

**FINAL**  
DESIGN TRAFFIC  
TECHNICAL MEMORANDUM

**US 301** FROM FOWLER AVENUE TO PROPOSED SR 56

WPI Segment No. 255796-1

Project Development and Environment Study



January 2016

**FINAL**

**Design Traffic Technical Memorandum**

**US 301 (SR 41)**

**Project Development and Environment Study**

**From Fowler Avenue to Proposed SR 56  
Hillsborough and Pasco Counties, Florida**

Work Program Item Segment Number: 255796-1

ETDM Number: 14194

This roadway capacity improvement project involves widening US 301 from the existing two-lane undivided arterial roadway to a four-lane divided arterial roadway to accommodate future travel demand in the study area. The study limits extend from the intersection with Fowler Avenue (State Road 582) in Hillsborough County to Proposed SR 56 in Pasco County. The total project length is approximately 13.1 miles.

**Florida Department of Transportation  
District Seven**

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Tampa, Florida

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## SECTION 1.0 INTRODUCTION

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### 1.1 Project Description

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) study to evaluate the proposed widening of US 301 to four lanes from Fowler Avenue (SR 582) in Hillsborough County to Proposed SR 56 in Pasco County. The total project length is approximately 13.1 miles, and is illustrated in **Figure 1-1**. The purpose of this PD&E study is to document the need for additional capacity within the study corridor and to evaluate the costs and impacts associated with providing this additional capacity. Federal funds are not planned to be used for the project, so it is being conducted in accordance with the *PD&E Manual*, Part 1, Chapter 10, which addresses non-federal projects.

The proposed action involves widening US 301 from the existing two-lane undivided roadway to a four-lane divided roadway. This improvement is necessary to provide additional capacity to accommodate the future travel demand that will be generated by the projected population and employment growth in Hillsborough and Pasco Counties. US 301 is a major north-south roadway that traverses both counties, and provides connectivity to many of Florida's major roadways including I-4, I-75, SR 54, and SR 52. This roadway is a vital link in the regional transportation network and also serves as an emergency evacuation route.

The four-laning of the Hillsborough County portion of the study corridor (from Fowler Avenue to the County line) is identified as a "Highway Need Beyond 2040" in the Hillsborough MPO's 2040 Long Range Transportation Plan (LRTP). The four-laning of the Pasco County portion of the study corridor (from the County line to proposed SR 56) is identified as an unfunded need in the Pasco County MPO's 2040 LRTP Needs Plan.

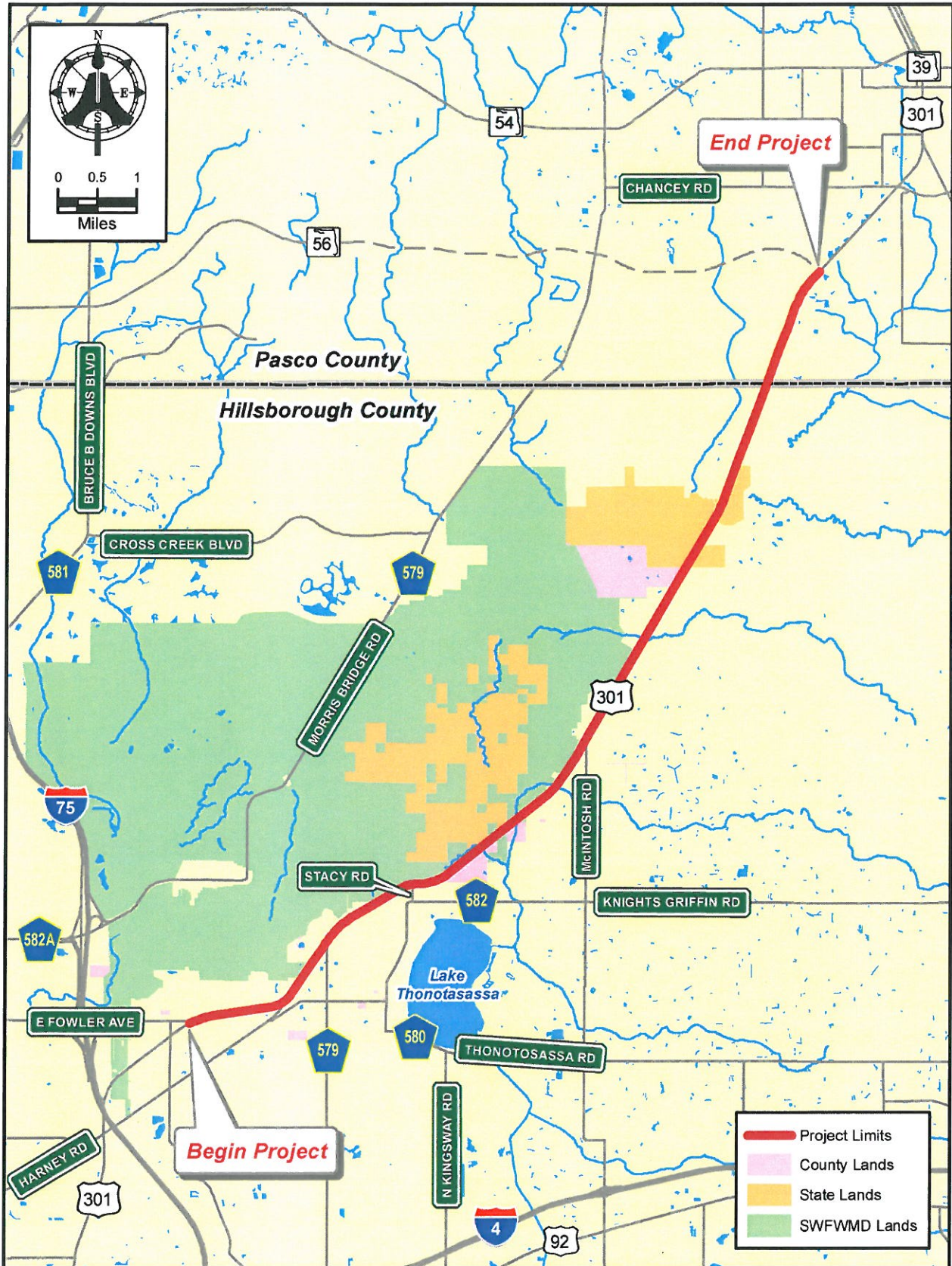
US 301 is functionally classified as an Urban Other Principal Arterial from Fowler Avenue to just north of CR 579 (Mango Road) and from the County line to the proposed SR 56 extension. The remaining portion of the project is classified as a Rural Other Principal Arterial. The posted speed limits within the study corridor are 55 miles per hour (mph) and 60 mph.

The existing right-of-way width ranges from 100 feet to 230 feet. There are paved shoulders and a 2.2-mile shared-use path (known as the Old Fort King Trail) running parallel to US 301 within the study limits. Drainage is collected in roadside ditches, and is ultimately conveyed to the Hillsborough River

There are also five structures located within the study corridor. Three of the bridges are located over Flint Creek, Flint Creek Relief and Hollomans Branch. The Old Fort King Trail also has pedestrian bridges over the same waters. The two other bridges on US 301 within the study corridor are over Two Holes Branch and the Hillsborough River.

The project was evaluated through the FDOT's Efficient Transportation Decision Making (ETDM) process. This project is designated as ETDM project #14194. An ETDM *Programming*

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**Figure 1-1: Project Location Map**



*Screen Summary Report* was published on April 21, 2015 containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical and social resources.

## **1.2 Purpose and Need**

The purpose of this project is to provide additional roadway capacity and improve safety on this portion of US 301 in unincorporated Hillsborough and Pasco Counties. US 301 is a major north-south roadway in close proximity to the City of Temple Terrace in Hillsborough County, and the City of Zephyrhills in Pasco County. This roadway extends from the Sarasota-Bradenton-Venice Metropolitan Statistical Area across the state to the Jacksonville Metropolitan Statistical Area. US 301 serves both regional and local travel and connects residential centers in the Zephyrhills and Temple Terrace areas with employment centers in the Tampa area. It provides regional connectivity with I-75, SR 52, SR 54 and I-4. US 301 has been designated by both Hillsborough and Pasco Counties' Emergency Management as an emergency evacuation route. In addition to increasing capacity, this project will add or enhance the multimodal facilities in this corridor.

The proposed widening of this portion of US 301 is expected to have positive mobility impacts. The Hillsborough County City-County Planning Commission's 2040 LRTP socioeconomic projections (July 2014) contain both population and employment projections. These projections show Hillsborough County's population increasing from 1,229,226 to 1,815,964 (a 48% increase) between 2010 and 2040. Employment is projected to increase from 711,400 to 1,112,059 (a 56% increase) between 2010 and 2040, mostly within the urban service area. The Pasco County MPO's Mobility 2040 LRTP (May 2015) documents socioeconomic projections for Pasco County. These projections show Pasco County's population increasing from 459,023 to 905,211 (a 97% increase) between 2010 and 2040. Employment is projected to increase from 125,400 to 374,966 (a 199% increase) between 2010 and 2040. Based on projected population and employment growth, the existing study corridor would experience failing levels of service in the future.

US 301 is a truck route that provides north-south access within eastern Hillsborough and Pasco County and connections to the surrounding Tampa Bay area. There is no existing bus service within the project area; however, the Mobility 2040 LRTP includes express bus service in express lanes for the portion of US 301 from Proposed SR 56 to Zephyrhills.

Safety within the US 301 corridor is also projected to improve with an increase in capacity and a reduction in congestion, thereby decreasing potential conflict with other vehicles.

## SECTION 2.0 EXISTING CONDITIONS

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### 2.1 Existing Roadway and Intersection Characteristics

The existing US 301 roadway (Roadway ID Nos. 10210000, 10260000 and 14050000) is a two-lane undivided north/south roadway. According to the 2010 Urban Area Boundaries and Federal Classification Map, the portions of this roadway from Fowler Avenue to approximately 0.16 miles north of CR 579 (Mango Road) and from the Hillsborough/Pasco County line to US 98 in Pasco County are functionally classified as an urban other principal arterial. The portion of US 301 from 0.16 miles north of CR 579 to the Hillsborough/Pasco County line is functionally classified as a rural other principal arterial. The posted speed limits within the study corridor are 55 miles per hour (mph) from Fowler Avenue to Stacy Road and 60 mph north of Stacy Road. There are five intersections included in this Design Traffic Technical Memorandum and these are as follows:

- Fowler Avenue – Milepost 4.597 (Roadway ID No. 10260000)
- Harney Road – Milepost 5.868 (Roadway ID No. 10260000)
- CR 579 – Milepost 0.808 (Roadway ID No. 10210000)
- Stacy Road – Milepost 2.153 (Roadway ID No. 10210000)
- McIntosh Road – Milepost 5.096 (Roadway ID No. 10210000)

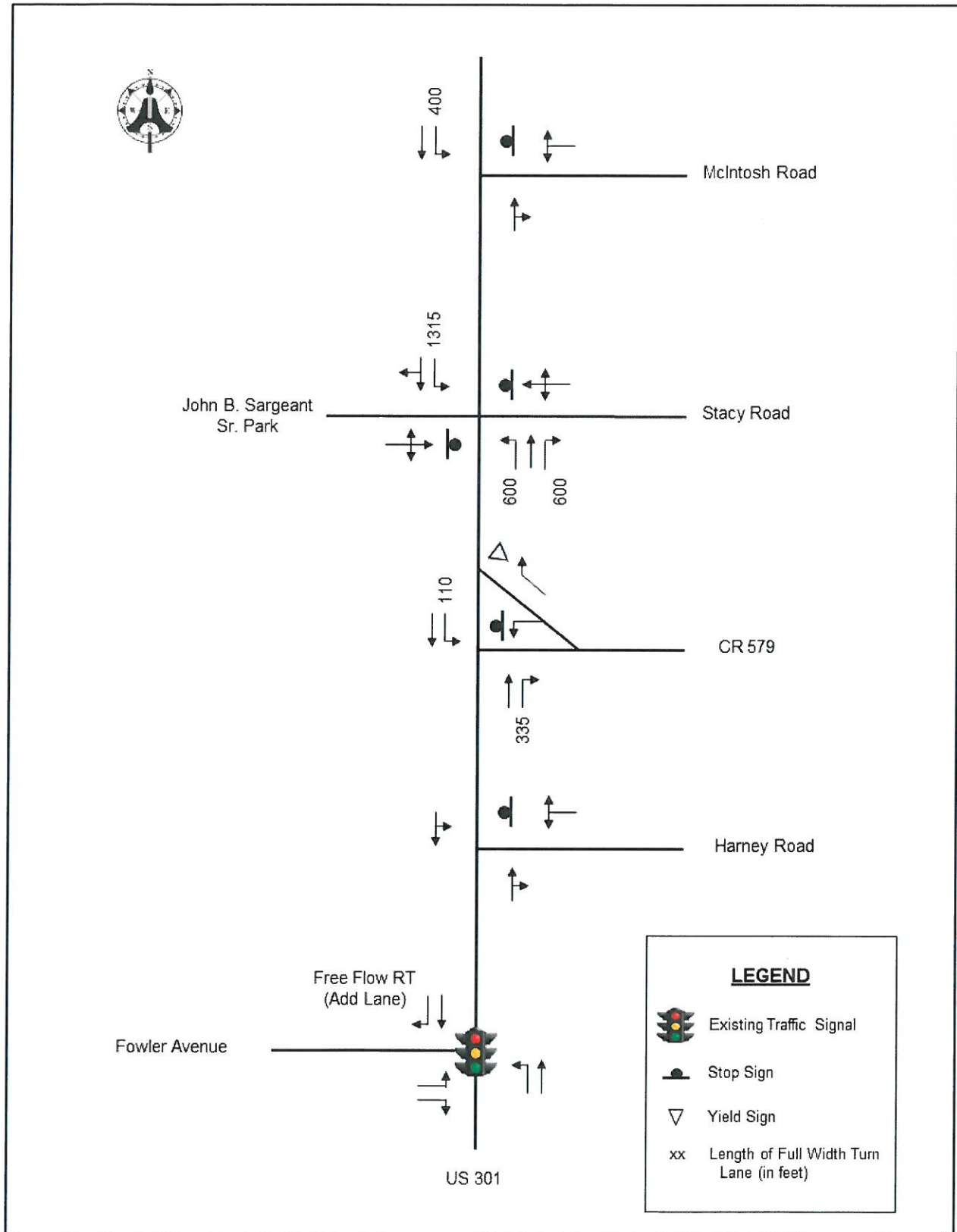
The Fowler Avenue intersection is a signalized intersection while the other four intersections are unsignalized. The Stacy Road intersection is a four-legged intersection and the other four intersections are T-intersections. Although Stacy Road is a four-legged intersection, the west leg serves as the entrance to John B. Sargeant Sr. Memorial Wilderness Park. **Figure 2-1** depicts the existing intersection laneage at these five intersections, as well as the approximate lengths of the full width turn lanes. Exclusive left-turn lanes are provided on US 301 at the Fowler Avenue (northbound), CR 579 (southbound), Stacy Road (northbound and southbound) and McIntosh Road (southbound) intersections. Exclusive right-turn lanes are provided on US 301 at the Fowler Avenue (southbound), CR 579 (northbound) and Stacy Road (northbound) intersections.

### 2.2 Existing Traffic Volumes

A traffic count program was conducted by Adams Traffic, Inc. during the months of June and July in 2015, and the count locations are illustrated in **Figure 2-2**. Within the study corridor, 72-hour bi-directional volume counts were conducted at 15 locations (including the cross streets) during the period from June 9th through June 11th. A series of graphics illustrating the specific locations of the 72-hour bi-directional volume counts are provided in **Appendix A** along with the actual traffic count data.

