DRAFT

SR 33
Project Development and Environment Study
Project Traffic Report

From Old Combee Road to North of Tomkow Road
Polk County, Florida

Financial Project ID No: 430185-1-22-01

Prepared for:
Florida Department of Transportation
District One

Prepared by:
AIM Engineering & Surveying, Inc.
Tampa, Florida

November 2013

CERTIFICATION
by
AIM ENGINEERING & SURVEYING, INC.

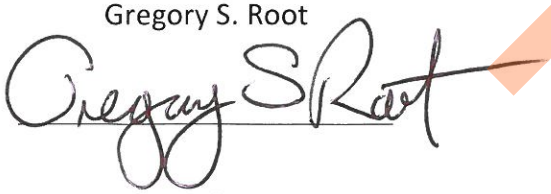
Project Traffic Report
Prepared for the
SR 33 Project Development & Environment (PD&E) Study

Polk County, Florida

Financial Project ID No. 430185-1-22-01

I, Gregory Root certify that the Project Traffic Report for the above referenced Florida Department of Transportation project was prepared by me or under my responsible charge. The future year traffic forecasts and future year traffic analyses have been conducted using current transportation planning and traffic engineering practices and procedures that are consistent with those used by the Florida Department of Transportation. All statements, conclusions, and recommendations made herein are true and correct to the best of my knowledge and ability.

Gregory S. Root



AIM Engineering & Surveying, Inc.

11/25/13

Date

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) Study for a portion of SR 33 in Polk County. The limits of the PD&E study extend from the Old Combee Road/Deeson Pointe Boulevard intersection to just north of the Tomkow Road intersection and are graphically illustrated in **Figure 1-1**. The purpose of the PD&E study is to document the need for capacity improvements within the SR 33 corridor and to determine the specific improvements that should be implemented in this corridor.

2.0 EXISTING CONDITIONS

2.1 Existing Roadway and Intersection/Interchange Geometrics

The existing SR 33 roadway is a two-lane undivided roadway and has a southwest/northeast orientation. Throughout the remainder of this document the portions of SR 33 between Old Combee Road/Deeson Pointe Boulevard and Spanish Oaks Boulevard and north of the I-4 interchange will be referred to as east/west roadways, while the portion between Spanish Oaks Boulevard and the I-4 interchange will be referred to as a north/south roadway. According to the Straight Line Diagram of Road Inventory (dated February 15, 2013), this portion of SR 33 is functionally classified as an urban minor arterial.

The study corridor includes 14 intersections and these are listed below:

- Old Combee Road/Deeson Pointe Boulevard (4-legged intersection) – Milepost 4.993
- Wood Circle W. (T-intersection) – Milepost 5.106
- Wood Circle E. (T-intersection) – Milepost 5.163
- Lake Deeson Village Mobile Home Park Entrance (T-intersection) – Milepost 5.228
- Sunset Way (T-intersection) – Milepost 5.364
- Lake Luther Road (T-intersection) – Milepost 5.490
- Spanish Oaks Boulevard (T-intersection) – Milepost 5.609
- Huron Way/Long Lake Circle (4-legged intersection) – Milepost 5.916
- N. Combee Road (SR 659)/Village Lakes Boulevard (4-legged intersection) – Milepost 6.793
- Firstpark Boulevard S. (T-intersection) – Milepost 7.627
- Firstpark Boulevard N./University Boulevard (4-legged intersection) – Milepost 7.880
- Eastbound I-4 On-/Off-Ramps (4-legged intersection) – Milepost 8.359
- Westbound I-4 On-/Off-Ramps (4-legged intersection) – Milepost 8.513
- Tomkow Road (T-intersection) – Milepost 8.714

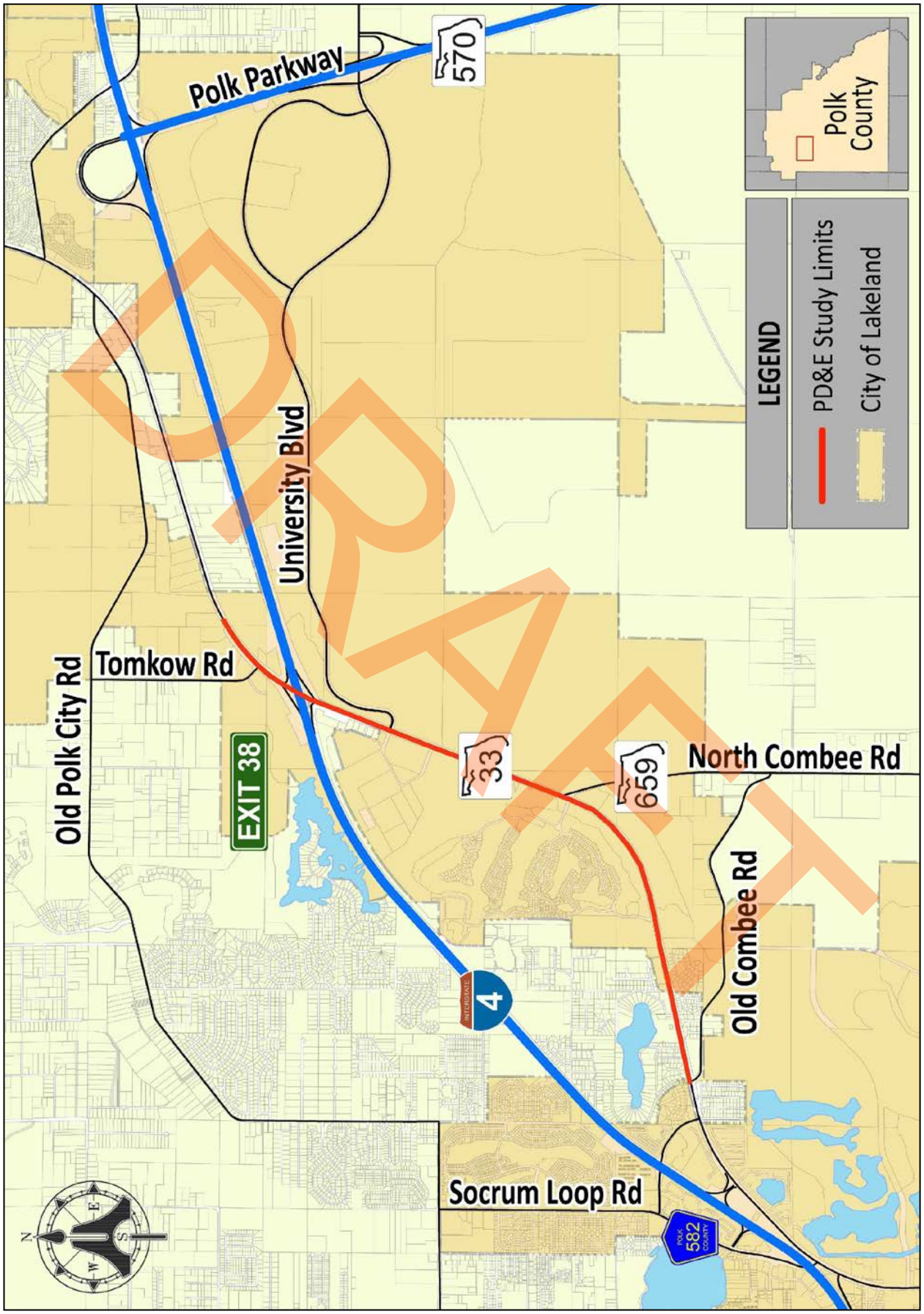


FIGURE 1-1: PROJECT LOCATION MAP

Although Tomkow Road is a T-intersection, there is a small park-and-ride lot located on the south side of SR 33 west of Tomkow Road. The entrance/exit to the park-and-ride lot is offset from Tomkow Road by approximately 30 feet (centerline-to-centerline). **Figures 2-1** and **2-2** depict the intersection laneage that existed within the SR 33 study corridor at the time the traffic counts were conducted. Traffic signals are located at the Old Combee Road/Deeson Pointe Boulevard intersection and the University Boulevard/First Park Boulevard N. intersection. The latter signal is currently displaying flashing yellow on SR 33 and flashing red on University Boulevard/Firstpark Boulevard N. In addition, there is a flashing beacon at the N. Combee Road/Village Lakes Boulevard intersection. This beacon displays flashing yellow on SR 33 and flashing red on N. Combee Road/Village Lakes Boulevard.

In the eastbound/northbound direction, the posted speed limits [miles per hour (mph)] are as follows:

- 45 mph (from Old Combee Road/Deeson Pointe Boulevard to Spanish Oaks Boulevard);
- 55 mph (from Spanish Oaks Boulevard to north of N. Combee Road/Village Lakes Boulevard); and
- 60 mph (from north of N. Combee Road/Village Lakes Boulevard to east of Tomkow Road).

In the westbound/southbound direction, the posted speed limits are as follows:

- 60 mph (from east of Tomkow Road to north of Huron Way/Long Lake Circle);
- 55 mph (from north of Huron Way/Long Lake Circle to Spanish Oaks Boulevard); and
- 45 mph (from Spanish Oaks Boulevard to Old Combee Road/Deeson Pointe Boulevard).

Vehicular passing is prohibited in various locations throughout the study corridor. The total length of the No-Passing Zones within each of the primary roadway segments (for both travel directions) is graphically illustrated in **Figure 2-3**. No-Passing Zones comprise 100.0% of the total segment length for each of the segments located between University Boulevard/Firstpark Boulevard N. and Tomkow Road.

The existing I-4/SR 33 interchange is a rural diamond interchange that has single lane on- and off-ramps in all four quadrants. I-4 is a six-lane divided limited access facility with a posted speed limit of 70 mph and crosses over SR 33 on a 135°/45° skew angle. I-4 is functionally classified as an urban principal arterial-interstate. Single left-turn and right-turn lanes are provided on SR 33 and on the I-4 off-ramps. The distance between the two unsignalized ramp terminal intersections is approximately 800 feet. The left-turn movements from the I-4 off-ramps onto SR 33 operate under stop sign control while the left-turn movements from SR 33 onto the I-4 on-ramps must yield to oncoming vehicles. All four of the right-turn movements are channelized and controlled by yield signs. Currently, there are no acceleration/deceleration lanes on SR 33 for the right-turn movements, and aside from the channelization of the right-turn and left-turn movements, there is no separate right-turn and left-turn queue storage provided on the I-4 off-ramps.

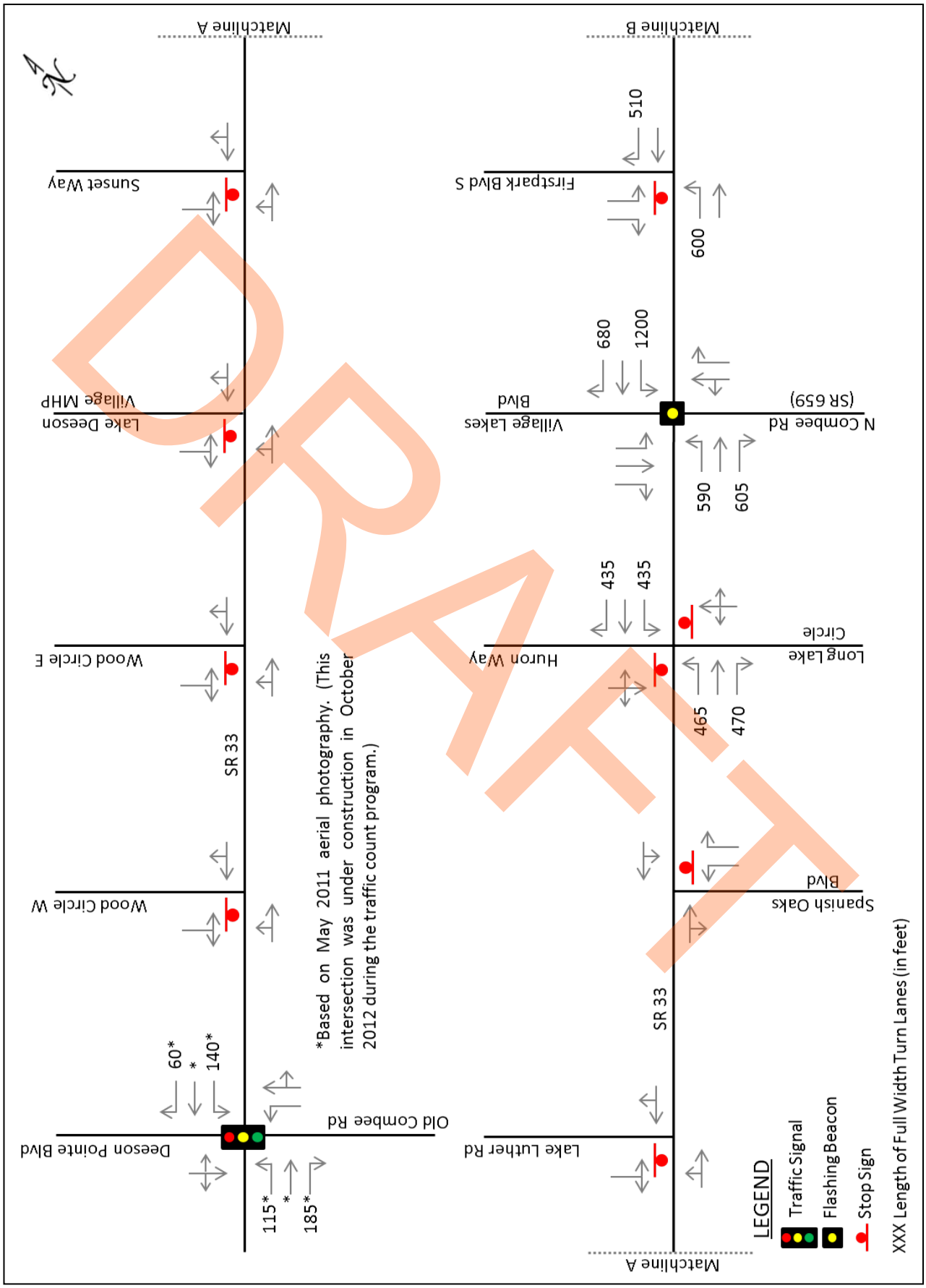


FIGURE 2-1: EXISTING YEAR (2012) INTERSECTION GEOMETRY

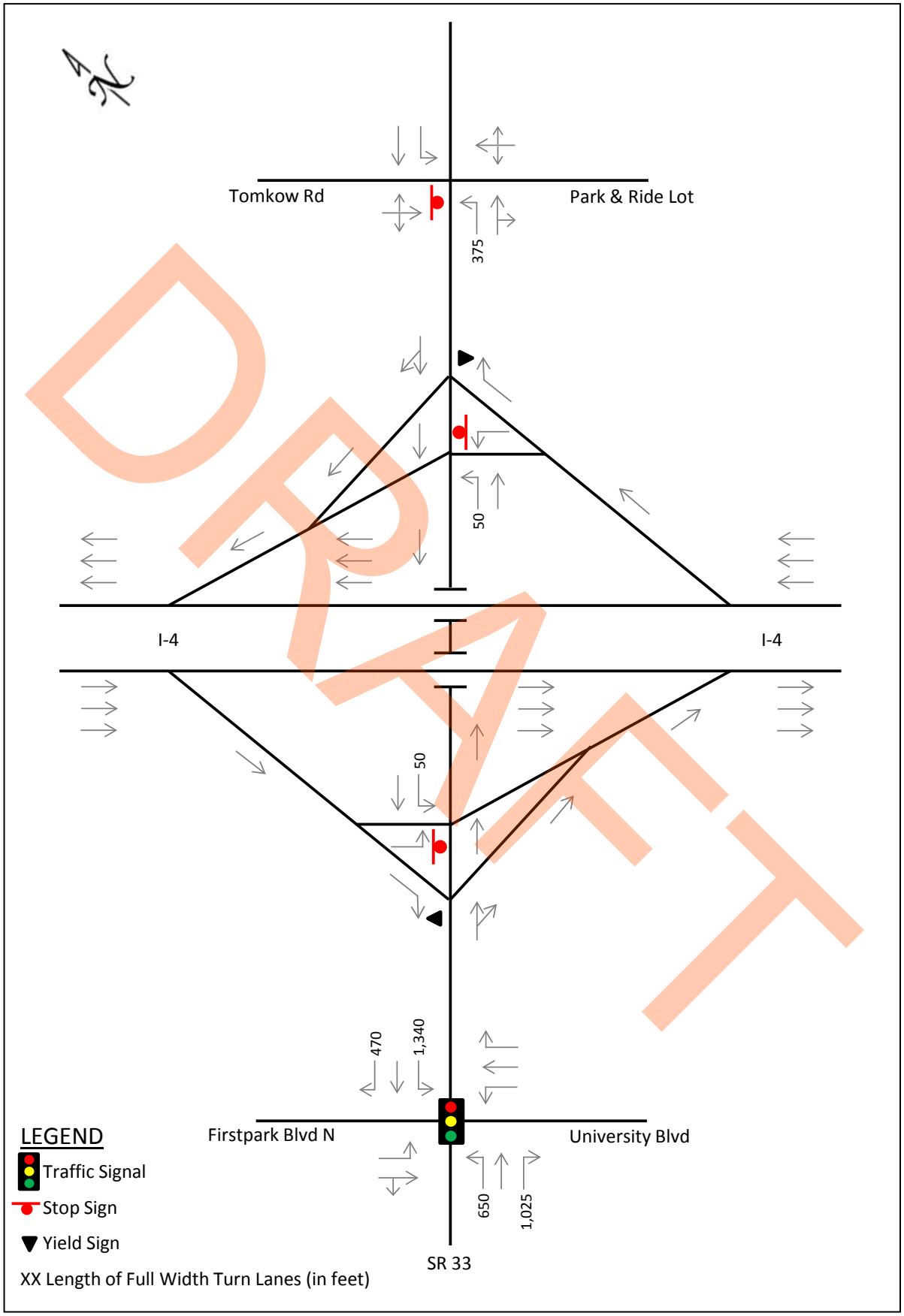


FIGURE 2-2: EXISTING YEAR (2012) INTERCHANGE/INTERSECTION GEOMETRY

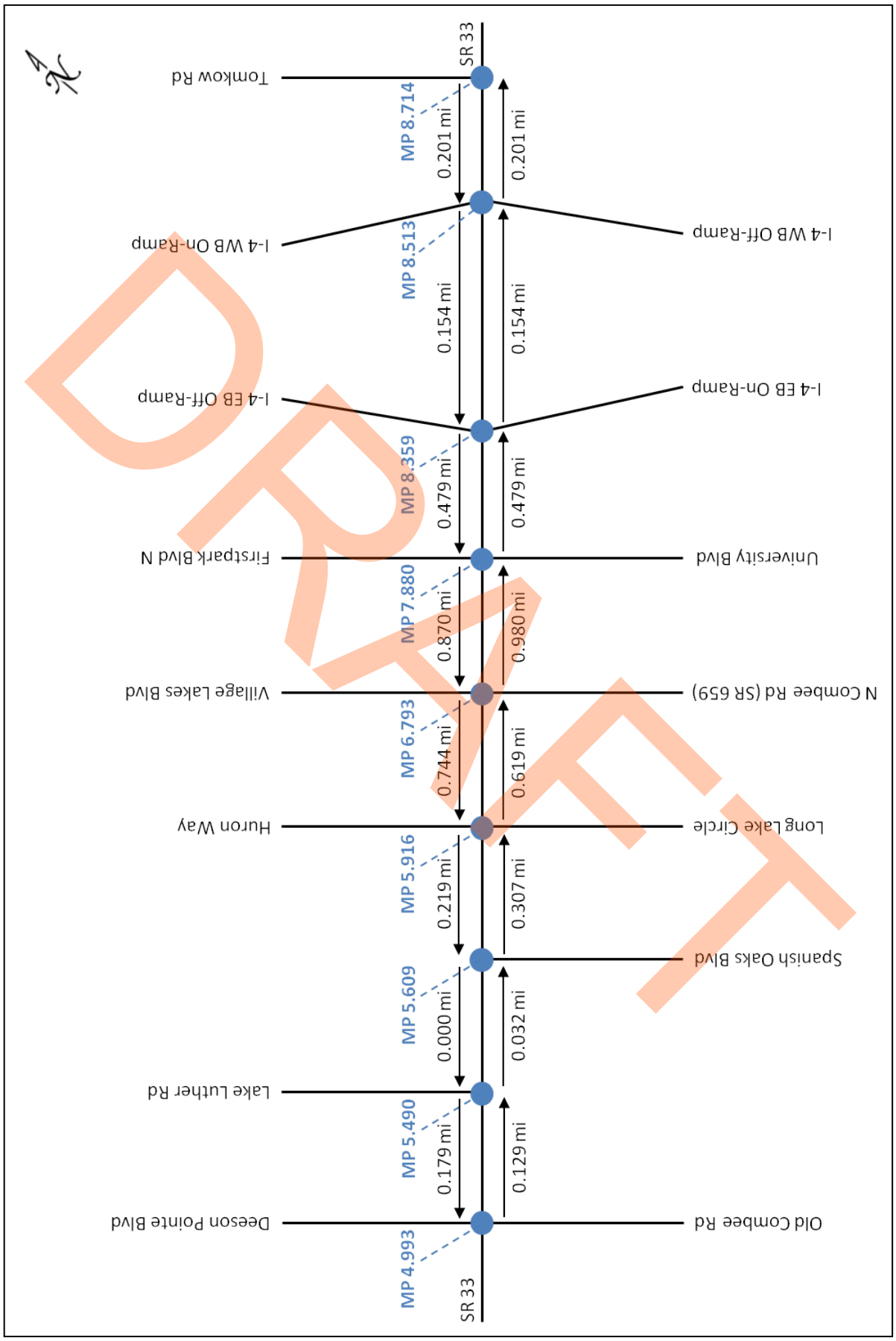


FIGURE 2-3: EXISTING YEAR (2012) NO-PASSING ZONE LENGTHS

2.2 Existing Daily Traffic Volumes

A traffic count program was conducted by Adams Traffic, Inc. during the months of September and October in 2012. Twenty-four (24) hour bi-directional volume counts were conducted at 34 locations within the study corridor (including cross streets) on September 6, 2012. A seventy-two (72) hour bi-directional vehicle classification count was also conducted between September 4th and September 6th on SR 33 north of N. Combee Road/Village Lakes Boulevard. The bi-directional volume count data and classification count data is provided in **Appendix A**.

The 2012 Annual Average Daily Traffic (AADT) volumes were calculated by multiplying the 24-hour count data by seasonal and axle adjustment factors. The 2012 seasonal and axle adjustment factors were obtained from the FDOT's Florida Traffic Online website and are provided in **Appendix B**. According to the 2012 Peak Season Factor Category Report, the countywide and I-4 weekly adjustment factors associated with the week of September 2nd through September 8th are equal to 1.07 and 1.09, respectively. The 2012 Weekly Axle Factor Category Report indicates that the axle adjustment factor for the portion of SR 33 south of N. Combee Road/Village Lakes Boulevard is 0.99, while the axle adjustment factor for the portion of SR 33 north of this intersection is 0.82. In addition, the 2012 axle adjustment factor for the portion of I-4 from US 98 to the Osceola County line is 0.90.

The three-day bi-directional vehicle classification count on SR 33 north of N. Combee Road/Village Lakes Boulevard was used to calculate an axle adjustment factor equal to 0.86 which is slightly higher than the 0.82 value contained in the FDOT database. The axle adjustment factor calculations are also provided in **Appendix B**. Since the axle adjustment factor that was calculated using the September 6th vehicle classification count was extremely close to the three-day average axle adjustment factor and all of the 24-hour volume counts north of N. Combee Road/Village Lakes Boulevard were conducted on September 6th; the use of the 0.86 axle adjustment factor for this portion of the study corridor was viewed as being more accurate.

