

EXHIBIT M: TRAFFIC IMPACT ANALYSIS FOR DELGADO COMMUNITY
COLLEGE RIVER CITY CAMPUS / ADVANCED MANUFACTURING CENTER
OF EXCELLENCE

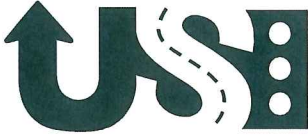
RFP NUMBER: 171116

Delgado Community College

Traffic Impact Analysis
Avondale, Louisiana

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Jefferson Parish Economic
Development Commission

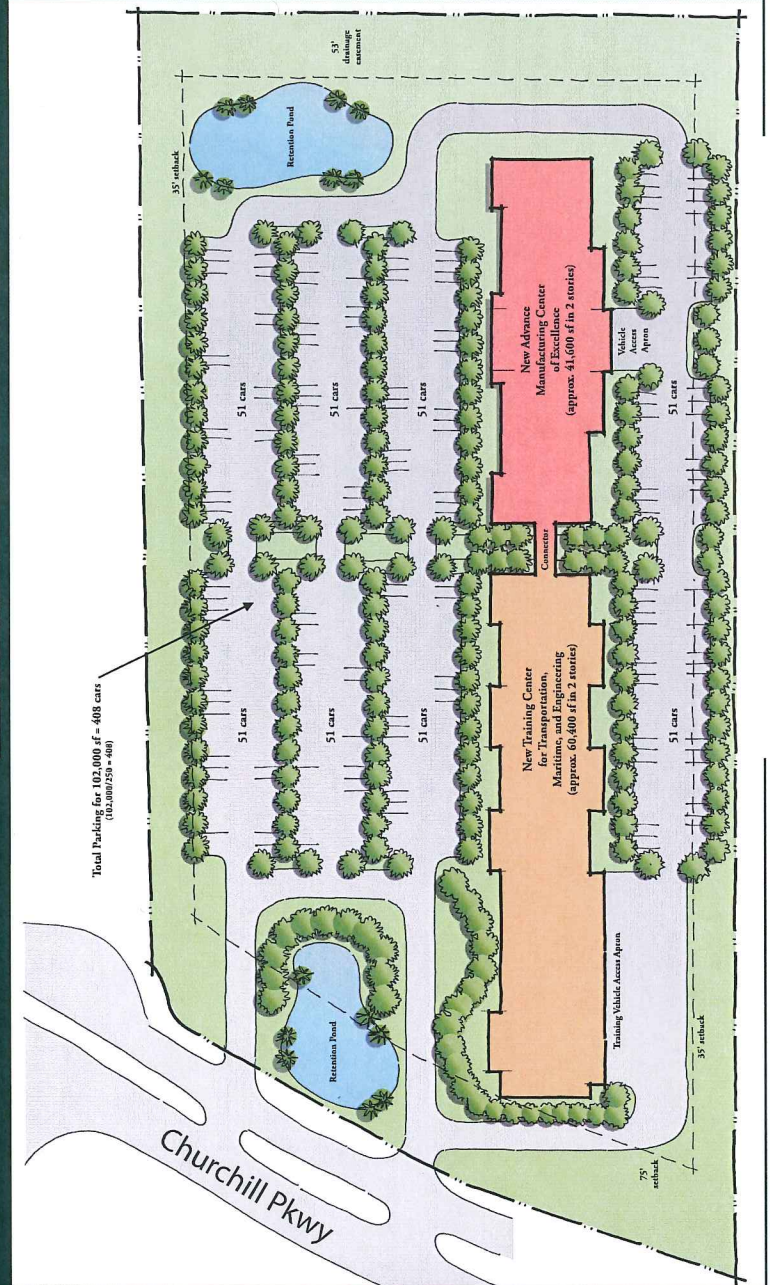


Image Source: JEDCO

Delgado Community College Avondale, Louisiana Traffic Impact Analysis

Introduction

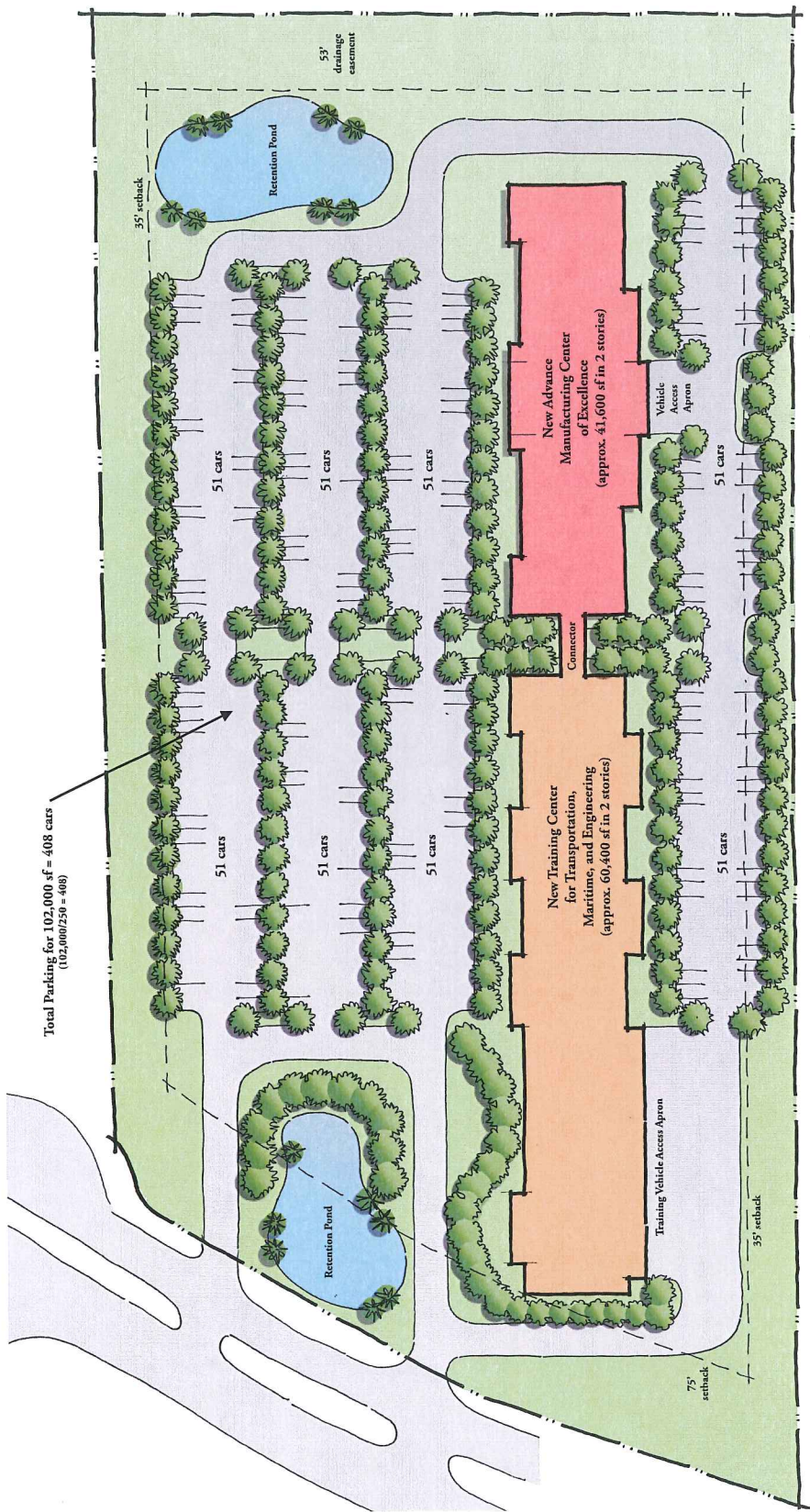
This report summarizes a traffic impact analysis for a proposed Delgado Community College Campus to be located in Churchill Technology Park in Avondale, Louisiana. Churchill Technology and Business Park is accessible from Nicolle Boulevard (Blvd) and the main entrance/exit roadway is Churchill Parkway (Pkwy). The community college is proposed to be 102,000 square feet with 408 parking spaces. The maximum enrollment is expected to be 3,000 students. Figure 1 presents a vicinity map indicating the proposed site location.



Figure 1. Vicinity Map
Source: © 2015 Google

Site Access

Access to the site is proposed via two (2) driveways on Churchill Pkwy. Figure 2 presents the proposed site plan for the development.



Source: JEDCO

Figure 2
Site Plan



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Study Area

Based on Jefferson Parish Traffic Engineering requirements, the study area included the following intersections:

- US 90 at Segnette
- Lapalco at Nicolle/Segnette
- US 90 at Lapalco
- Nicolle at South Jamie
- Nicolle at Churchill

Existing Conditions

Churchill Technology and Business Park is being developed to include office and educational uses. Patrick F. Taylor Science & Technology Academy is located on the southeast quadrant of the intersection of Nicolle Blvd at Churchill Pkwy and JEDCO Conference Center is in the southwest quadrant. The existing site is an open field on Churchill Parkway southeast of the roundabout at the termination of the developed road.

