040 No Build Volumes  
Washington/Dalrymple IMR

**I-10 Stage 1 Feasibility Study  
East Baton Rouge Parish, LA**

URBAN SYSTEMS inc.



**Table 2.5** presents the results of the No Build merge/diverge analysis.

**Table 2.5**  
**No Build Conditions Ramp Junctions**  
**HCS Merge/Diverge**

Location	AM	PM
	Density (pc/ln/mi)	Density (pc/ln/mi)
<i>I-10 Eastbound Diverge to Washington St</i>	--	35.8
<i>I-10 Eastbound Merge from Braddock St</i>	--	45.3
<i>I-10 Eastbound Diverge to Dalrymple Dr</i>	41.1	--
<i>I-10 Westbound Diverge to Dalrymple Dr</i>	--	--
<i>I-10 Westbound Merge from Dalrymple Dr</i>	--	--
<i>I-10 Westbound Merge from Washington St</i>	--	--
<i>I-10 Westbound Diverge to Louise St</i>	--	--

--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	95 <sup>th</sup> % Queues	Delay (sec)	V/C Ratio	95 <sup>th</sup> % Queues
<b>I-10 WB ramps at Dalrymple Dr</b>	<b>6.9</b>	<b>-</b>	<b>-</b>	<b>5.9</b>	<b>-</b>	<b>-</b>
<i>I-10 off-ramp Eastbound</i>	27.3	0.24	40	27.7	0.27	45
<i>E Lakeshore Dr Westbound</i>	27.4	0.26	43	27.0	0.17	28
<i>Dalrymple Dr Northbound</i>	2.7	0.27	55	2.6	0.28	55
<i>Dalrymple Dr Southbound</i>	6.0	0.15	60	6.0	0.18	68
<b>I-10 EB off-ramp at Dalrymple Dr</b>	<b>7.4</b>	<b>-</b>	<b>-</b>	<b>4.0</b>	<b>-</b>	<b>-</b>
<i>I-10 off-ramp Eastbound</i>	26.9	0.81	155	32.7	0.79	68
<i>Dalrymple Dr Northbound</i>	3.8	0.20	68	2.2	0.25	73
<i>Dalrymple Dr Southbound</i>	4.4	0.32	123	2.1	0.23	65
<b>I-10 WB on-ramp at Washington St</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<i>Washington St Eastbound</i>	5.0	0.32	35	5.6	0.33	35
<b>I-10 EB off-ramp at Washington St</b>	<b>13.0</b>	<b>-</b>	<b>-</b>	<b>13.6</b>	<b>-</b>	<b>-</b>
<i>Washington St Eastbound</i>	15.7	0.61	230	16.1	0.63	248
<i>Washington St Westbound</i>	11.3	0.29	70	11.1	0.26	63
<i>Kentucky St Northbound</i>	11.2	0.28	75	10.7	0.23	65
<i>I-10 off-ramp Southbound</i>	10.7	0.22	68	9.2	0.03	8

- Output not reported

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**.

### **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. The main safety concern in the study area is due to the outside lane of I-10 EB dropping as an exit only lane to Washington St requiring through traffic to merge. Congestion was identified as the other main contributing factor to crashes in the area.