Table 2-1 summarizes the two-way 24-hour volumes obtained from the traffic counts, as well as the estimated 2012 AADT volumes for the SR 33 mainline. The 2012 AADT volume on SR 33 ranges from 4,700 vehicles per day (vpd) between Huron Way/Long Lake Circle and N. Combee Road/Village Lakes Boulevard to 12,400 vpd between the westbound I-4 on-/off-ramps and Tomkow Road; however, a majority of the study corridor has 2012 AADT volumes less than or equal to 10,100 vpd. **Table 2-2** summarizes the two-way 24-hour traffic counts, as well as the estimated 2012 AADT volumes for the SR 33 cross streets. Since the only "existing" land use located along University Boulevard is the initial phase of the Florida Polytechnic University, which is still under construction, a majority of the vehicles that were counted on University

TABLE 2-1: EXISTING YEAR (2012) AADT VOLUMES – SR 33 MAINLINE

Location	Count Date	24-Hour Volume	SF [1]	AF [2]	AADT Volume	AADT Volume [3]
West of Old Combee Road/ Deeson Pointe Boulevard	9/6/2012	17,654	1.07	0.99	18,701	18,700
East of Old Combee Road/ Deeson Pointe Boulevard	9/6/2012	7,946	1.07	0.99	8,417	8,400
East of Wood Circle W.	9/6/2012	7,956	1.07	0.99	8,428	8,400
East of Wood Circle E.	9/6/2012	7,703	1.07	0.99	8,160	8,200
East of Lake Deeson Village Mobile Home Park Entrance	9/6/2012	7,410	1.07	0.99	7,849	7,800
East of Sunset Way	9/6/2012	7,551	1.07	0.99	7,999	8,000
East of Lake Luther Road	9/6/2012	6,273	1.07	0.99	6,645	6,600
East of Spanish Oaks Boulevard	9/6/2012	5,930	1.07	0.99	6,282	6,300
North of Huron Way/ Long Lake Circle	9/6/2012	4,473	1.07	0.99	4,738	4,700
North of N. Combee Road (SR 659)/ Village Lakes Boulevard	9/6/2012	10,993	1.07	0.86 [4]	10,116	10,100
North of Firstpark Boulevard S.	9/6/2012	10,628	1.07	0.86 [4]	9,780	9,800
North of Firstpark Boulevard N./ University Boulevard	9/6/2012	11,381	1.07	0.86 [4]	10,473	10,500
North of Eastbound I-4 On-/ Off-Ramps	9/6/2012	12,834	1.07	0.86 [4]	11,810	11,800
North of Westbound I-4 On-/ Off-Ramps	9/6/2012	13,488	1.07	0.86 [4]	12,412	12,400
North of Tomkow Road	9/6/2012	10,187	1.07	0.86 [4]	9,374	9,400

[1] 2012 Weekly Seasonal Adjustment Factor obtained from FDOT Database

[2] 2012 Weekly Axle Adjustment Factor obtained from FDOT Database

[3] Rounded AADT volume

[4] 2012 Axle Adjustment Factor calculated based on vehicle classification count data obtained between 9/4/2012 and 9/6/2012

TABLE 2-2: EXISTING YEAR (2012) AADT VOLUMES – SR 33 CROSS STREETS

Location	Count Date	24-Hour Volume	SF [1]	AF [2]	AADT Volume	AADT Volume [3]
Deeson Pointe Boulevard North of SR 33	9/6/2012	932	1.07	0.99	987	990
Old Combee Rd South of SR 33	9/6/2012	9,913	1.07	0.99	10,501	10,500
Wood Circle W. North of SR 33	9/6/2012	185	1.07	0.99	196	200
Wood Circle E. North of SR 33	9/6/2012	102	1.07	0.99	108	110
Lake Deeson Village Mobile Home Park Entrance North of SR 33	9/6/2012	465	1.07	0.99	493	490
Sunset Way North of SR 33	9/6/2012	120	1.07	0.99	127	130
Lake Luther Road North of SR 33	9/6/2012	1,922	1.07	0.99	2,036	2,000
Spanish Oaks Boulevard South of SR 33	9/6/2012	382	1.07	0.99	405	400
Huron Way West of SR 33	9/6/2012	946	1.07	0.99	1,002	1,000
Long Lake Circle East of SR 33	9/6/2012	1,290	1.07	0.99	1,366	1,400
Village Lakes Boulevard West of SR 33	9/6/2012	991	1.07	0.99	1,050	1,050
N. Combee Road (SR 659) East of SR 33	9/6/2012	8,918	1.07	0.86 [4]	8,206	8,200
Firstpark Boulevard S. West of SR 33	9/6/2012	567	1.07	0.86 [4]	522	500
First Park Boulevard N. West of SR 33	9/6/2012	1,970	1.07	0.86 [4]	1,813	1,800
University Boulevard East of SR 33	9/6/2012	731	N/A	0.86 [4]	629	630
Eastbound I-4 Off-Ramp West of SR 33	9/6/2012	3,432	1.09	0.90	3,367	3,400
Eastbound I-4 On-Ramp West of SR 33	9/6/2012	2,829	1.09	0.90	2,775	2,800
Westbound I-4 On-Ramp West of SR 33	9/6/2012	4,332	1.09	0.90	4,250	4,250
Westbound I-4 Off-Ramp East of SR 33	9/6/2012	2,819	1.09	0.90	2,765	2,800
Tomkow Road North of SR 33	9/6/2012	2,722	1.07	0.86 [4]	2,505	2,500

[1] 2012 Weekly Seasonal Adjustment Factor obtained from FDOT Database

[2] 2012 Weekly Axle Adjustment Factor obtained from FDOT Database

[3] Rounded AADT volume

[4] 2012 Axle Adjustment Factor calculated based on vehicle classification count data obtained between 9/4/2012 and 9/6/2012

Boulevard east of SR 33 were associated with the ongoing construction. Consequently, the use of a weekly adjustment factor greater than 1.00 was not appropriate for this facility at this time. In addition, Village Lakes Boulevard is not a through street and serves only to provide access to the residential land uses located within the Bridgewater development. Since the volume of truck traffic traveling on Village Lakes Boulevard is likely to be low, an axle adjustment factor equal to 0.99 was also used for this cross street. The 2012 AADT volumes for the study corridor are also graphically illustrated in **Figure 2-4**.

Table 2-3 summarizes the 24-hour total volumes and 24-hour heavy vehicle volumes recorded for each of the three consecutive days, as well as the 3-day average volumes. **Table 2-3** indicates that the two-way 24-hour truck percentage on SR 33 ranges between approximately 17.6% and 19.4%, with an average value of 18.3%.

TABLE 2-3: EXISTING YEAR (2012) 24-HOUR TRUCK VOLUMES AND PERCENTAGES [(1)]

Date	Direction	Total Volume	Truck Volume	Truck %
9/4/2012	Northbound	5,100	1,076	21.10%
	Southbound	4,734	833	17.60%
	Two-Way	9,834	1,909	19.41%
9/5/2012	Northbound	4,903	941	19.19%
	Southbound	4,629	770	16.63%
	Two-Way	9,532	1,711	17.95%
9/6/2012	Northbound	4,877	943	19.34%
	Southbound	4,550	715	15.71%
	Two-Way	9,427	1,658	17.59%
3-Day Average	Northbound	4,960	987	19.90%
	Southbound	4,638	772	16.65%
	Two-Way	9,598	1,759	18.33%

[(1)] Based on the vehicle classification count conducted on SR 33 just north of N. Combee Road/Village Lakes Boulevard

2.3 Existing and Design Year Traffic Characteristics

Eight-hour manual turning movement counts were conducted by Adams Traffic, Inc. at the 14 intersections previously identified on either a Tuesday, Wednesday or Thursday between October 17th and October 25th, 2012. The manual turning movement counts were conducted from 6:30 a.m. to 9:30 a.m. and from 2:00 p.m. to 7:00 p.m. for all of the intersections between Old Combee Road/Deeson Pointe Boulevard and Huron Way/Long Lake Circle. For all of the intersections north of Huron Way/Long Lake Circle, the turning movement counts were conducted from 6:00 a.m. to 9:00 a.m. and from 1:00 p.m. to 6:00 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**.

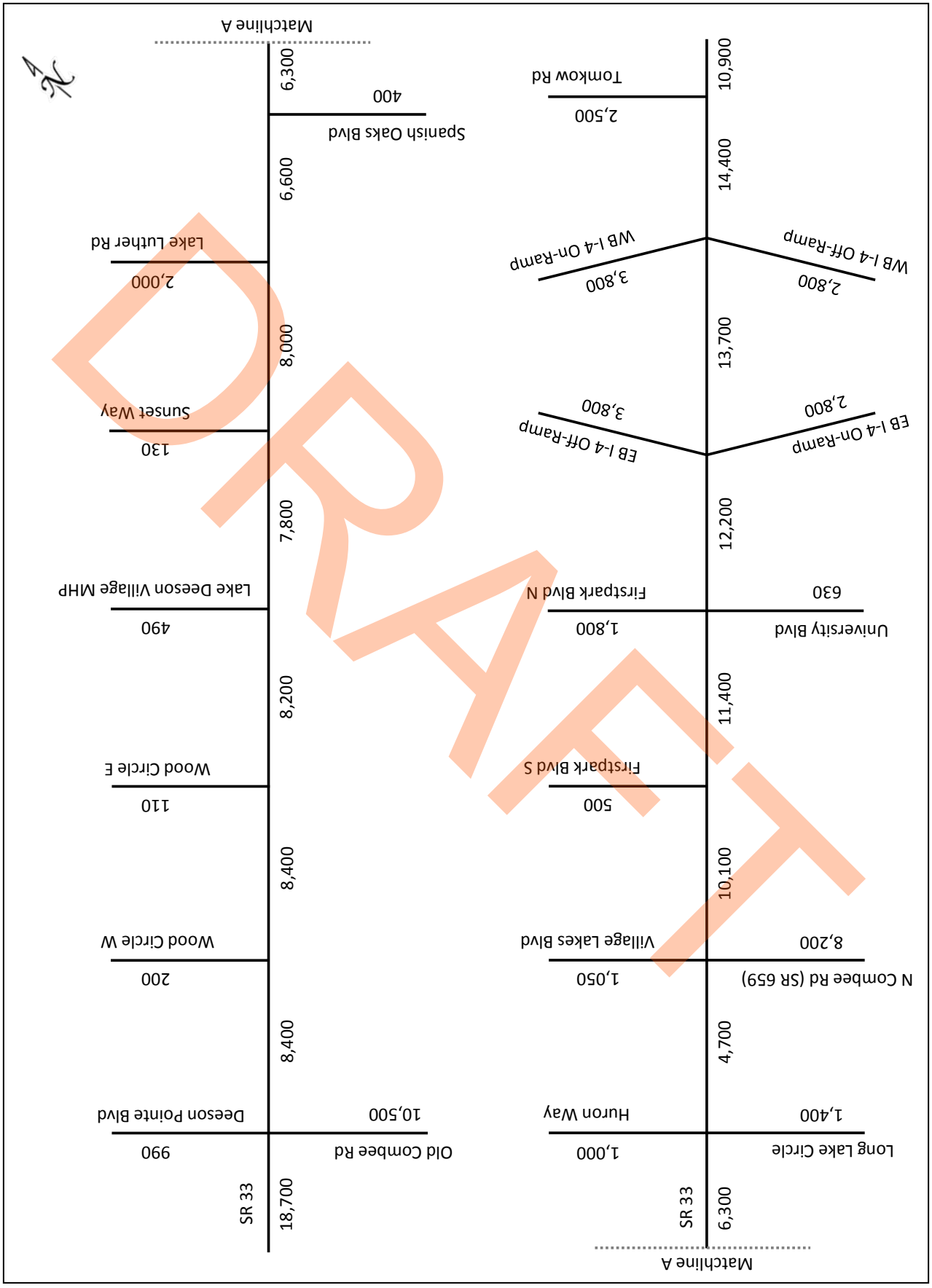


FIGURE 2-4: EXISTING YEAR (2012) AADT VOLUMES

A review of the a.m. peak hour turning movement count data indicated that the highest 60-minute volumes occurred between 7:15 a.m. and 8:15 a.m. at 11 of the 14 intersections. Consequently, the a.m. peak hour was defined to be from 7:15 a.m. to 8:15 a.m. A review of the p.m. peak hour turning movement count data indicated more variability with respect to the timing of the p.m. peak hour; however, eight of the 14 intersections "peaked" between 4:45 p.m. and 5:45 p.m. The highest 60-minute volumes recorded at the other 6 intersections were all recorded between 5:00 p.m. and 6:00 p.m. Therefore, the p.m. peak hour was defined to be from 4:45 p.m. to 5:45 p.m. The raw turning movement counts recorded between 7:15 a.m. and 8:15 a.m. are graphically summarized in **Figures 2-5** and **2-6**. The raw turning movement counts recorded between 4:45 p.m. and 5:45 p.m. are graphically summarized in **Figures 2-7** and **2-8**.

Eight-hour manual turning movement counts were also conducted at the Gourmet Foods International driveway and the two existing Manheim of Lakeland Auto Auction driveways. Both of these businesses are located to the east of Tomkow Road. Gourmet Foods International is located on the north side of SR 33 while the Auto Auction is located on the south side of SR 33. The Gourmet Foods International turning movement counts were conducted from 6:00 a.m. to 9:00 a.m. and from 1:00 p.m. to 6:00 p.m. on October 25, 2012; while the Auto Auction turning movement counts were conducted from 12:30 p.m. to 8:30 p.m. on October 3, 2012. These counts were conducted to obtain data that would be used during the development of the preliminary SR 33 access management plan. Auctions are only conducted at this location on Wednesdays between the hours of 2:00 p.m. and 8:00 p.m. (although people start arriving on Wednesdays as early as 12:30 p.m.); therefore, the Auto Auction turning movement counts were conducted during the "peak hours" of this land use.

There are two FDOT portable count stations located on SR 33 and the specific count station identification numbers and locations are as follows:

- Station No. 160118 – Milepost 8.230 (just south of the eastbound I-4 on-/off-ramps)
- Station No. 160027 – Milepost 8.613 (just north of the westbound I-4 on-/off-ramps)

In addition to the two FDOT portable count stations located on SR 33, there are also two FDOT portable count stations located on I-4 in the vicinity of the I-4/SR 33 interchange. The specific count station identification numbers and locations are as follows:

- Station No. 160114 (west of the I-4/SR 33 interchange)
- Station No. 160113 (east of the I-4/SR 33 interchange)

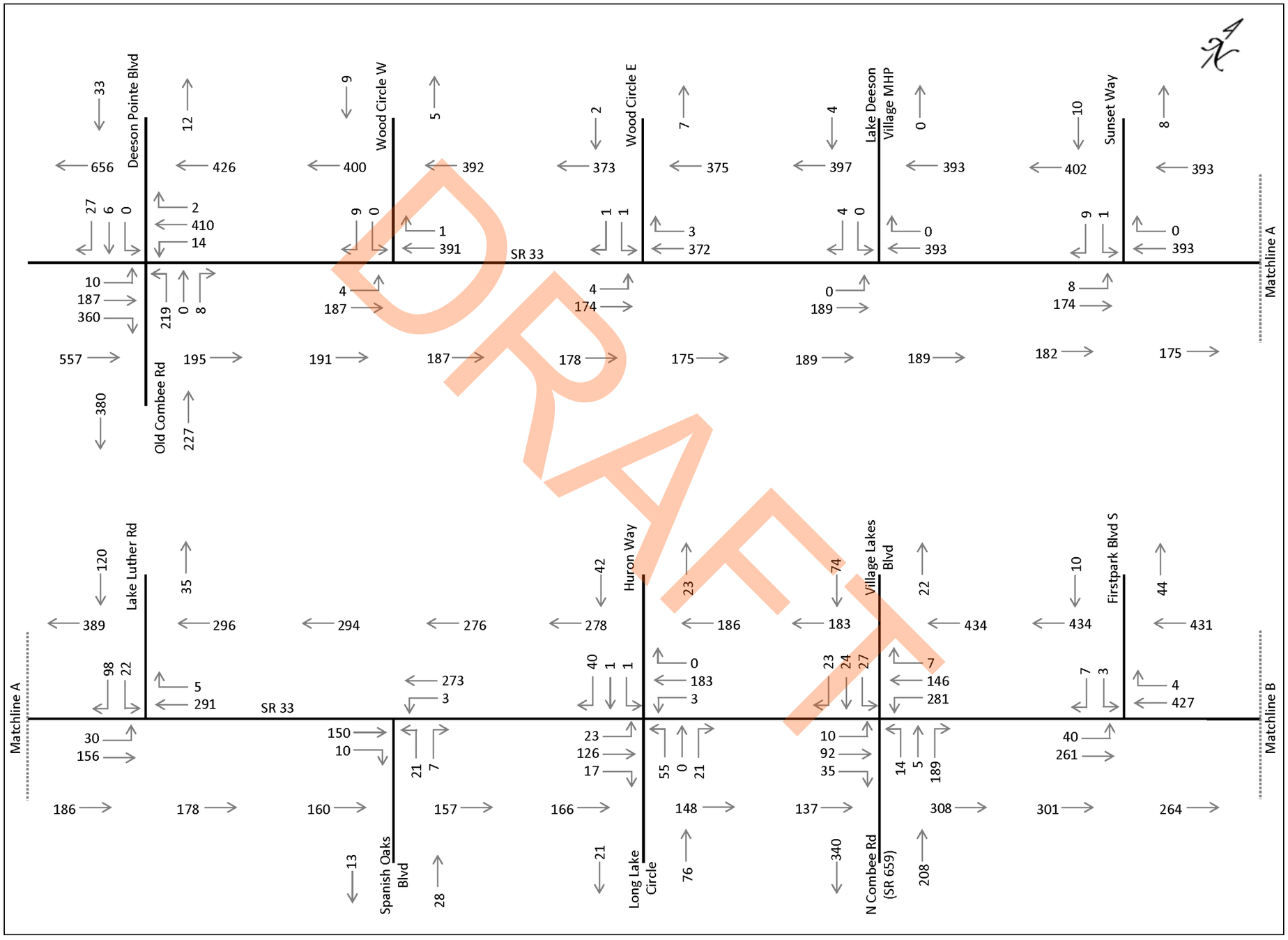


FIGURE 2-5: EXISTING YEAR (2012) AM PEAK HOUR TRAFFIC COUNTS

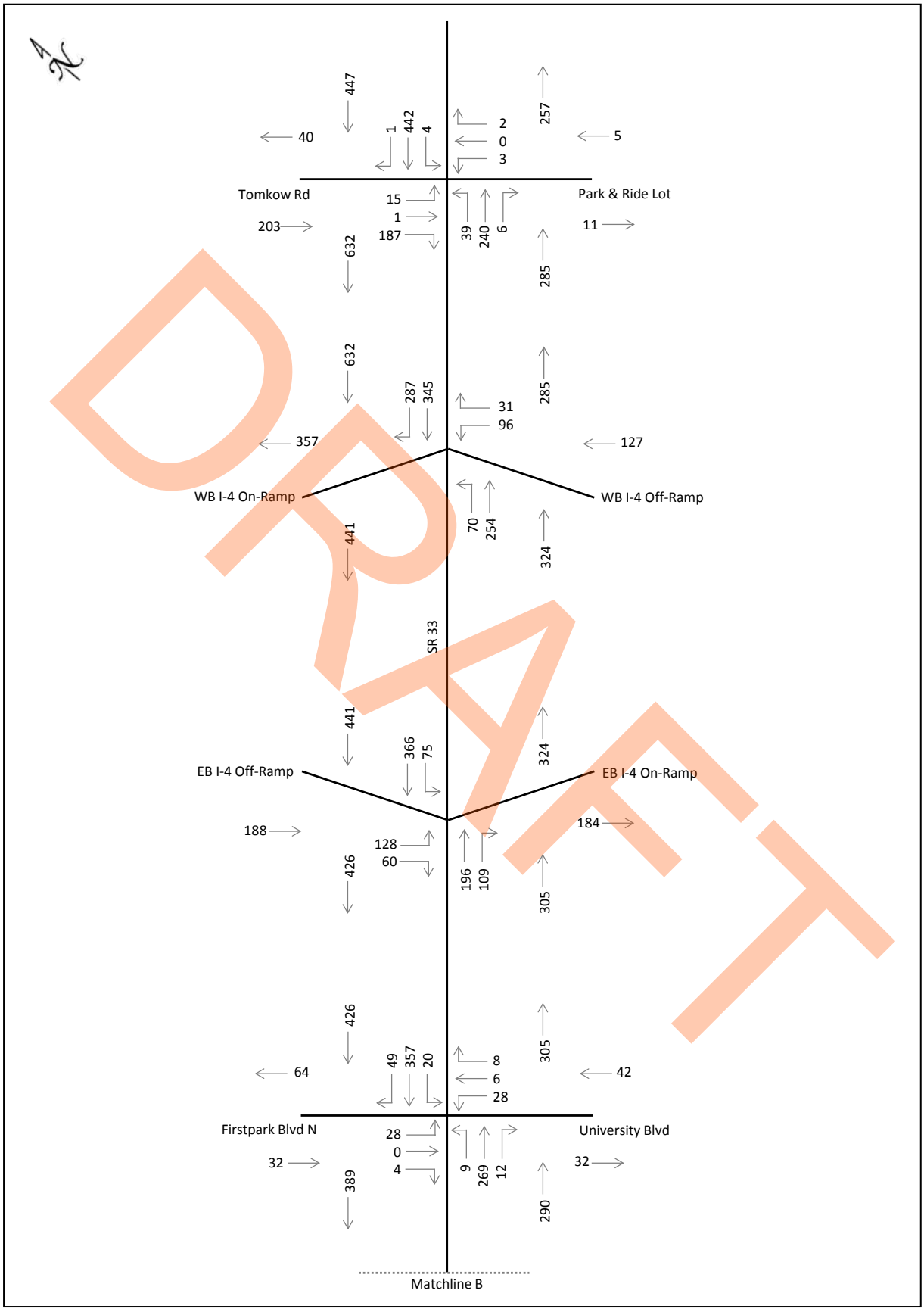


FIGURE 2-6: EXISTING YEAR (2012) AM PEAK HOUR TRAFFIC COUNTS

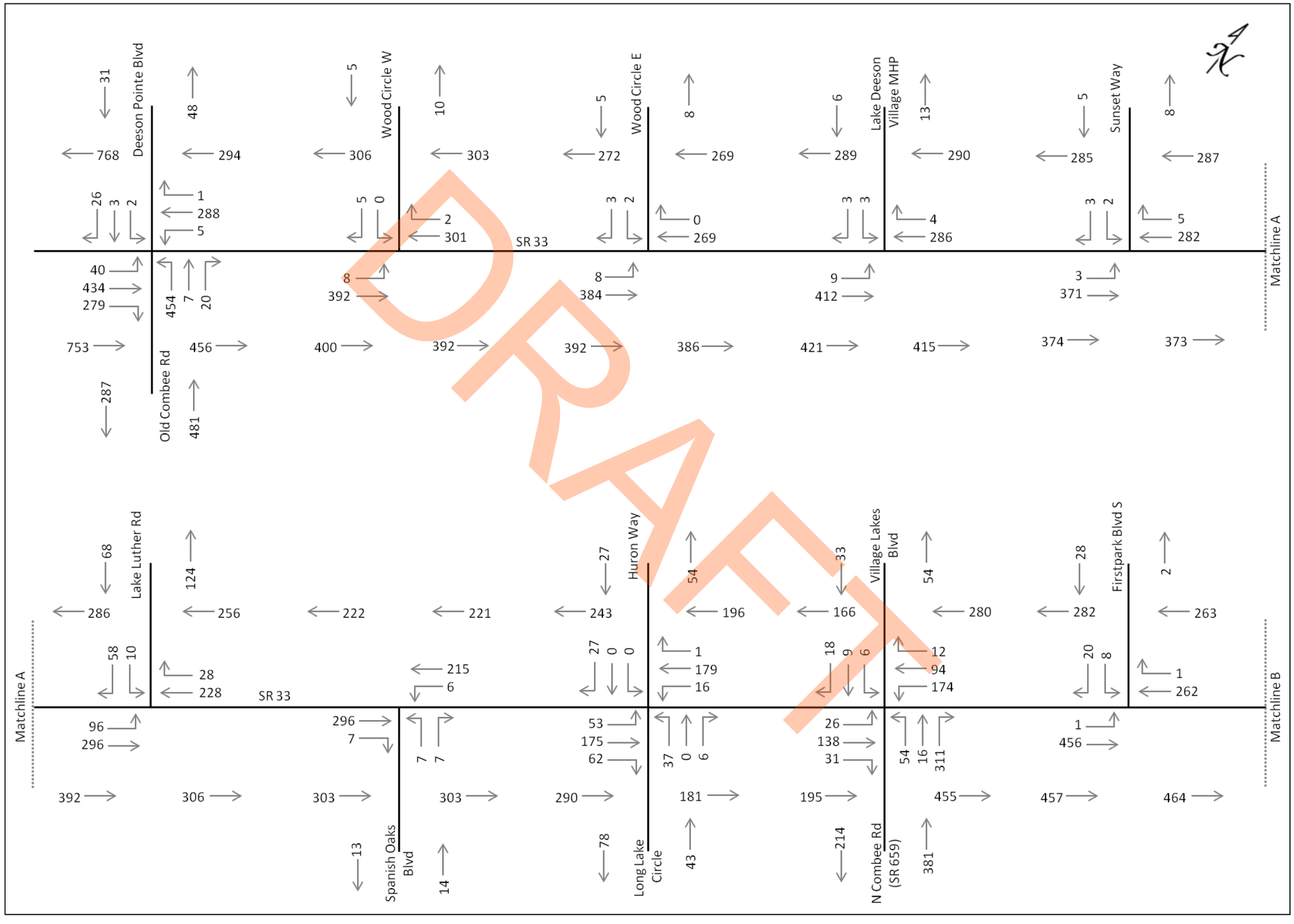


FIGURE 2-7: EXISTING YEAR (2012) PM PEAK HOUR TRAFFIC COUNTS

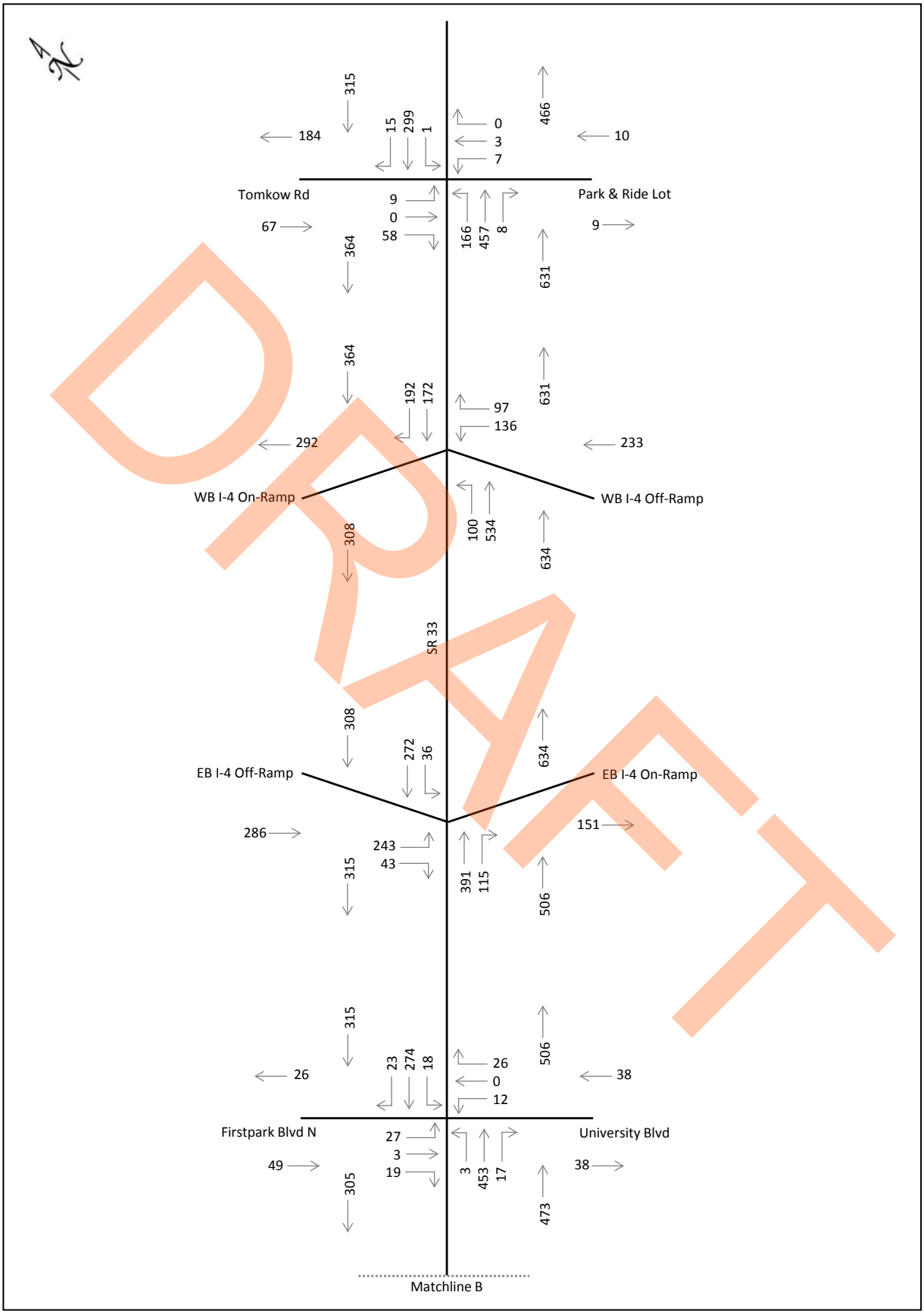


FIGURE 2-8: EXISTING YEAR (2012) PM PEAK HOUR TRAFFIC COUNTS

Table 2-4 summarizes the 2011 and 2012 K-, D- and T-factors contained in the FDOT's 2012 Historical AADT Reports for these four count stations. Copies of the AADT Reports are provided in **Appendix D**.