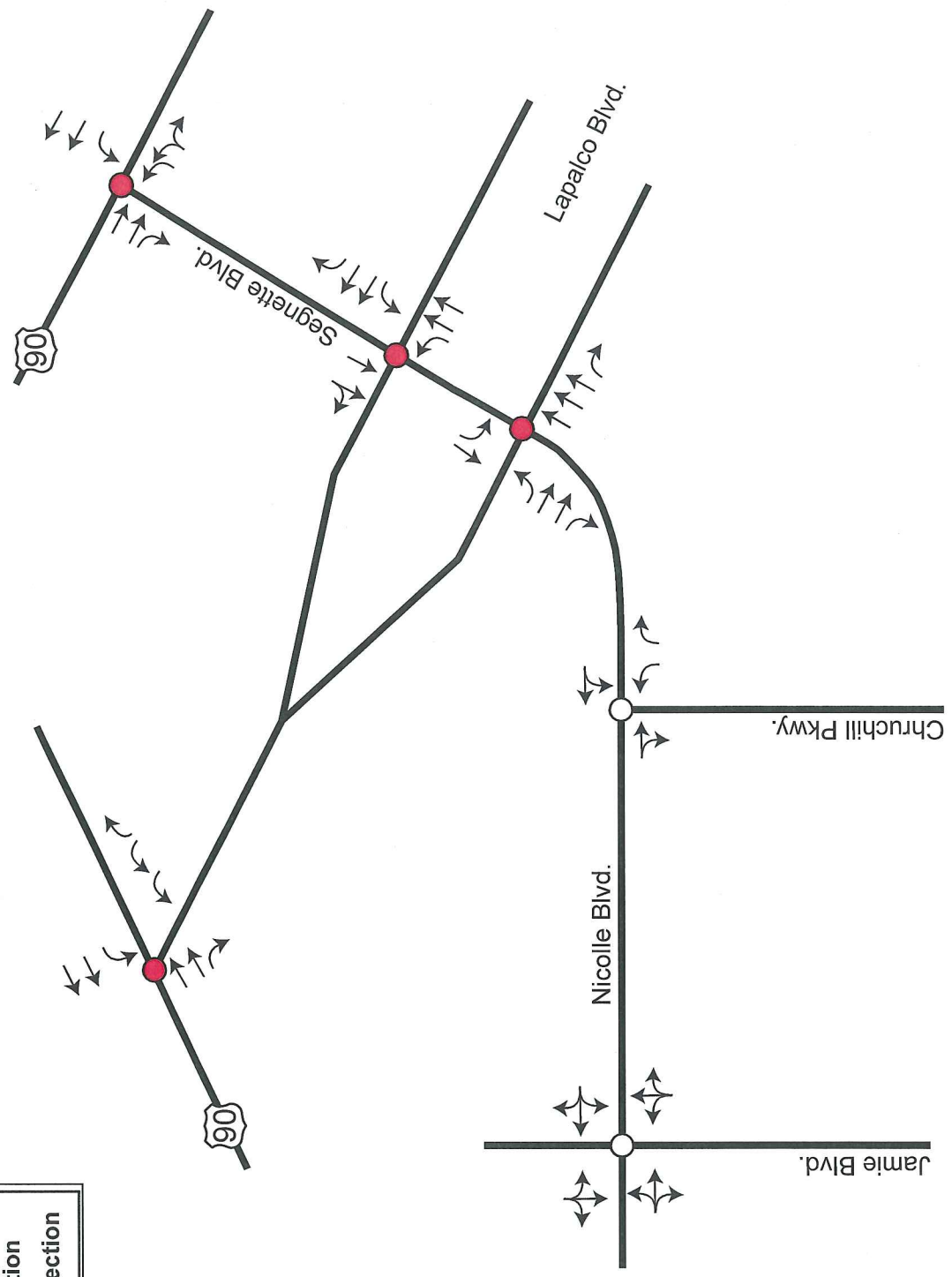
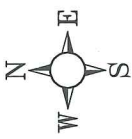
Churchill Pkwy is a four-lane divided roadway with parallel parking adjacent to outer travel lanes. The Churchill Pkwy northbound approach to Nicolle Blvd is controlled by a STOP condition.

Nicolle Blvd is a two-lane undivided parish roadway that parallels US 90. It has a posted speed limit of 40 mph that reduces to 20 mph on the west side of the study area where it transitions to a two lane boulevard as it approaches S. Jamie Blvd. On the east side of the study area, Nicolle Blvd widens into a four lane divided roadway through the signalized Lapalco intersection and becomes Segnette Blvd on the north side.

Lapalco Blvd is a four-lane divided parish roadway that generally parallels US 90 until it intersects US 90 in between Segnette and S. Jamie Blvds. US 90 is a four-lane divided state highway oriented in a general west-east direction. Actuated traffic signals at the T-intersections of US 90 at Lapalco Blvd and at Segnette Blvd are operated and maintained by the Louisiana Department of Transportation and Development (LADOTD).

S. Jamie Blvd is the main roadway through Avondale Homes subdivision. It is a two-lane divided parish road with parking lanes on the outside. S. Jamie Blvd also provides access to Henry Ford Junior High and a public park. The intersection of S. Jamie Blvd and Nicolle Blvd is an all way stop controlled intersection with one lane approach in each direction.

Existing lane configurations for the intersections are presented in Figure 3.