The 2015 Annual Average Daily Traffic (AADT) volumes were calculated by multiplying the 72-hour count data by seasonal and axle adjustment factors. The 2014 seasonal and axle adjustment factors were obtained from FDOT's Florida Traffic Online website and are provided in **Appendix B**. According to the 2014 Peak Season Factor Category Report, the weekly adjustment factor

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**Figure 2-1: Existing (2015) Intersection Laneage**

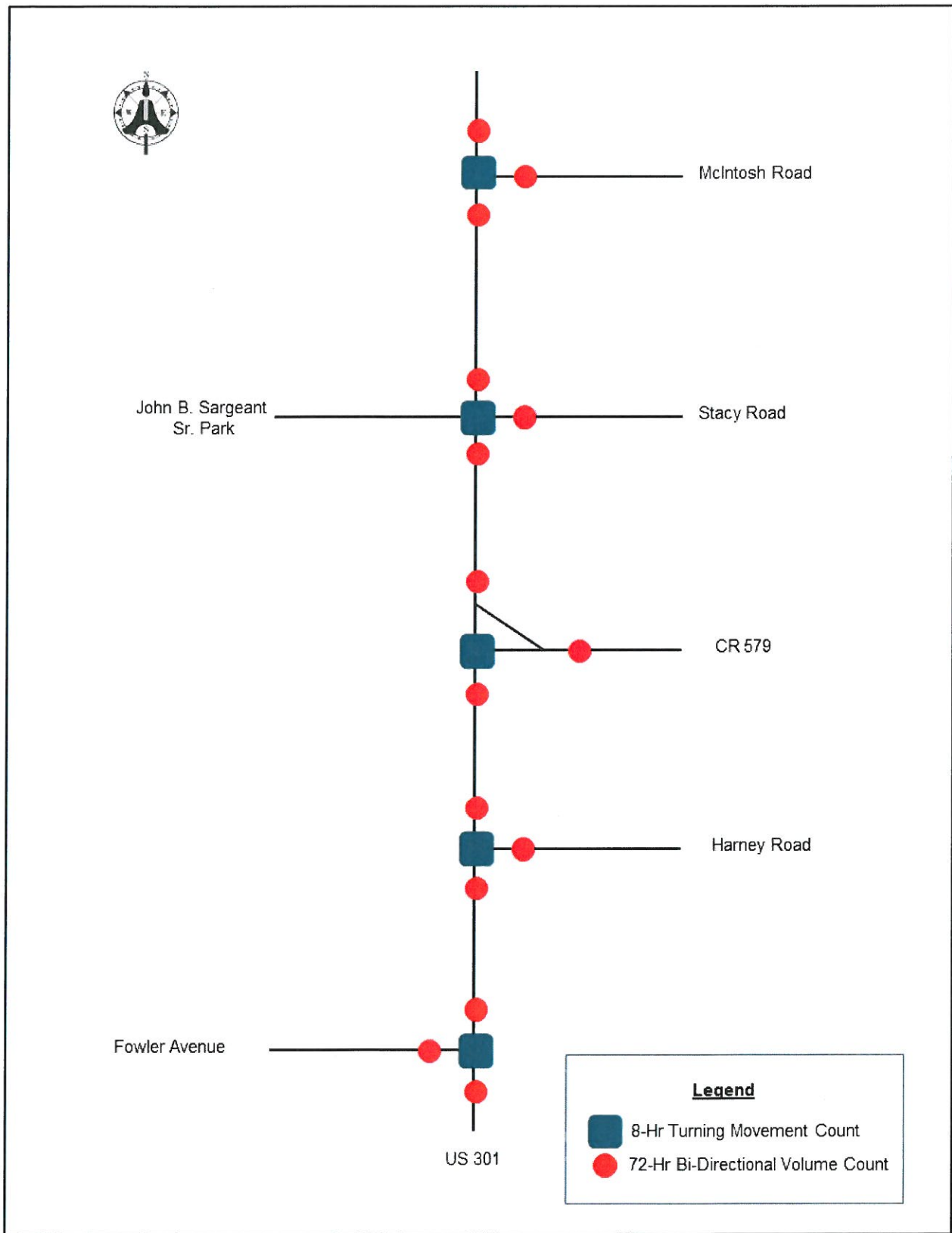


Figure 2-2: Existing (2015) Count Locations

associated with the week of June 8th through June 14th is 1.01. The 2014 Weekly Axle Factor Category Report indicates that axle adjustment factors of 0.94 and 0.93 are associated with the portions of US 301 from Fowler Avenue to Harney Road and from Harney Road to north of McIntosh Road, respectively. The Hillsborough countywide axle adjustment factor of 0.94 was used for the US 301 cross streets. The three 24-hour bi-directional volume counts at each location were converted to AADT volumes and then averaged to obtain the final 2015 AADT volumes. **Table 2-1** summarizes the two-way 24-hour volumes obtained from the traffic counts, as well as the estimated 2015 AADT volumes for the US 301 mainline and cross streets. The 2015 AADT volumes are also graphically illustrated on **Figure 2-3**. The 2015 AADT volumes on US 301 range from 11,600 vehicles per day (vpd) to 18,400 vpd.

There are two FDOT count stations located within the study corridor and two others located to the south and north of the study limits. These count stations and their locations are provided in **Table 2-2** along with the 2014 AADT volumes obtained from the FDOT Florida Traffic Online website. A comparison of the 2014 AADT volumes listed in **Table 2-2** for the three Hillsborough County locations and the 2015 AADT volumes listed in **Table 2-1** indicates that the 2015 AADT volumes are higher than the 2014 AADT volumes at two of the three locations. The 2015 AADT volume on US 301 south of Fowler Avenue is lower than the 2014 AADT volume; however, it should be noted that the portion of US 301 south of Fowler Avenue is currently being widened to four lanes. It is quite possible that the roadway construction that was occurring at the Fowler Avenue intersection may have resulted in additional drivers using Williams Road (located approximately 0.28 miles south of Fowler Avenue) to travel between US 301 and Fowler Avenue. It should also be noted that the 2014 and 2015 AADT volumes were not counted at the exact same locations.

Vehicle classification count data was available at three of the four FDOT count stations. The 24-hour heavy vehicle percentages (i.e., the  $T_{24}$ -factors) recorded at these three locations in 2014 are also provided in **Table 2-2**. The  $T_{24}$ -factors range from approximately 10.0% (north of Fowler Avenue) to approximately 11.2% (south of Chancey Road). The  $T_{24}$ -factor associated with the count station south of Fowler Avenue is 9.3%; however, it should be noted that vehicle classification counts were not conducted at this location. **Table 2-2** also provides information regarding the daily percentages of medium and heavy trucks. The medium truck percentages range from approximately 5.4% to approximately 6.1%, while the heavy truck percentages range from approximately 4.1% to approximately 5.7%.

Eight-hour manual turning movement counts were conducted at the five intersections previously identified on either a Tuesday, Wednesday or Thursday, between June 30th and July 2nd, 2015 within the hours of 6:00 a.m. to 9:00 a.m. and 2:00 p.m. to 7:00 p.m. Heavy vehicles (i.e., trucks and buses), bicyclists and pedestrians were counted in addition to passenger vehicles. The peak hour intersection turning movement count data is provided in **Appendix C**.

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**Table 2-1: Existing (2015) AADT Volumes**

Location	Count Date	24-Hour Volume	Seasonal Factor <sup>(1)</sup>	Axle Factor <sup>(2)</sup>	AADT Volumes	Avg. AADT Volume	Avg. AADT Volume <sup>(3)</sup>
US 301 South of Fowler Avenue	6/9/15	11,860	1.01	0.94	11,260	11,778	11,800
	6/10/15	13,039	1.01	0.94	12,379		
	6/11/15	12,319	1.01	0.94	11,696		
US 301 North of Fowler Avenue	6/9/15	19,349	1.01	0.94	18,370	18,431	18,400
	6/10/15	19,069	1.01	0.94	18,104		
	6/11/15	19,822	1.01	0.94	18,819		
US 301 South of Harney Road	6/9/15	17,750	1.01	0.94	16,852	16,916	16,900
	6/10/15	17,659	1.01	0.94	16,765		
	6/11/15	18,044	1.01	0.94	17,131		
US 301 North of Harney Road	6/9/15	17,992	1.01	0.93	16,900	17,001	17,000
	6/10/15	17,925	1.01	0.93	16,837		
	6/11/15	18,383	1.01	0.93	17,267		
US 301 South of CR 579	6/9/15	15,727	1.01	0.93	14,772	15,029	15,000
	6/10/15	15,528	1.01	0.93	14,585		
	6/11/15	16,746	1.01	0.93	15,730		
US 301 North of CR 579	6/9/15	15,486	1.01	0.93	14,546	14,719	14,700
	6/10/15	15,561	1.01	0.93	14,616		
	6/11/15	15,962	1.01	0.93	14,993		
US 301 South of Stacy Road	6/9/15	15,220	1.01	0.93	14,296	14,460	14,500
	6/10/15	15,288	1.01	0.93	14,360		
	6/11/15	15,674	1.01	0.93	14,723		
US 301 North of Stacy Road	6/9/15	12,497	1.01	0.93	11,738	11,789	11,800
	6/10/15	12,438	1.01	0.93	11,683		
	6/11/15	12,718	1.01	0.93	11,946		
US 301 South of McIntosh Road	6/9/15	12,337	1.01	0.93	11,588	11,591	11,600
	6/10/15	12,185	1.01	0.93	11,445		
	6/11/15	12,499	1.01	0.93	11,740		
US 301 North of McIntosh Road	6/9/15	13,139	1.01	0.93	12,341	12,376	12,400
	6/10/15	12,999	1.01	0.93	12,210		
	6/11/15	13,389	1.01	0.93	12,576		
Fowler Avenue West of US 301	6/9/15	15,533	1.01	0.94	14,747	14,762*	14,800*
	6/10/15	17,297	1.01	0.94	16,422		
	6/11/15	15,565	1.01	0.94	14,777		
Harney Road South of US 301	6/9/15	606	1.01	0.94	575	621	600
	6/10/15	656	1.01	0.94	623		
	6/11/15	701	1.01	0.94	666		
CR 579 South of US 301	6/9/15	3,304	1.01	0.94	3,137	3,232	3,200
	6/10/15	3,727	1.01	0.94	3,538		
	6/11/15	3,182	1.01	0.94	3,021		
Stacy Road South of US 301	6/9/15	3,281	1.01	0.94	3,115	3,210	3,200
	6/10/15	3,367	1.01	0.94	3,197		
	6/11/15	3,495	1.01	0.94	3,318		
McIntosh Road South of US 301	6/9/15	1,884	1.01	0.94	1,789	1,805	1,800
	6/10/15	1,888	1.01	0.94	1,792		
	6/11/15	1,931	1.01	0.94	1,833		

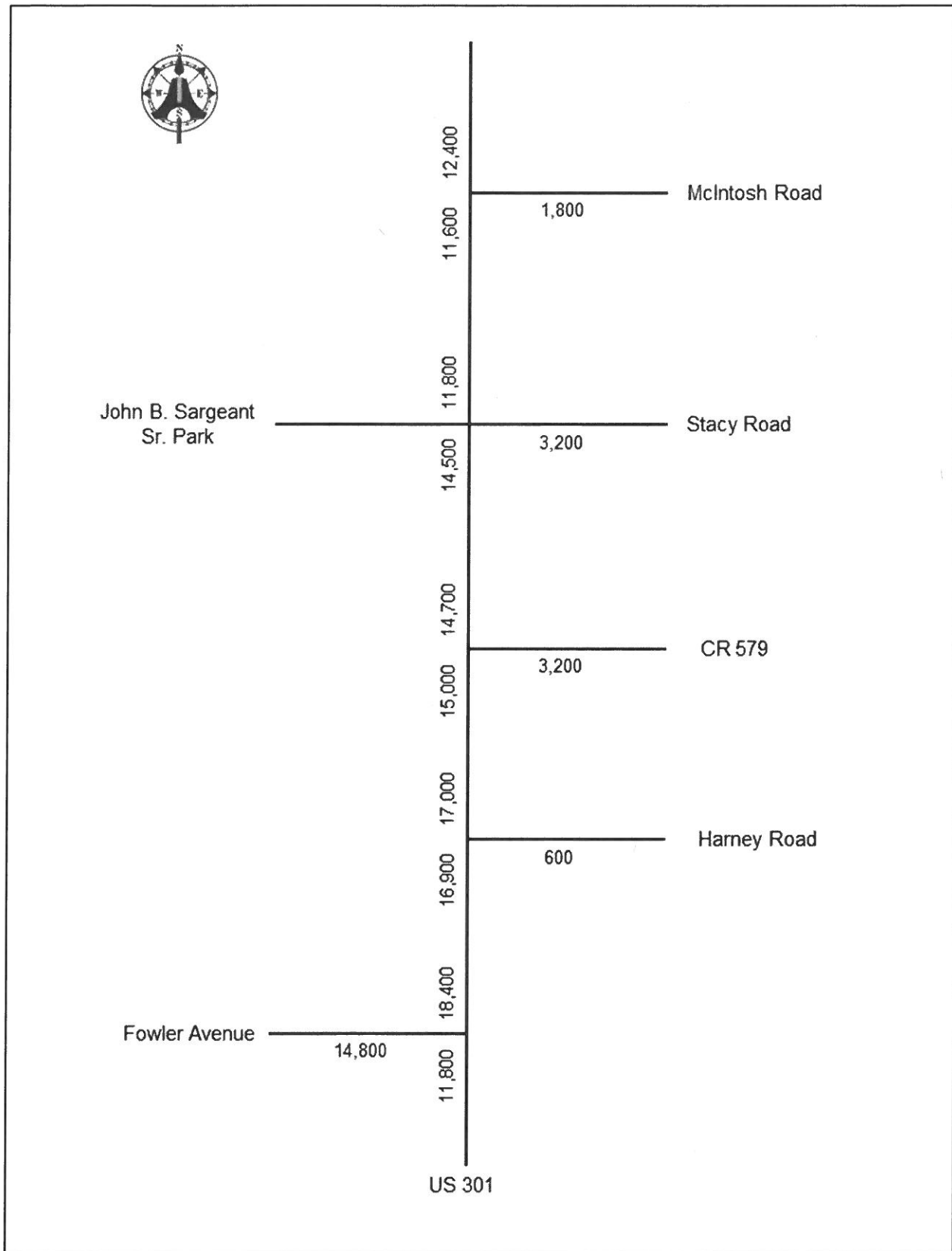
<sup>(1)</sup> 2014 Weekly Seasonal Adjustment Factor obtained from FDOT Database.

<sup>(2)</sup> 2014 Axle Adjustment Factors obtained from FDOT Database.

<sup>(3)</sup> Rounded AADT volume.

\* Average AADT volume calculated using 6/9/15 and 6/11/15 counts only

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**Figure 2-3: Existing (2015) AADT Volumes**

**Table 2-2: 2014 FDOT Count Station Data**

Count Station No.	Location	AADT Volume	K-Factor	D-Factor	T <sub>24</sub> -Factor	Medium Trucks	Heavy Trucks
105261 Hillsborough County	0.197 miles South of Fowler Avenue	12,700	9.0%	58.6%	9.3%*	N/A	N/A
100060 Hillsborough County	0.403 miles North of Fowler Avenue	16,400	9.0%	58.6%	9.97%	5.88%	4.09%
100050 Hillsborough County	0.347 miles North of Stacy Road	11,200	9.5%	58.6%	10.65%	6.10%	4.55%
145501 Pasco County	0.767 miles South of Chancey Road	14,500	9.0%	56.1%	11.16%	5.43%	5.73%

\* No classification count data was available at this site.

### 2.3 Existing Peak Hour Traffic Characteristics

A review of the a.m. peak hour turning movement counts indicated that the highest 60-minute volumes occurred between 6:45 a.m. and 7:45 a.m. at three of the five intersections and between 7:00 a.m. and 8:00 a.m. at the other two intersections. To determine the most appropriate a.m. peak hour to use in the existing conditions analysis, the intersection approach volumes for each of the five intersections were summed to obtain a total “corridor” peak hour volume. Since the highest total a.m. peak hour corridor volume occurs between 6:45 a.m. and 7:45 a.m., this hour was used to represent the a.m. peak hour. A review of the p.m. peak hour turning movement counts indicated that the highest 60-minute volumes occurred between 5:00 p.m. and 6:00 p.m. at four of the five intersections; therefore this hour was used to represent the p.m. peak hour. The raw turning movement counts recorded between 6:45 a.m. and 7:45 a.m. and between 5:00 p.m. and 6:00 p.m. are summarized in **Appendix C**.

The percentage of the two-way peak hour volume that occurs in the peak direction was calculated for the US 301 mainline using the 72-hour bi-directional volume counts. These a.m. and p.m. peak hour directional distribution percentages (i.e., D-factors) are summarized in **Table 2-3** and **Table 2-4**, respectively. A review of these tables indicates that the directionality of peak hour traffic flow within the study corridor is highly skewed. In the a.m. peak hour, the peak travel direction on US 301 is southbound and the D-factors range from 76.45% (south of Fowler Avenue) to 81.67% (south of Stacy Road) with an overall average value of 79.72%. In the p.m. peak hour, the peak travel direction on US 301 is northbound and the D-factors range from 65.56% (south of Fowler Avenue) to 75.07% (south of Stacy Road) with an overall average value of 71.58%. This traffic count data supports the statement made in Section 2.6.3 of the FDOT’s 2014 Project Traffic Forecasting (PTF) Handbook which states “during peak hours on most rural highways, from 55 to 70 percent of the traffic is in one direction”.