TABLE 2-4: YEAR 2011/2012 TRAFFIC CHARACTERISTIC FACTORS

Count Station No.	Location	K-Factor		D-Factor		T-Factor (24-Hour)	
		2011	2012	2011	2012	2011	2012
160113	I-4 East of SR 33	9.00%	9.00%	53.00%	51.90%	15.16%	14.42%
160114	I-4 West of SR 33	9.00%	9.00%	53.00%	51.90%	15.42%	13.42%
160118	SR 33 South of I-4	9.00%	9.00%	55.70%	55.80%	14.37% (1)	18.83%
160027	SR 33 North of I-4	9.00%	9.00%	55.70%	55.80%	11.87% (1)	12.82%

(1) 2010 value

2.3.1 K-Factor

In 2011, FDOT decided to replace the K_{30}-factors with Standard K-factors due to the widespread recognition that it is no longer cost-effective to design long-term improvements for roadways located in urban areas based on the 30th-highest hourly volume that is estimated to occur throughout the design year. Standard K-factors have been established statewide by using data obtained from telemetered (permanent) count stations and are based on area type and facility type. The K-factor value of 9.0% represents the "standard" K-factor associated with urban freeways, highways, and arterials and is representative of a typical weekday peak hour.

A review of FDOT's 2012 Historical AADT Reports for Count Station Nos. 160113 and 160114 indicates that between 1997 and 2010 the K_{30}-factor values ranged between 7.7% and 9.9%. A review of the FDOT's 2012 Historical AADT Reports for Count Station Nos. 160118 and 160027 indicates that between 1996 and 2010 the K_{30}-factor values ranged between 9.3% and 10.4%.

Although the existing SR 33 study corridor exhibits characteristics that are more representative of a rural corridor, the entire corridor is located within the urban area. In addition, there is a significant amount of future residential and commercial development expected to occur in the vicinity of the SR 33 study corridor that will increase the urban nature of the corridor. Based on the information provided above, a K-factor of 9.0% was used to develop the future year peak hour volumes.

2.3.2 D-Factor

Table 2-5 summarizes the minimum, maximum and average D-factors obtained from FDOT's 2012 Historical AADT Reports for the four count stations. It should be noted that only computed values were summarized

and used in the calculation of average values (i.e., no first year or second year estimated values were included). **Table 2-5** indicates that the average D-factors for the I-4 locations west and east of SR 33 are 52.95% and 55.32%, respectively while the average D-factors for the SR 33 locations south and north of I-4 are 55.53% and 55.32%, respectively.

TABLE 2-5: HISTORIC D-FACTORS – 1997 TO 2012

Count Station No.	Location	Minimum D-Factor	Maximum D-Factor	Average D-Factor
160113	I-4 East of SR 33	51.10%	57.40%	55.32%
160114	I-4 West of SR 33	51.10%	55.00%	52.95%
160118	SR 33 South of I-4	51.80%	61.80%	55.53%
160027	SR 33 North of I-4	54.20%	56.35%	55.32%

Since none of the four FDOT count stations are permanent (i.e., telemetered) count stations, the D-factor values contained in the FDOT's 2012 Historical AADT Reports do not actually represent the median D-factors for the 200 highest hours of traffic counts observed at these locations. **Tables 2-6** and **2-7** summarize the D-factors that were calculated for I-4 west and east of SR 33 using peak hour bi-directional traffic count data obtained from the synopsis reports associated with Count Station Nos. 160113 and 160114. The D-factors were calculated for the hours of 7:00 a.m., 8:00 a.m., 4:00 p.m., and 5:00 p.m. The average a.m. and p.m. peak hour D-factors for I-4 west of SR 33 are 52.16% and 52.14%, respectively. The average a.m. and p.m. peak hour D-factors for I-4 east of SR 33 are 50.77% and 51.28%, respectively.

Tables 2-8 and **2-9** summarize the a.m. and p.m. peak hour D-factors that were calculated for the SR 33 PD&E study corridor using both the 24-hour bi-directional traffic count data and the peak hour turning movement count data obtained by Adams Traffic, Inc. in September and October of 2012. The average a.m. and p.m. peak hour D-factors calculated using the bi-directional count data are equal to 63.5% and 57.9%, respectively, while the average a.m. and p.m. peak hour D-factors calculated using the peak hour intersection turning movement count data are equal to 64.2% and 58.6%, respectively. The existing traffic count data indicates that there is a higher directional distribution of traffic flow on SR 33 during the a.m. peak hour as compared to the p.m. peak hour. Since the two-way peak hour volumes are generally higher in the p.m. peak hour than in the a.m. peak hour, the traffic count data indicates a decreasing directionality with increased total peak hour traffic flow.

TABLE 2-6: EXISTING PEAK HOUR D-FACTORS – I-4 WEST OF SR 33 [1]

Date	AM Peak Hour				PM Peak Hour			
	Hour	Direction	Volume	D-Factor	Hour	Direction	Volume	D-Factor
2/15/2011	7:00-8:00	Eastbound	2,143	51.34%	4:00-5:00	Eastbound	2,514	50.96%
		Westbound	2,261			Westbound	2,612	
		Two-Way	4,404			Two-Way	5,126	
2/15/2011	8:00-9:00	Eastbound	2,208	50.38%	5:00-6:00	Eastbound	2,289	51.96%
		Westbound	2,242			Westbound	2,476	
		Two-Way	4,450			Two-Way	4,765	
4/26/2011	7:00-8:00	Eastbound	2,215	51.67%	4:00-5:00	Eastbound	2,709	52.08%
		Westbound	2,368			Westbound	2,493	
		Two-Way	4,583			Two-Way	5,202	
4/26/2011	8:00-9:00	Eastbound	2,254	50.75%	5:00-6:00	Eastbound	2,504	52.48%
		Westbound	2,323			Westbound	2,267	
		Two-Way	4,577			Two-Way	4,771	
8/17/2011	7:00-8:00	Eastbound	1,937	52.31%	4:00-5:00	Eastbound	2,430	54.24%
		Westbound	2,125			Westbound	2,880	
		Two-Way	4,062			Two-Way	5,310	
8/17/2011	8:00-9:00	Eastbound	1,917	54.11%	5:00-6:00	Eastbound	2,517	51.61%
		Westbound	2,260			Westbound	2,685	
		Two-Way	4,177			Two-Way	5,202	
10/5/2011	7:00-8:00	Eastbound	1,805	53.25%	4:00-5:00	Eastbound	2,254	52.71%
		Westbound	2,056			Westbound	2,512	
		Two-Way	3,861			Two-Way	4,766	
10/5/2011	8:00-9:00	Eastbound	1,874	53.44%	5:00-6:00	Eastbound	2,179	51.07%
		Westbound	2,151			Westbound	2,274	
		Two-Way	4,025			Two-Way	4,453	
Average				**52.16%**				**52.14%**

[1] FDOT Count Station No. 160114

TABLE 2-7: EXISTING PEAK HOUR D-FACTORS – I-4 EAST OF SR 33 [1]

Date	AM Peak Hour				PM Peak Hour			
	Hour	Direction	Volume	D-Factor	Hour	Direction	Volume	D-Factor
3/21/2011	7:00-8:00	Eastbound	2,180	50.37%	4:00-5:00	Eastbound	2,499	51.49%
		Westbound	2,148			Westbound	2,652	
		Two-Way	4,328			Two-Way	5,151	
3/21/2011	8:00-9:00	Eastbound	2,248	51.27%	5:00-6:00	Eastbound	2,343	51.46%
		Westbound	2,137			Westbound	2,484	
		Two-Way	4,385			Two-Way	4,827	
4/26/2011	7:00-8:00	Eastbound	2,257	51.06%	4:00-5:00	Eastbound	2,586	51.16%
		Westbound	2,163			Westbound	2,469	
		Two-Way	4,420			Two-Way	5,055	
4/26/2011	8:00-9:00	Eastbound	2,269	50.64%	5:00-6:00	Eastbound	2,415	51.47%
		Westbound	2,212			Westbound	2,277	
		Two-Way	4,481			Two-Way	4,692	
8/8/2011	7:00-8:00	Eastbound	2,018	51.22%	4:00-5:00	Eastbound	1,978	52.74%
		Westbound	1,922			Westbound	2,207	
		Two-Way	3,940			Two-Way	4,185	
8/8/2011	8:00-9:00	Eastbound	2,019	50.37%	5:00-6:00	Eastbound	2,045	51.68%
		Westbound	2,049			Westbound	2,187	
		Two-Way	4,068			Two-Way	4,232	
10/6/2011	7:00-8:00	Eastbound	1,723	50.48%	4:00-5:00	Eastbound	2,464	50.20%
		Westbound	1,690			Westbound	2,484	
		Two-Way	3,413			Two-Way	4,948	
10/6/2011	8:00-9:00	Eastbound	1,802	50.73%	5:00-6:00	Eastbound	2,318	50.04%
		Westbound	1,750			Westbound	2,322	
		Two-Way	3,552			Two-Way	4,640	
Average				**50.77%**				**51.28%**

[1] FDOT Count Station No. 160113

TABLE 2-8: EXISTING SR 33 PEAK HOUR DIRECTIONAL VOLUMES AND D-FACTORS BASED ON 24-HOUR MACHINE COUNTS

Location	AM Peak Hour			
	WB/SB Volume	EB/NB Volume	Two-Way Volume	D-Factor
East of Deeson Point Boulevard/Old Combee Road	416	219	635	65.5%
East of Wood Circle W.	408	179	587	69.5%
East of Wood Circle E.	409	181	590	69.3%
East of Lake Deeson Village	393	177	570	68.9%
East of Sunset Way	386	176	562	68.7%
East of Lake Luther Road	302	161	463	65.2%
East of Spanish Oaks Boulevard	285	159	444	64.2%
East of Huron Way/Long Lake Circle	198	155	353	56.1%
North of N. Combee Road/Village Lakes Boulevard	479	400	879	54.5%
North of Firstpark Boulevard S.	464	375	839	55.3%
North of Firstpark Boulevard N./University Boulevard	517	394	911	56.8%
North of WB I-4 Ramps	711	322	1,033	68.8%
East of Tomkow Road	457	269	726	62.9%
Average				**63.5%**
Location	**PM Peak Hour**			
	WB/SB Volume	**EB/NB Volume**	**Two-Way Volume**	**D-Factor**
East of Deeson Point Boulevard/Old Combee Road	284	386	670	57.6%
East of Wood Circle W.	327	384	711	54.0%
East of Wood Circle E.	272	380	652	58.3%
East of Lake Deeson Village	256	372	628	59.2%
East of Sunset Way	311	377	688	54.8%
East of Lake Luther Road	277	293	570	51.4%
East of Spanish Oaks Boulevard	244	299	543	55.1%
East of Huron Way/Long Lake Circle	205	211	416	50.7%
North of N. Combee Road/Village Lakes Boulevard	324	509	833	61.1%
North of Firstpark Boulevard S.	297	501	798	62.8%
North of Firstpark Boulevard N./University Boulevard	306	523	829	63.1%
North of WB I-4 Ramps	376	686	1,062	64.6%
East of Tomkow Road	313	469	782	60.0%
Average				**57.9%**

TABLE 2-9: EXISTING SR 33 PEAK HOUR DIRECTIONAL VOLUMES AND D-FACTORS BASED ON PEAK HOUR TURNING MOVEMENT COUNTS

Location	AM Peak Hour			
	WB/SB Volume	EB/NB Volume	Two Way Volume	D-Factor
East of Deeson Point Boulevard/Old Combee Road	426	195	621	68.6%
East of Wood Circle W.	392	187	579	67.7%
East of Wood Circle E.	375	175	550	68.2%
East of Lake Deeson Village	393	189	582	67.5%
East of Sunset Way	393	175	568	69.2%
East of Lake Luther Road	296	178	474	62.4%
East of Spanish Oaks Boulevard	276	157	433	63.7%
East of Huron Way/Long Lake Circle	186	148	334	55.7%
North of N. Combee Road/Village Lakes Boulevard	434	308	742	58.5%
North of Firstpark Boulevard S.	431	264	695	62.0%
North of Firstpark Boulevard N./University Boulevard	427	304	731	58.4%
North of WB I-4 Ramps	631	278	909	69.4%
East of Tomkow Road	453	257	710	63.8%
Average				**64.2%**
Location	**PM Peak Hour**			
	WB/SB Volume	**EB/NB Volume**	**Two-Way Volume**	**D-Factor**
East of Deeson Point Boulevard/Old Combee Road	294	446	740	60.3%
East of Wood Circle W.	303	392	695	56.4%
East of Wood Circle E.	269	386	655	58.9%
East of Lake Deeson Village	290	415	705	58.9%
East of Sunset Way	287	373	660	56.5%
East of Lake Luther Road	256	306	562	54.4%
East of Spanish Oaks Boulevard	221	303	524	57.8%
East of Huron Way/Long Lake Circle	196	181	377	48.0%
North of N. Combee Road/Village Lakes Boulevard	280	455	735	61.9%
North of Firstpark Boulevard S.	263	464	727	63.8%
North of Firstpark Boulevard N./University Boulevard	315	518	833	62.2%
North of WB I-4 Ramps	364	631	995	63.4%
East of Tomkow Road	315	466	781	59.7%
Average				**58.6%**

Since the design year peak hour traffic volumes on SR 33 are projected to be significantly higher than the existing p.m. peak hour volumes, it is not unreasonable to expect that the design year peak hour directional distribution on SR 33 would be lower than the existing p.m. peak hour directional distribution. As stated in Chapter 2 of the FDOT's Project Traffic Forecasting Handbook, "for urban highways, as the land use changes, the directional distribution tends to the lower end of the facility type". As stated earlier, there is a significant amount of future residential and commercial development expected to occur in the vicinity of the SR 33 study corridor that will increase the urban nature of the corridor. Consequently, a D-factor value of 53.0% was used for I-4 and a D-factor value of 55.4% was used for SR 33.

2.3.3 T-Factors

The historic AADT volumes and 24-hour T-factors for the two I-4 locations were obtained for the years 1997 through 2012 using the FDOT's 2012 Vehicle Classification History Data Reports. The AADT volumes were placed in ascending order and average AADT volumes and average 24-hour T-factors were calculated for each volume range. This information is provided in **Table 2-10**. As indicated in this table, the 24-hour truck percentages decrease with increasing AADT volumes. A review of the historic vehicle classification data for I-4 west of SR 33 indicates that the average 24-hour truck percentages were 17.68% for the period between 1997 and 2005 and 16.43% for the period between 2006 and 2012. A review of the historic vehicle classification data for I-4 east of SR 33 indicates that the average 24-hour truck percentages were 17.52% for the period between 1997 and 2005 and 15.76% for the period between 2006 and 2012. It should be noted that although the average 24-hour truck percentages decreased, the average 24-hour truck volumes increased. This also illustrates a general trend of decreasing daily truck percentages with increasing AADT volumes.

Vehicle classification counts were not conducted at the two FDOT count stations on SR 33 in 2011 and therefore, the 2011 $T_{24\text{-}Hr}$-factors of 14.37% and 11.87% contained in the FDOT's 2012 Historical AADT Reports represent the 2010 values. Vehicle classification counts were conducted at these two count stations in 2012 and the $T_{24\text{-}Hr}$-factors for these two locations are 18.83% (Count Station No. 160118) and 12.82% (Count Station No. 160027). As discussed earlier in **Section 2.2**, the average 24-hour truck percentage on SR 33 north of N. Combee Road/Village Lakes Boulevard is equal to 18.3%, which compares favorably to the 18.83% value on SR 33 just south of the eastbound I-4 on-/off-ramps.

TABLE 2-10: HISTORIC AADT VOLUMES AND 24-HOUR T-FACTORS

FDOT Count Station 160114 - I-4 West of SR 33				
Year	**AADT**	**Avg. AADT**	**T-Factor**	**Avg. T-Factor**
1998	54,500	55,375	16.50%	17.74%
1999	55,000		19.90%	
1997	56,000		16.07%	
2002	56,000		18.48%	
2000	59,000	61,000	17.02%	18.12%
2001	61,000		18.60%	
2005	61,500		17.22%	
2008	62,500		19.64%	
2009	64,500	65,000	17.75%	17.32%
2010	65,500		16.88%	
2006	69,000	69,500	15.48%	15.45%
2011	70,000		15.42%	
2012	74,000	74,000	13.42%	13.42%
FDOT Count Station 160113 - I-4 East of SR 33				
Year	**AADT**	**Avg. AADT**	**T-Factor**	**Avg. T-Factor**
1997	49,500	49,500	18.20%	19.63%
1998	49,500		21.06%	
1999	56,500	57,500	18.28%	18.28% [(1)]
2000	58,500		11.88%	
2005	60,500	60,750	18.20%	17.84%
2001	61,000		17.47%	
2006	64,500	64,500	16.15%	16.33%
2009	64,500		16.35%	
2010	64,500		16.48%	
2008	67,500	68,000	17.18%	15.34%
2011	68,000		15.16%	
2012	68,000		14.42%	
2007	68,500		14.60%	

[(1)] Year 2000 T-factor was not used in the calculation of the average value

The existing (2012) truck percentages on SR 33 are high due to a combination of factors including the following:

- The lack of existing residential development located in the portion of the SR 33 corridor from N. Combee Road to Tomkow Road;
- The existing industrial/light-industrial land uses located north and south of I-4 that are accessed via the portion of SR 33 between N. Combee Road and Tomkow Road (e.g., Firstpark at Bridgewater Industrial Park, Manheim Auto Auction of Lakeland, Saddle Creek Corporation, CD McIntosh Power Plant, Northside Water Reclamation Facility, etc.); and

- The construction activity that has been ongoing to the east of SR 33 (due to the construction of the first buildings associated with the Florida Polytechnic University) and on SR 33 south of the Old Combee Road/Deeson Pointe Boulevard intersection (due to the widening of SR 33 south of this intersection).

Although the existing area is primarily industrial/light-industrial in nature, significant amounts of future residential development (both single family and multi-family), as well as retail development, office/business parks, hotels, and the Florida Polytechnic University are planned to occur south of I-4, both east and west of SR 33. These land uses will generate much higher passenger vehicle volumes (as compared to truck volumes) which in turn will result in overall lower future truck percentages, especially for SR 33 south of I-4. A $T_{24\text{-}Hr}$-factor equal to 13.0% was determined to be appropriate for use throughout the SR 33 PD&E study corridor and the I-4 interchange. The $T_{24\text{-}Hr}$-factor of 13.0% is slightly lower than the average of the 2012 $T_{24\text{-}Hr}$-factors for I-4 and SR 33 north of I-4.

Table 2-11 summarizes the peak hour truck percentages that were calculated using the 72-hour vehicle classification count data obtained in September of 2012. Trucks represent approximately 16.0% of the total a.m. peak hour volume and approximately 12.0% of the total p.m. peak hour volume. It should be noted that the actual number of trucks traveling in the p.m. peak hour is also lower than in the a.m. peak hour. The standard FDOT assumption regarding peak hour truck percentages ($T_{Pk\text{-}Hr}$) is that the peak hour truck percentage is equal to 50.0% of the 24-hour truck percentage. Based on this assumption, the design year $T_{Pk\text{-}Hr}$ factor is equal to 6.5%. Although this design year peak hour truck percentage is lower than the existing (2012) peak hour truck percentages, it is reasonable to expect that the future land uses will cause the peak hour passenger vehicles to increase at a higher rate than the peak hour trucks (resulting in a lower peak hour truck percentage).

One of the inputs used to conduct the noise analysis for the PD&E study is the percentage of medium and heavy trucks in the peak hour. **Table 2-12** summarizes the peak hour medium and heavy truck volumes and percentages that were calculated using the 72-hour vehicle classification count data obtained in September of 2012. The three-day average medium and heavy truck percentages in the a.m. peak hour are approximately 33.0% and 67.0%, respectively. In the p.m. peak hour, the three-day average medium and heavy truck percentages are approximately 38.0% and 62.0%, respectively.

TABLE 2-11: EXISTING YEAR (2012) PEAK HOUR TRUCK VOLUMES AND PERCENTAGES [1]

Date	Direction	AM Peak Hour			PM Peak Hour		
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %
9/4/2012	Northbound	301	56	17.20%	454	68	13.81%
	Southbound	443	72		350	43	
	Two-Way	744	128		804	111	
9/5/2012	Northbound	329	54	14.51%	431	43	10.55%
	Southbound	381	49		384	43	
	Two-Way	710	103		815	86	
9/6/2012	Northbound	341	69	16.37%	471	68	11.30%
	Southbound	435	58		308	20	
	Two-Way	776	127		779	88	
3-Day Average	Northbound	324	60	16.02%	452	60	11.89%
	Southbound	420	60		347	35	
	Two-Way	743	119		799	95	

[1] Based on the vehicle classification count conducted on SR 33 just north of N. Combee Road/Village Lakes Boulevard

TABLE 2-12: EXISTING YEAR (2012) PEAK HOUR MEDIUM AND HEAVY TRUCK VOLUMES AND PERCENTAGES [1]

Date	Direction	AM PEAK HOUR			PM PEAK HOUR		
		Total Trucks	Medium Trucks	Heavy Trucks	Total Trucks	Medium Trucks	Heavy Trucks
9/4/2012	Northbound	56	25	31	68	26	42
	Southbound	72	14	58	43	11	32
	Two-Way	128	39	89	111	37	74
9/5/2012	Northbound	54	20	34	43	16	27
	Southbound	49	18	31	43	13	30
	Two-Way	103	38	65	86	29	57
9/6/2012	Northbound	69	22	47	68	34	34
	Southbound	58	19	39	20	7	13
	Two-Way	127	41	86	88	41	47
3-Day Average Volume		119	39	80	95	36	59
3-Day Average Percentage			32.8%	67.2%		37.9%	62.1%

[1] Based on the vehicle classification count conducted on SR 33 just north of N. Combee Road/Village Lakes Boulevard

2.4 Existing Levels of Service

A review of aerial photography indicated that at the time the traffic counts were conducted there were only two driveways located on SR 33 between Old Combee Road/Deeson Pointe Boulevard and the interchange at I-4, and both of these are gated. All of the unrestricted access to SR 33 is provided via the cross streets identified in **Section 2.1** of this memorandum. Consequently, the raw turning movement counts were manually adjusted so that the departure and approach volumes at adjacent intersections were equal. The adjusted a.m. peak hour intersection and roadway segment volumes are graphically illustrated in **Figures 2-9** and **2-10,** while **Figures 2-11** and **2-12** depict the adjusted p.m. peak hour volumes.