LEGEND:

- Signalized Intersection
- Unsignalized Intersection

Figure 3
 2015 Existing Lane Configurations

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Data Collection

Turning movement counts were collected in May 2015 for the study intersections. Counts were collected from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM at all intersections. Counts at the intersection of for Nicolle Blvd at Churchill Blvd included 5:00 AM to midnight for use in traffic signal warrant analysis. The peak hours were identified as 7:00 AM to 8:00 AM and 4:45 PM to 5:45 PM. The resulting AM and PM peak hour existing volumes are presented in Figure 4. The count data is included in the Appendix.

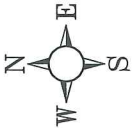
Capacity Analysis

Capacity analysis was performed to determine operational conditions in the AM and PM peaks. This type of analysis is the industry standard for traffic impact studies and the methods are the widely accepted practice of evaluating impacts on traffic operations.

Levels of Service (LOS) represent a qualitative and quantitative evaluation of the traffic operation of a given intersection 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, which include signalized and unsignalized intersection modules.

Intersection geometry, turning movement volumes, and traffic control parameters were entered into Hwy Capacity Software, version 5.4 (HCS+) for the signalized and unsignalized intersections to determine the expected LOS. For signalized and stop-controlled intersections, the HCM bases LOS quality on average control delay (in terms of seconds per vehicle).

Levels of Service range from LOS A, a condition of little or no delay, to LOS F, a condition of capacity breakdown represented by heavy delay and congestion. LOS B is characterized as stable flow. LOS C is considered to have a stable traffic flow, but is becoming susceptible to congestion with general levels of comfort and convenience declining noticeably. LOS D approaches unstable flow as speed and freedom to maneuver are severely restricted and LOS E represents unstable flow at or near capacity levels with poor levels of comfort and convenience. Tables 1 and 2 present Level of Service criteria for signalized and unsignalized intersections, respectively.



LEGEND:

- X AM Peak Hour
- (X) PM Peak Hour
- Unsignalized Intersection
- Signalized Intersection