**Table 2-5** summarizes the peak hour total approach volumes and heavy vehicle volumes that were recorded on the US 301 mainline during the intersection turning movement counts. A review of this table indicates that the percentage of heavy vehicles is significantly higher in the northbound direction than in the southbound direction during the a.m. peak hour. The average



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**Table 2-3: Existing (2015) AM Peak Hour Directional Distributions**

Location	Direction	AM Peak Hour Volumes					D-Factor	Peak Direction	Average D-Factor
		6/9/15	6/10/15	6/11/15	Average	Avg. 2-Way			
US 301 South of Fowler Avenue	NB	236	214	232	227	964	76.45%	SB	79.72%
	SB	776	726	709	737				
US 301 North of Fowler Avenue	NB	373	354	361	363	1,635	77.80%	SB	
	SB	1,300	1,269	1,246	1,272				
US 301 South of Harney Road	NB	324	311	325	320	1,515	78.88%	SB	
	SB	1,256	1,169	1,160	1,195				
US 301 North of Harney Road	NB	330	313	323	322	1,549	79.21%	SB	
	SB	1,280	1,209	1,193	1,227				
US 301 South of CR 579	NB	275	268	268	270	1,402	80.74%	SB	
	SB	1,154	1,069	1,174	1,132				
US 301 North of CR 579	NB	275	248	254	259	1,388	81.34%	SB	
	SB	1,204	1,077	1,105	1,129				
US 301 South of Stacy Road	NB	270	238	247	252	1,375	81.67%	SB	
	SB	1,194	1,081	1,093	1,123				
US 301 North of Stacy Road	NB	241	220	217	226	1,149	80.33%	SB	
	SB	978	889	902	923				
US 301 South of McIntosh Road	NB	235	197	192	208	1,121	81.45%	SB	
	SB	964	886	890	913				
US 301 North of McIntosh Road	NB	261	243	224	243	1,174	79.30%	SB	
	SB	963	917	912	931				
Fowler Avenue West of US 301	EB	455	562	405	474	1,196	60.37%	WB	60.37%
	WB	733	745	689	722				
Harney Road South of US 301	WB	18	14	19	17	49	65.31%	EB	65.31%
	EB	31	35	31	32				
CR 579 South of US 301	WB	131	149	108	129	272	52.57%	EB	52.57%
	EB	150	141	139	143				
Stacy Road South of US 301	WB	244	221	210	225	274	82.12%	WB	82.12%
	EB	55	46	45	49				
McIntosh Road South of US 301	WB	77	80	68	75	135	55.56%	WB	55.56%
	EB	56	63	61	60				

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**Table 2-4: Existing (2015) PM Peak Hour Directional Distributions**

Location	Direction	PM Peak Hour Volumes					D-Factor	Peak Direction	Average D-Factor
		6/9/15	6/10/15	6/11/15	Average	Avg. 2-Way			
US 301 South of Fowler Avenue	NB	700	936	842	826	1,260	65.56%	NB	71.57%
	SB	411	477	413	434				
US 301 North of Fowler Avenue	NB	1,150	1,112	1,210	1,157	1,688	68.54%	NB	
	SB	513	533	547	531				
US 301 South of Harney Road	NB	1,112	1,078	1,149	1,113	1,588	70.09%	NB	
	SB	465	472	488	475				
US 301 North of Harney Road	NB	1,178	1,153	1,234	1,188	1,663	71.44%	NB	
	SB	459	462	503	475				
US 301 South of CR 579	NB	1,058	1,026	1,090	1,058	1,469	72.02%	NB	
	SB	387	401	445	411				
US 301 North of CR 579	NB	1,093	1,120	1,159	1,124	1,520	73.95%	NB	
	SB	387	385	417	396				
US 301 South of Stacy Road	NB	1,081	1,120	1,149	1,117	1,488	75.07%	NB	
	SB	376	357	381	371				
US 301 North of Stacy Road	NB	828	838	866	844	1,160	72.76%	NB	
	SB	327	322	298	316				
US 301 South of McIntosh Road	NB	843	817	853	838	1,136	73.77%	NB	
	SB	307	295	291	298				
US 301 North of McIntosh Road	NB	871	850	903	875	1,206	72.55%	NB	
	SB	341	321	330	331				
Fowler Avenue West of US 301	EB	1,106	1,407	1,268	1,187*	1,695	70.02%	EB	70.02%
	WB	501	507	517	508				
Harney Road South of US 301	WB	78	86	88	84	104	80.77%	WB	80.77%
	EB	16	19	25	20				
CR 579 South of US 301	WB	164	250	203	206	293	70.31%	WB	70.31%
	EB	88	77	95	87				
Stacy Road South of US 301	WB	91	95	96	94	396	76.26%	EB	76.26%
	EB	289	301	317	302				
McIntosh Road South of US 301	WB	92	94	92	93	196	52.55%	EB	52.55%
	EB	110	99	100	103				

\* Average peak hour volume calculated using 6/9/15 and 6/11/15 counts only.

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**Table 2-5: Existing (2015) Peak Hour Heavy Vehicle Volumes and Percentages**

Intersection	Date	Approach Direction	AM Peak Hour			PM Peak Hour		
			Total Vehicles	Heavy Vehicles	Heavy Vehicle Percent	Total Vehicles	Heavy Vehicles	Heavy Vehicle Percent
Fowler Avenue	6/30/15	Northbound	181	32	17.7%	697	34	4.9%
		Southbound	1105	47	4.3%	558	20	3.6%
		<b>Total</b>	<b>1286</b>	<b>79</b>	<b>6.1%</b>	<b>1255</b>	<b>54</b>	<b>4.3%</b>
Harney Road	7/1/15	Northbound	282	35	12.4%	1087	51	4.7%
		Southbound	1075	59	5.5%	425	20	4.7%
		<b>Total</b>	<b>1357</b>	<b>94</b>	<b>6.9%</b>	<b>1512</b>	<b>71</b>	<b>4.7%</b>
CR 579	7/2/15	Northbound	220	35	15.9%	914	51	5.6%
		Southbound	999	41	4.1%	414	21	5.1%
		<b>Total</b>	<b>1219</b>	<b>76</b>	<b>6.2%</b>	<b>1328</b>	<b>72</b>	<b>5.4%</b>
Stacy Road	7/1/15	Northbound	209	29	13.9%	1075	22	2.0%
		Southbound	824	34	4.1%	272	19	7.0%
		<b>Total</b>	<b>1033</b>	<b>63</b>	<b>6.1%</b>	<b>1347</b>	<b>41</b>	<b>3.0%</b>
McIntosh Road	7/2/15	Northbound	192	29	15.1%	728	41	5.6%
		Southbound	831	46	5.5%	348	16	4.6%
		<b>Total</b>	<b>1023</b>	<b>75</b>	<b>7.3%</b>	<b>1076</b>	<b>57</b>	<b>5.3%</b>
<b>Corridor Average</b>		<b>Northbound</b>				<b>15.0%</b>		
		<b>Southbound</b>				<b>4.7%</b>		
						<b>4.6%</b>		
						<b>5.0%</b>		
Intersection	Date	Approach Direction	AM Peak Hour			PM Peak Hour		
			Total Vehicles	Heavy Vehicles	Heavy Vehicle Percent	Total Vehicles	Heavy Vehicles	Heavy Vehicle Percent
Fowler Avenue	6/30/15	Eastbound	325	23	7.1%	849	28	3.3%
Harney Road	7/1/15	Westbound	19	3	15.8%	62	0	0.0%
CR 579	7/2/15	Westbound	60	10	16.7%	140	2	1.4%
Stacy Road	7/1/15	Westbound	195	7	3.6%	84	1	1.2%
McIntosh Road	7/2/15	Westbound	61	3	4.9%	107	4	3.7%

a.m. peak hour heavy vehicle percentages in the northbound and southbound directions are 15.0% and 4.7%, respectively. In contrast, the percentages of heavy vehicles traveling in the northbound and southbound directions during the p.m. peak hour are approximately the same (4.6% and 5.0%, respectively).

## **2.4 Design Traffic Factors**

The K-factors and D-factors provided on the FDOT's 2014 AADT Reports for the four count stations are listed in **Table 2-2**. Copies of the 2014 AADT reports are included in **Appendix D**. The K-factor values of 9.0% and 9.5% represent the "Standard" K-factors for urban and rural highways, respectively. Since the four count stations are not permanent (telemetered) count station, the D-factor values of 58.6% and 56.1% do not actually represent the directional distributions observed at these locations during the 30th-highest hour of the year (or the median D-factor of the 200 highest hours). As discussed earlier in **Section 2.3**, the 2015 peak hour volumes obtained from the 72-hour bi-directional volume counts yielded average D-factors of 79.72% and 71.58% for the a.m. and p.m. peak hours, respectively. The average of these two values is approximately 75.7% which is within the acceptable range of D-factors as documented in the 2014 PTF Handbook. In addition, the PTF Handbook also states that "directional traffic during peak hours is generally consistent from year to year and from day to day on a given rural road" and "the measured directional distribution may be assumed to apply to the design hour volume for the future year for which the facility is designed, except for urban highways".

Based on a review of the 2014 data contained in the FDOT's database, as well as the 2015 traffic data collected for the PD&E study, the following K- and D-factor values were used to derive the 2015 Directional Design Hour Volumes (DDHVs) for the US 301 mainline:

- K-factor = 9.0%
- D-factor = 75.0%

The 2015 AADT volumes were multiplied by these factors to obtain a preliminary estimate of the 2015 DDHVs. The initial estimates of the peak and off-peak DDHVs are provided in **Appendix E**. The existing peak hour turning movement percentages were calculated using the a.m. and p.m. peak hour intersection turning movement counts and are also provided in **Appendix E**. The peak hour intersection approach volumes were then multiplied by the existing peak hour turning movement percentages to obtain an estimate of the 2015 peak hour intersection turning movement volumes. These calculations are provided in **Appendix E**. Manual adjustments were made for individual movements at several locations to enhance the reasonableness of the 2015 peak hour volumes.

The intersection departure volumes on the US 301 mainline were compared to the intersection approach volumes for adjacent intersections and the differences in these volumes were calculated. Aerial photography of the study corridor was reviewed to determine whether there were any significant cross streets located between the study intersections. This review indicated that there were several significant cross streets located between Fowler Avenue and Harney Road (e.g., E. Fowler Avenue, Tom Folsom Road, Bradley Road, Jackson Road) and between

Harney Road and CR 579 (e.g., Ohio Avenue, Langshaw Drive, Florence Avenue). Consequently, it is reasonable to expect that the approach (and departure) volumes north of Fowler Avenue would be different than the departure (and approach) volumes south of Harney Road. This same situation would apply for the approach and departure volumes between Harney Road and CR 579.

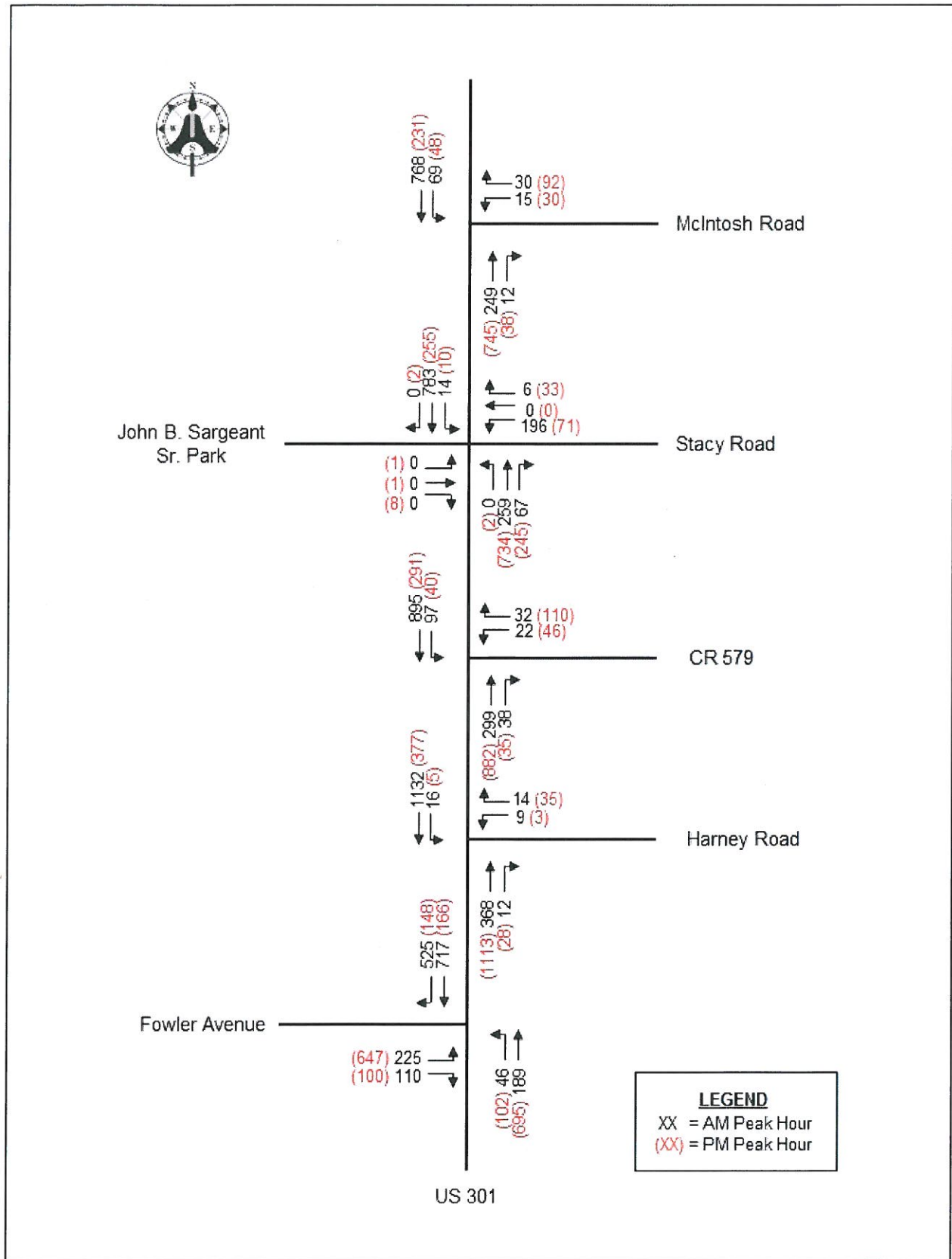
A summary table containing the actual peak hour volumes that were counted, the peak hour volumes that were calculated using the K- and D-factors along with the existing turning movement percentages, and the final peak hour volumes that were obtained based on the manual adjustments is provided in **Appendix E**. The final adjusted a.m. and p.m. peak hour volumes are also graphically illustrated in **Figure 2-4**.

The US 301 study corridor was subdivided into five roadway segments and these segments were analyzed as Class I two-lane highway segments using the 2010 Highway Capacity Manual software (HCS). According to the 2010 Highway Capacity Manual, Class I two-lane highways are highways that serve mostly long distance trips where motorists expect to travel at relatively high speeds, Daily commuter routes, major links in the state highway network and/or primary connectors of major traffic generators are all generally designated as Class I. The portions of US 301 where passing is prohibited were determined based on a site visit and the percentage of no-passing zones located within each of the segments was calculated based on the total segment lengths and the lengths of the no-passing zones.

The number of access points located within each US 301 roadway segment was also determined during a site visit and then divided by the roadway segment length to obtain the access point density (i.e., the number of access points per mile). The two-lane highway segment analyses were conducted using a base free flow speed of 55 mph for the segments south of Stacy Road and 60 mph for the segments north of Stacy Road. The Peak Hour Factors (PHFs) used in the existing conditions analyses were based on the average a.m. and p.m. PHFs calculated using the peak hour intersection turning movement counts. The average PHFs were 0.85 (a.m. peak hour) and 0.88 (p.m. peak hour). The average a.m. and p.m. peak hour truck percentages summarized in **Table 2-5** were also used in the roadway segment analyses.

**Table 2-6** summarizes the results of the two-lane highway segment analyses for both the a.m. and p.m. peak hours. This table includes the peak hour volumes, percent of free flow speeds, percent “time-spent-following”, and levels of service for both travel directions. The percent of free flow speed represents the ability of vehicles to travel at or near the posted speed limit while the percent time-spent-following represents the average percentage of the time that vehicles must travel in platoons behind slower vehicles due to the inability to pass. **Table 2-6** indicates that all five roadway segments are operating at Level of Service E (LOS E) in the peak travel direction during both peak hours. In addition, the two segments between Fowler Avenue and CR 579 are also operating at LOS E in the off-peak travel direction during both peak hours. The three roadway segments located north of CR 579 are currently operating at LOS D or better in the off-peak travel direction during both peak hours. The existing conditions HCS two-lane highway segment analyses are provided in **Appendix F**.