The SR 33 roadway segments were analyzed using the 2010 Highway Capacity Manual software (HCS). The percentage of no-passing zones located within each of the SR 33 roadway segments was calculated for each travel direction. The Peak Hour Factors (PHFs) used in the existing conditions roadway segment HCS analyses were based on the average a.m. and p.m. PHFs calculated using the 24-hour bi-directional traffic count data. A review of the individual PHFs indicated that the portion of SR 33 from Old Combee Road/Deeson Pointe Boulevard to N. Combee Road/Village Lakes Boulevard was experiencing lower PHFs than the portion of SR 33 north of N. Combee Road/Village Lakes Boulevard during both peak hours. In the a.m. peak hour, the average PHF was equal to 0.83 for the portion of SR 33 from Old Combee Road/Deeson Pointe Boulevard to N. Combee Road/Village Lakes Boulevard and 0.92 for the portion north of N. Combee Road/Village Lakes Boulevard. In the p.m. peak hour, the average PHF was equal to 0.90 for the portion of SR 33 from Old Combee Road/Deeson Pointe Boulevard to N. Combee Road/Village Lakes Boulevard and 0.94 for the portion north of N. Combee Road/Village Lakes Boulevard.

The average a.m. and p.m. peak hour truck percentages summarized in **Table 2-11** were also used in the existing conditions roadway segment analyses for the portion of SR 33 from N. Combee Road/Village Lakes Boulevard to Tomkow Road. The SR 33 axle adjustment factors contained in FDOT's database indicate that there are significantly less heavy vehicles traveling on the portion of SR 33 south of N. Combee Road/Village Lakes Boulevard compared to the portion north of this intersection. Consequently, the peak hour truck percentages that were used to conduct the roadway segment analyses for the portion of SR 33 from Old Combee Road/Deeson Pointe Boulevard to N. Combee Road/Village Lakes Boulevard were the average through movement truck percentages calculated from the intersection turning movement counts. The portion of SR 33 from Spanish Oaks Boulevard to Tomkow Road was analyzed as a Class 1 highway. According to the 2010 Highway Capacity Manual, "Class 1 two-lane highways are highways where motorists expect to travel at relatively high speeds. Two-lane highways that are primary connectors of major traffic generators, daily commuter routes, or major links in state highway networks are generally assigned to Class 1.

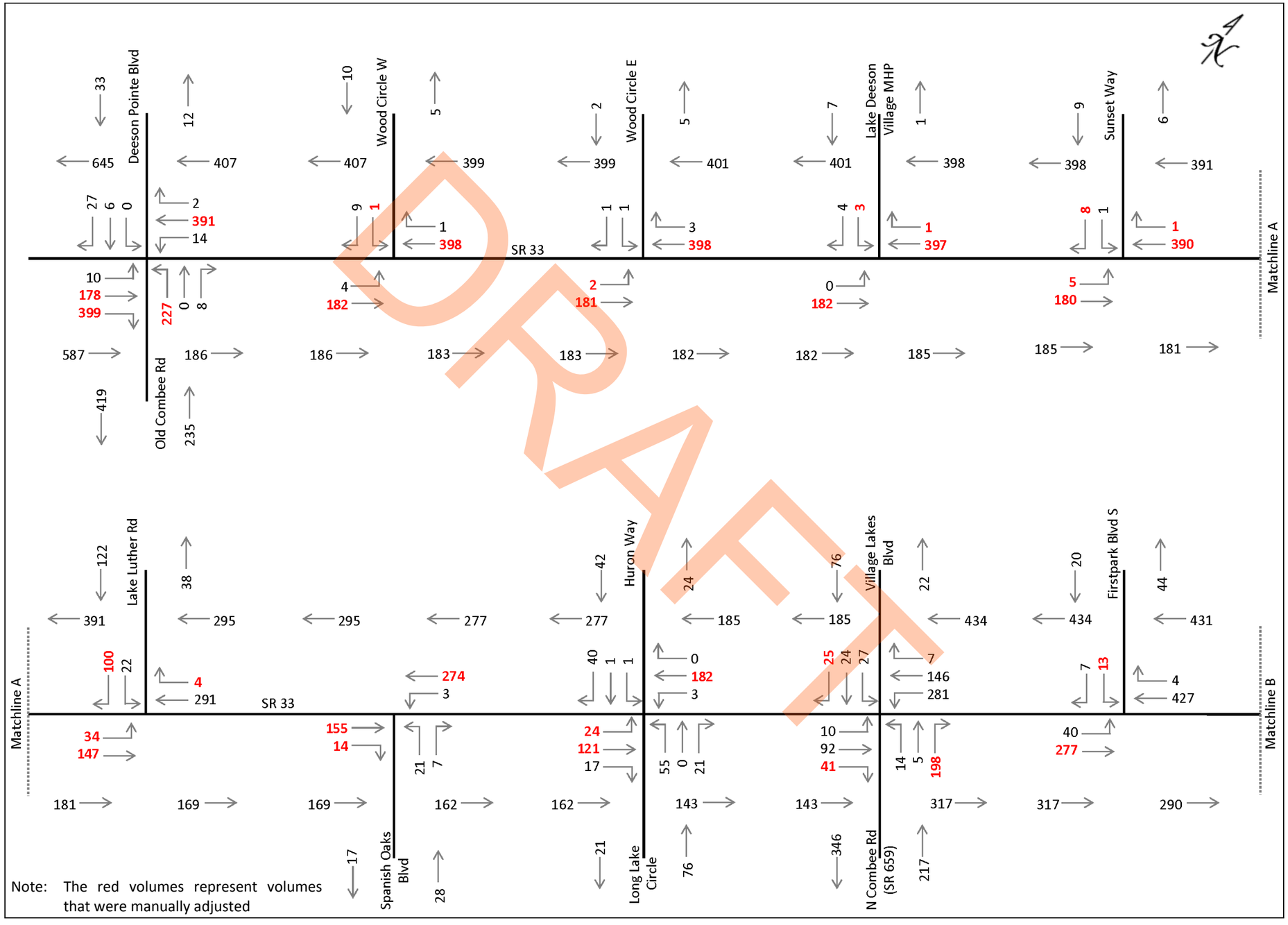


FIGURE 2-9: ADJUSTED EXISTING YEAR (2012) AM PEAK HOUR VOLUMES

Note: The red volumes represent volumes that were manually adjusted

FIGURE 2-10: ADJUSTED EXISTING YEAR (2012) AM PEAK HOUR VOLUMES

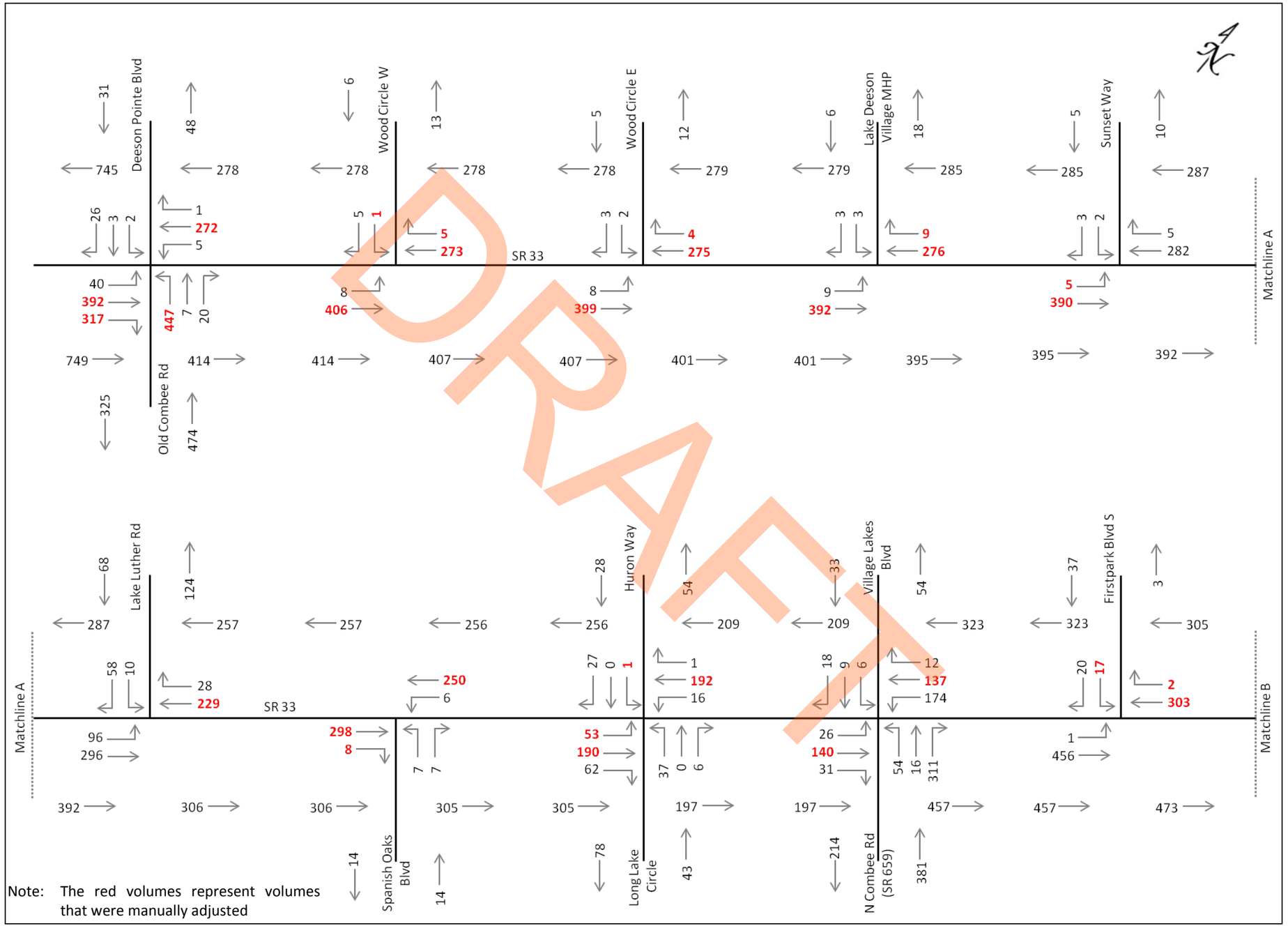
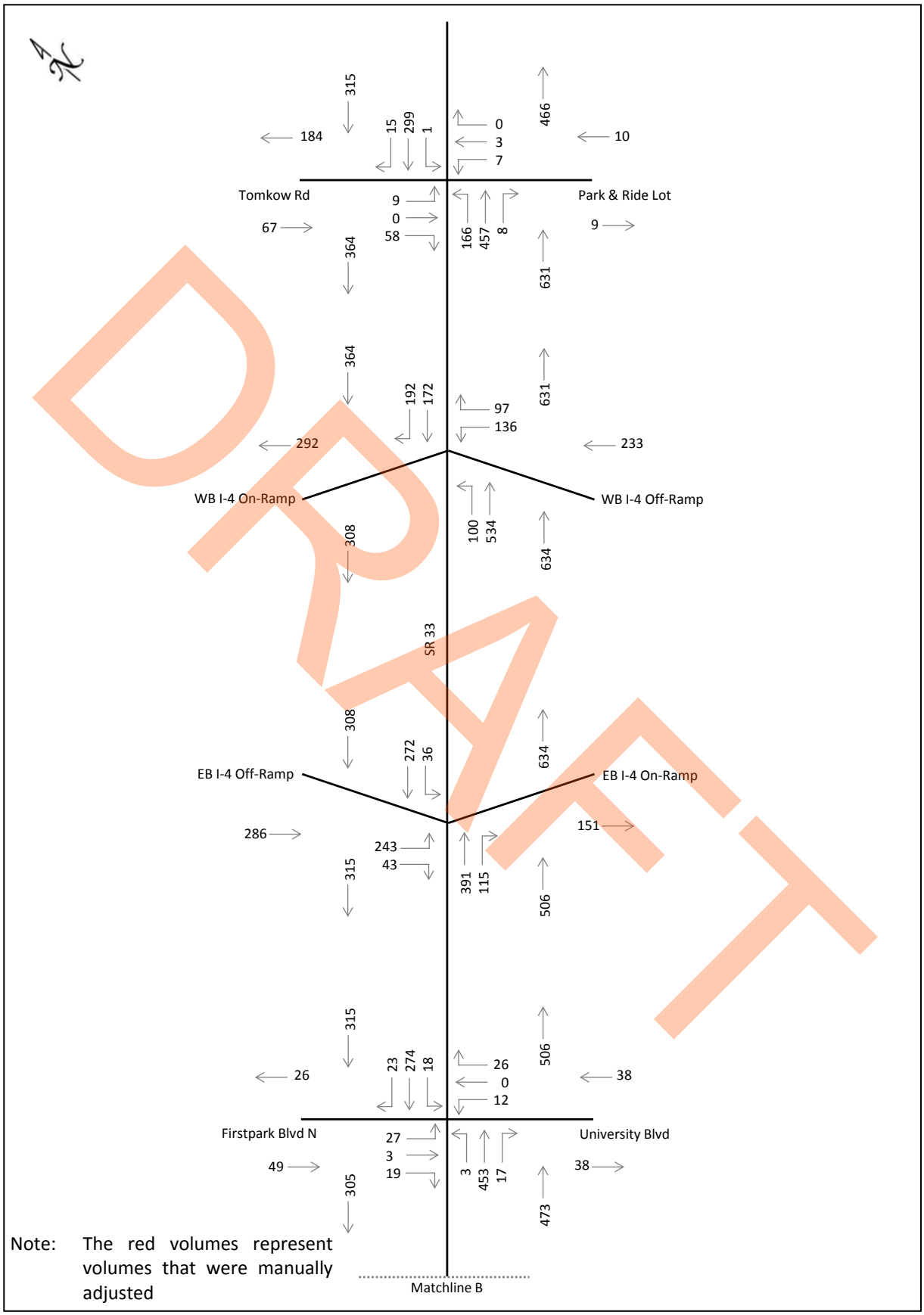


FIGURE 2-11: ADJUSTED EXISTING YEAR (2012) PM PEAK HOUR VOLUMES



Note: The red volumes represent volumes that were manually adjusted

FIGURE 2-12: ADJUSTED EXISTING YEAR (2012) PM PEAK HOUR VOLUMES

These facilities serve mostly long-distance trips or provide the connections between facilities that serve long-distance trips." The portion of SR 33 between Old Combee Road/Deeson Pointe Boulevard and Spanish Oaks Boulevard was analyzed as a Class 3 highway due to the much lower posted speed limit (i.e., 45 mph) in this area.

Table 2-13 summarizes the results of the two-lane highway segment analyses for both the a.m. and p.m. peak hours. This table includes the volume-to-capacity (v/c) ratio, percent "time spent following" (PTSF), average travel speed (ATS), percent of free-flow speed (%FFS), and Level of Service (LOS). The PTSF performance measure is the average percentage of the total time that vehicles must travel in platoons behind slower moving vehicles due to the inability to pass. The PTSF is estimated based on the peak hour flow rate (adjusted for the percentage of heavy vehicles), directional distribution and percentage of no-passing zones. As the peak hour volume, directional distribution, and percentage of no-passing zones increases, the ability of vehicles to pass slower moving vehicles in each direction decreases, which results in higher values for percent time spent following. For Class 1 two-lane highways, LOS is defined in terms of both ATS and PTSF. On Class 3 two-lane highways, high speeds are not expected and the %FFS performance measure is used to define the LOS.

With two exceptions, all of the SR 33 roadway segments are operating at LOS D or better in both the peak and off-peak travel directions during the peak hours. LOS E conditions are occurring on the segment between the westbound I-4 on-/off-ramps and Tomkow Road in the peak travel directions (i.e., southbound in the a.m. peak hour and northbound in the p.m. peak hour). The existing conditions roadway segment analyses are provided in **Appendix E**.

Unsignalized intersection analyses were conducted for 13 of the intersections identified in **Section 2.1** of this report using the 2010 HCS. The average PHFs that were used to conduct the roadway segment analyses were also used for the SR 33 movements in the unsignalized intersection analyses. The specific PHFs calculated from the 2012 turning movement counts were used in the unsignalized intersection analyses for the cross street approaches because many of the cross street approaches are experiencing significant fluctuations in traffic flow (i.e., peaking characteristics) within the peak hour. The average peak hour truck percentages that were used to conduct the roadway segment analyses were also used for the SR 33 through movements in the unsignalized intersection analyses. The specific peak hour truck percentages that were calculated from the 2012 turning movement counts were used in the unsignalized intersection analyses for all of the other intersection movements.

TABLE 2-13: EXISTING YEAR (2012) PEAK HOUR ROADWAY SEGMENT OPERATIONS

Segment		Two-Way Volume	Directional Volume	V/C [1]	PTSF [2]	ATS [3]	% FFS [4]	LOS [5]
From	To							
AM PEAK HOUR								
Old Combee Road/ Deeson Pointe Boulevard	Lake Luther Road	582	399 (WB)	0.29	66.7%	40.9	85.1%	B
			183 (EB)	0.13	38.1%	41.6	86.7%	B
Lake Luther Road	Spanish Oaks Boulevard	464	295 (WB)	0.21	43.1%	44.4	88.8%	B
			169 (EB)	0.12	38.6%	44.3	88.5%	B
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	439	277 (WB)	0.20	64.9%	51.9	86.6%	C
			162 (EB)	0.12	43.2%	51.8	86.4%	B
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	328	185 (SB)	0.13	56.7%	53.1	88.5%	C
			143 (NB)	0.10	44.7%	53.2	88.6%	B
N. Combee Road/ Village Lakes Boulevard	Firstpark Boulevard N./ University Boulevard	737	433 (SB)	0.29	69.4%	55.2	85.2%	D
			304 (NB)	0.21	56.4%	55.8	86.1%	C
Firstpark Boulevard N./ University Boulevard	EB I-4 On-/Off-Ramps	731	426 (SB)	0.28	69.8%	54.8	84.9%	D
			305 (NB)	0.21	56.4%	55.4	86.0%	C
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	765	441 (SB)	0.29	70.7%	55.2	84.9%	D
			324 (NB)	0.22	58.5%	55.8	85.9%	C
WB I-4 On-/Off-Ramps	Tomkow Road	917	632 (SB)	0.41	81.3%	53.7	82.6%	E
			285 (NB)	0.19	50.4%	55.3	85.0%	C
PM PEAK HOUR								
Old Combee Road/ Deeson Pointe Boulevard	Lake Luther Road	683	281 (WB)	0.19	52.0%	41.1	85.5%	B
			402 (EB)	0.26	64.4%	40.9	85.2%	B
Lake Luther Road	Spanish Oaks Boulevard	563	257 (WB)	0.17	40.2%	44.0	87.9%	B
			306 (EB)	0.20	56.8%	43.7	87.4%	B
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	561	256 (WB)	0.17	56.8%	52.1	86.9%	C
			305 (EB)	0.20	65.0%	51.0	85.1%	C
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	406	209 (SB)	0.14	56.8%	52.5	87.5%	C
			197 (NB)	0.13	52.7%	52.8	88.0%	C
N. Combee Road/ Village Lakes Boulevard	Firstpark Boulevard N./ University Boulevard	779	314 (SB)	0.21	55.5%	55.8	86.2%	C
			465 (NB)	0.30	72.8%	54.9	84.8%	D
Firstpark Boulevard N./ University Boulevard	EB I-4 On-/Off-Ramps	821	315 (SB)	0.21	55.7%	55.3	85.7%	C
			506 (NB)	0.32	75.4%	54.2	84.0%	D
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	942	308 (SB)	0.20	52.0%	55.2	85.0%	C
			634 (NB)	0.40	79.8%	53.8	82.7%	D
WB I-4 On-/Off-Ramps	Tomkow Road	995	364 (SB)	0.24	58.4%	54.8	84.3%	C
			631 (NB)	0.40	80.6%	53.7	82.7%	E

[1] Volume-to-Capacity Ratio

[2] Percent Time Spent Following

[3] Average Travel Speed (miles/hour)

[4] Percent of Free-Flow Speed

[5] Level of Service

The results of the a.m. and p.m. peak hour unsignalized intersection analyses are summarized in **Table 2-14**. A majority of the movements are operating at LOS C or better during both peak hours. In the a.m. peak hour, there are three movements operating at LOS D and one movement operating at LOS E. These specific movements are as follows:

- Eastbound Village Lakes Boulevard left-turn movement (LOS E);
- Eastbound Village Lakes Boulevard through movement (LOS D); and
- Westbound N. Combee Road left-turn and through movements (LOS D).

The average a.m. peak hour vehicle delays associated with these movements range from approximately 25 seconds/vehicle to 40 seconds/vehicle. In the p.m. peak hour, there are three movements operating at LOS D and four movements operating at LOS E. These specific movements are as follows:

- Eastbound Village Lakes Boulevard left-turn movement (LOS E);
- Eastbound Firstpark Boulevard N. left-turn movement (LOS D);
- Eastbound I-4 off-ramp left-turn movement (LOS D);
- Westbound I-4 off-ramp left-turn movement (LOS D); and
- Northbound left-turn, through, and right-turn movements from the park-and-ride lot (LOS E).

The average p.m. peak hour vehicle delays associated with these movements range from approximately 25 seconds/vehicle to 36 seconds/vehicle. The existing conditions unsignalized intersection analyses are provided in **Appendix E**.

The HCS analyses that were conducted for the I-4 ramp terminal intersections included separate left-turn and right-turn lanes for the eastbound and westbound I-4 off-ramp approaches. Both of the I-4 off-ramps are single lane ramps that provide channelized right-turn lanes in the vicinity of SR 33. There is approximately 325 feet of left-turn vehicle storage provided on the westbound off-ramp prior to the beginning of the channelized right-turn lane. Based on an average vehicle spacing of 25 feet, the westbound right-turn vehicles are able to access the right-turn lane if the westbound left-turn queue is less than or equal to 13 vehicles. Similarly, there is approximately 125 feet of left-turn vehicle storage provided on the eastbound off-ramp prior to the beginning of the channelized right-turn lane. Based on an average vehicle spacing of 25 feet, the eastbound right-turn vehicles are able to access the right-turn lane if the eastbound left-turn queue is less than or equal to five vehicles.

TABLE 2-14: EXISTING (2012) PEAK HOUR UNSIGNALIZED INTERSECTION OPERATIONS

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
Wood Circle W.	Eastbound	L/T	0.00	8.3	A	0.01	7.9	A
	Southbound	L/R	0.04	11.6	B	0.02	10.7	B
Wood Circle E.	Eastbound	L/T	0.00	9.1	A	0.01	7.9	A
	Southbound	L/R	0.01	14.4	B	0.01	12.0	B
Lake Deeson Village MHP	Eastbound	L/T	0.00	0.0	N/A	0.01	7.9	A
	Southbound	L/R	0.03	12.5	B	0.02	13.1	B
Sunset Way	Eastbound	L/T	0.01	8.3	A	0.00	7.9	A
	Southbound	L/R	0.02	11.4	B	0.01	12.0	B
Lake Luther Road	Eastbound	L/T	0.03	8.1	A	0.08	8.1	A
	Southbound	L/R	0.29	13.1	B	0.12	11.3	B
Spanish Oaks Boulevard	Westbound	L/T	0.00	8.0	A	0.00	7.9	A
	Northbound	L	0.05	12.9	B	0.03	13.2	B
	Northbound	R	0.01	9.3	A	0.02	10.1	B
Huron Way/ Long Lake Circle	Eastbound	L/T/R	0.08	9.8	A	0.05	9.7	A
	Westbound	L/T/R	0.20	13.4	B	0.14	15.1	C
	Northbound	L	0.02	7.7	A	0.04	7.7	A
	Southbound	L	0.00	7.5	A	0.01	7.8	A
North Combee Road/ Village Lakes Boulevard	Eastbound	L	0.25	40.4	E	0.08	36.3	E
	Eastbound	T	0.14	25.1	D	0.05	18.0	C
	Eastbound	R	0.04	9.2	A	0.03	9.2	A
	Westbound	L/T	0.11	26.4	D	0.29	23.5	C
	Westbound	R	0.24	10.2	B	0.41	12.0	B
	Northbound	L	0.01	7.7	A	0.02	7.6	A
	Southbound	L	0.22	8.4	A	0.14	8.1	A
Firstpark Boulevard S.	Eastbound	L	0.07	18.6	C	0.06	15.8	C
	Eastbound	R	0.02	11.4	B	0.03	10.2	B
	Northbound	L	0.04	8.4	A	0.00	7.9	A
University Boulevard/ Firstpark Boulevard N.	Eastbound	L	0.19	24.0	C	0.24	25.2	D
	Eastbound	T/R	0.02	10.5	B	0.07	11.2	B
	Westbound	L	0.26	21.2	C	0.09	20.3	C
	Westbound	T	0.02	16.7	C	0.00	0.0	N/A
	Westbound	R	0.01	9.8	A	0.09	11.7	B
	Northbound	L	0.01	8.2	A	0.00	8.3	A
	Southbound	L	0.02	8.0	A	0.02	8.4	A
I-4 Eastbound Ramps	Eastbound	L	0.41	20.0	C	0.63	27.2	D
	Eastbound	R	0.13	11.9	B	0.07	24.8	C
	Southbound	L	0.06	7.9	A	0.03	8.4	A
I-4 Westbound Ramps	Westbound	L	0.30	19.6	C	0.50	27.1	D
	Westbound	R	0.04	10.1	B	0.23	14.2	B
	Northbound	L	0.08	8.9	A	0.08	8.0	A
Tomkow Road	Eastbound	L	0.04	8.4	A	0.14	8.4	A
	Westbound	L	0.00	7.8	A	0.00	8.3	A
	Northbound	L/T/R	0.05	23.0	C	0.17	36.0	E
	Southbound	L/T/R	0.43	16.6	C	0.18	14.5	B

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

Queue length observations were conducted for the eastbound and westbound I-4 off-ramps on the same day that the eight-hour turning movement counts were conducted at the ramp terminal intersections. The maximum number of queued vehicles that were observed during each 15-minute interval was recorded separately for the left-turn and right-turn lanes on the off-ramps. These observations are provided in **Appendix C**. The queue length data indicated the following:

- With one exception, the maximum left-turn queues were always greater than or equal to the maximum right-turn queues at both off-ramps.
- The longest left-turn queues recorded during the morning hours at both ramps occurred during the 60-minute period from 7:15 a.m. to 8:15 a.m. The maximum left-turn queues were 10 vehicles on the westbound off-ramp and 5 vehicles on the eastbound off-ramp.
- The longest left-turn queues recorded during the afternoon hours at both ramps occurred during the 60-minute period from 4:15 p.m. to 5:15 p.m. The maximum left-turn queues were 9 vehicles on the westbound off-ramp and 11 vehicles on the eastbound off-ramp.