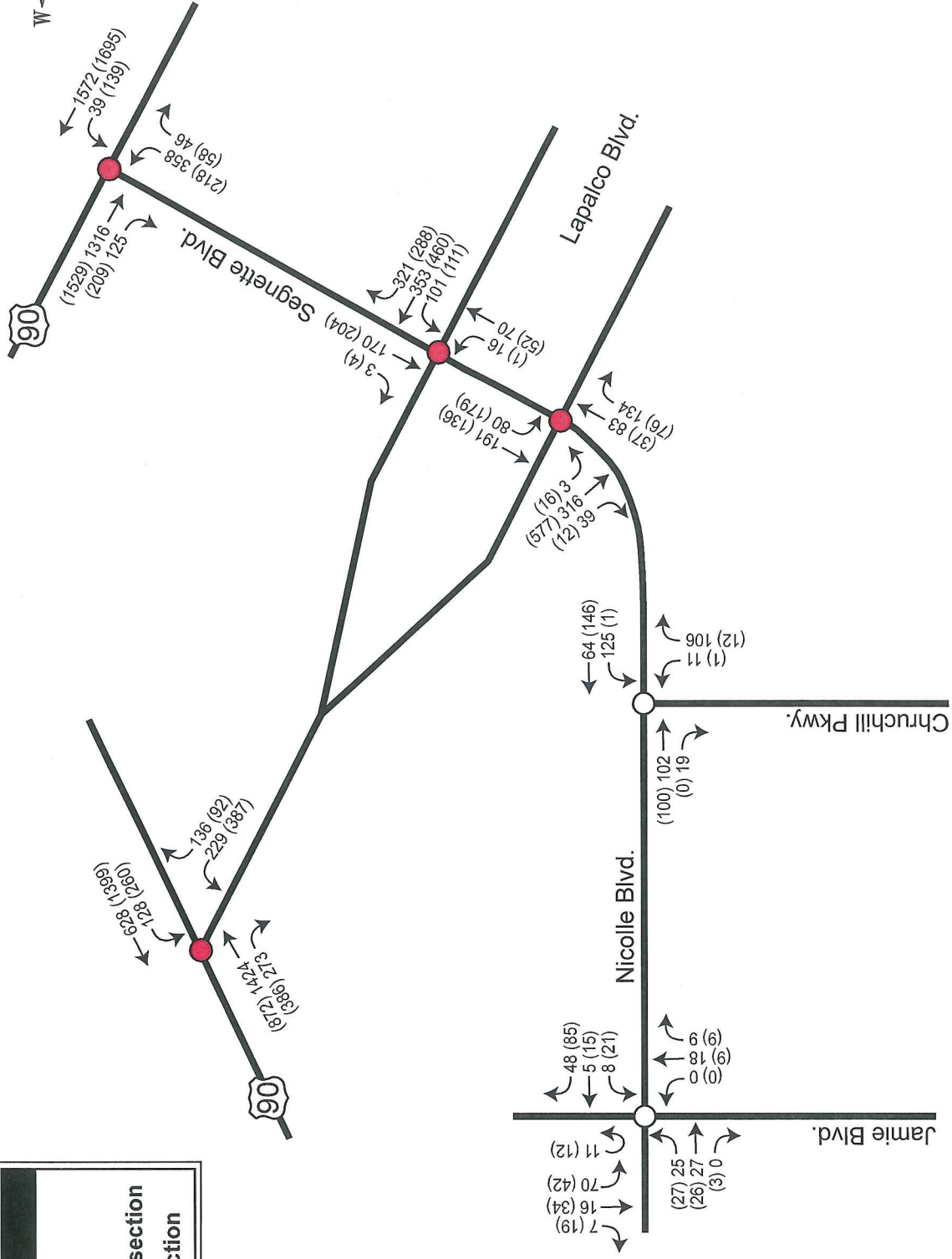


Figure 4
2015 Existing Conditions

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**Table 1
Level of Service Criteria:
Signalized Intersections**

Level of Service	Stopped Delay (Sec/Veh)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

**Table 2
Level of Service Criteria:
Unsignalized Intersections**

Level of Service	Average Total Delay (Sec/Veh)
A	< 10
B	> 10 and < 15
C	> 15 and < 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

Existing Conditions Analysis

Existing volume and intersection control data were input into HCS+ software to generate Level of Service and delay estimates for each intersection. Signalized intersection analysis was based on the existing traffic signal phasing and timing data provided by LADOTD and Jefferson Parish. The provided signal data is included in the Appendix. The intersection of Lapalco Blvd at Nicolle Blvd/Segnette Blvd was analyzed as two intersections due to the width of the median separating the two directions of Lapalco Blvd. Table 3 presents the results of the analysis of the existing conditions.

Table 3
Level of Service Analysis
2015 Existing Conditions

Intersection/Approach	AM Peak		PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
US 90 at Segnette	C	21.4	C	28.9
<i>US 90 eastbound</i>	C	27.9	D	40.4
<i>US 90 westbound</i>	B	14.4	B	19.7
<i>Segnette Blvd. northbound</i>	C	27.9	C	26.7
Eastbound Lapalco at Nicolle/Segnette	C	30.0	C	31.8
<i>Lapalco eastbound</i>	C	28.8	C	32.9
<i>Nicolle/Segnette northbound</i>	C	32.0	C	30.9
<i>Nicolle/Segnette southbound</i>	C	30.2	C	30.1
Westbound Lapalco at Nicolle/Segnette	C	29.4	C	30.0
<i>Lapalco westbound</i>	C	29.3	C	30.0
<i>Nicolle/Segnette northbound</i>	C	32.6	C	32.7
<i>Nicolle/Segnette southbound</i>	C	29.1	C	28.5
US 90 at Lapalco	C	24.3	B	17.8
<i>US 90 eastbound</i>	C	29.4	C	22.8
<i>US 90 westbound</i>	A	7.4	B	11.2
<i>Lapalco northbound</i>	D	39.9	C	31.9
Nicolle at S. Jamie	A	7.68	A	7.76
<i>Nicolle eastbound</i>	A	7.76	A	7.79
<i>Nicolle westbound</i>	A	7.16	A	7.56
<i>S. Jamie northbound</i>	A	7.27	A	7.26
<i>S. Jamie southbound</i>	A	8.05	A	8.06
Nicolle at Churchill	*	*	*	*
<i>Nicolle westbound</i>	A	8.4	A	7.5
<i>Churchill northbound</i>	B	11.8	A	9.0

*Overall LOS is not available for two-way stop controlled intersections.

Analysis results indicate that all intersections are currently operating with acceptable levels of service during the AM and PM peaks. Field observations indicate the majority of the queues were able to clear during the green time.

Trip Generation

The estimated new trips that will be generated by the development were estimated using the 9th Edition of the *ITE Trip Generation Manual*. This manual represents the summary of vehicle trip generation studies conducted by public and private sector entities for a wide variety of land uses. Data reported in *Trip Generation* is considered to be appropriate for use in the estimation of traffic impacts resulting from land development and, as such, is accepted by Jefferson Parish in the preparation of traffic impact analyses.

Trips were estimated using data presented in Land Use “540, Junior / Community College” using the independent variable of number of students. All project trips during AM and PM peak hours are expected to be new trips, including those of student, staff and visitors. The anticipated enrollment for the Delgado Community College Avondale Campus is 3,000 students. Table 4 summarizes entering and exiting vehicle trips for the proposed project. The trip generation data is included in the Appendix.