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**Figure 2-4: Existing (2015) Peak Hour Volumes**

**Table 2-6: Existing (2015) Peak Hour Roadway Segment Operations**

Roadway Segment	Direction	AM Peak Hour				PM Peak Hour			
		Volume	PFFS <sup>(1)</sup>	PTSF <sup>(2)</sup>	LOS <sup>(3)</sup>	Volume	PFFS <sup>(1)</sup>	PTSF <sup>(2)</sup>	LOS <sup>(3)</sup>
Between Fowler Avenue and Harney Road	NB	397	71.3%	61.9%	E	1242	70.7%	90.6%	E
	SB	1192	70.0%	91.6%	E	347	72.3%	56.5%	E
Between Harney Road and CR 579	NB	360	73.5%	60.2%	E	1033	71.2%	93.7%	E
	SB	1033	70.4%	94.4%	E	360	74.4%	59.1%	E
Between CR 579 and Stacy Road	NB	329	76.3%	55.8%	D	986	74.0%	87.5%	E
	SB	986	74.0%	88.6%	E	329	77.2%	54.1%	D
Between Stacy Road and McIntosh Road	NB	263	81.8%	48.6%	C	775	79.4%	83.8%	E
	SB	790	78.6%	85.6%	E	263	82.6%	47.3%	C
Between McIntosh Road and Future SR 56	NB	279	80.9%	50.0%	C	837	78.6%	85.0%	E
	SB	837	78.0%	84.8%	E	279	81.6%	48.5%	C

<sup>(1)</sup> Percent Free Flow Speed

<sup>(2)</sup> Percent Time-Spent-Following

<sup>(3)</sup> Level of Service

Unsignalized intersection analyses were conducted for the four existing unsignalized intersections identified in **Section 2.1** of this report using the 2010 HCS. The peak hour truck percentages and overall average PHFs that were calculated from the 2015 turning movement counts were used in the unsignalized intersection analyses. **Table 2-7** summarizes the results of the unsignalized intersection analyses conducted for both the a.m. and p.m. peak hours. This table includes volume-to-capacity (v/c) ratios, average vehicle delays and levels of service for the northbound and southbound US 301 left-turn movements, as well as the eastbound and westbound cross street movements. All of the northbound and southbound US 301 left-turn movements are operating at LOS B or better during both peak hours. In the a.m. peak hour, the following cross street movements are operating at LOS F:

- Westbound left-turn movement at CR 579
- Westbound left-turn, through and right-turn movements at Stacy Road

All of the other cross street movements are operating at LOS D or better during the a.m. peak hour. In the p.m. peak hour, all of the cross street movements are operating at LOS E or better. The existing conditions HCS unsignalized intersection analyses are provided in **Appendix F**.

Signalized intersection analyses were conducted for the Fowler Avenue intersection using the 2010 HCS. Traffic signal timing data for this intersection was obtained from Hillsborough County to verify that the signal phasing used in the HCS analyses was consistent with the phasing currently being used by the county and to verify that the green times used in the HCS analyses were within the current ranges as specified by the county's minimum and maximum phase times. The peak hour truck percentages and overall average PHFs that were calculated from the 2015 turning movement counts were used in the signalized intersection analyses.

**Table 2-7** also summarizes the results of the signalized intersection analyses conducted for the Fowler Avenue intersection. All of the signal controlled movements are operating at LOS D or

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better during the a.m. peak hour. In the p.m. peak hour, one movement (the eastbound left-turn) is operating at LOS F while all of the other movements are operating at LOS C or better. The existing conditions HCS signalized intersection analyses are also provided in **Appendix F**.

**Table 2-7: Existing (2015) Peak Hour Intersection Operations**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>
Fowler Avenue (Signalized)	NB	LT	0.40	43.3	D	0.20	15.1	B
	NB	TH	0.26	12.1	B	0.87	28.9	C
	SB	TH	0.91	32.4	C	0.21	12.1	B
	EB	LT	0.50	24.2	C	1.29	173.6	F
	EB	RT	0.28	22.1	C	0.23	21.1	C
	Overall Intersection		N/A	27.5	C	N/A	80.7	F
Harney Road (Unsignalized)	SB	LT	0.02	8.3	A	0.01	11.9	B
	WB	LT/RT	0.15	30.1	D	0.22	29.2	D
CR 579 (Unsignalized)	SB	LT	0.10	8.5	A	0.07	10.9	B
	WB	LT	0.27	57.4	F	0.37	44.7	E
	WB	RT	0.06	10.8	B	0.42	25.8	D
Stacy Road (Unsignalized)	NB	LT	0.00	0.0	A	0.00	7.8	A
	SB	LT	0.01	8.1	A	0.02	10.9	B
	WB	LT/TH/RT	1.59	349.0	F	0.57	44.0	E
	EB	LT/TH/RT	0.00	0.0	A	0.03	14.3	B
McIntosh Road (Unsignalized)	SB	LT	0.07	8.1	A	0.07	10.2	B
	WB	LT/RT	0.16	18.3	C	0.49	29.4	D

<sup>(1)</sup> Volume-to-Capacity Ratio

<sup>(2)</sup> Average Delay (in seconds/vehicle)

<sup>(3)</sup> Level of Service



## **SECTION 3.0 FUTURE YEAR TRAFFIC VOLUMES**

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### **3.1 Tampa Bay Regional Planning Model (TBRPM) Modifications**

The first step in the travel demand forecasting methodology involved a review of the Traffic Analysis Zone (TAZ) structure and roadway network coding included in the 2010 Base Year TBRPM, Version 8.0. This review revealed the following:

- There are only eight TAZ's between Fowler Avenue and Chancey Road that have centroid connectors that are connected to US 301 and only six of these centroid connectors have non-zero volumes. The total AADT volume for all six centroid connectors is approximately 7,000 vpd.
- Many of the existing collector/local roadways that intersect US 301 north of Harney Road are not included in the model network. These roadways include Ohio Avenue, Florence Avenue, Langshaw Drive, and Palm Tree Drive.

The net effect is that a majority of the 2010 AADT volume on US 301 just north of E. Fowler Avenue is also on US 301 north of Stacy Road and south of Chancey Road due to the scarcity of cross street connections/adjacent land use access points in the model network. Based on the 2010 TBRPM review, the following facility type coding revisions were made:

- The facility type (FT) coding for the portion of US 301 from Fowler Avenue to north of Stacy Road was revised from FT 32 (Undivided Arterial Class Ia with Turn Bays) to FT 31 (Undivided Arterial Unsignalized with Turn Bays) since there are no existing traffic signals on US 301 from north of Fowler Avenue to north of Stacy Road. This revised coding matches the facility type coding included in the 2010 model for the portion of US 301 north of Stacy Road.
- The facility type (FT) coding for E. Fowler Avenue, Main Street, Stacy Road/Ft. King Highway, CR 579, and the portion of Harney Road from Williams Road to US 301 was revised from FT 42 (Major Local Undivided Roadway with Turn Bays) to FT 43 (Major Local Undivided Roadway without Turn Bays) since these local undivided roadways do not currently have exclusive turn lanes).

Two centroid connector modifications were also made to more accurately represent the existing locations of the primary access points to the adjacent area roadway network. The specific modifications that were made consisted of the following:

- Deletion of the centroid connector in TAZ No. 533 that was connected to US 301
- Deletion of the centroid connector in TAZ No. 494 that was connected to Ft. King Highway

### **3.2 Design Year (2040) Daily Traffic Volumes**

The highway network coding revisions made to the 2010 TBRPM were also incorporated into the 2040 Cost Affordable TBRPM. After these network coding revisions were made, the revised 2040 Cost-Affordable TBRPM was run and the 2040 Peak Season Weekday Average Daily Traffic (PSWADT) volumes were converted to AADT volumes using a Model Output Conversion Factor of 0.96. It should be noted that the portion of US 301 from the Fowler Avenue intersection to the Proposed SR 56 intersection is coded as a two-lane undivided roadway in the 2040 Cost Affordable TBRPM because the four-laning of this portion of US 301 is not identified as a cost-affordable improvement in either the Hillsborough or Pasco County MPOs 2040 LRTP. The 2040 TBRPM network does include a new four-lane extension of SR 56 from Meadow Point Boulevard eastward to US 301 as well as a new two-lane extension of Beardsley Drive from Meadow Point Boulevard eastward to US 301 (south of the SR 56 extension) in the vicinity of the Hillsborough/Pasco County line.

**Table 3-1** provides a comparison of the 2040 AADT volumes and the 2015 AADT volumes, along with the average growth rates reflective of the 2040 AADT volumes. The 2040 AADT volumes are projected to range from 27,800 vpd to 49,300 vpd. On average, the 2040 AADT volumes represent a yearly growth rate of approximately 5.9% per year. The 2040 AADT volume projected for the US 301 mainline north of McIntosh Road (35,600 vpd) was compared to the 2040 AADT volume projected for US 301 south of the proposed SR 56 (33,000 vpd) that was documented in the April 2015 *Final Design Traffic Technical Memorandum* prepared for the US 301 PD&E Study from the proposed SR 56 to SR 39 (Buchman Highway). The difference between these 2040 AADT volumes was only 2,600 vpd. A review of the 2040 AADT volume projected by the TBRPM for US 301 north of the Beardsley Drive extension (which is located to the south of the proposed SR 56 extension) indicated a volume of 32,700 vpd, which is approximately equal to the 2040 AADT volume documented in the April 2015 *Final Design Traffic Technical Memorandum*. **Figure 3-1** provides a graphical summary of the 2040 AADT volumes for the US 301 study corridor.

The significant growth in AADT volumes projected to occur by the year 2040 is attributable to both the proposed SR 56 extension and the future land use that is expected to occur in the vicinity of the proposed SR 56 extension. **Table 3-2** summarizes the 2010 and 2040 land use projections for the five TAZs located between the Beardsley Drive extension and Chancey Road and between Morris Bridge Road and US 301. These TAZs are graphically illustrated in **Figure 3-2**. Between 2010 and 2040, the population in these five TAZs is projected to increase by approximately 728% while the total employment is projected to increase by approximately 1,328%. **Table 3-2** also summarizes the 2010 and 2040 AADT volumes projected to be generated by the land uses in these TAZs. The combined 2010 trip generation is approximately 8,700 vpd while the combined 2040 trip generation is approximately 82,400 vpd. A significant portion of the trips generated by these TAZs are projected to travel to and from the south via US 301.

Future land use growth is also forecasted to occur for portions of eastern Hillsborough County. **Table 3-3** summarizes the 2010 and 2040 land use data for 10 TAZs located to the south/east of US 301. These TAZs are graphically illustrated in **Figure 3-3**.

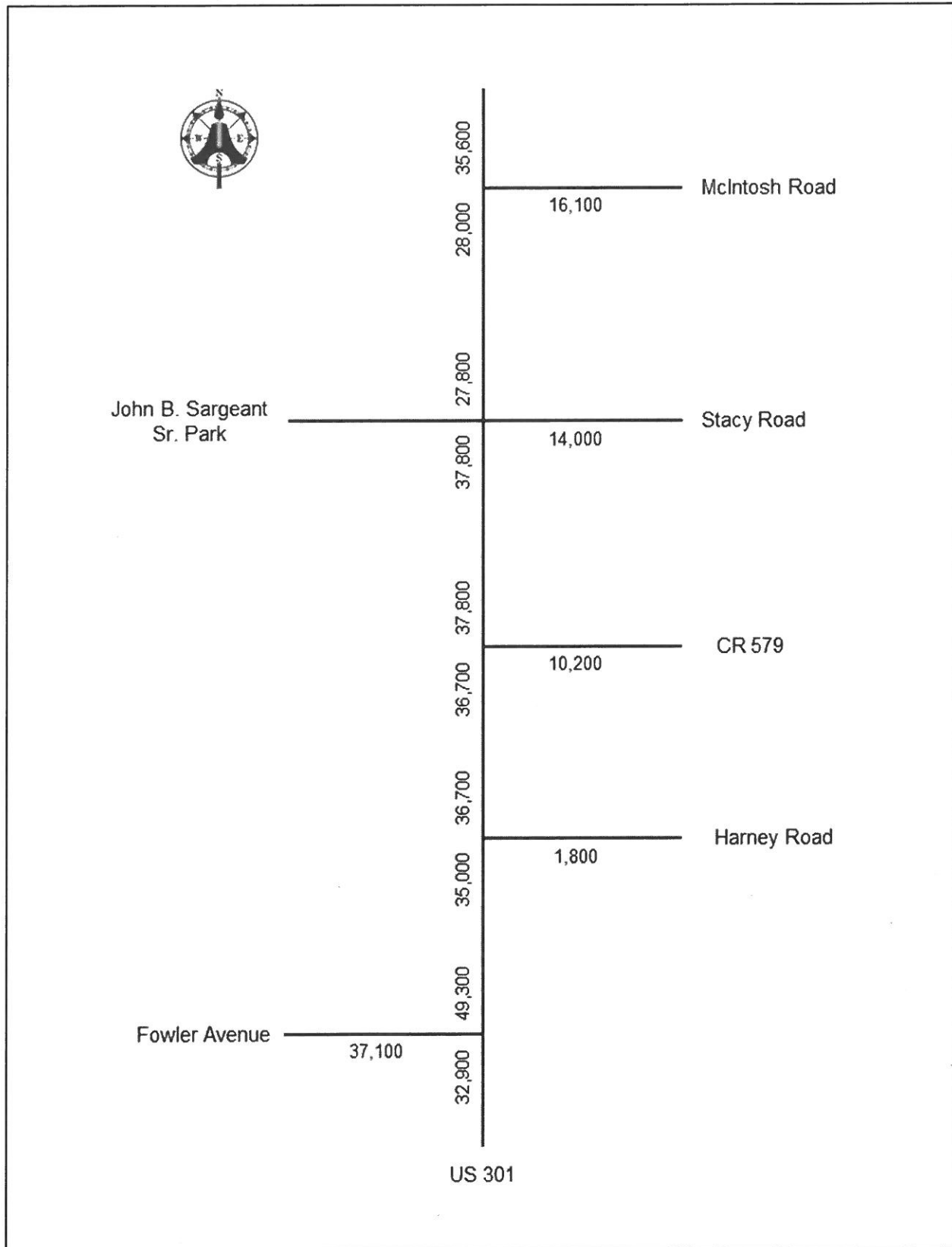
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**FUTURE YEAR TRAFFIC VOLUMES**

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**Table 3-1: US 301 Mainline AADT Volume Comparison – 2015 vs. 2040**

Location	2015 AADT Volume	2040 AADT Volume	Average Yearly Growth Rate
North of Fowler Avenue	18,400	49,300	6.72%
South of Harney Road	16,900	35,000	4.28%
North of Harney Road	17,000	36,700	4.63%
South of CR 579	15,000	36,700	5.79%
North of CR 579	14,700	37,800	6.29%
South of Stacy Road	14,500	37,800	6.43%
North of Stacy Road	11,800	27,800	5.42%
South of McIntosh Road	11,600	28,000	5.66%
North of McIntosh Road	12,400	35,600	7.48%
Average			5.86%

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FUTURE YEAR TRAFFIC VOLUMES**



**Figure 3-1: Design Year (2040) AADT Volumes**

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**FUTURE YEAR TRAFFIC VOLUMES**

**Table 3-2: Land Use Data Comparison for Traffic Analysis Zones 2331, 2332, 2339, 2340 and 2344**

2010 Land Use Data										
TAZ No.	Residential		Employment						School	AADT Volume
	Dwelling Units	Population	Industrial	Commerical Regional	Commercial Local	Service Regional	Service Local	Total Employment		
2331	567	1,123	116	0	6	318	0	440	0	5,557
2332	692	787	32	0	0	39	0	71	0	2,864
2339	0	0	0	0	0	0	0	0	0	0
2340	35	88	0	3	0	13	0	16	0	235
2344	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1,294</b>	<b>1,998</b>	<b>148</b>	<b>3</b>	<b>6</b>	<b>370</b>	<b>0</b>	<b>527</b>	<b>0</b>	<b>8,656</b>

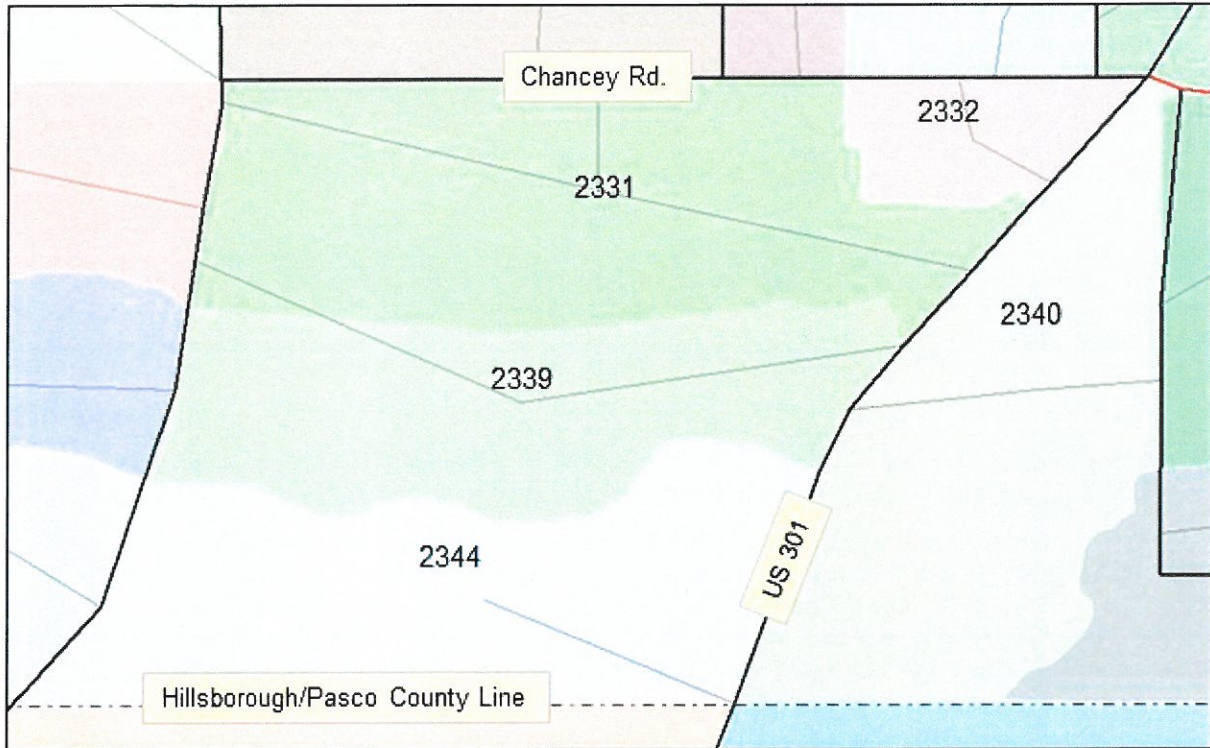
  

2040 Land Use Data										
TAZ No.	Residential		Employment						School	AADT Volume
	Dwelling Units	Population	Industrial	Commerical Regional	Commercial Local	Service Regional	Service Local	Total Employment		
2331	2,485	4,922	735	0	923	2,061	0	3,719	0	34,184
2332	943	1,073	32	2	3	60	0	97	0	3,974
2339	2,282	4,564	321	265	319	808	352	2,065	0	19,922
2340	908	2,294	0	180	81	568	326	1,155	3,075	14,629
2344	1,842	3,684	50	91	111	164	71	487	0	9,664
<b>Total</b>	<b>8,460</b>	<b>16,537</b>	<b>1,138</b>	<b>538</b>	<b>1,437</b>	<b>3,661</b>	<b>749</b>	<b>7,523</b>	<b>3,075</b>	<b>82,373</b>