In addition, the left-turn vehicle queues on the westbound I-4 off-ramp did not prohibit the right-turning vehicles from accessing the right-turn lane at any time during the eight-hour period, In contrast, there were multiple occasions where the left-turn vehicle queues on the eastbound I-4 off-ramp did not allow access to the right-turn lane. All of these occurred during the afternoon hours, with maximum left-turn vehicle queues in the range of 10 to 11 vehicles occurring between 4:15 p.m. and 5:15 p.m. These observations suggested that the p.m. peak hour average vehicle delay for the eastbound right-turn movement that was obtained from the HCS analysis (i.e., 10.7 seconds/vehicle) may be lower than the actual delay.

As long as the left-turn vehicle queues do not extend back and block the access to the channelized right-turn lanes, the right-turn vehicle delays are independent of the left-turn vehicle delays. However, once the left-turn vehicle queues block the access to the channelized right-turn lanes, the right-turn vehicle delays become affected by the left-turn vehicle delays and their delays start to approximate the delay associated with a single shared left-turn/right-turn lane. Since the eastbound left-turn queues did extend back and block the access to the eastbound right-turn lane for at least a portion of each 15-minute interval between 4:15 p.m. and 6:00 p.m., the weighted average approach delay value of 24.8 seconds/vehicle was used as the estimate of the average vehicle delay for the eastbound right-turn movement and is included in **Table 2-14**.

A signalized intersection analysis was conducted for the Old Combee Road/Deeson Pointe Boulevard intersection using the 2010 HCS and the results of this analysis are summarized in **Table 2-15**. This intersection is operating at LOS C overall during the a.m. peak hour and all of the individual movements are operating at LOS D or better. In the p.m. peak hour, this intersection is operating at LOS D overall, and with one exception, all of the individual movements are operating at LOS D or better. The northbound Old Combee Road left-turn movement is operating at LOS E with a v/c ratio of 0.98 and an average delay of 74 seconds/vehicle. The existing conditions signalized intersection analyses are also provided in **Appendix E**.

TABLE 2-15: EXISTING (2012) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – SR 33 AT OLD COMBEE ROAD/DEESON POINTE BOULEVARD

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
Eastbound SR 33	Left	0.03	19.7	B	0.10	20.1	C
	Thru	0.33	26.4	C	0.67	34.1	C
	Right	0.47	13.5	B	0.31	9.6	A
	Approach	N/A	17.8	B	N/A	23.8	C
Westbound SR 33	Left	0.03	17.0	B	0.02	21.1	C
	Thru	0.71	34.4	C	0.47	29.4	C
	Right	0.00	23.2	C	0.00	24.5	C
	Approach	N/A	33.8	C	N/A	29.2	C
Northbound Old Combee Road	Left	0.70	45.7	D	0.98	74.0	E
	Thru	0.03	34.7	C	0.07	29.8	C
	Right	0.03	34.7	C	0.07	29.8	C
	Approach	N/A	45.3	D	N/A	71.5	E
Southbound Deeson Pointe Boulevard	Left	0.19	44.7	D	0.22	47.4	D
	Thru	0.19	44.7	D	0.22	47.4	D
	Right	0.19	44.7	D	0.22	47.4	D
	Approach	N/A	44.7	D	N/A	47.4	D
Overall Intersection		N/A	29.1	C	N/A	40.4	D

[1] Volume-to-Capacity Ratio

[2] Average Delay (in seconds/vehicle)

[3] Level of Service

3.0 FUTURE YEAR TRAFFIC VOLUMES

3.1 Review of the Original Polk TPO Travel Demand Models

The first step in the travel demand forecasting methodology used for the SR 33 PD&E study involved a review of the Polk County Transportation Planning Organization's (TPO's) 2007 Base Year travel demand model and 2035 Financially Feasible Long Range Transportation Plan model (commonly referred to as the 2035 Mobility Vision Plan model).

3.1.1 Traffic Analysis Zones

Figure 3-1 illustrates the sizes and boundaries of the Traffic Analysis Zones (TAZs) in the vicinity of the study corridor that are contained within the original 2007 and 2035 Polk County TPO travel demand models. There are five TAZs located immediately adjacent to the SR 33 PD&E study corridor. Two of these are on the north side of SR 33 (TAZ Nos. 241 and 250), and three are on the south side of SR 33 (TAZ Nos. 238, 276 and 277). In addition, TAZ No. 225 is located to the east of Melody Lane and to the south of Old Combee Road. Although there also appears to be a TAZ located to the west of Melody Lane and south of SR 33, this "zone" has no zone number, zonal data or centroid connectors associated with it. Several of these TAZs are rather large due to the limited number of local roadways included in the model network and the relatively undeveloped nature of the northern portion of the study area.

3.1.2 Centroid Connectors

In the original 2007 model, there are ten centroid connectors associated with the five TAZs located immediately adjacent to the study corridor. **Figure 3-2** illustrates the locations of these ten centroid connectors. Only four of these connect directly to SR 33. Two of the four centroid connectors appear to intersect SR 33 in the vicinity of Long Lake Circle (south of SR 33) and Lake Luther Road (north of SR 33). There are no centroid connectors representing either Village Lakes Boulevard or Huron Way, which are the only access roadways for the existing Bridgewater development located in TAZ No. 241. In addition, there is only one centroid connector associated with TAZ No. 225 and this is connected to Lake Parker Drive.

Figure 3-3 illustrates the locations of the centroid connectors in the original 2035 model. A comparison of **Figure 3-2** and **Figure 3-3** indicates that the centroid connector associated with TAZ No. 276 is in different locations in the 2007 and 2035 models. In the 2007 model, this connector is located within the boundaries of TAZ No. 276 and is connected to SR 33 in the vicinity of the Firstpark Boulevard S. intersection. In the 2035 model, this connector is located within the boundaries of TAZ No. 265 (in the vicinity of the location of the future Florida Polytechnic University) and is connected to a loop road associated with the campus. In addition, the 2035 model included a third centroid connector for TAZ No. 265 that was connected to N. Combee Road.

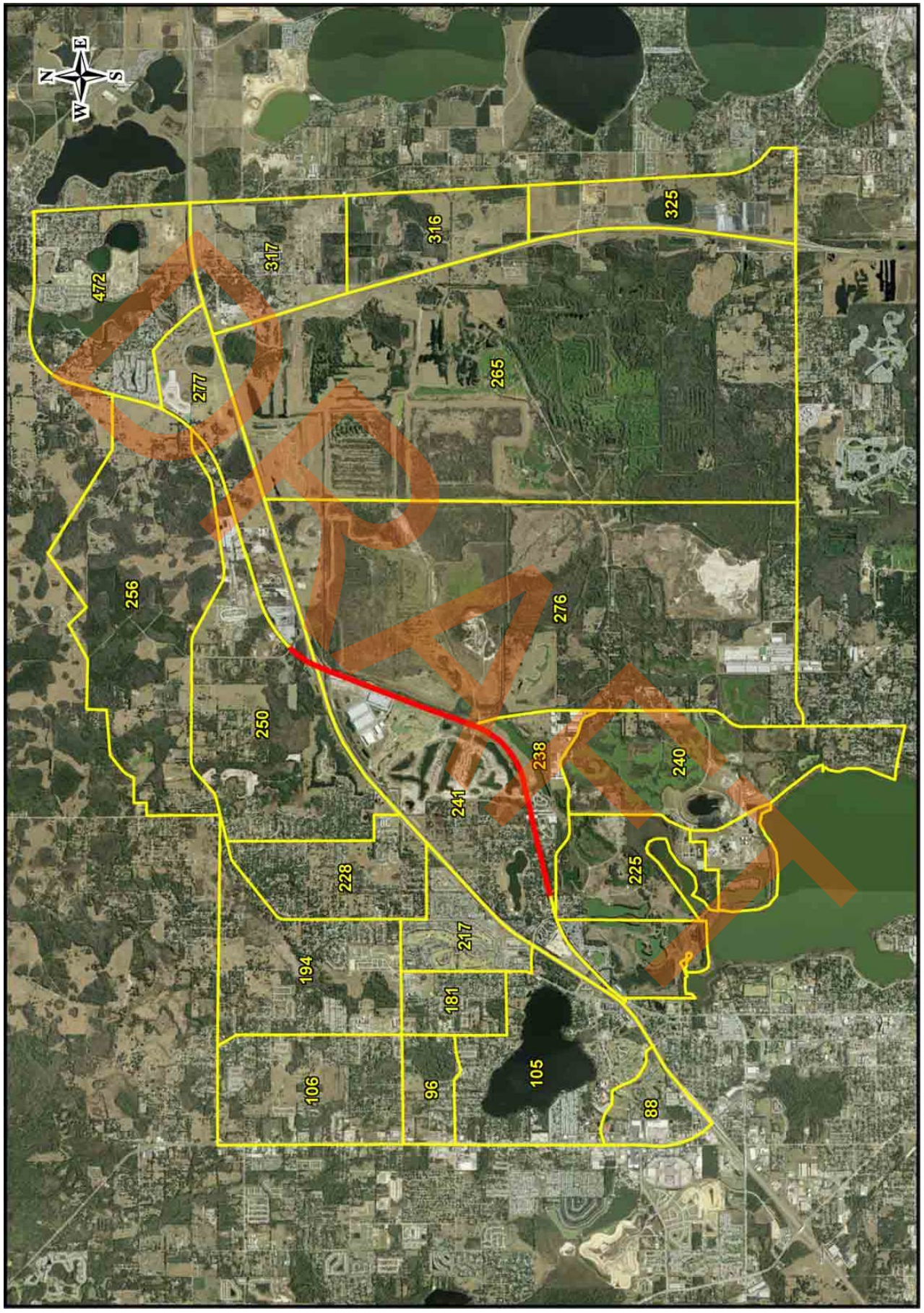


FIGURE 3-1: STUDY AREA TRAFFIC ANALYSIS ZONE BOUNDARIES – ORIGINAL POLK TPO TRAVEL DEMAND MODELS

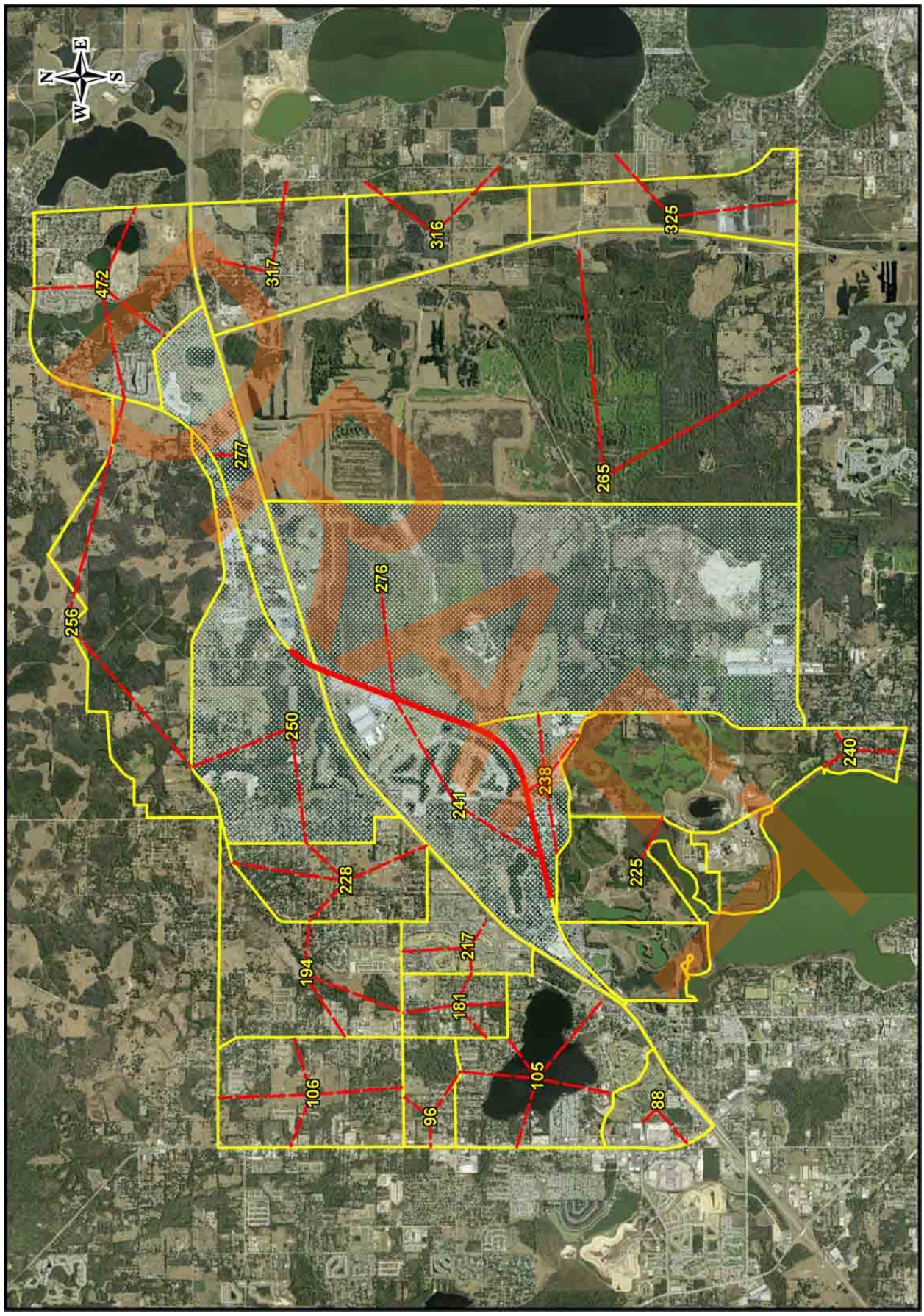


FIGURE 3-2: STUDY AREA TRAFFIC ANALYSIS ZONE CENTROID CONNECTORS – ORIGINAL POLK TPO 2007 MODEL

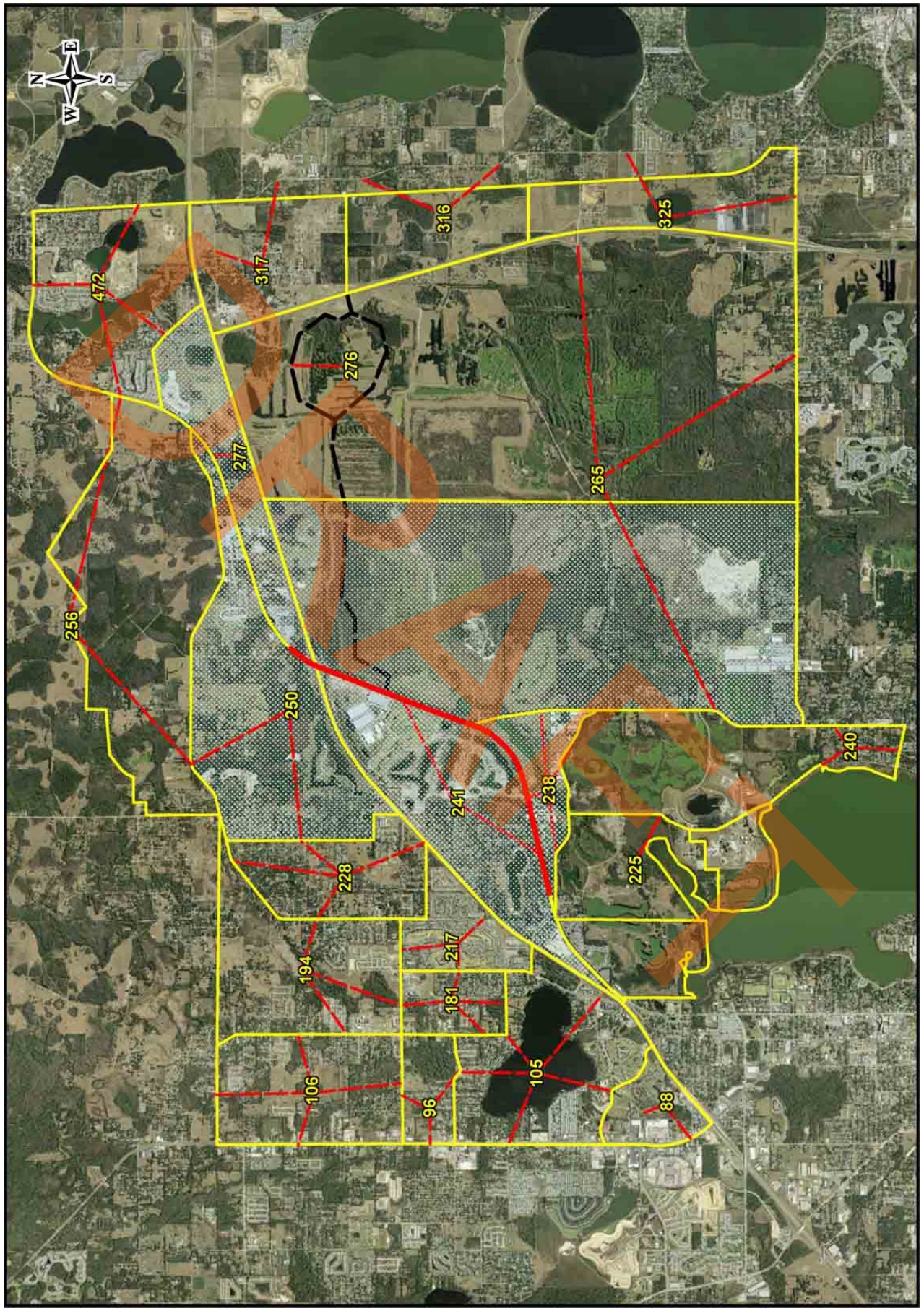


FIGURE 3-3: STUDY AREA TRAFFIC ANALYSIS ZONE CENTROID CONNECTORS – ORIGINAL POLK TPO 2035 MODEL

3.1.3 Roadway Network Coding

Within the PD&E study limits, the only existing SR 33 cross streets that are coded in the 2007 Polk TPO model are the following:

- Old Combee Road
- N. Combee Road
- Tomkow Road

The facility types, area types and number of lanes that are coded for the study area roadways in the 2007 model are illustrated in **Figures 3-4**, **3-5** and **3-6**, respectively. SR 33 is coded as a two-lane undivided unsignalized minor arterial that does not have left-turn bays (i.e., Facility Type 35). Several cross streets that were included in the PD&E study traffic count program are not coded in the model (either as a roadway or as a centroid connector). These cross streets include Deeson Pointe Boulevard, Wood Circle E., Wood Circle W., Sunset Way, Spanish Oaks Boulevard, Huron Way, Village Lakes Boulevard, Firstpark Boulevard S., and Firstpark Boulevard N.

Figures 3-7, **3-8** and **3-9** illustrate the facility types, area types and number of lanes coded for the study area roadways in the 2035 model. The SR 33 study corridor is coded as a four-lane undivided unsignalized minor arterial that does not have left-turn bays (Facility Type 35). The 2035 model also includes four lanes on the portion of the Polk Parkway from Saddle Creek Road to I-4 and the portion of Saddle Creek Road from N. Combee Road to east of the Polk Parkway.

There is one additional east/west roadway (University Boulevard) and one loop road (Research Way) in the 2035 model that are not included in the 2007 model. University Boulevard is coded as a two-lane undivided major collector that does not have turn bays (i.e., Facility Type 43) and extends from SR 33 to the Polk Parkway. This roadway was recently constructed as a four-lane divided roadway with turn bays from SR 33 to Research Way and as a six-lane divided roadway from Research Way to the Polk Parkway. Portions of Research Way were constructed as a four-lane divided roadway and another portion was constructed as a two-lane undivided roadway. This loop road will provide direct access to and from the Florida Polytechnic University which will be located to the west of the Polk Parkway and to the south of I-4. In the 2035 model, this entire loop road was also coded as a two-lane undivided major collector without turn bays (Facility Type 43).