**Table 4.
Proposed Vehicle Trip Generation**

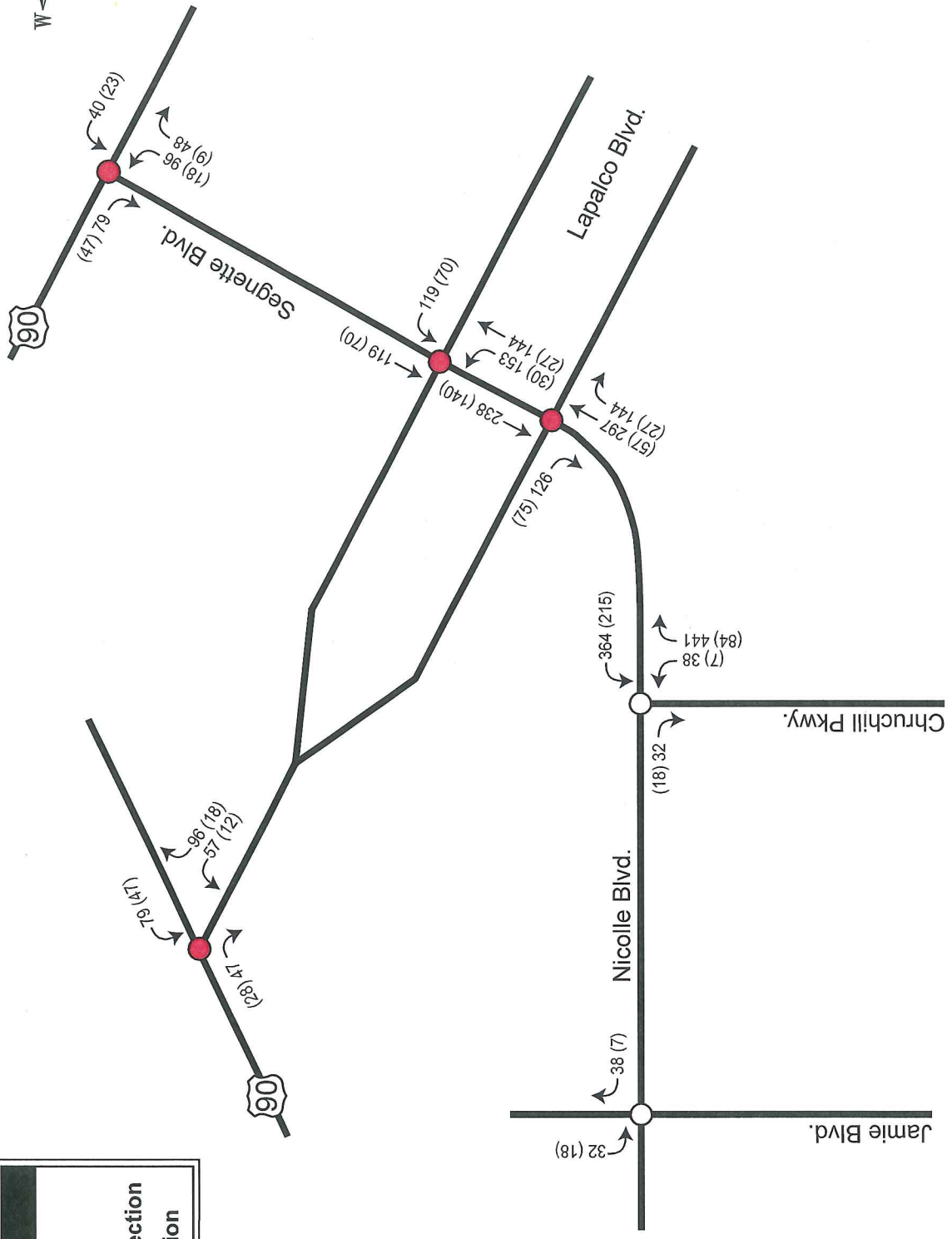
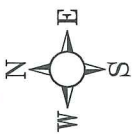
No. of Students	Projected AM Trips			Projected PM Trips		
	Enter	Exit	Total	Enter	Exit	Total
3,000	479	91	570	396	233	629

Trip Distribution

The directional distribution of new trips to the site was estimated based on existing traffic patterns, other community college campuses, surrounding land use, and engineering judgment. The estimated project trips are presented in Figure 5 and the resulting projected traffic volumes are presented in Figure 6.

Turn Lane Warrant Analysis

Right and left turn lane warrants were conducted to determine the need for the turn lanes at Nicolle Blvd at Churchill Pkwy. The analyses were performed for the critical AM peak hour using an NCHRP Report 457 Microsoft Excel spreadsheet for two-way stop controlled intersections on a two-lane roadway. Based on the projected traffic volumes, analysis indicates a westbound left turn lane would be warranted at the intersection of Nicolle Blvd. at Churchill Pkwy. Analysis indicates an eastbound right turn lane would not be warranted. Turn lane warrant documentation is included in the Appendix.