Growth in Land Use Data ( 2040-2010)										
TAZ No.	Residential		Employment						School	Growth in AADT Volume
	Dwelling Units	Population	Industrial	Commerical Regional	Commercial Local	Service Regional	Service Local	Total Employment		
2331	1,918	3,799	619	0	917	1,743	0	3,279	0	28,627
2332	251	286	0	2	3	21	0	26	0	1,110
2339	2,282	4,564	321	265	319	808	352	2,065	0	19,922
2340	873	2,206	0	177	81	555	326	1,139	3,075	14,394
2344	1,842	3,684	50	91	111	164	71	487	0	9,664
<b>Total</b>	<b>7,166</b>	<b>14,539</b>	<b>990</b>	<b>535</b>	<b>1,431</b>	<b>3,291</b>	<b>749</b>	<b>6,996</b>	<b>3,075</b>	<b>73,717</b>

2010 TBRPM



2040 TBRPM

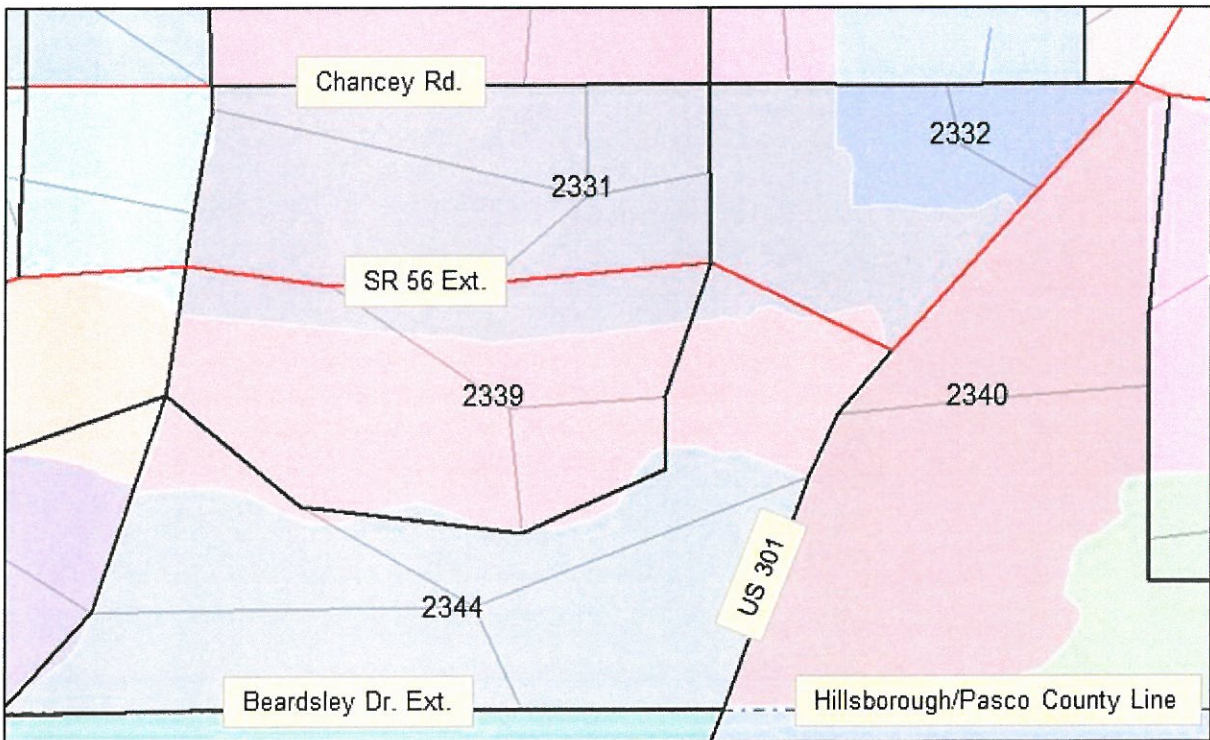


Figure 3-2: Traffic Analysis Zones 2331, 2332, 2339, 2340 and 2344

**SECTION 3.0**  
**FUTURE YEAR TRAFFIC VOLUMES**

**Table 3-3: Land Use Data Comparison for Traffic Analysis Zones 488-489, 492-494, 500-502, 533 and 536**

2010 Land Use Data										
TAZ No.	Residential		Employment						School	AADT Volume
	Dwelling Units	Population	Industrial	Commerical Regional	Commercial Local	Service Regional	Service Local	Total Employment		
488	676	1,115	568	62	25	152	19	826	0	5,250
489	195	509	123	0	0	15	2	140	0	1,242
492	792	1,678	147	39	8	118	12	324	0	4,417
493	804	1,848	53	0	19	93	65	230	424	4,349
494	343	707	152	0	3	94	15	264	0	2,228
500	324	827	150	0	0	45	113	308	565	3,136
501	308	851	372	2	79	114	89	656	469	5,178
502	672	1,750	137	36	0	116	1	290	0	4,343
533	1,130	2,942	469	15	36	267	3	790	0	6,908
536	1,024	2,793	274	33	11	48	7	373	46	5,841
<b>Total</b>	<b>6,268</b>	<b>15,020</b>	<b>2,445</b>	<b>187</b>	<b>181</b>	<b>1,062</b>	<b>326</b>	<b>4,201</b>	<b>1,504</b>	<b>42,892</b>

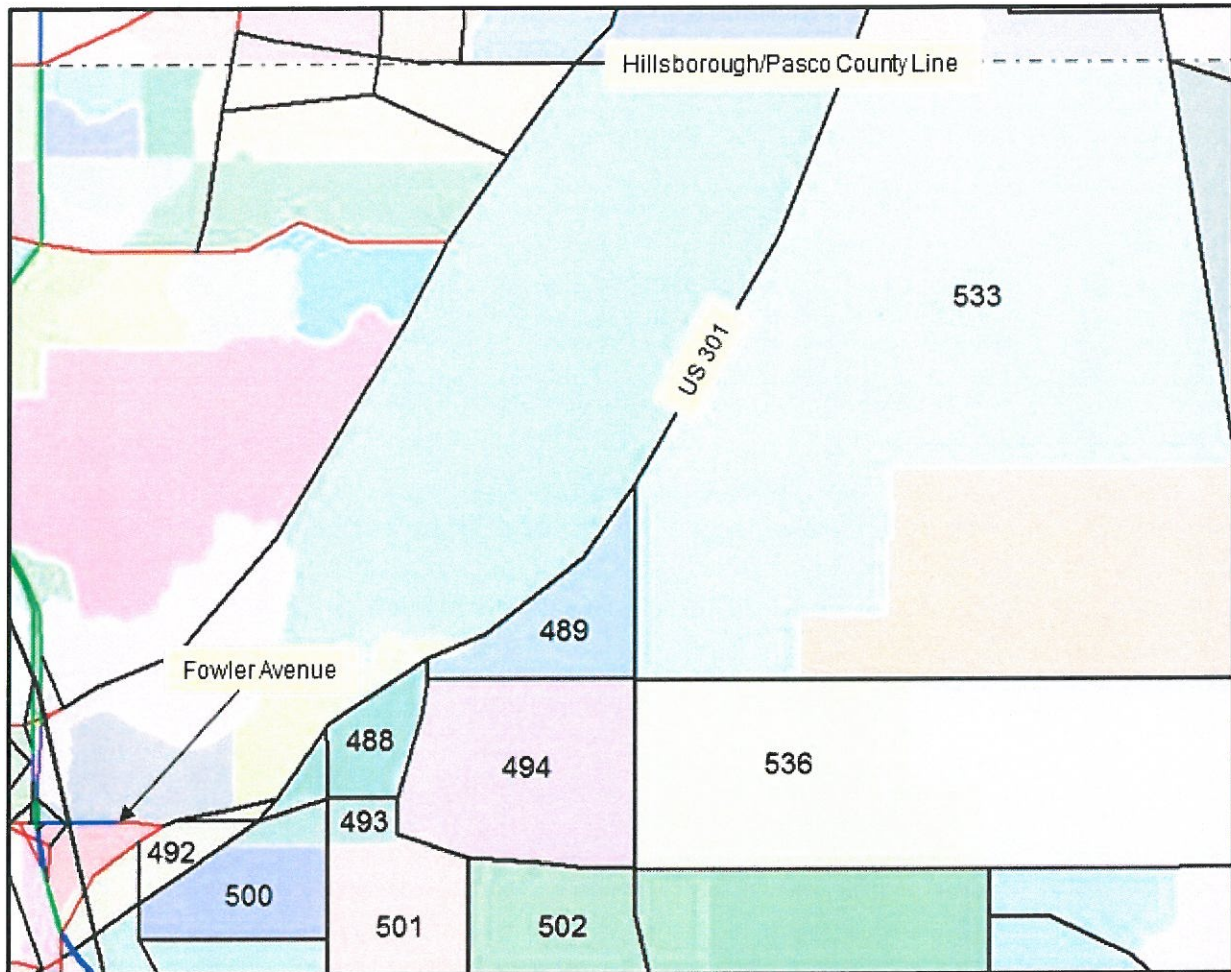
  

2040 Land Use Data										
TAZ No.	Residential		Employment						School	AADT Volume
	Dwelling Units	Population	Industrial	Commerical Regional	Commercial Local	Service Regional	Service Local	Total Employment		
488	943	1,555	568	62	25	154	19	828	0	6,841
489	433	1,130	123	0	0	16	2	141	0	2,428
492	1,311	2,778	152	46	14	157	15	384	0	6,896
493	850	1,953	53	0	19	93	104	269	630	5,584
494	737	1,519	152	0	3	94	15	264	0	4,233
500	2,163	5,520	250	40	61	57	165	573	839	13,406
501	1,003	2,770	372	2	79	116	132	701	696	9,088
502	2,267	5,905	637	356	190	943	1	2,127	0	20,575
533	1,340	3,488	756	17	39	291	3	1,106	0	8,973
536	1,368	3,731	274	274	11	50	11	620	68	7,719
<b>Total</b>	<b>12,415</b>	<b>30,349</b>	<b>3,337</b>	<b>797</b>	<b>441</b>	<b>1,971</b>	<b>467</b>	<b>7,013</b>	<b>2,233</b>	<b>85,743</b>

Growth in Land Use Data ( 2040-2010)										
TAZ No.	Residential		Employment						School	Growth in AADT Volume
	Dwelling Units	Population	Industrial	Commerical Regional	Commercial Local	Service Regional	Service Local	Total Employment		
488	267	440	0	0	0	2	0	2	0	1,591
489	238	621	0	0	0	1	0	1	0	1,186
492	519	1,100	5	7	6	39	3	60	0	2,479
493	46	105	0	0	0	0	39	39	206	1,235
494	394	812	0	0	0	0	0	0	0	2,005
500	1,839	4,693	100	40	61	12	52	265	274	10,270
501	695	1,919	0	0	0	2	43	45	227	3,910
502	1,595	4,155	500	320	190	827	0	1,837	0	16,232
533	210	546	287	2	3	24	0	316	0	2,065
536	344	938	0	241	0	2	4	247	22	1,878
<b>Total</b>	<b>6,147</b>	<b>15,329</b>	<b>892</b>	<b>610</b>	<b>260</b>	<b>909</b>	<b>141</b>	<b>2,812</b>	<b>729</b>	<b>42,851</b>

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**Figure 3-3: Traffic Analysis Zones 488, 489, 492-494, 500-502, 533 and 536**



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**FUTURE YEAR TRAFFIC VOLUMES**

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Between 2010 and 2040, the population in these 10 TAZs is projected to increase by approximately 102% while the employment is projected to increase by approximately 67%. **Table 3-3** also summarizes the 2010 and 2040 AADT volumes projected to be generated by the land uses in these 10 TAZs. The combined 2010 trip generation is approximately 42,900 vpd while the combined 2040 trip generation is approximately 85,700 vpd. A portion of the trips generated by these TAZs is also projected to access US 301 via the local roadways in this area (e.g, CR 579, Stacy Road, Ft. King Highway, Knights-Griffin Road, and McIntosh Road).

Historic growth trend analyses were also conducted using the historical AADT volumes obtained from the four FDOT count stations located on US 301 and the FDOT's TRENDS software. Copies of these growth trend analyses are provided in **Appendix G**. **Table 3-4** provides a comparison of the 2040 AADT volumes obtained from the historic growth trend analysis and the 2040 AADT volumes obtained from the TBRPM. As indicated in this table, the 2040 AADT volumes obtained from the TBRPM are significantly higher than the 2040 AADT volumes obtained from the TRENDS analysis. The historic growth trend analysis methodology is unable to take into account the impact of future land use growth and new roadway facilities on future travel demand. Since significant increases in future year population and employment are projected to occur for multiple TAZs in the study area, and a new four-lane divided roadway is planned to be implemented at the northern end of the study corridor, the 2040 AADT volumes forecasted by the TBRPM were viewed as being the more reasonable design year traffic projections.

**Table 3-4: Design Year (2040) AADT Volume Comparison – TBRPM vs. Historic Growth Trend Analysis**

Location	2040 AADT TBRPM	2040 AADT Growth Trend Analysis
US 301 South of Fowler Avenue	32,900	17,200
US 301 North of Fowler Avenue	49,300	20,000
US 301 North of Stacy Road	27,800	16,600
US 301 South of Chancey Road	29,200	21,100

### 3.3 Design Year (2040) Peak Hour Traffic Volumes

The 2040 AADT volumes were used along with a K-factor of 9.0%, a D-factor of 65.0% and the existing peak hour turning movement percentages to derive preliminary estimates of the 2040 a.m. and p.m. peak hour intersection volumes. The PTF Handbook states that “directional traffic during peak hours is generally consistent from year to year and from day to day on a given rural road” and “the measured directional distribution may be assumed to apply to the design hour volume for the future year for which the facility is designed, except for urban highways”. For urban highways, as land use changes over time, directional distributions tend to decrease over time. Although the existing US 301 study corridor exhibits more rural characteristics than urban characteristics, the magnitude of the land uses forecasted to occur by the design year suggests that the study corridor will become more “urbanized” over time. With the large amount of employment forecasted to occur at the northern end of the study corridor, it is reasonable to