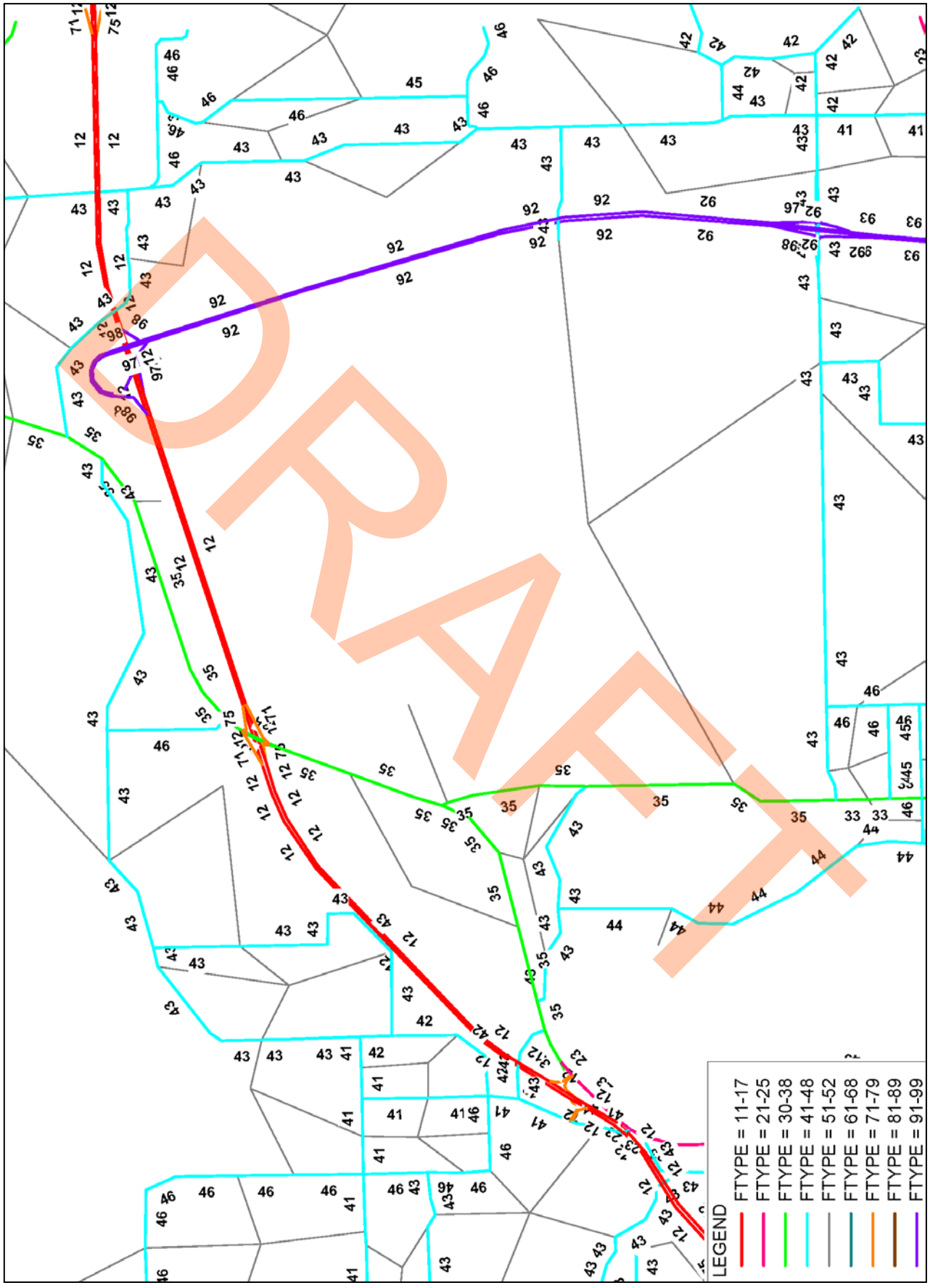


FIGURE 3-4: ORIGINAL POLK TPO 2007 MODEL – FACILITY TYPES

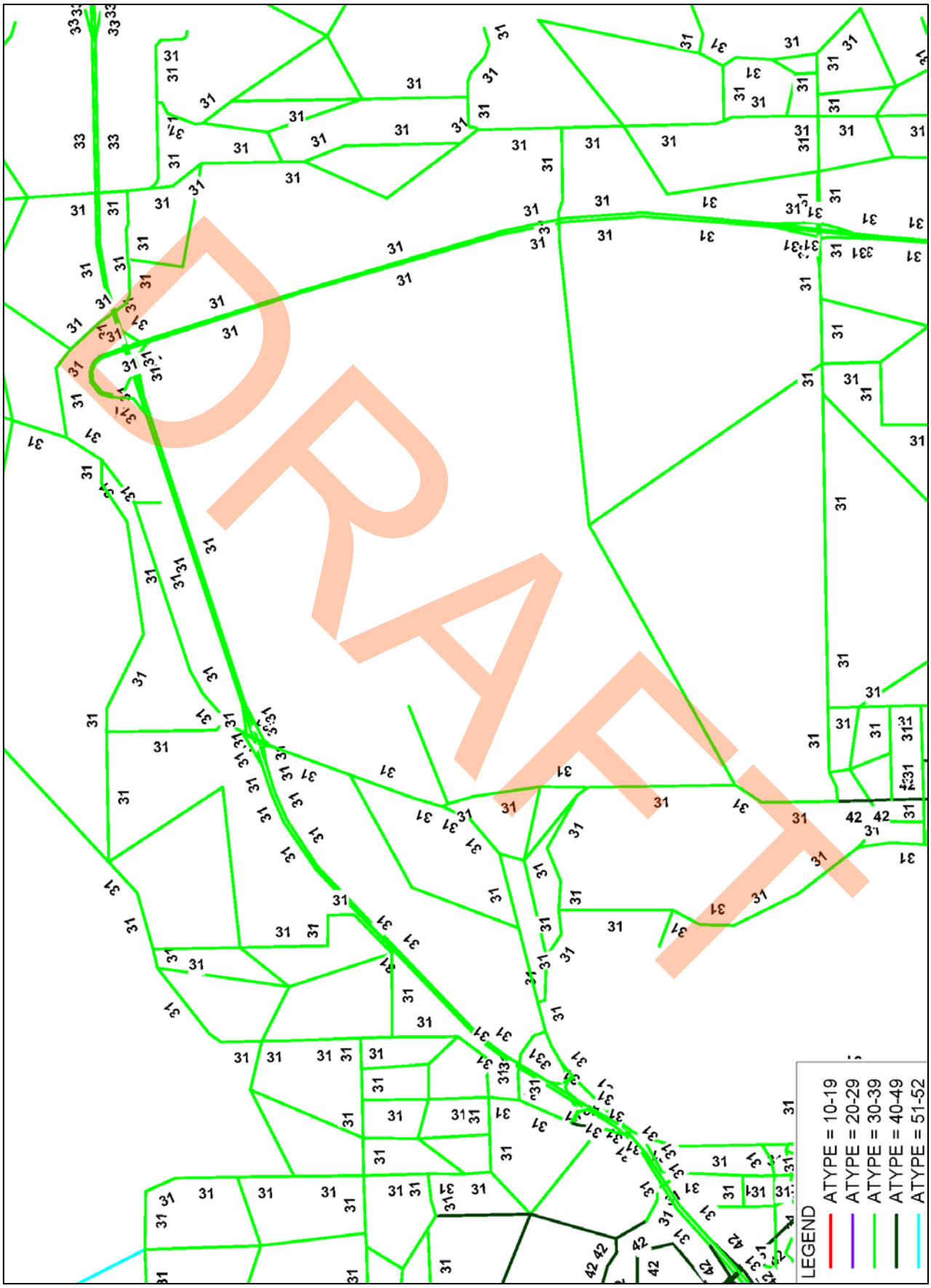


FIGURE 3-5: ORIGINAL POLK TPO 2007 MODEL – AREA TYPES

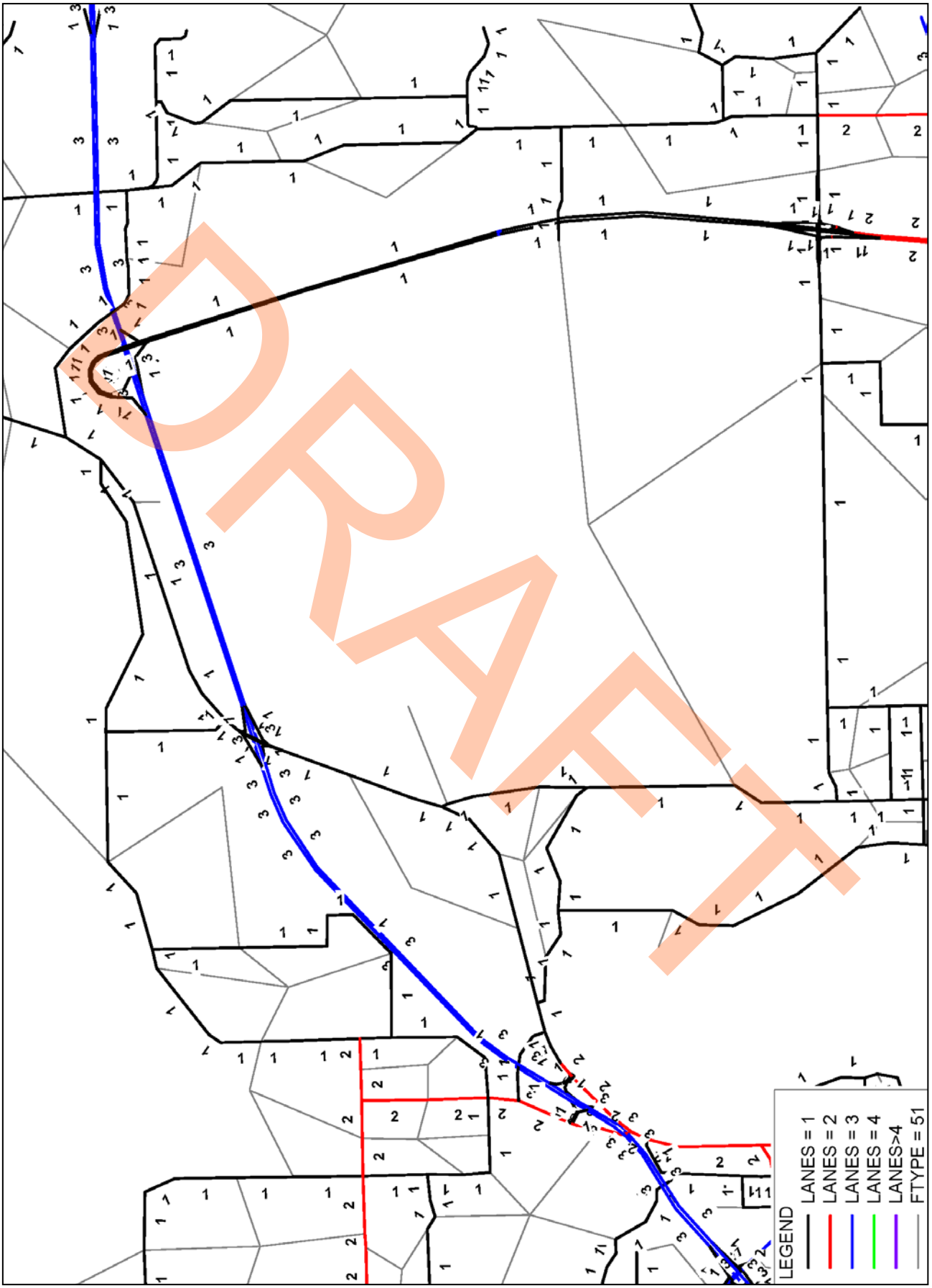


FIGURE 3-6: ORIGINAL POLK TPO 2007 MODEL – NUMBER OF DIRECTIONAL LANES

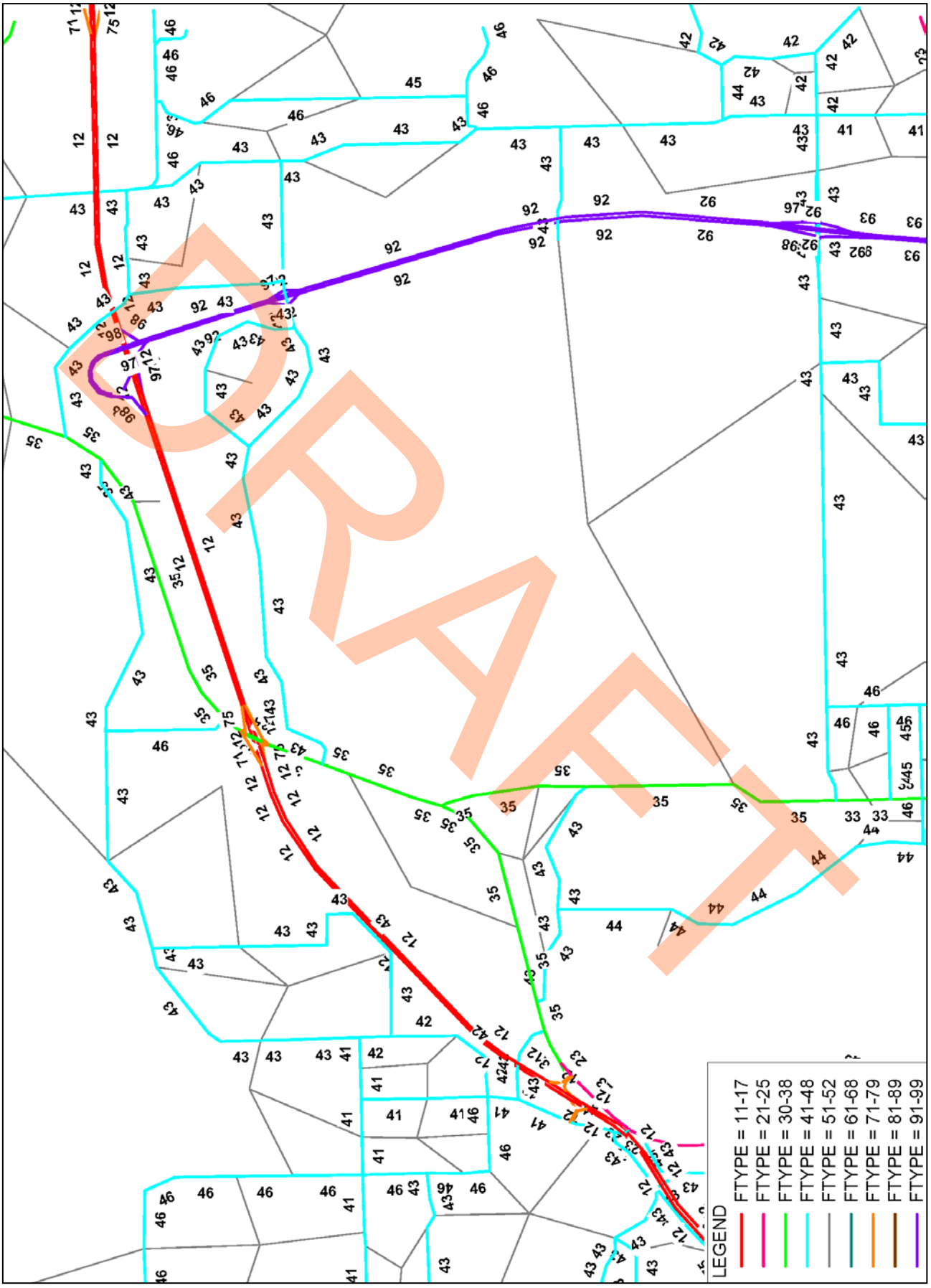


FIGURE 3-7: ORIGINAL POLK TPO 2035 MODEL – FACILITY TYPES

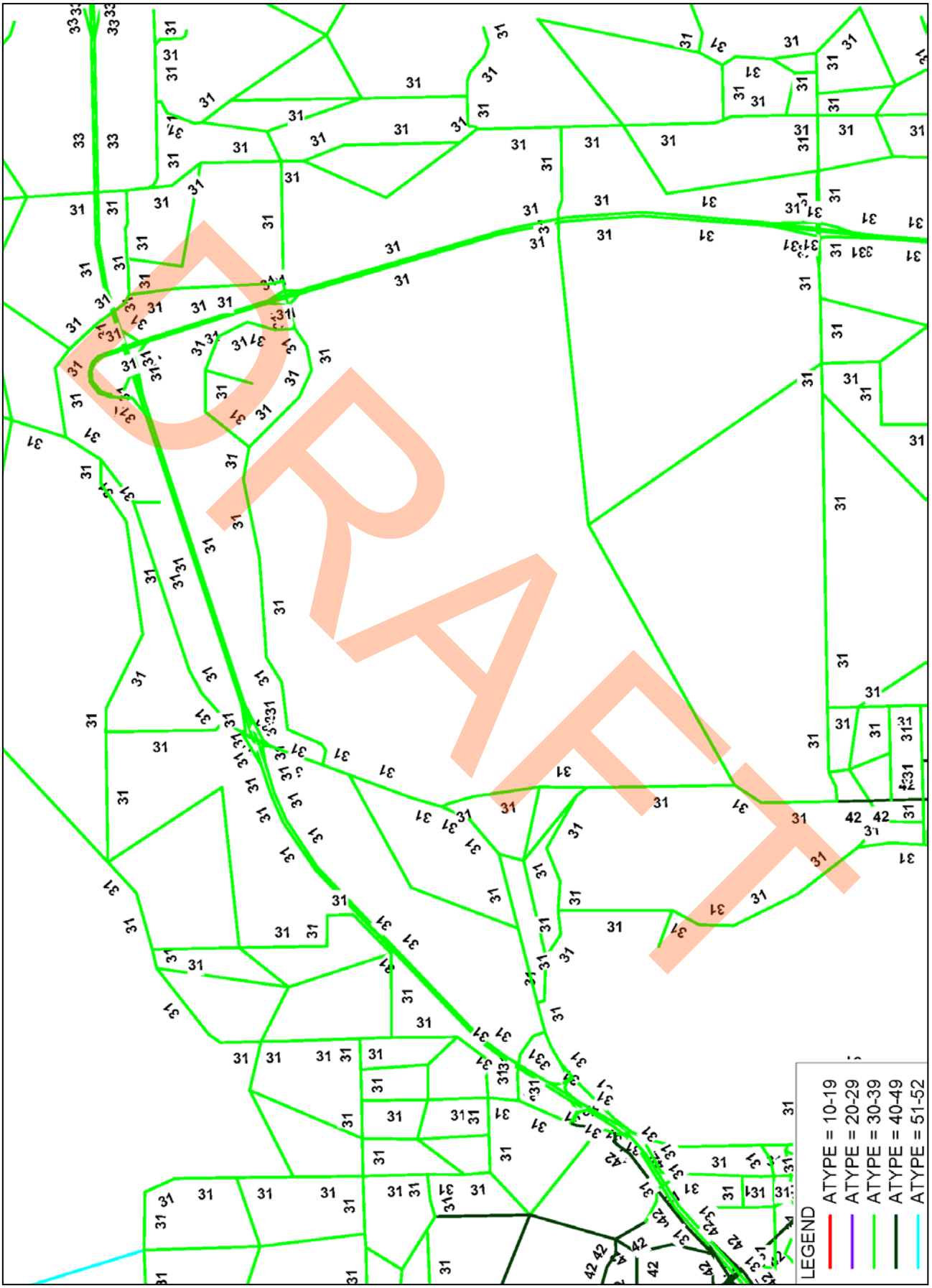


FIGURE 3-8: ORIGINAL POLK TPO 2035 MODEL – AREA TYPES

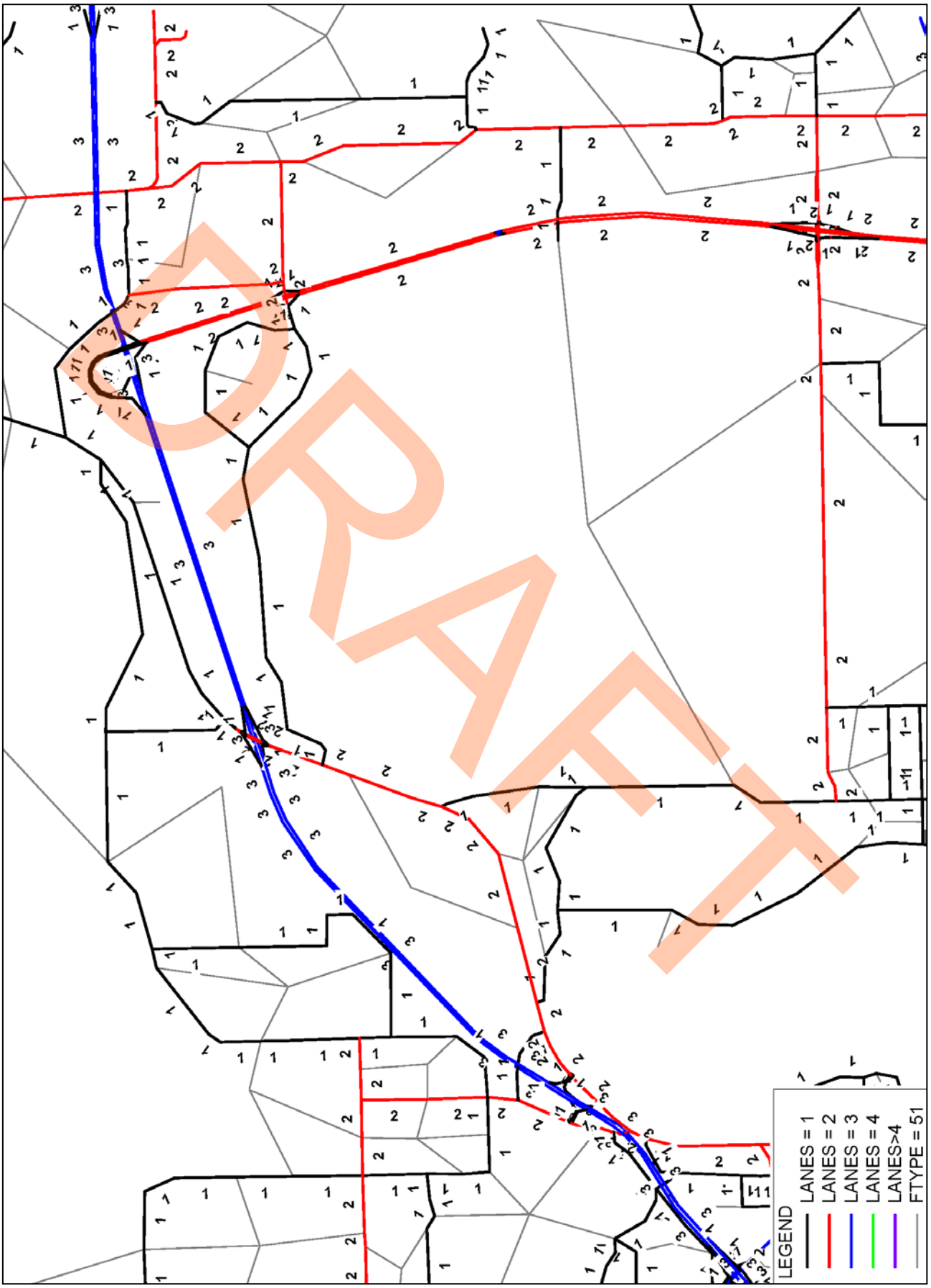


FIGURE 3-9: ORIGINAL POLK TPO 2035 MODEL – NUMBER OF DIRECTIONAL LANES

There is also one additional interchange coded in the 2035 model on the Polk Parkway that is not included in the 2007 model. The Pace Road interchange was recently constructed concurrent with University Boulevard to provide access to and from Florida Polytechnic University via the Polk Parkway. Pace Road currently exists as a four-lane divided roadway with turn bays from the southbound Polk Parkway on- and off-ramps eastward over to CR 655; however, this roadway is coded as a four-lane major local undivided roadway without turn bays (Facility Type 43) in the 2035 model. Both the northbound on-ramp and the southbound off-ramp were constructed as tolled ramps (SunPass only ramps); however, the 2035 model does not include any toll links on either of these ramps. In addition, the northbound off-ramp, northbound on-ramp, and southbound off-ramp are all two-lane ramps but are coded as one-lane ramps in the 2035 model.

3.1.4 Land Use Data

A comparison of the land use data contained in the 2007 and 2035 Polk County TPO models was conducted to quantify the amount of growth that is projected to occur within the vicinity of the study corridor. **Table 3-1** summarizes the 2007 and 2035 land use data for 17 TAZs located in the vicinity of the SR 33 study corridor. The five TAZs that are immediately adjacent to SR 33 within the limits of the PD&E study are highlighted in yellow.

Table 3-1 indicates that the total number of single family and multi-family dwelling units are projected to increase by 4,189 and 1,549, respectively. These represent increases of approximately 41.3% and 53.6% when compared to the 2007 values. The single family and multi-family population is projected to increase by 13,516 and 3,435; respectively. These represent increases of approximately 54.5% and 65.2% when compared to the 2007 values.

Table 3-1 also indicates that significant increases in industrial, commercial and service employment are projected to occur between 2007 and 2035. The number of commercial employees is projected to increase from 1,319 to 2,964 while the number of service employees is projected to increase from 2,445 to 4,126. These represent increases of approximately 124.7% and 68.8%, respectively. The number of industrial employees is projected to increase from 3,193 to 7,089, which represents a 122.0% increase in industrial employment.

Although the total population and employment within these 17 TAZs is projected to increase over the 28-year period between 2007 and 2035, there are several individual TAZs that are projected to have lower

TABLE 3-1: POLK TPO MODEL LAND USE DATA COMPARISON

2007 ZONAL DATA											
ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
105	826	1,931	582	956	404	738	103	574	1,281	1,958	0
181	675	1,677	176	416	0	0	32	4	173	209	782
194	1,262	3,056	120	207	0	0	107	112	325	544	3,257
217	1,183	2,220	125	216	0	0	42	413	166	621	0
225	111	246	500	862	0	0	4	4	27	35	0
228	1,096	3,029	0	0	0	0	106	24	131	261	842
238	86	250	0	0	0	0	212	64	6	282	0
240	243	572	183	261	0	0	47	8	24	79	0
241	436	989	328	401	0	0	33	6	51	90	0
250	835	2,285	0	0	0	0	1,321	14	97	1,432	0
256	349	966	0	0	0	0	15	2	9	26	0
265	1,048	2,843	648	1,455	0	0	888	14	45	947	0
276	2	6	0	0	8	14	0	0	4	4	0
277	45	135	0	0	0	0	184	21	43	248	0
317	286	792	58	152	0	0	13	0	4	17	0
325	562	1,486	104	236	0	0	35	43	31	109	0
472	1,089	2,320	64	108	0	0	51	16	28	95	0
Total	**10,134**	**24,803**	**2,888**	**5,270**	**412**	**752**	**3,193**	**1,319**	**2,445**	**6,957**	**4,881**
2035 ZONAL DATA											
ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
105	1,128	3,292	585	966	404	738	103	814	1,601	2,518	701
181	881	2,342	183	470	0	0	32	4	155	191	782
194	1,267	3,136	120	207	0	0	107	112	247	466	3,257
217	1,200	2,454	334	402	0	0	42	434	194	670	701
225	150	295	505	870	0	0	8	4	27	39	0
228	1,101	3,316	0	0	0	0	106	24	111	241	842
238	104	327	5	9	0	0	212	64	6	282	0
240	264	678	38	59	0	0	47	8	24	79	0
241	1,044	2,340	798	1,259	0	0	127	69	125	321	701
250	835	2,491	0	0	0	0	1,321	22	108	1,451	0
256	349	1,053	0	0	0	0	15	2	9	26	0
265	1,925	5,529	808	1,943	0	0	2,453	286	236	2,975	701
276	758	2,116	730	1,695	405	740	234	650	905	1,789	701
277	45	147	0	0	0	0	184	21	43	248	0
317	972	2,851	148	412	0	0	1,930	193	37	2,160	0
325	1,149	3,292	119	292	0	0	117	218	240	575	0
472	1,151	2,660	64	121	0	0	51	39	58	148	0
Total	**14,323**	**38,319**	**4,437**	**8,705**	**809**	**1,478**	**7,089**	**2,964**	**4,126**	**14,179**	**8,386**
Difference	*4,189*	*13,516*	*1,549*	*3,435*	*397*	*726*	*3,896*	*1,645*	*1,681*	*7,222*	*3,505*

Five Highlighted TAZ's

2007	1,404	3,665	328	401	8	14	1,750	105	201	2,056	0
2035	2,786	7,421	1,533	2,963	405	740	2,078	826	1,187	4,091	1,402
Difference	*1,382*	*3,756*	*1,205*	*2,562*	*397*	*726*	*328*	*721*	*986*	*2,035*	*1,402*

values in 2035 than in 2007. These include the following:

- TAZ No. 240 – Decrease of 145 multi-family dwelling units & 202 multi-family population
- TAZ No. 181 – Decrease of 18 service employees
- TAZ No. 194 – Decrease of 78 service employees
- TAZ No. 228 – Decrease of 20 service employees

In addition, three of the five TAZs immediately adjacent to SR 33 (i.e., TAZ Nos. 238, 250 and 277) are not projected to experience much (if any) growth in either population or employment. The largest increases in population and employment are located in TAZ Nos. 276, 317 and 325. A review of the 2007 land use data for TAZ No. 265 indicates that this zone contains 1,048 single family dwelling units, 648 multi-family dwelling units and 947 employees. This TAZ is located to the west of the Polk Parkway and is bordered by Saddle Creek Road (on the south) and I-4 (to the north). Based on a review of 2010 aerial photography, the number of single family and multi-family dwelling units included in the 2007 model for this zone appears to be significantly overestimated. In addition, the 2010 aerial photography also indicates that there is only one significant business located in this zone. Saddle Creek Corporation is located just north of Saddle Creek Road and to the east of N. Combee Road. This two million square foot warehouse and distribution center is also the company's corporate headquarters. Currently, this business employs approximately 2,000 people in 28 offices throughout the country and it appeared unlikely that almost 900 employees would be located in this one office. Almost all of the existing residential and industrial land uses in this zone are located either adjacent to N. Combee Road (south of the SR 33 intersection) or adjacent to Saddle Creek Road.

A preliminary assessment of the accuracy of the 2007 land use data was conducted for the five TAZs located adjacent to the SR 33 study corridor as well as TAZ No. 265. This preliminary assessment was based on a comparison of the 2007 model data and actual 2010 data. The number of single family and multi-family dwelling units present in these six TAZs in the year 2010 was determined by using a combination of 2010 aerial photography and information obtained from the Polk County Property Appraiser's website. The number of industrial, commercial and service employees was obtained from the 2010 InfoUSA database. **Table 3-2** provides a comparison of the 2007 and 2010 dwelling units and employees.