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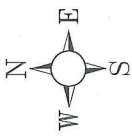
- X AM Peak Hour
- (X) PM Peak Hour
- Unsignalized Intersection
- Signalized Intersection

Figure 5
Trip Generation

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LEGEND:

X	AM Peak Hour
(X)	PM Peak Hour
○	Unsignalized Intersection
●	Signalized Intersection

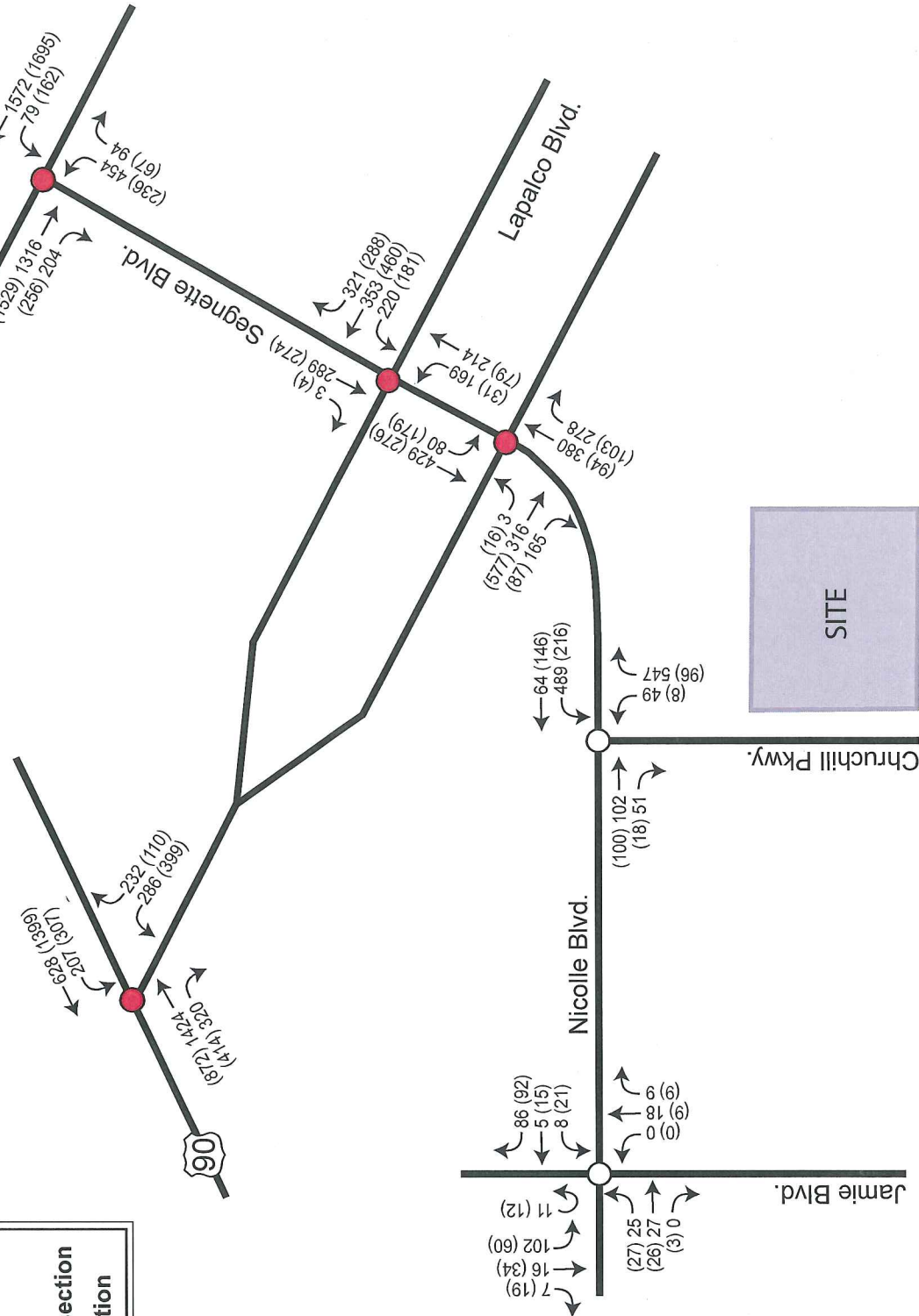


Figure 6
 Projected Conditions
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Projected Conditions

Intersection capacity analyses were conducted for the study intersections based on the existing intersection geometry and traffic control for the AM and PM peaks with the exception of Nicolle Blvd at Churchill Pkwy. The projected conditions analysis for this intersection included the warranted westbound left turn lane. The signalized intersection analysis included timing changes within the minimum and maximum green times to account for actuation. The capacity analysis reports are included in the Appendix.

Tables 5 and 6 present a comparison of the existing conditions to the projected conditions for the AM and PM peaks, respectively.