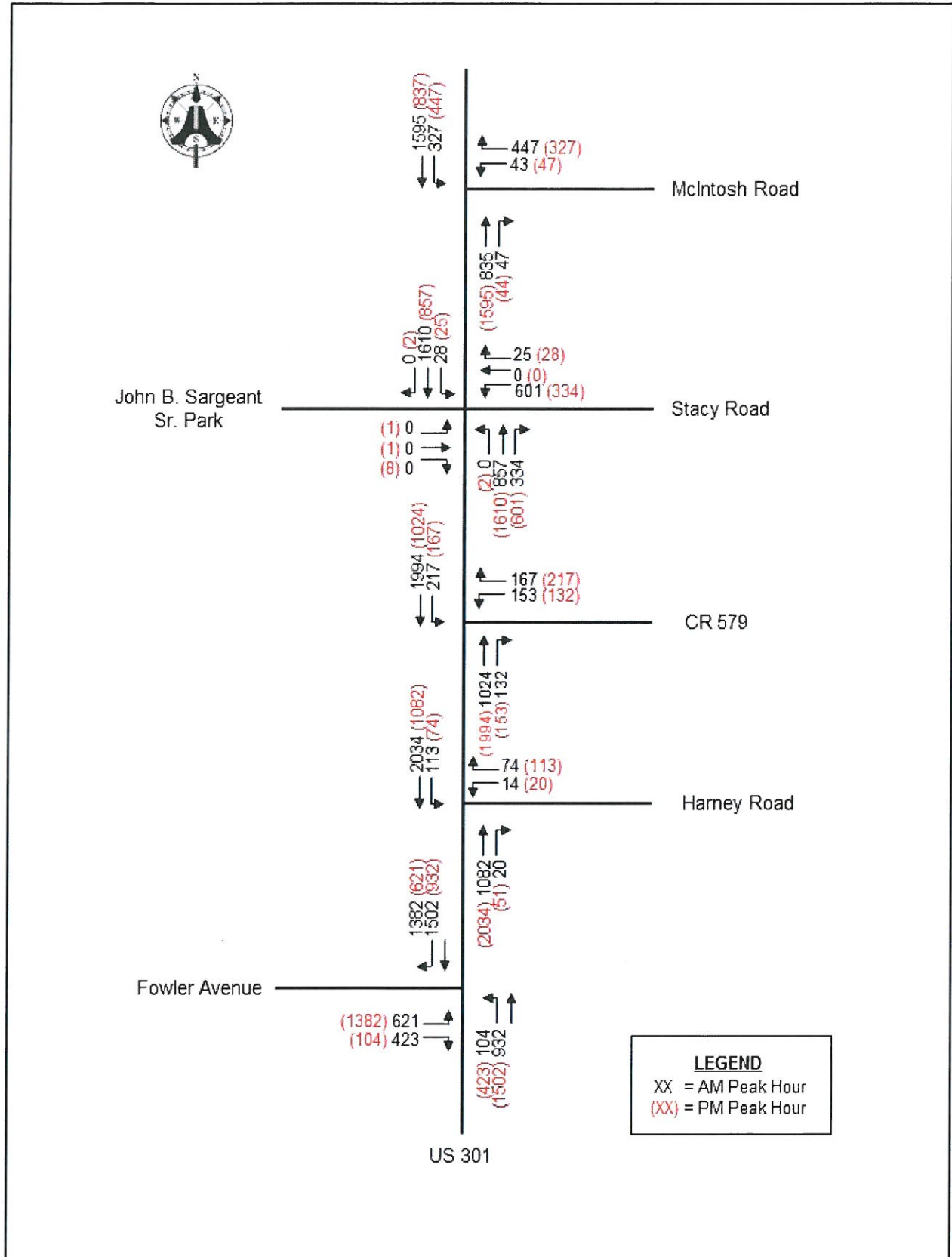
expect an increase in the volume of traffic traveling northbound in the a.m. peak hour and southbound in the p.m. peak hour. A D-factor of 65.0% was used to help derive the 2040 peak hour volumes for the US 301 study corridor to ensure that the resultant design year peak hour volumes were consistent with the 2040 peak hour volumes south of the proposed SR 56 that are documented in the April 2015 *Final Design Traffic Technical Memorandum* (prepared in support of the adjacent PD&E study).

Manual adjustments were subsequently made to obtain intersection departure volumes that more closely reflected the peak and off-peak directional distribution percentages (i.e., 65% and 35%, respectively) and to reduce (or increase) individual movement volumes whose initial estimated volume was viewed as being unreasonable. The 2040 a.m. and p.m. peak hour volumes are graphically illustrated on **Figure 3-4**.

### **3.4 Opening Year (2020) Daily and Peak Hour Traffic Volumes**

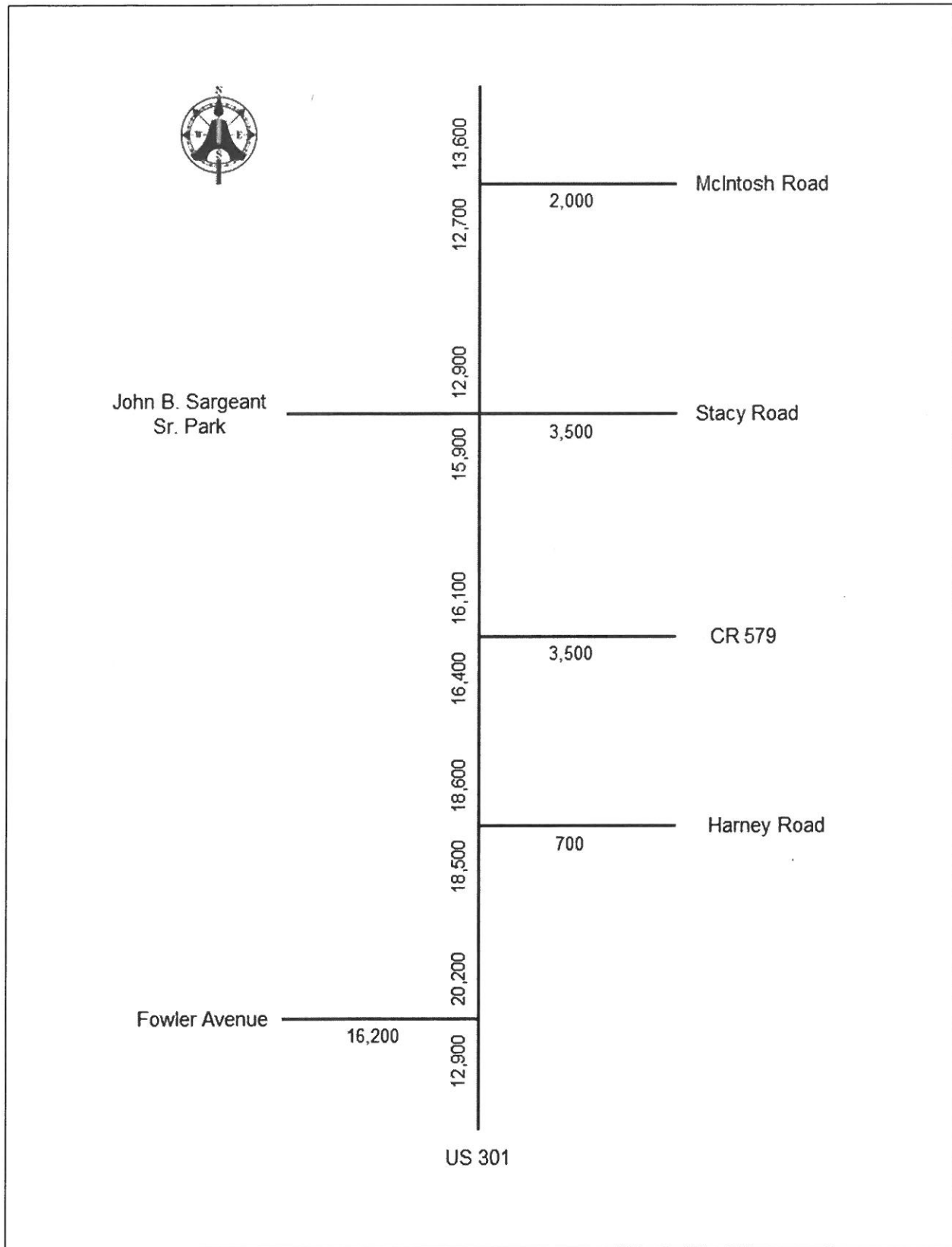
Opening year (2020) AADT and peak hour volumes were originally estimated by interpolating between the existing (2015) and design year (2040) volumes; however, the resultant 2020 volumes were viewed as being unreasonably high. A review of the historic growth trend analyses conducted for the four FDOT count stations indicated that reasonable growth rates had occurred at three of the four locations. The annual historic growth rates at these three locations ranged between 1.82% per year and 1.96 % per year with an overall average growth rate of 1.91% per year. Consequently, a second estimate of the 2020 AADT volumes was derived by multiplying the 2015 AADT volumes by 1.0955 (reflecting a 1.91% per year growth rate for five years). These 2020 AADT volumes are illustrated in **Figure 3-5**. A second estimate of the 2020 a.m. and p.m. peak hour volumes was also obtained by multiplying the 2015 peak hour volumes by 1.0955. These 2020 peak hour volumes are illustrated in **Figure 3-6**.

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FUTURE YEAR TRAFFIC VOLUMES**



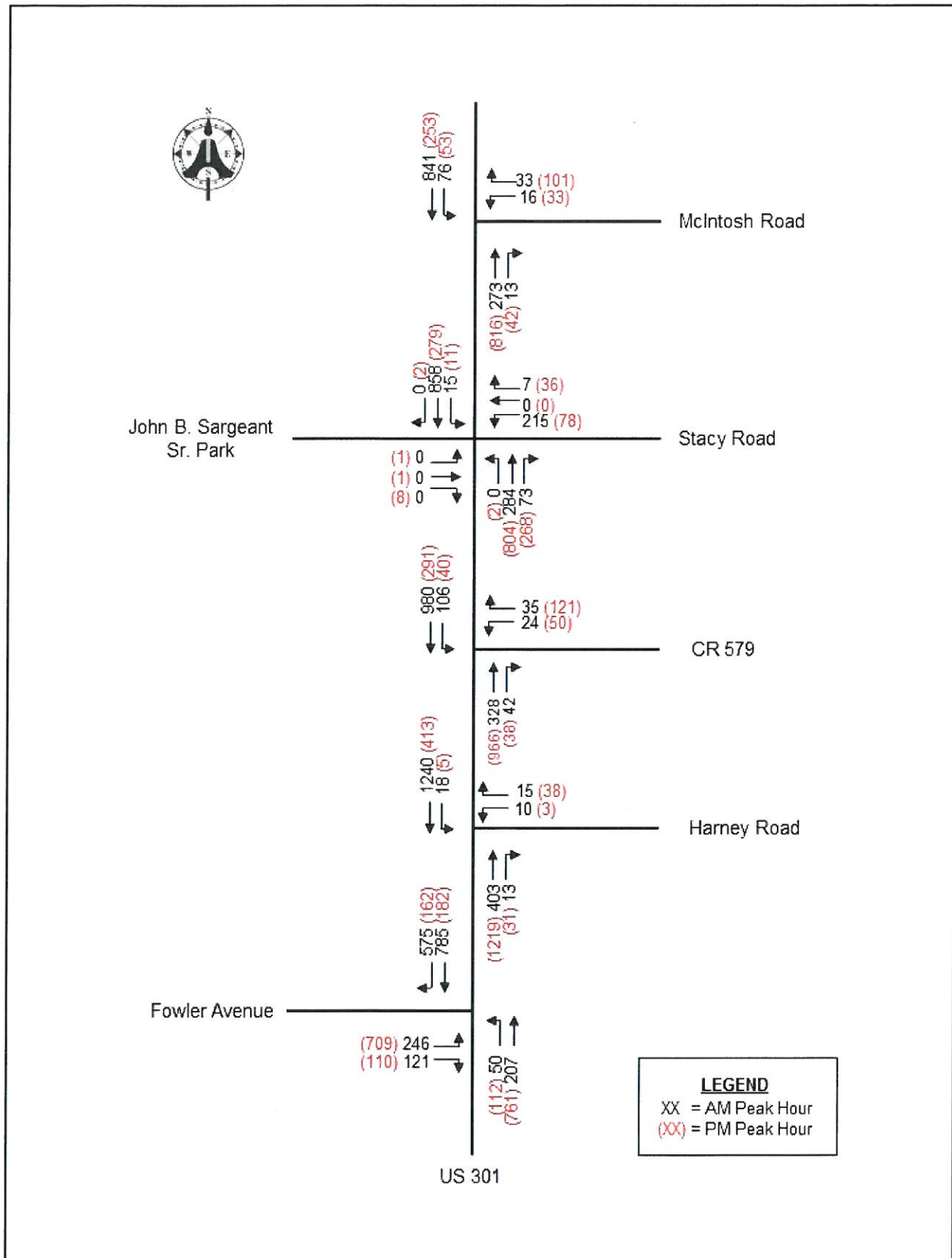
**Figure 3-4: Design Year (2040) Peak Hour Volumes**

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FUTURE YEAR TRAFFIC VOLUMES**



**Figure 3-5: Opening Year (2020) AADT Volumes**

**SECTION 3.0  
FUTURE YEAR TRAFFIC VOLUMES**



**Figure 3-6: Opening Year (2020) Peak Hour Volumes**

## SECTION 4.0 NO-BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSIS

### 4.1 Opening Year (2020) No-Build Alternative Level of Service Analysis

The opening year (2020) No-Build Alternative two-lane highway segment analyses were conducted using the same parameter values that were used in the existing conditions analyses. **Table 4-1** summarizes the results of the 2020 peak hour two-lane highway segment analyses. All five roadway segments are projected to operate at LOS E in the peak travel direction during both peak hours. In the a.m. peak hour, the three segments between Fowler Avenue and Stacy Road are also operating at LOS E in the off-peak travel direction. In the p.m. peak hour, the two segments between Fowler Avenue and CR 579 are also operating at LOS E in the off-peak travel direction. LOS D or better operations are projected for all other segments in the off-peak travel direction during both peak hours. The opening year No-Build Alternative HCS two-lane highway segment analysis summary sheets are provided in **Appendix H**.

**Table 4-1: Opening Year (2020) Peak Hour Highway Segment Operations – No-Build Alternative**

Roadway Segment	Direction	AM Peak Hour				PM Peak Hour			
		Volume	PFFS <sup>(1)</sup>	PTSF <sup>(2)</sup>	LOS <sup>(3)</sup>	Volume	PFFS <sup>(1)</sup>	PTSF <sup>(2)</sup>	LOS <sup>(3)</sup>
Between Fowler Avenue and Harney Road	NB	435	68.6%	65.6%	E	1360	68.3%	92.7%	E
	SB	1305	67.6%	92.9%	E	380	69.8%	60.0%	E
Between Harney Road and CR 579	NB	394	71.4%	63.3%	E	1131	69.3%	95.5%	E
	SB	1131	68.5%	95.8%	E	394	72.3%	62.2%	E
Between CR 579 and Stacy Road	NB	360	74.1%	58.7%	E	1081	72.9%	90.1%	E
	SB	1080	72.1%	90.4%	E	365	75.1%	58.2%	D
Between Stacy Road and McIntosh Road	NB	289	80.3%	51.0%	C	850	78.1%	85.2%	E
	SB	865	77.3%	87.0%	E	289	81.3%	49.7%	C
Between McIntosh Road and Future SR 56	NB	306	79.3%	53.1%	C	917	77.2%	86.5%	E
	SB	917	76.6%	87.9%	E	306	80.1%	51.4%	C

<sup>(1)</sup> Percent Free Flow Speed

<sup>(2)</sup> Percent Time-Spent-Following

<sup>(3)</sup> Level of Service

**Table 4-2** summarizes the results of the 2020 No-Build Alternative intersection analyses. The intersection geometry analyzed at the four unsignalized intersections is exactly the same geometry that was analyzed for the existing conditions. All of the northbound and southbound US 301 left-turn movements at the unsignalized intersections are operating at LOS B or better during both peak hours. The following cross street movements are operating at LOS F during both peak hours:

- Westbound left-turn movement at CR 579
- Westbound left-turn, through and right-turn movements at Stacy Road

**SECTION 4.0**  
**NO-BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSIS**

**Table 4-2: Opening Year (2020) Peak Hour Intersection Operations - No-Build Alternative**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>
Fowler Avenue (Signalized)	NB	LT	0.18	15.1	B	0.20	13.8	B
	NB	TH	0.13	9.4	A	0.45	13.3	B
	SB	TH	0.65	25.3	C	0.16	20.5	C
	EB	LT	0.33	29.7	C	0.80	36.9	D
	EB	RT	0.26	22.4	C	0.20	20.0	B
	Overall Intersection		N/A	23.1	C	N/A	23.3	C
Harney Road (Unsignalized)	SB	LT	0.02	8.5	A	0.01	12.7	B
	WB	LT/RT	0.21	39.1	E	0.29	36.3	E
CR 579 (Unsignalized)	SB	LT	0.11	8.7	A	0.08	11.5	B
	WB	LT	0.38	82.2	F	0.49	63.8	F
	WB	RT	0.06	11.1	B	0.53	33.3	D
Stacy Road (Unsignalized)	NB	LT	0.00	0.0	A	0.00	7.9	A
	SB	LT	0.02	8.3	A	0.02	11.5	B
	WB	LT/TH/RT	2.11	586.0	F	0.74	70.0	F
	EB	LT/TH/RT	0.00	0.0	A	0.03	15.3	C
McIntosh Road (Unsignalized)	SB	LT	0.07	8.2	A	0.09	10.7	B
	WB	LT/RT	0.20	21.0	C	0.61	40.1	E

<sup>(1)</sup> Volume-to-Capacity Ratio

<sup>(2)</sup> Average Delay (in seconds/vehicle)

<sup>(3)</sup> Level of Service

All of the other cross street movements at the unsignalized intersections are projected to operate at LOS E or better during both peak hours. The opening year No-Build Alternative HCS unsignalized intersection analysis summary sheets are provided in **Appendix H**.

**Table 4-2** also indicates that with one exception, all of the signal controlled movements at the Fowler Avenue intersection are projected to operate at LOS C or better during both peak hours. In the p.m. peak hour, the eastbound left-turn movement is projected to operate at LOS D. This signalized intersection is projected to operate at LOS C overall during both peak hours. A comparison of **Table 2-7** and **Table 4-2** indicates that the Fowler Avenue intersection operates better in 2020 with the No-Build Alternative than it does in 2015. As stated earlier in **Section 2.2** of this report, US 301 is currently being widened to four lanes south of Fowler Avenue and the four-lane widening actually extends approximately 0.37 miles north of Fowler Avenue. In addition to providing two northbound and southbound through lanes at this intersection, a second eastbound left-turn lane is also being constructed. Since this construction project will be completed in 2016, the 2020 No-Build Alternative included the Fowler Avenue intersection improvements. The opening year No-Build Alternative HCS signalized intersection analysis summary sheets are also provided in **Appendix H**.