Table 3-2 indicates that the 2007 model overestimates the number of single family and multi-family dwelling units located in TAZ No. 265. The 2007 model also appears to have underestimated the number of multi-family dwelling units present in TAZ Nos. 238 and 241. With respect to total employment, the largest differences between the 2007 and 2010 values are associated with TAZ Nos. 250, 265 and 277. There is also

a significant difference between the two distributions of employees in TAZ No. 250. The 2007 model indicates that approximately 92.2% of the total employees are industrial employees, while the 2010 InfoUSA data indicates that approximately 82.2% of the total employees are service employees.

Based on the results of the initial 2007 and 2035 land use data comparison that was conducted for 17 TAZs and the follow-up assessment of the accuracy of the 2007 land use data for six of these 17 TAZs, a decision was made to expand the land use data review to include an additional 7 TAZs (for a total of 24 TAZs). The results of this expanded review and the specific land use data modifications that were subsequently made are discussed in **Section 3.3** of this memorandum.

TABLE 3-2: LAND USE DATA COMPARISON (2007 VS. 2010)

YEAR	TAZ	SFDU	MFDU	TOTAL	IND	COM	SER	TOTAL
2007	238	86	0	86	212	64	6	282
2010		109	240	349	227	29	6	262
Difference		**-23**	**-240**	**-263**	**-15**	**35**	**0**	**20**
2007	241	436	328	764	33	6	51	90
2010		498	1,838	2,336	26	7	43	76
Difference		**-62**	**-1,510**	**-1,572**	**7**	**-1**	**8**	**14**
2007	250	835	0	835	1,321	14	97	1,432
2010		826	0	826	37	192	1,054	1,283
Difference		**9**	**0**	**9**	**1,284**	**-178**	**-957**	**149**
2007	265	1,048	648	1,696	888	14	45	947
2010		424	46	470	23	21	26	70
Difference		**624**	**602**	**1,226**	**865**	**-7**	**19**	**877**
2007	276	2	0	2	0	0	4	4
2010		139	12	151	1	2	3	6
Difference		**-137**	**-12**	**-149**	**-1**	**-2**	**1**	**-2**
2007	277	45	0	45	184	21	43	248
2010		42	0	42	3	22	61	86
Difference		**3**	**0**	**3**	**181**	**-1**	**-18**	**162**

3.1.5 External Station Volumes

An external station AADT volume equal to 7,435 vpd is included in the 2007 base year model for SR 33 at the Polk/Lake County line. The two closest FDOT count stations to the Polk/Lake County line on SR 33 are Station No. 111000 and Station No. 160001. These stations are located south of CR 561 in Lake County and north of Deen Still Road in Polk County, respectively. There are two east/west roads (CR 474 and Rock Ridge Road) located between these two counts stations. The 2007 AADT volume at Station No. 111000 was 7,300 vpd, while the 2007 AADT volume at Station No. 160001 was 7,000 vpd. Based on the 2007 AADT volumes recorded at these two count stations, the SR 33 external station volume included in the 2007 model is reasonable. A SR 33 external station volume equal to 10,568 vpd is included in the 2035 model. This

represents a 42.0% increase in the external station AADT volume over the 28-year period (or a 1.5% per year increase) and was also viewed as being reasonable.

3.1.6 Validation Accuracy of the Original Base Year Model

A comparison of the 2007 AADT volumes obtained from the base year model and the actual 2007 AADT volumes was conducted to assess the validation accuracy of the base year model within the SR 33 study corridor. The 2007 model volumes and actual volumes are provided in **Table 3-3**. Roadway network plots of the 2007 model AADT volumes are also provided in **Appendix F**. The 2007 model volumes on SR 33 south and north of the I-4 interchange are approximately 4,600 vpd and 14,300 vpd, respectively. The actual 2007 volumes were 9,300 vpd and 12,100 vpd, respectively. Therefore, the 2007 model is underestimating the volume on SR 33 south of I-4 by 4,700 vpd (approximately 51%) and overestimating the volume on SR 33 north of I-4 by 2,200 vpd (approximately 18%). The 2007 model volume on N. Combee Road just south of SR 33 is approximately 4,000 vpd while the actual 2007 volumes was 6,900 vpd. Consequently, the 2007 model is underestimating the volume at this location on N. Combee Road by approximately 42%. It should be noted that although these percentage differences are large, the actual magnitude of the volume differences range between 2,200 vpd and 4,700 vpd. The large percentage differences are the result of the low AADT volumes that existed at these three locations in 2007.

Table 3-3 also illustrates that the 2007 model volumes on I-4 east and west of the SR 33 interchange are also both lower than the actual 2007 volumes. Although the differences between the model volumes and the actual volumes are in the range of 4,300 to 5,600 vpd, the percentage differences are both less than 10%. Based on a review of the model volumes and the actual volumes for the other roadways located south and north of the study corridor, it appeared that overall the 2007 model is underestimating the daily traffic volumes. It was believed that this could be an indication that some of the other 2007 land use data that is included in the model is lower than the actual values.

TABLE 3-3: 2007 COUNTS VS. ORIGINAL 2007 POLK TPO MODEL VOLUMES

Roadway	Location	2007 Count	2007 Original TPO Model	
			Two-Way AADT Volume	% Difference
SR 33	South of I-4	9,300	4,600	-50.50%
	North of I-4	12,100	14,300	18.20%
N. Combee Road	South of SR 33	6,900	4,000	-42.00%
I-4	West of SR 33	75,000	69,400	-7.50%
	East of SR 33	68,500	64,200	-6.30%

A select link trace assignment was conducted for the SR 33 roadway link located just north of N. Combee Road to review the distribution of the 2007 model AADT volume on this portion of SR 33. **Figure 3-10** illustrates this select link trace assignment. A review of **Figure 3-10** indicates that a majority of the volume on SR 33 north of N. Combee Road travels on N. Combee Road. The only volume that travels on SR 33 to the west of N. Combee Road is a small percentage of vehicles (approximately 6.9%) that enter/exit TAZ No. 238 via the northern centroid connector. **Figure 3-10** also indicates that approximately 38.6% of the volume on SR 33 north of N. Combee Road travels on I-4 east of SR 33 and approximately 31.0% travels on SR 33 north of Tomkow Road.

A select link trace assignment was also conducted for the SR 33 roadway link located between the northern and southern portions of Old Combee Road. **Figure 3-11** illustrates this select link trace assignment. A review of **Figure 3-11** indicates that approximately 66.1% of the volume on this SR 33 link travels on Old Combee Road to the east of SR 33 with 44.4% using N. Combee Road and 21.7% using Lake Parker Drive. **Figure 3-11** also indicates that approximately 62.3% of the volume on this SR 33 link travels on Old Combee Road to the north and west of SR 33 while 37.7% travels on SR 33 to the south and west of this link. Approximately 25.2% of the select link volume accesses I-4 via the CR 582 interchange for travel to and from the west; while 0.0% accesses I-4 via this interchange for travel to and from the east.

The two select link trace assignments conducted using the 2007 Polk TPO model suggest that the SR 33 study corridor was not primarily functioning as a through route in 2007. This may be due to the geographical orientation of both the SR 33 study corridor and I-4.

3.1.7 Reasonableness of the Original 2035 Model AADT Volumes

The 2035 Polk County TPO travel demand model was run and the Peak Season Weekday Average Daily Traffic (PSWADT) volumes estimated by the model were converted to AADT volumes. This was accomplished by multiplying the PSWADT volumes on SR 33 by 0.92 and the PSWADT volumes on I-4 by 0.94. These values were the most current Model Output Conversion Factors (MOCF) for the Polk County model at the time this review was conducted. These 2035 AADT volumes were compared to the 2007 AADT volumes derived from the base year model, and this comparison is provided in **Table 3-4**. Roadway network plots of the 2035 model AADT volumes are also provided in **Appendix F**.

A review of this table indicates that minimal growth in model AADT volumes is projected to occur for the portion of SR 33 north of I-4. In addition, the 2035 AADT volumes projected for Tomkow Road north of SR 33 and N. Combee Road south of SR 33 are slightly lower than the 2007 AADT volumes. Since the 2007 model is underestimating the actual 2007 AADT volumes at many locations, the 2035 model AADT volumes represent even smaller increases in AADT volumes than what is indicated in **Table 3-4**.

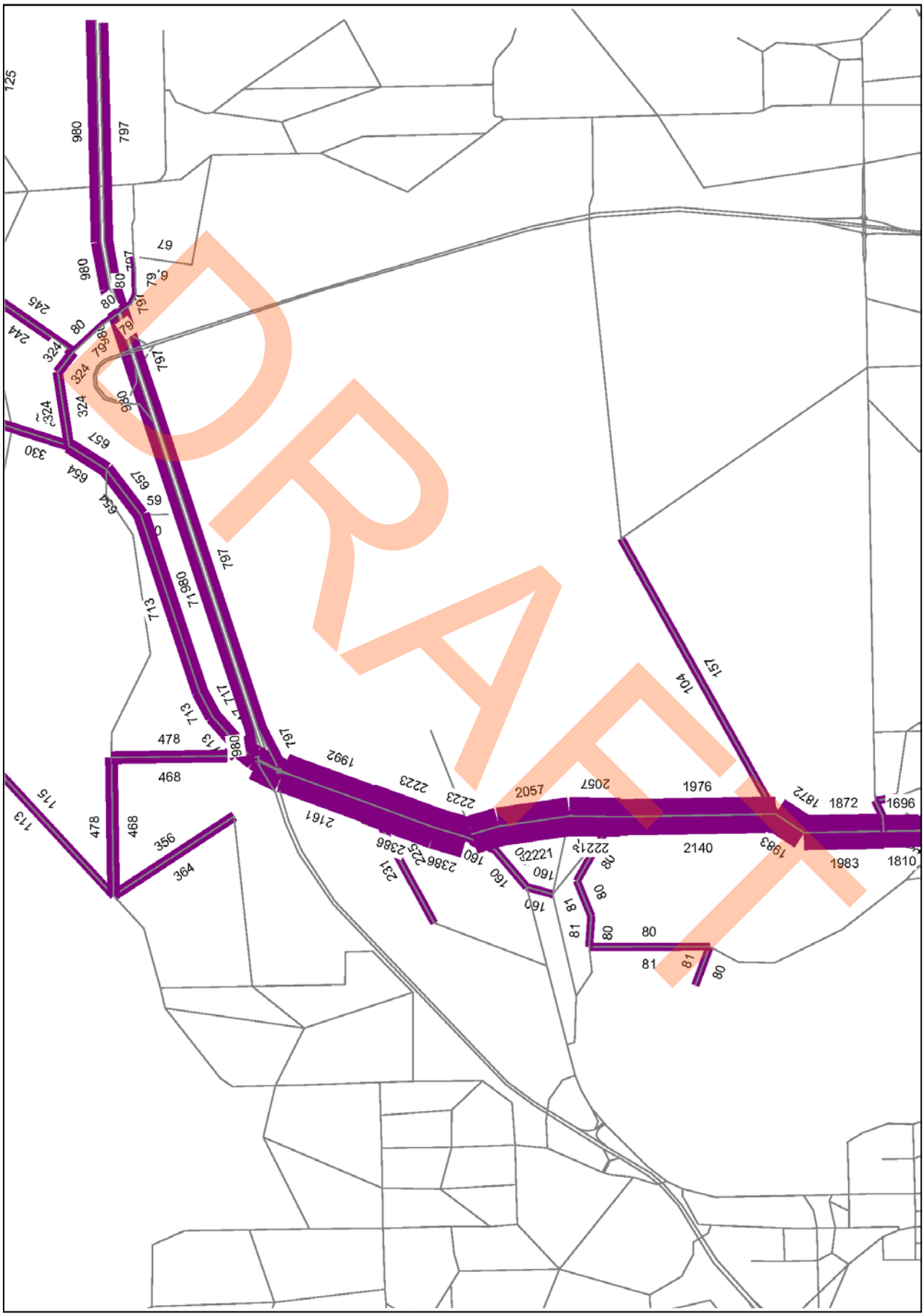


FIGURE 3-10: ORIGINAL POLK TPO 2007 MODEL SELECT LINK TRACE ASSIGNMENT – SR 33 NORTH OF N. COMBEE ROAD

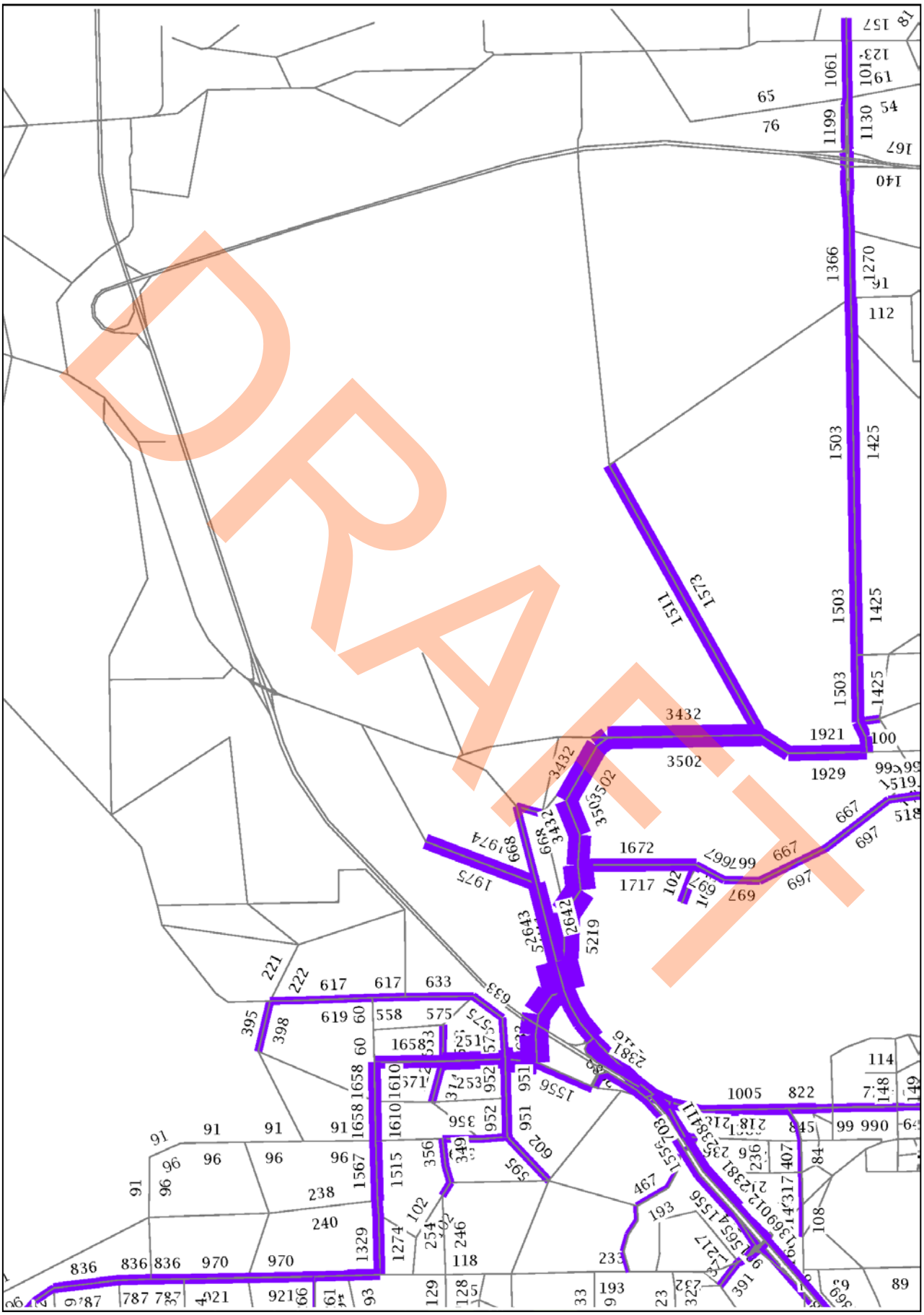


FIGURE 3-11: ORIGINAL POLK TPO 2007 MODEL SELECT LINK TRACE ASSIGNMENT – SR 33 SOUTH OF OLD COMBEE ROAD SOUTH

TABLE 3-4: ORIGINAL POLK TPO MODEL AADT VOLUME COMPARISON

Roadway	Location	2007 Polk TPO Model	2035 Polk TPO Model	Increase
SR 33	West of Old Combee Road S.	14,400	39,500	25,100
	East of Old Combee Road S.	4,900	24,500	19,600
	West of N. Combee Road	300	14,900	14,600
	North of N. Combee Road	4,200	18,800	14,600
	South of I-4	4,600	12,100	7,500
	North of I-4	14,300	14,900	600
	East of Tomkow Road	9,900	11,100	1,200
I-4*	West of CR 582/SR 33	69,800	98,400	28,600
	West of SR 33	69,400	99,400	30,000
	East of SR 33	64,200	99,200	35,000
	East of Polk Parkway	64,300	105,000	40,700
Old Combee Road S.	South of SR 33	9,600	16,100	6,500
	West of N. Combee Road	7,000	12,800	5,800
N. Combee Road	North of Saddle Creek Road	12,800	17,700	4,900
	South of Old Combee Road	10,600	15,400	4,800
	South of SR 33	4,000	3,800	-200
Tomkow Road	North of SR 33	4,300	3,800	-500

* The AADT volumes for I-4 were derived using a Model Output Conversion Factor (MOCF) equal to 0.94.

A select link trace assignment was conducted for the SR 33 roadway link located just north of N. Combee Road to review the distribution of the 2035 AADT volume on this portion of SR 33. **Figure 3-12** illustrates this select link trace assignment. A review of **Figure 3-12** indicates that approximately 78.0% of the select link volume travels on SR 33 south and west of the N. Combee Road intersection while only 20.0% of this volume travels on N. Combee Road. This distribution is significantly different than the 2007 model distribution and is at least partially influenced by the capacity and the UROAD factor values coded for I-4 in the 2035 model. The 2007 and 2035 volume-to-capacity ratios for the portion of I-4 between the CR 582 and SR 33 interchanges are 0.55 and 0.79, respectively. Although this six-lane portion of I-4 is projected to be well below capacity in 2035, the UROAD factor is equal to 0.68. This factor is often referred to as the "practical" capacity and represents the assumed level of congestion when travelers begin to seek an alternative travel route. In addition, only 20.4% of the volume on SR 33 north of N. Combee Road travels on I-4 east of SR 33 and only 19.4% travels on SR 33 north of Tomkow Road. These distribution percentages are significantly lower than the corresponding 2007 model distribution percentages as a result of the inclusion of University Boulevard in the 2035 model network. Approximately 54.0% of the volume on SR 33 north of N. Combee Road travels on University Boulevard and more than half of this (i.e., 29.6%) travels east of Florida Polytechnic University. This indicates that in the future, University Boulevard will serve as an alternative route to I-4 and the Polk Parkway for vehicles traveling to and from the land uses located on the east side of the Polk Parkway.

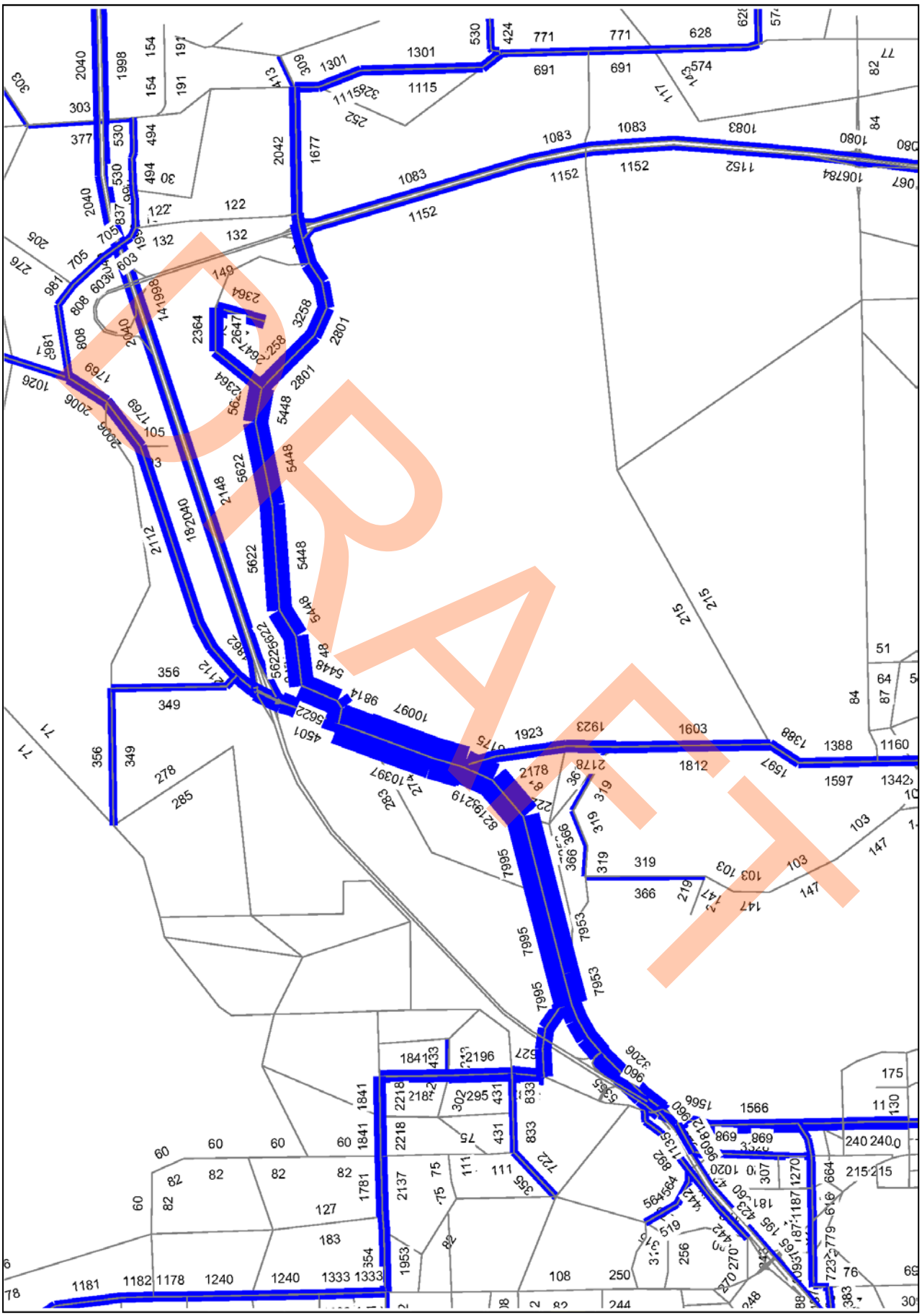


FIGURE 3-12: ORIGINAL POLK TPO 2035 MODEL SELECT LINK TRACE ASSIGNMENT – SR 33 NORTH OF N. COMBEE ROAD

3.2 Travel Demand Model Revisions

Based on the reviews of the 2007 and 2035 Polk TPO travel demand models, some revisions/modifications were made to these models. These revisions/modifications included the following:

- TAZ structure (boundary modifications and several zone splits)
- Centroid connectors (additions, relocations and removals)
- Land use data
- Facility type coding and number of lanes
- Toll link coding

The following sections discuss the specific revisions/modifications that were made to the original 2007 and 2035 models.

3.2.1 TAZ Structure Modifications

The Polk TPO models contained nine dummy zones that were used to create additional TAZs. TAZ Nos. 105, 241, and 250 were subdivided based on the locations of the local roadways and the I-4/CR 582/SR 33 interchange ramps. TAZ No. 105 originally included the area bordered by I-4 (on the south and east), Old Combee Road (on the north), and N. Socrum Loop Road (on the west); however, this zone was subdivided into three zones based on the locations of Old Combee Road and the westbound on-and off-ramps at the I-4/CR 582/SR 33 interchange. New TAZ No. 67 is bordered by I-4 (on the south and east), the westbound I-4 on-ramp (on the north), and N. Socrum Loop Road (on the west); while new TAZ No. 68 is bordered by the westbound I-4 off-ramp (on the south), I-4 (on the east), Old Combee Road (on the north), and N. Socrum Loop Road (on the west). The eastern boundary of TAZ No. 105 was relocated to N. Socrum Loop Road.

TAZ No. 241 originally encompassed the entire area between I-4 and the portion of SR 33 on the south side of I-4; however, this zone was subdivided into five zones (i.e., TAZ Nos. 235, 241, 423, 471, and 577). New TAZ No. 235 is generally bordered by Huron Way and Maggiore Boulevard (on the west) and portions of Lake Luther Road, Lakewood Road, and a north/south line to the east of Lakewood Lane. The modified TAZ No. 241 is located to the east of TAZ No. 235 and encompasses the existing Bridgewater residential development. New TAZ No. 423 is located to the east of TAZ No. 241 and encompasses the existing Firstpark at Bridgewater Industrial Park. New TAZ No. 471 is located to the west of TAZ No. 235 and extends westward over to Old Combee Road while new TAZ No. 577 is located to the west of TAZ No. 471 and is bordered by SR 33 (on the south and east), Old Combee Road (on the north), and I-4 (on the west).

TAZ No. 250 originally encompassed the entire area bordered by I-4 (on the south), SR 33 (on the east), Old Polk City Road (on the north), and Walt Williams Road (on the west); however, this zone was subdivided into two zones based on the location of Tomkow Road. New TAZ No. 576 is located to the east of Tomkow Road while the remaining portion of the original TAZ No. 250 is located to the west of Tomkow Road.