Table 5
Level of Service Analysis
AM Peak Projected Conditions

Intersection/Approach	Existing		Projected	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
US 90 at Segnette	C	21.4	C	22.7
<i>US 90 eastbound</i>	C	27.9	C	27.9
<i>US 90 westbound</i>	B	14.4	B	14.9
<i>Segnette Blvd. northbound</i>	C	27.9	C	33.4
Eastbound Lapalco at Nicolle/Segnette	C	30.0	D	38.5
<i>Lapalco eastbound</i>	C	28.8	C	32.2
<i>Nicolle/Segnette northbound</i>	C	32.0	D	40.5
<i>Nicolle/Segnette southbound</i>	C	30.2	D	41.8
Westbound Lapalco at Nicolle/Segnette	C	29.4	C	33.4
<i>Lapalco westbound</i>	C	29.3	C	33.5
<i>Nicolle/Segnette northbound</i>	C	32.6	D	33.9
<i>Nicolle/Segnette southbound</i>	C	29.1	C	32.3
US 90 at Lapalco	C	24.3	C	31.3
<i>US 90 eastbound</i>	C	29.4	D	38.8
<i>US 90 westbound</i>	A	7.4	B	13.5
<i>Lapalco northbound</i>	D	39.9	D	40.1
Nicolle at S. Jamie	A	7.7	A	8.0
<i>Nicolle eastbound</i>	A	7.8	A	7.9
<i>Nicolle westbound</i>	A	7.2	A	7.4
<i>S. Jamie northbound</i>	A	7.3	A	7.4
<i>S. Jamie southbound</i>	A	8.1	A	7.5
Nicolle at Churchill	*	*	*	*
<i>Nicolle westbound</i>	A	8.4	C	17.1
<i>Churchill northbound</i>	B	11.8	F	618.2

Table 6
Level of Service Analysis
PM Peak Projected Conditions

Intersection/Approach	Existing		Projected	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
US 90 at Segnette	C	28.9	C	31.1
<i>US 90 eastbound</i>	D	40.4	D	40.4
<i>US 90 westbound</i>	B	19.7	C	24.0
<i>Segnette Blvd. northbound</i>	C	26.7	C	27.3
Eastbound Lapalco at Nicolle/Segnette	C	31.8	C	32.2
<i>Lapalco eastbound</i>	C	32.9	C	32.4
<i>Nicolle/Segnette northbound</i>	C	30.9	C	31.2
<i>Nicolle/Segnette southbound</i>	C	30.1	C	32.3
Westbound Lapalco at Nicolle/Segnette	C	30.0	C	29.7
<i>Lapalco westbound</i>	C	30.0	C	29.4
<i>Nicolle/Segnette northbound</i>	C	32.7	C	32.8
<i>Nicolle/Segnette e southbound</i>	C	28.5	C	29.5
US 90 at Lapalco	B	17.8	B	18.9
<i>US 90 eastbound</i>	C	22.8	C	22.8
<i>US 90 westbound</i>	B	11.2	B	12.9
<i>Lapalco northbound</i>	C	31.9	C	32.4
Nicolle at S. Jamie	A	7.76	A	7.91
<i>Nicolle eastbound</i>	A	7.79	A	7.86
<i>Nicolle westbound</i>	A	7.56	A	7.66
<i>S. Jamie northbound</i>	A	7.26	A	7.31
<i>S. Jamie southbound</i>	A	8.06	A	8.27
Nicolle at Churchill	*	*	*	*
<i>Nicolle westbound</i>	A	7.5	A	8.1
<i>Churchill northbound</i>	A	9.0	B	10.2

A review of Tables 5 and 6 indicates minor increases in delay with the addition of the project trips, except for westbound Nicolle Blvd which is expected to result in LOS F in the AM peak. Signalization was identified as a potential improvement to mitigate delays.

Potential Improvements

Traffic signal warrant analysis, based on the *Manual on Uniform Traffic Control Devices (MUTCD), 2003 Edition*, was conducted for the Nicolle Blvd at Churchill Pkwy intersection with the addition of the project related trips. The estimated new daily trips generated by the development were determined using the *ITE Trip Generation Manual*.

A twenty-four (24) hour traffic count collected for a separate project at a driveway for the River Parish Community College in Sorrento was used to estimate the hourly distribution of trips on a

typical day in fifteen minute intervals. The count was collected in September 2011 and is included in the Appendix.

The hourly trips in fifteen minute intervals were estimated for each approach of the intersection based on the estimated directional distributions and added to the volume counts collected at the existing intersection. The resulting volumes were entered into the PC-Warrants version 1.14. The results indicate that only Warrant 3A – Peak Hour Delay is expected to be satisfied. A review of the analysis indicates that the minor street volume (Churchill Pkwy approach) meets the threshold requirements for Warrants 1A, 1B and 1C. The low traffic volume on Nicolle Blvd that is not associated with Churchill Business and Technology Park is the reason signal warrants are not expected to be satisfied. The analysis report is included in the Appendix.

Conclusions and Recommendations

This study projected new traffic associated with the proposed community college campus and evaluated the impact at the study intersections. Projected conditions capacity analyses indicated that the majority of the roadway network is expected to accommodate the new trips for the school.

Widening of the westbound Nicolle Blvd approach at Churchill Pkwy to include a left only turn lane is warranted and recommended. The westbound approach of Nicolle Blvd at Churchill Pkwy, however, is still expected to experience significant increases in delay with the addition of the project trips. While traffic signal warrants are not expected to be met at this intersection with the addition of the community college, as background volumes increase from development of the surrounding areas, a signal may become necessary. Conversion of the intersection to a roundabout in the future could also be considered.