## 4.2 Design Year (2040) No-Build Alternative Level of Service Analysis

With two exceptions, the design year (2040) No-Build Alternative two-lane highway segment analyses were conducted using the same parameter values that were used in the opening year No-Build Alternative analyses. A truck percentage of 5.0% was used for the northbound travel direction in the a.m. peak hour and a PHF of 0.92 was used for both travel directions and both peak hours.

**SECTION 4.0**  
**NO-BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSIS**

**Table 4-3** summarizes the results of the 2040 peak hour two-lane highway segment analyses. All five roadway segments are projected to operate at LOS F in both travel directions during both peak hours. The design year No-Build Alternative HCS two-lane highway segment analysis summary sheets are provided in **Appendix I**.

**Table 4-3: Design Year (2040) Peak Hour Roadway Segment Operations – No-Build Alternative**

Roadway Segment	Direction	AM Peak Hour				PM Peak Hour			
		Volume	PFFS <sup>(1)</sup>	PTSF <sup>(2)</sup>	LOS <sup>(3)</sup>	Volume	PFFS <sup>(1)</sup>	PTSF <sup>(2)</sup>	LOS <sup>(3)</sup>
Between Fowler Avenue and Harney Road	NB	1328	38.1%	94.0%	F	2466	38.1%	100.0%	F
	SB	2466	38.1%	100.0%	F	1328	38.1%	94.0%	F
Between Harney Road and CR 579	NB	1156	45.5%	92.2%	F	2147	44.8%	100.0%	F
	SB	2147	44.8%	100.0%	F	1156	45.5%	92.2%	F
Between CR 579 and Stacy Road	NB	1191	45.3%	92.7%	F	2212	45.2%	100.0%	F
	SB	2211	45.3%	100.0%	F	1195	45.2%	92.8%	F
Between Stacy Road and McIntosh Road	NB	882	62.5%	85.7%	F	1639	62.1%	98.4%	F
	SB	1638	62.2%	98.4%	F	884	62.5%	85.7%	F
Between McIntosh Road and Future SR 56	NB	1282	52.5%	93.5%	F	1922	52.4%	100.0%	F
	SB	1922	52.4%	100.0%	F	1282	52.5%	93.5%	F

<sup>(1)</sup> Percent Free Flow Speed

<sup>(2)</sup> Percent Time-Spent-Following

<sup>(3)</sup> Level of Service

**Table 4-4** summarizes the results of the 2040 No-Build Alternative intersection analyses. The intersection geometry analyzed at the four unsignalized intersections is exactly the same geometry that was analyzed for the existing conditions. With two exceptions, all of the northbound and southbound US 301 left-turn movements at the unsignalized intersections are projected to operate at LOS D or better during both peak hours. The following left-turn movements are projected to operate at LOS F during the p.m. peak hour:

- Southbound left-turn movement at CR 579
- Southbound left-turn movement at McIntosh Road

In addition, with the exception of the eastbound movements at the Stacy Road intersection during the a.m. peak hour (i.e., the movements exiting John B. Sargeant Sr. Memorial Wilderness Park), all of the US 301 cross street movements are projected to operate at LOS F during both the a.m. and p.m. peak hours. The design year No-Build Alternative HCS unsignalized intersection analysis summary sheets are provided in **Appendix I**.

**Table 4-4** also indicates that all of the signal controlled movements at the Fowler Avenue intersection are projected to operate at LOS E or better during the a.m. peak hour. In the p.m. peak hour, only two movements (the northbound and eastbound left-turn movements) are projected to operate at LOS F. This signalized intersection is projected to operate at LOS D overall during the a.m. peak hour and at LOS E overall during the p.m. peak hour. The design year No-Build Alternative HCS signalized intersection analysis summary sheets are also provided in **Appendix I**.



**SECTION 4.0**  
**NO-BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSIS**

**Table 4-4: Design Year (2040) Peak Hour Intersection Operations – No Build Alternative**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>
Fowler Avenue (Signalized)	NB	LT	0.51	27.3	C	1.12	122.9	F
	NB	TH	0.46	10.6	B	0.87	31.8	C
	SB	TH	0.99	49.0	D	0.99	72.3	E
	EB	LT	0.90	55.5	E	1.14	116.5	F
	EB	RT	0.96	67.7	E	0.13	14.5	B
	Overall Intersection		N/A	41.7	D	N/A	75.0	E
Harney Road (Unsignalized)	SB	LT	0.21	13.0	B	0.36	30.4	D
	WB	LT/RT	4.13	1753.0	F	7.53	3336.0	F
CR 579 (Unsignalized)	SB	LT	0.43	16.6	C	0.87	81.5	F
	WB	LT	83.00	40445.0	F	143.00	70945.0	F
	WB	RT	0.76	56.7	F	3.92	1454.0	F
Stacy Road (Unsignalized)	NB	LT	0.00	0.0	A	0.00	9.9	A
	SB	LT	0.06	12.3	B	0.14	26.5	D
	WB	LT/TH/RT	56.67	25657.0	F	35.73	16289.0	F
	EB	LT/TH/RT	0.00	0.0	A	0.42	236.7	F
McIntosh Road (Unsignalized)	SB	LT	0.50	15.1	C	1.42	233.8	F
	WB	LT/RT	12.95	5564.0	F	*	**	F

<sup>(1)</sup> Volume-to-Capacity Ratio

<sup>(2)</sup> Average Delay (in seconds/vehicle)

<sup>(3)</sup> Level of Service

\* Theoretically, the capacity for this movement is equal to zero. Therefore, the v/c ratio is infinite.

\*\* No estimate of delay is provided since the v/c ratio is infinite.

## SECTION 5.0 BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSES

### 5.1 Opening Year (2020) Build Alternative Level of Service Analysis

With the Build Alternative, the US 301 roadway segments were analyzed as multilane highway segments using the 2010 HCS. The opening year (2020) Build Alternative HCS analyses were conducted using the same values for truck percentages and PHFs that were used in the opening year No-Build Alternative HCS analyses. A driver population factor of 1.00 was also used in the multilane highway segment analyses which reflects a driver population composed primarily of commuters or drivers who are familiar with the facility. **Table 5-1** summarizes the results of the 2020 peak hour multilane highway segment analyses. All five roadway segments are projected to operate at LOS B or better in the peak travel direction during both peak hours. LOS A operations are projected for all five roadway segments in the off-peak travel direction during both peak hours. The opening year Build Alternative HCS multilane highway segment analysis summary sheets are provided in **Appendix J**.

**Table 5-1: Opening Year (2020) Peak Hour Roadway Segment Operations – Build Alternative**

Roadway Segment	Direction	AM Peak Hour			PM Peak Hour		
		Volume	Density <sup>(1)</sup>	LOS <sup>(2)</sup>	Volume	Density <sup>(1)</sup>	LOS <sup>(2)</sup>
Between Fowler Avenue and Harney Road	NB	435	5.0	A	1360	14.4	B
	SB	1305	14.3	B	380	4.0	A
Between Harney Road and CR 579	NB	394	4.5	A	1131	12.0	B
	SB	1131	12.4	B	394	4.2	A
Between CR 579 and Stacy Road	NB	360	4.1	A	1081	11.4	B
	SB	1080	11.8	B	365	3.9	A
Between Stacy Road and McIntosh Road	NB	289	3.0	A	850	8.3	A
	SB	865	8.7	A	289	2.8	A
Between McIntosh Road and Future SR 56	NB	306	3.2	A	917	8.9	A
	SB	917	9.2	A	306	3.0	A

<sup>(1)</sup> Average Density (in passenger cars/mile/lane)

<sup>(2)</sup> Level of Service

**Table 5-2** summarizes the results of the 2020 Build Alternative intersection analyses. It should be noted that the analyses of the Stacy Road and McIntosh Road unsignalized intersections included exclusive westbound left-turn lanes at both locations. All of the northbound and southbound US 301 left-turn movements at the unsignalized intersections are projected to operate at LOS B or better during both peak hours. With one exception, all of the cross street movements at the unsignalized intersections are projected to operate at LOS D or better during both peak hours. The westbound left-turn movement at the Stacy Road intersection is projected to operate at LOS E in the a.m. peak hour. The opening year Build Alternative HCS unsignalized intersection analysis summary sheets are provided in **Appendix J**.

**SECTION 5.0**  
**BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSIS**

**Table 5-2: Opening Year (2020) Peak Hour Intersection Operations – Build Alternative**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>
Fowler Avenue (Signalized)	NB	LT	0.18	15.1	B	0.20	13.8	B
	NB	TH	0.13	9.4	A	0.45	13.3	B
	SB	TH	0.65	25.3	C	0.16	20.5	C
	EB	LT	0.33	29.7	C	0.80	36.9	D
	EB	RT	0.26	22.4	C	0.20	20.0	B
<b>Overall Intersection</b>			<b>N/A</b>	<b>23.1</b>	<b>C</b>	<b>N/A</b>	<b>23.3</b>	<b>C</b>
Harney Road (Unsignalized)	SB	LT	0.02	8.5	A	0.01	12.9	B
	WB	LT/RT	0.06	13.8	B	0.12	15.3	C
CR 579 (Unsignalized)	SB	LT	0.11	8.7	A	0.08	11.6	B
	WB	LT	0.12	21.9	C	0.25	26.6	D
	WB	RT	0.05	9.9	A	0.26	14.3	B
Stacy Road (Unsignalized)	NB	LT	0.00	0.0	A	0.00	7.9	A
	SB	LT	0.02	8.3	A	0.02	11.7	B
	WB	LT	0.71	36.0	E	0.35	27.3	D
	WB	TH/RT	0.01	9.1	A	0.07	11.4	B
	EB	LT/TH/RT	0.00	0.0	A	0.02	10.8	B
McIntosh Road (Unsignalized)	SB	LT	0.07	8.2	A	0.09	10.8	B
	WB	LT	0.05	16.5	C	0.14	20.9	C
	WB	RT	0.04	9.4	A	0.20	12.8	B

<sup>(1)</sup> Volume-to-Capacity Ratio

<sup>(2)</sup> Average Delay (in seconds/vehicle)

<sup>(3)</sup> Level of Service

**Table 5-2** also indicates that with one exception, all of the signal controlled movements at the Fowler Avenue intersection are projected to operate at LOS C or better during both peak hours. In the p.m. peak hour, the eastbound left-turn movement is operating at LOS D. This signalized intersection is projected to operate at LOS C overall during both peak hours. The opening year Build Alternative HCS signalized intersection analysis summary sheets are also provided in **Appendix J**.

## 5.2 Design Year (2040) Build Alternative Level of Service Analysis

The design year (2040) Build Alternative HCS analyses were conducted using the same parameter values for truck percentages and PHFs that were used in the design year No-Build Alternative HCS analyses. A driver population factor of 1.00 was also used in the design year multilane highway segment analyses.

**Table 5-3** summarizes the results of the 2040 peak hour multilane highway segment analyses. All five roadway segments are projected to operate at LOS C or better in the peak travel direction during both peak hours. LOS B or better operations are projected for all five roadway segments in the off-peak travel direction during both peak hours. The design year Build Alternative HCS multilane highway segment analysis summary sheets are provided in **Appendix K**.

**Table 5-4** summarizes the results of the 2040 Build Alternative intersection analyses. In the a.m. peak hour, all of the northbound and southbound US 301 left-turn movements are projected to operate at LOS C or better. In the p.m. peak hour, there are two US 301 left-turn movements that are projected to operate at LOS F and these are as follows:

- Southbound left-turn movement at CR 579
- Southbound left-turn movement at McIntosh Road

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**Table 5-3: Design Year (2040) Peak Hour Roadway Segment Operations – Build Alternative**

Roadway Segment	Direction	AM Peak Hour			PM Peak Hour		
		Volume	Density <sup>(1)</sup>	LOS <sup>(2)</sup>	Volume	Density <sup>(1)</sup>	LOS <sup>(2)</sup>
Between Fowler Avenue and Harney Road	NB	1328	13.4	B	2466	25.0	C
	SB	2466	25.0	C	1328	13.4	B
Between Harney Road and CR 579	NB	1156	11.7	B	2147	21.7	C
	SB	2147	21.7	C	1156	11.7	B
Between CR 579 and Stacy Road	NB	1191	12.1	B	2212	22.4	C
	SB	2211	22.4	C	1195	12.1	B
Between Stacy Road and McIntosh Road	NB	882	8.2	A	1639	15.2	B
	SB	1638	15.2	B	884	8.2	A
Between McIntosh Road and Future SR 56	NB	1282	11.9	B	1922	17.8	B
	SB	1922	17.8	B	1282	11.9	B

<sup>(1)</sup> Average Density (in passenger cars/mile/lane)

<sup>(2)</sup> Level of Service

**Table 5-4: Design Year (2040) Peak Hour Intersection Operations – Build Alternative**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>
Fowler Avenue (Signalized)	NB	LT	0.51	27.3	C	1.12	122.9	F
	NB	TH	0.46	10.6	B	0.87	31.8	C
	SB	TH	0.99	49.0	D	0.99	72.3	E
	EB	LT	0.90	55.5	E	1.14	116.5	F
	EB	RT	0.96	67.7	E	0.13	14.5	B
	<b>Overall Intersection</b>			<b>N/A</b>	<b>41.7</b>	<b>D</b>	<b>N/A</b>	<b>75.0</b>
Harney Road (Unsignalized)	SB	LT	0.22	13.2	B	0.38	31.7	D
	WB	LT/RT	0.35	25.0	C	0.89	101.7	F
CR 579 (Unsignalized)	SB	LT	0.44	17.0	C	0.90	89.9	F
	WB	LT	3.02	1068.0	F	6.81	2978.0	F
	WB	RT	0.41	18.7	C	1.00	102.0	F
Stacy Road (Unsignalized)	NB	LT	0.00	0.0	A	0.00	9.9	A
	SB	LT	0.06	12.4	B	0.14	27.3	D
	WB	LT	4.53	1652.0	F	5.04	1934.0	F
	WB	TH/RT	0.04	11.3	B	0.09	16.2	C
	EB	LT/TH/RT	0.00	0.0	A	0.05	24.9	C
McIntosh Road (Unsignalized)	SB	LT	0.51	15.5	C	1.45	250.7	F
	WB	LT	0.79	176.5	F	*	**	F
	WB	RT	0.84	36.0	E	1.06	102.0	F

<sup>(1)</sup> Volume-to-Capacity Ratio

<sup>(2)</sup> Average Delay (in seconds/vehicle)

<sup>(3)</sup> Level of Service

\* Theoretically, the capacity for this movement is equal to zero. Therefore, the v/c ratio is infinite.

\*\*No estimate of delay is provided since the v/c ratio is infinite.

Although both of these movements are projected to operate at LOS F, only the southbound left-turn at McIntosh Road is projected to operate overcapacity (i.e., with a v/c ratio greater than 1.00). In addition, a majority of the US 301 cross street movements are projected to operate at LOS F during one or both peak hours. These include the following:

- Westbound left-turn/right-turn from Harney Road (p.m. peak hour only)
- Westbound left-turn from CR 579 (both peak hours)
- Westbound right-turn from CR 579 (p.m. peak hour only)
- Westbound left-turn from Stacy Road (both peak hours)

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- Westbound left-turn from McIntosh Road (both peak hours)
- Westbound right-turn from McIntosh Road (p.m. peak hour only)

Most of the movements listed above are projected to operate at or overcapacity during at least one of the peak hours. The design year Build Alternative HCS unsignalized intersection analysis summary sheets are also provided in **Appendix K**.

**Table 5-4** also indicates that all of the signal controlled movements at the Fowler Avenue intersection are projected to operate at LOS E or better during the a.m. peak hour. In the p.m. peak hour, only two movements (the northbound and eastbound left-turn movements) are operating at LOS F. This signalized intersection is projected to operate at LOS D overall during the a.m. peak hour and at LOS E overall during the p.m. peak hour. The design year Build Alternative HCS signalized intersection analysis summary sheets are provided in **Appendix K**.

Given the severe overcapacity conditions that are projected to occur at the CR 579, Stacy Road and McIntosh Road unsignalized intersections in the design year, signalized intersection analyses were also conducted for the Build Alternative for these three intersections. The signalized intersection analyses were conducted to determine whether acceptable levels of service could be achieved at these three locations in the design year with the implementation of a traffic signal. These additional design year Build Alternative HCS signalized intersection analysis summary sheets are also provided in **Appendix K**.

**Table 5-5** summarizes the results of the 2040 peak hour signalized intersection analyses conducted for CR 579, Stacy Road and McIntosh Road intersections. **Table 5-5** indicates that acceptable operations are projected to occur at all three of these intersections in the design year with the installation of traffic signals. In the a.m. peak hour, all of the individual movements are projected to operate at LOS D or better. In the p.m. peak hour, there are a few individual movements that are projected to operate at LOS E or F; however, none of the movements are projected to have v/c ratios greater than 1.00. In addition, all three intersections are projected to operate at LOS D or better overall during both peak hours. It should be noted that the Stacy Road intersection analysis results summarized in **Table 5-5** assume the provision of dual left-turn lanes on the westbound Stacy Road approach. Initially, this intersection was analyzed with only a single westbound left-turn lane; however, the results of this analysis indicated that the intersection was projected to operate overcapacity. The recommended design year intersection geometrics are graphically illustrated in **Figure 5-1**.

Although the results of the signalized intersection analyses indicate that the cross street vehicle delays at the existing unsignalized intersections are projected to improve significantly with the implementation of traffic signal control, this does not imply that traffic signals should be (or will be) installed at these unsignalized intersections when US 301 is widened to a four-lane divided roadway. The decision to install a traffic signal at one or more of the existing unsignalized intersections will be made during the final design of the project and will be based on the results of a more detailed traffic signal warrant study to be conducted by FDOT.

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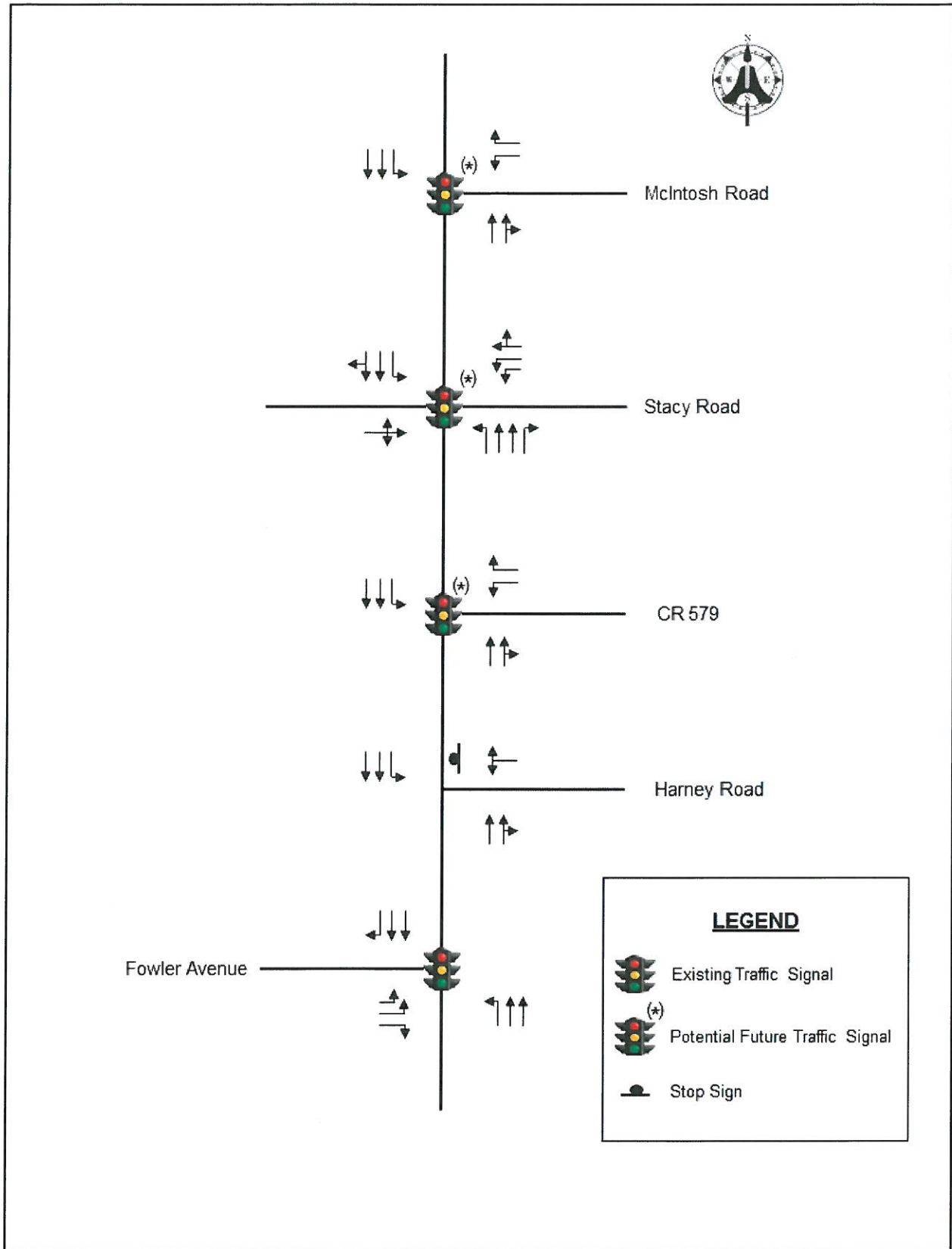
**Table 5-5: Design Year (2040) Peak Hour Signalized Intersection Operations for CR 579, Stacy Road and McIntosh Road - Build Alternative**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	V/C <sup>(1)</sup>	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>
CR 579 (Signalized)	NB	TH	0.76	28.7	C	0.97	39.4	D
	NB	RT	0.76	29.0	C	1.00	46.2	D
	SB	LT	0.52	19.0	B	0.92	90.1	F
	SB	TH	0.90	18.6	B	0.41	4.4	A
	WB	LT	0.66	48.0	D	0.87	91.0	F
	WB	TRT	0.38	27.3	C	0.86	72.5	E
	<b>Overall Intersection</b>		<b>N/A</b>	<b>23.5</b>	<b>C</b>	<b>N/A</b>	<b>37.7</b>	<b>D</b>
Stacy Road (Signalized)	NB	LT	0.02	53.8	D	0.01	20.6	C
	NB	TH	0.55	19.8	B	0.90	29.1	C
	NB	RT	0.48	18.9	B	0.75	24.1	C
	SB	LR	0.13	28.4	C	0.30	55.6	E
	SB	TH	0.99	54.2	D	0.46	15.9	B
	SB	RT	0.99	54.2	D	0.46	15.9	B
	WB	LT	0.89	53.8	D	0.63	48.1	D
	WB	TH/RT	0.08	34.3	C	0.12	42.6	D
	EB	LT/TH/RT	0.02	45.6	D	0.08	50.9	D
	<b>Overall Intersection</b>		<b>N/A</b>	<b>41.8</b>	<b>D</b>	<b>N/A</b>	<b>27.2</b>	<b>C</b>
McIntosh Road (Signalized)	NB	TH	0.61	25.5	C	0.99	56.1	E
	NB	RT	0.61	25.5	C	0.99	58.0	E
	SB	LT	0.69	20.7	C	1.00	79.5	E
	SB	TH	0.75	13.5	B	0.33	3.7	A
	WB	LT	0.14	37.1	D	0.35	52.5	D
	WB	RT	0.85	42.8	D	0.70	38.6	D
	<b>Overall Intersection</b>		<b>N/A</b>	<b>21.7</b>	<b>C</b>	<b>N/A</b>	<b>44.6</b>	<b>D</b>

### 5.3 Design Year (2040) Build Alternative Queue Lengths

Three different methodologies were used to obtain estimates of the peak hour queue lengths for the northbound and southbound left-turn and right-turn lanes at the US 301 unsignalized intersections. The first methodology involved the use of the HCS 2010 unsignalized intersection analyses. The 95<sup>th</sup>-percentile queue length estimates (expressed in terms of vehicles) obtained from the unsignalized intersection analyses were multiplied by an average vehicle spacing of 25.0 feet. The second methodology involved the use of the HCS 2010 signalized intersection analyses conducted for the CR 579, Stacy Road and McIntosh Road intersections. The 50<sup>th</sup>-percentile queue length estimates (expressed in terms of vehicles) obtained from the signalized intersection analyses were multiplied by a factor of 2.0 and used as an estimate of the 95<sup>th</sup>-percentile queue lengths. Once again, these queue lengths were multiplied by an average vehicle spacing of 25.0 feet. The third methodology involved the use of the Red Time Formula. Design year queue lengths were not estimated for the Fowler Avenue signalized intersection because intersection improvements are currently being constructed as a part of the four-laning of US 301 from Fowler Avenue southward to the Tampa Bypass Canal.

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**Figure 5-1: Design Year (2040) Recommended Intersection Geometrics – Build Alternative**

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**Table 5-6** summarizes the design year (2040) a.m. and p.m. peak hour queue length estimates obtained using all three of the methodologies. It should be noted that the HCS unsignalized intersection analysis only provides queue length estimates for the US 301 left-turn movements and the cross street movements. Ideally, the length of the exclusive left-turn and right-turn lanes should be designed to:

- Minimize the possibility of left-turn and right-turn vehicle queues extending back into the adjacent through lanes; and
- Minimize the possibility of through vehicle queues extending back and blocking the access to the exclusive turn lanes.

**Table 5-6: Design Year (2040) Peak Hour Queue Length Estimates – Build Alternative**

Intersection	Movement	No. of Lanes	AM Peak Hour				PM Peak Hour			
			Volume	Queue Length <sup>(1)</sup> (feet)	Queue Length <sup>(2)</sup> (feet)	Queue Length <sup>(3)</sup> (feet)	Volume	Queue Length <sup>(1)</sup> (feet)	Queue Length <sup>(2)</sup> (feet)	Queue Length <sup>(3)</sup> (feet)
Harney Road	SB LT	1	113	21	N/A	N/A	74	39	N/A	N/A
	SB TH	2	2,034	N/A	N/A	N/A	1,082	N/A	N/A	N/A
CR 579	SB LT	1	217	56	140	114	167	179	390	73
	SB TH	2	1,994	N/A	815	476	1,024	N/A	135	195
Stacy Road	SB LT	1	28	5	30	23	25	12	45	19
	SB TH/RT	2	1,611	N/A	1,310	654	859	N/A	340	323
	NB LT	1	0	0	0	0	2	0	0	2
	NB TH	2	858	N/A	370	348	1,610	N/A	1,015	606
	NB RT	1	334	N/A	275	271	601	N/A	645	452
McIntosh Road	SB LT	1	327	73	185	187	445	647	930	187
	SB TH	2	1,595	N/A	530	419	837	N/A	90	154

<sup>(1)</sup> HCS 2010 Unsignalized Intersection Analysis: Queue Length = (95% Queue Length) x (25)

<sup>(2)</sup> HCS 2010 Signalized Intersection Analysis: Queue Length = (2) x (50% Queue Length) x (25)

<sup>(3)</sup> Red Time Equation: Queue Length = [(2) x (Volume) x (25) x (1+T%) x (1-g/C)]/[No. of Lanes] x (No. of Cycles]

In recognition of these design concerns, northbound and southbound through vehicle queue lengths were also estimated for the CR 579, Stacy Road and McIntosh Road intersections using the HCS 2010 signalized intersection analysis output and the Red Time Formula. These through queues are also provided in **Table 5-6**. A spreadsheet containing more detailed information regarding the queue length estimates is provided in **Appendix K**.

**Table 5-7** provides preliminary recommendations for the total lengths of the exclusive left-turn and right-turn lanes. These lengths include queue storage as well as deceleration. The deceleration lengths include tapers and are based on Standard Index 301 of the FDOT Design Standards. The queue storage for the southbound left-turn lane at the Harney Road unsignalized intersection was based on the number of vehicles likely to arrive in an average two-minute period within the peak hour in accordance with the 2015 Florida Intersection Design Guide.



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**Table 5-7: Recommended Design Year (2040) Turn Lane Lengths – Build Alternative**

<b>Intersection</b>	<b>Movement</b>	<b>No. of Lanes</b>	<b>Queue Storage (feet)</b>	<b>Decel Length (feet)</b>	<b>Total Length (feet)</b>
Harney Road	SB LT	1	100	350 <sup>(1)</sup>	450
CR 579	SB LT	1	200	350 <sup>(1)</sup>	550
Stacy Road	NB LT	1	250	350 <sup>(1)</sup>	600 <sup>(3)</sup>
	NB RT	1	300	350 <sup>(1)</sup>	650
	SB LT	1	910	405 <sup>(2)</sup>	1315 <sup>(3)</sup>
McIntosh Road	SB LT	1	200	405 <sup>(2)</sup>	605

<sup>(1)</sup> Deceleration length based on a 55 mph design speed from the FDOT Design Standards

<sup>(2)</sup> Deceleration length based on a 60 mph design speed from the FDOT Design Standards

<sup>(3)</sup> Length of full width turn lane (existing conditions)

## SECTION 6.0 SUMMARY

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This Design Traffic Technical Memorandum was prepared in support of the FDOT District Seven US 301 Project Development and Environment (PD&E) study. The limits of this PD&E study extend from Fowler Avenue to the proposed SR 56 extension. The purpose of this Design Traffic Technical Memorandum is to document the existing and future year traffic volumes throughout the study corridor and identify the additional geometric improvements that will be needed to provide acceptable traffic operations in the future.

The existing US 301 roadway is a two-lane undivided north/south roadway. The 2015 AADT volumes on US 301 range from 11,600 vpd to 18,400 vpd. The results of the existing conditions two-lane highway segment analyses indicate that all five roadway segments are operating at LOS E in the peak travel direction during both peak hours. In addition, the two segments between Fowler Avenue and CR 579 are also operating at LOS E in the off-peak travel direction during both peak hours. The three roadway segments located north of CR 579 are currently operating at LOS D or better in the off-peak travel direction during both peak hours.

Unsignalized intersection analyses were conducted for four existing unsignalized intersections. All of the northbound and southbound US 301 left-turn movements are operating at LOS B or better during both peak hours. In the a.m. peak hour, the following cross street movements are operating at LOS F:

- Westbound left-turn movement at CR 579
- Westbound left-turn, through and right-turn movements at Stacy Road

In the p.m. peak hour, all of the cross street movements are operating at LOS E or better.

Signalized intersection analyses were also conducted for the Fowler Avenue intersection. All of the signal controlled movements are operating at LOS D or better during the a.m. peak hour. In the p.m. peak hour, one movement (the eastbound left-turn) is operating at LOS F while all of the other movements are operating at LOS C or better.

Opening year (2020) daily and peak hour traffic projections were estimated using a growth rate methodology based on an analysis of historic traffic growth trends. Design year (2040) daily and peak hour traffic projections for the study corridor were estimated with the use of the 2040 Cost-Affordable Tampa Bay Regional Planning Model (TBRPM). The 2020 AADT volumes are projected to range between 12,700 vpd and 20,200 vpd, while the 2040 AADT volumes are projected to range between 27,800 vpd and 49,300 vpd.

The results of the 2040 No-Build Alternative two-lane highway segment analyses indicate that the entire study corridor is projected to operate at LOS F for both travel directions during both peak hours thus demonstrating the need to widen this portion of US 301. With two exceptions, all of the northbound and southbound US 301 left-turn movements at the unsignalized intersections

are projected to operate at LOS D or better during both peak hours. The following left-turn movements are projected to operate at LOS F during the p.m. peak hour:

- Southbound left-turn movement at CR 579
- Southbound left-turn movement at McIntosh Road

In addition, with the exception of the eastbound movements at the Stacy Road intersection during the a.m. peak hour (i.e., the movements exiting John B. Sargeant Sr. Memorial Wilderness Park), all of the US 301 cross street movements are projected to operate at LOS F during both the a.m. and p.m. peak hours.

The results of the 2040 Build Alternative multilane highway segment analyses indicate that the entire study corridor is projected to operate at LOS C or better in the peak travel direction during both peak hours with a four-lane divided US 301. LOS B or better operations are projected for the study corridor in the off-peak travel direction during both peak hours. In the a.m. peak hour, all of the northbound and southbound US 301 left-turn movements are projected to operate at LOS C or better. In the p.m. peak hour, there are only two US 301 left-turn movements that are projected to operate at LOS F and these are as follows:

- Southbound left-turn movement at CR 579
- Southbound left-turn movement at McIntosh Road

Although both of these movements are projected to operate at LOS F, only the southbound left-turn at McIntosh Road is projected to operate overcapacity (i.e., with a v/c ratio greater than 1.00). In addition, a majority of the US 301 cross street movements are projected to operate at LOS F during one or both peak hours. These include the following:

- Westbound left-turn/right-turn from Harney Road (p.m. peak hour only)
- Westbound left-turn from CR 579 (both peak hours)
- Westbound right-turn from CR 579 (p.m. peak hour only)
- Westbound left-turn from Stacy Road (both peak hours)
- Westbound left-turn from McIntosh Road (both peak hours)
- Westbound right-turn from McIntosh Road (p.m. peak hour only)

Most of the movements listed above are also projected to operate at or overcapacity during at least one of the peak hours.

Since the results of the 2040 Build Alternative unsignalized intersection analyses indicate that overcapacity operations are projected to occur for many of the cross street movements, a second design year analysis was conducted for the Build Alternative. Signalized intersection analyses were conducted for the CR 579, Stacy Road and McIntosh Road intersections and the results indicate that acceptable operations are projected to occur at all three of these intersections in the design year with the installation of traffic signals.