In addition, a new TAZ (i.e., TAZ No. 204) was created on the south side of SR 33 to the west of Melody Lane. As stated earlier in **Section 3.1.1**, the boundaries of this zone appeared to be defined in the Polk TPO model; however, this "zone" had no zone number, zonal data or centroid connectors associated with it. TAZ No. 204 includes the Lakeland Harbor residential community that is located on the south side of SR 33. The sole access for this residential development is via Lakeland Harbor Boulevard which is located directly across from the eastbound I-4 on- and off-ramps at the CR 582/SR 33 interchange. The original Polk TPO models also included a zonal boundary located just west of Lake Parker Drive and north of Lake Parker that did not have a zone number or any centroid connectors associated with it. Since this area currently contains a wastewater plant and a power plant, a new TAZ (i.e., TAZ No. 224) was created using this existing zonal boundary along with the appropriate number of industrial employees.

Lastly, the north/south boundary between TAZ Nos. 265 and 276 was replaced with an east/west boundary since there is no existing north/south roadway in this area. Tenoroc Mine Road is an existing east/west road that intersects N. Combee Road south of the intersection at Old Combee Road and extends across most of the land located between N. Combee Road and the Polk Parkway. The location of this existing east/west roadway was used as the revised boundary between these two TAZs. **Figure 3-13** illustrates the revised TAZ structure that was incorporated in both the 2007 and 2035 travel demand models.

3.2.2 Centroid Connector Modifications

Ten additional centroid connectors were added due to the creation of the nine new TAZs. **Figures 3-14** through **3-18** illustrate the locations of these new centroid connectors (blue dashed lines) as well as the locations of the centroid connectors that were included in the original TPO models (red dashed lines). **Figures 3-15** through **3-18** also indicate that several original centroid connectors were either eliminated or relocated (these are denoted with black "X''s). The location of the centroids associated with TAZ Nos. 250 and 265 were modified to more accurately reflect the density/distribution of the existing land uses within these two zones. **Figures 3-16** and **3-18** illustrate these shifts in centroid location as well as the corresponding changes in centroid connector lengths.

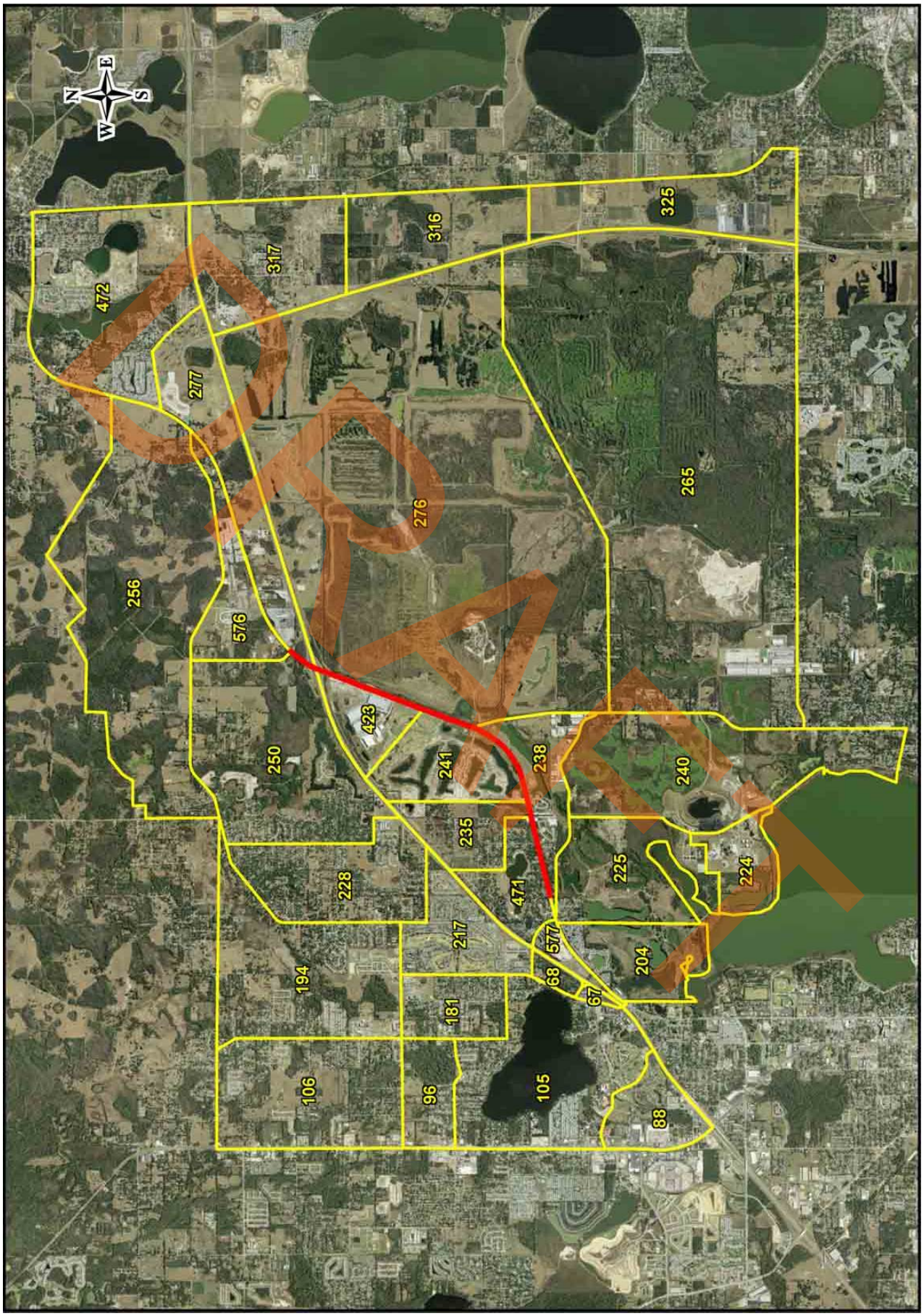


FIGURE 3-13: SR 33 STUDY AREA TRAFFIC ANALYSIS ZONE BOUNDARIES – REVISED POLK TPO TRAVEL DEMAND MODELS

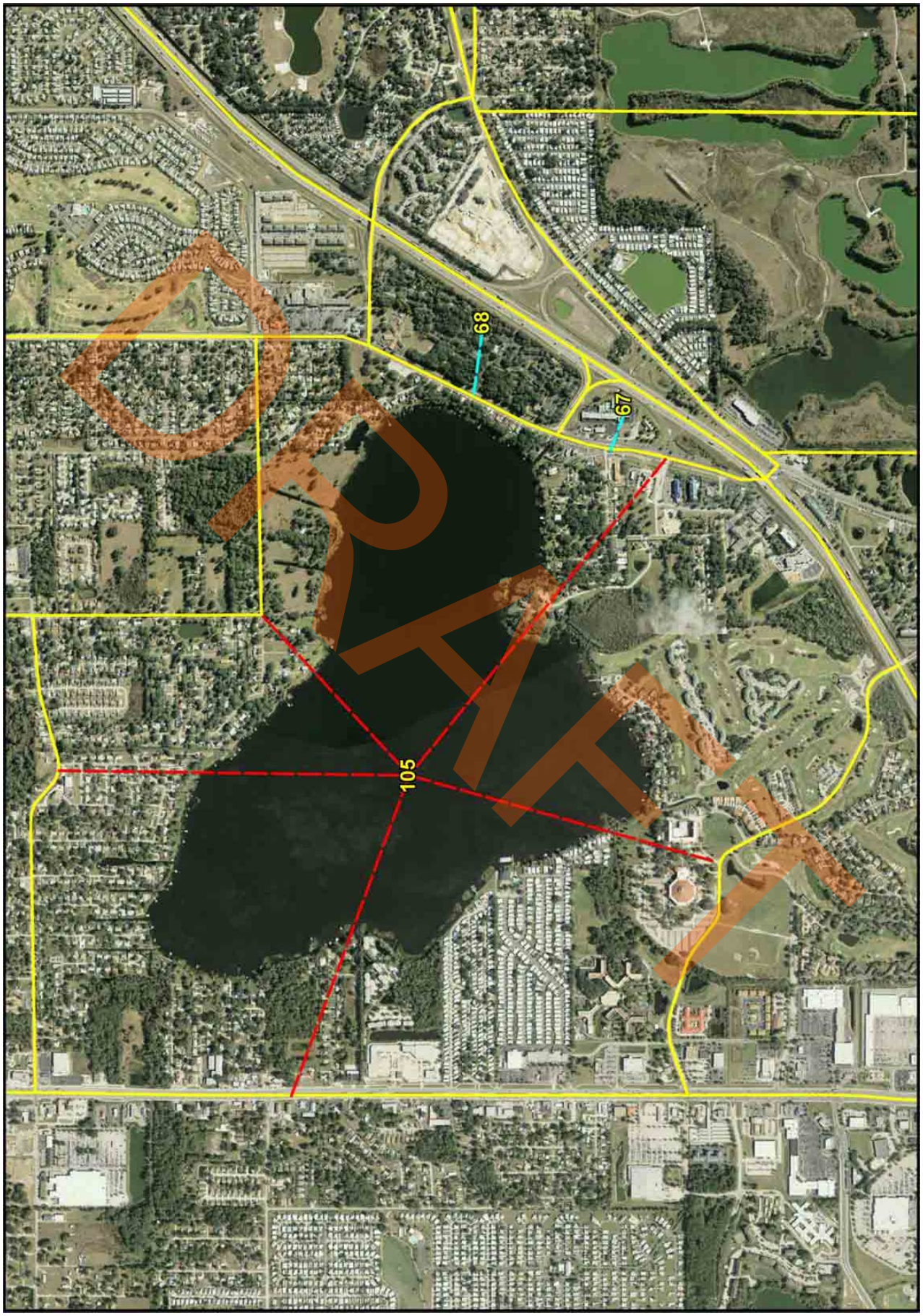


FIGURE 3-14: SR 33 STUDY AREA CENTROID CONNECTOR REVISIONS – TRAFFIC ANALYSIS ZONES 67, 68 AND 105

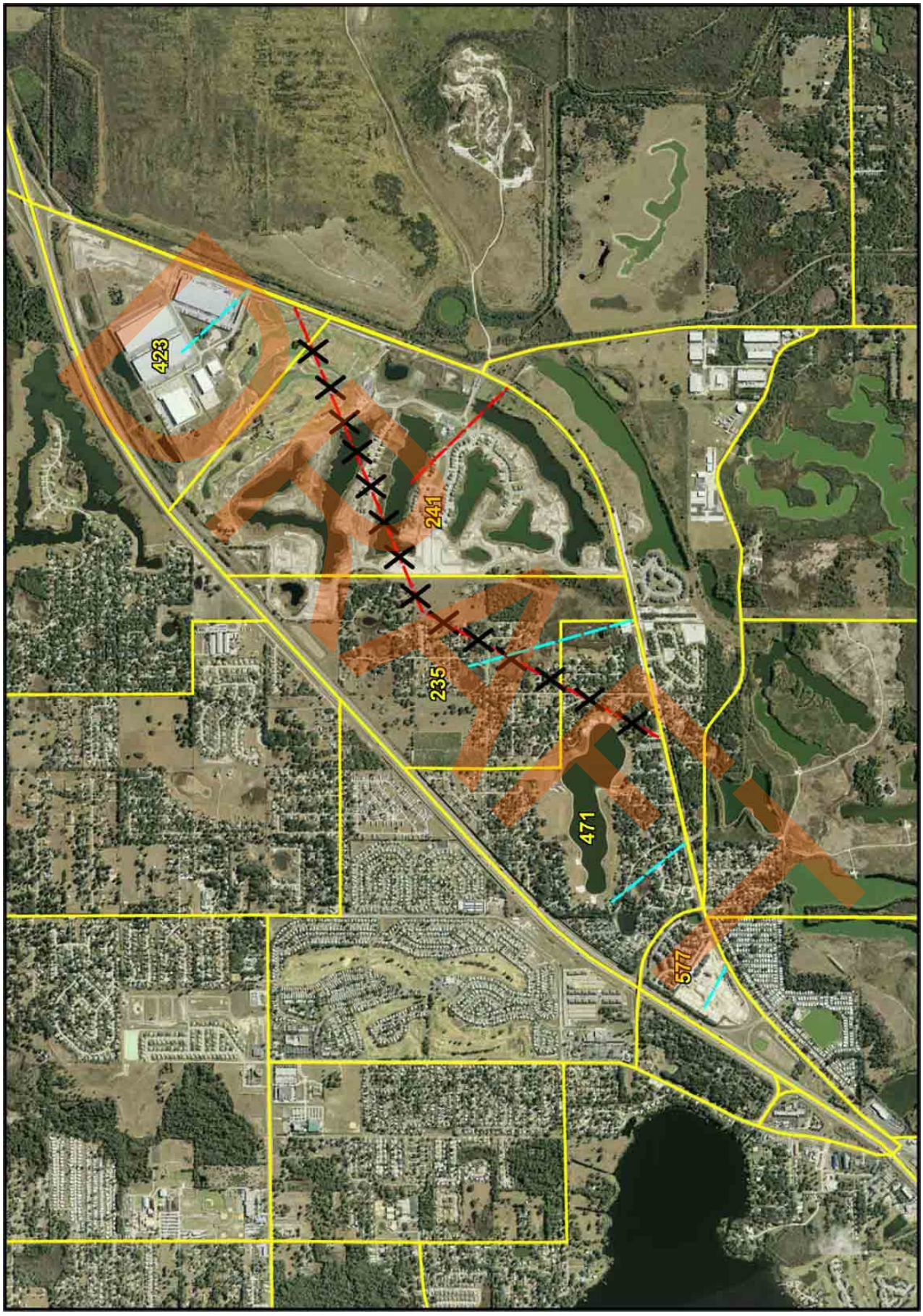


FIGURE 3-15: SR 33 STUDY AREA CENTROID CONNECTOR REVISIONS – TRAFFIC ANALYSIS ZONES 235, 241, 423, 471, AND 577

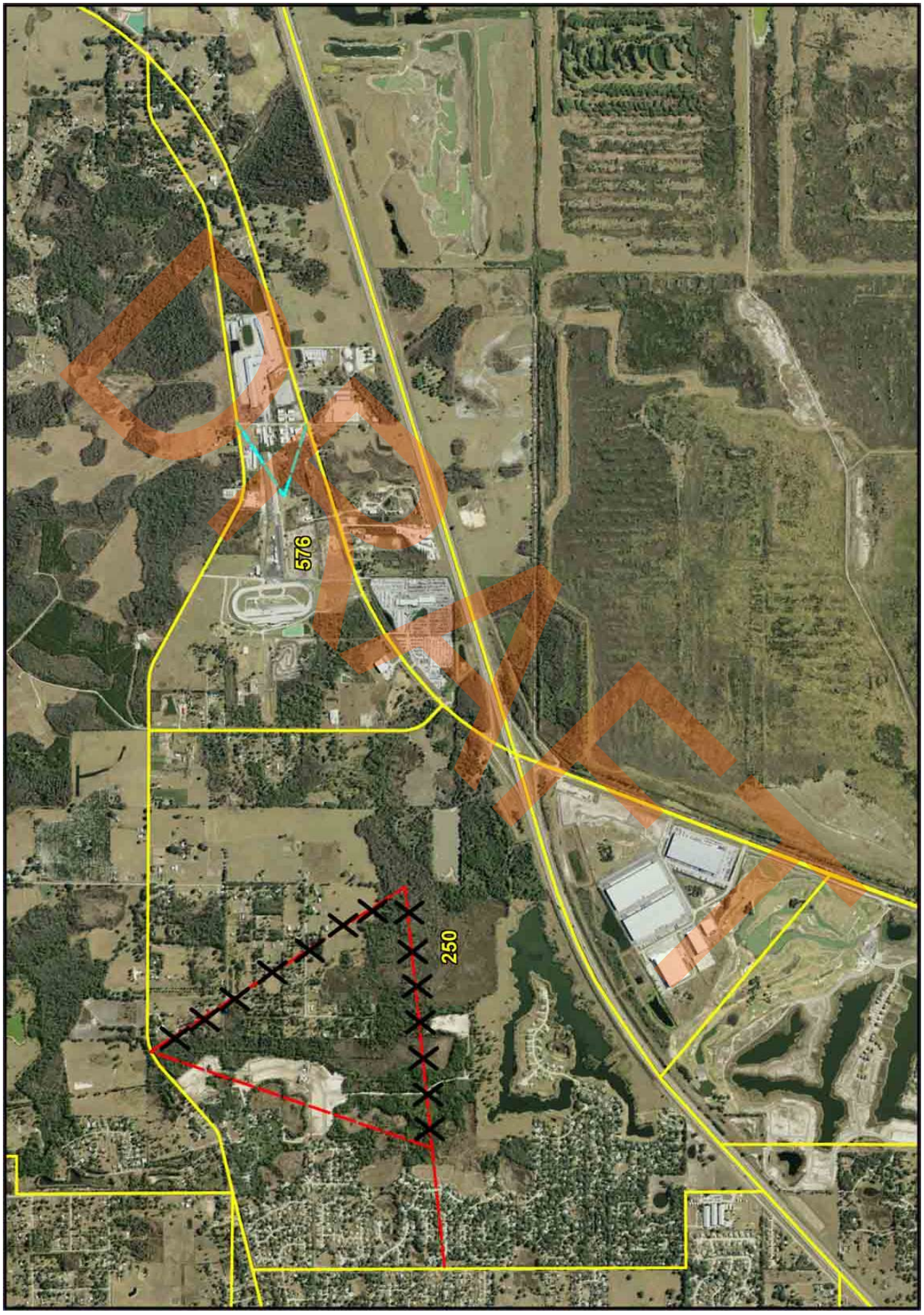


FIGURE 3-16: SR 33 STUDY AREA CENTROID CONNECTOR REVISIONS – TRAFFIC ANALYSIS ZONES 250 AND 576

FIGURE 3-17: SR 33 STUDY AREA CENTROID CONNECTOR REVISIONS – TRAFFIC ANALYSIS ZONES 204, 224 AND 225

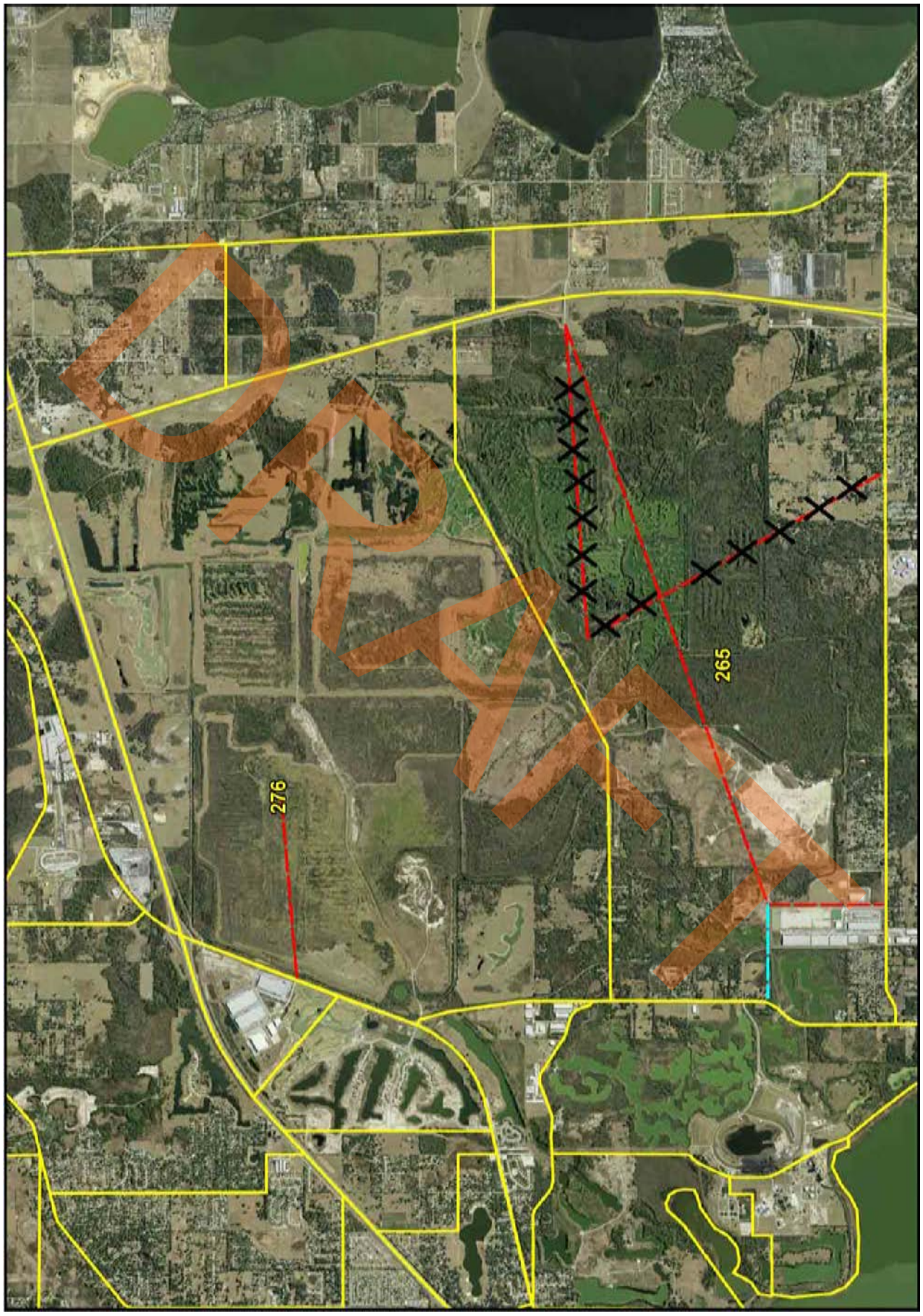


FIGURE 3-18: SR 33 STUDY AREA CENTROID CONNECTOR REVISIONS – TRAFFIC ANALYSIS ZONES 265 AND 276

3.2.3 Land Use Data Modifications

Table 3-5 summarizes the 2007 land use data that was contained in the TPO's original base year model as well as the revised 2007 land use data that was developed based on an inventory that was conducted for 31 TAZs located either immediately adjacent to the SR 33 study corridor or in the vicinity of the study corridor. The 31 TAZs listed in **Table 3-5** include the seven new TAZs that were created by subdividing the original TAZ Nos. 105, 241 and 250. This inventory included a review of 2007 aerial photography, information from the Polk County Property Appraiser's website, 2007 employment data obtained from the InfoUSA database, and interviews with local businesses and hotel owners/operators.

A review of **Table 3-5** indicates that the single family dwelling units were reduced by 995 units while the multi-family dwelling units were increased by 2,101 units. Similarly, the associated single family population was reduced by 2,828 persons while the multi-family population was increased by 2,507 persons. This resulted in a net decrease in total population of 321 persons. Although the total number of single family dwelling units (and the corresponding single family population) for these 31 TAZs was reduced, the total number of single family dwelling units and the total single family population for the eight TAZs immediately adjacent to the study corridor (i.e., TAZ Nos. 235, 238, 241, 250, 276, 423, 471, and 576) were actually increased by 292 units and 686 persons, respectively. The total number of multi-family dwelling units and the total multi-family population for the eight TAZs immediately adjacent to the study corridor were increased by 867 units and 1,063 persons, respectively. This resulted in a net increase in total population of 1,749 persons for these eight TAZs.

Table 3-5 also indicates that the industrial and service employment for the 31 TAZs was decreased by 1,877 and 201 employees, respectively. The commercial employment was increased by 769 employees. This resulted in a net reduction in total employment of 1,309 employees; however, the revised 2007 employment data actually reflects a smaller decrease in total employment (i.e., 81 employees) for the eight TAZs immediately adjacent to the study corridor.

Table 3-6 provides a comparison of the 2035 land use data that was contained in the original 2035 model and both the original and revised 2007 land use data. A review of this table indicates that the original 2035 land use data is less than the revised (actual) 2007 land use data for multiple TAZs. This is primarily because the 2007 land use data that is contained in the Polk TPO's base year model is lower than the actual 2007 land use data based on the inventories that were conducted. There are also several TAZs where the original 2035 model land use data is less than the original 2007 model land use data.

TABLE 3-5: LAND USE DATA COMPARISON – 2007 (ORIGINAL) VS. 2007 (REVISED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
88	238	648	194	383	183	334	45	1,010	478	1,533	208
88	**209**	**569**	**320**	**632**	**189**	**345**	**6**	**915**	**309**	**1,230**	**208**
Difference	**-29**	**-79**	**126**	**249**	**6**	**11**	**-39**	**-95**	**-169**	**-303**	**0**
96	227	454	221	427	0	0	29	44	207	280	136
96	**225**	**450**	**198**	**383**	**0**	**0**	**10**	**38**	**50**	**98**	**136**
Difference	**-2**	**-4**	**-23**	**-44**	**0**	**0**	**-19**	**-6**	**-157**	**-182**	**0**
105	826	1,931	582	956	404	738	103	574	1,281	1,958	0
105	**1,169**	**2,733**	**1,013**	**1,664**	**676**	**1,235**	**74**	**613**	**1,241**	**1,928**	**0**
67	**0**	**0**	**0**	**0**	**144**	**263**	**0**	**9**	**26**	**35**	**0**
68	**0**	**0**	**464**	**751**	**0**	**0**	**5**	**0**	**143**	**148**	**0**
Difference	**343**	**802**	**895**	**1,459**	**416**	**760**	**-24**	**48**	**129**	**153**	**0**
106	694	1,487	165	341	0	0	150	363	181	694	0
106	**700**	**1,500**	**210**	**434**	**0**	**0**	**159**	**362**	**219**	**740**	**0**
Difference	**6**	**13**	**45**	**93**	**0**	**0**	**9**	**-1**	**38**	**46**	**0**
181	675	1,677	176	416	0	0	32	4	173	209	782
181	**676**	**1,679**	**182**	**430**	**0**	**0**	**14**	**2**	**138**	**154**	**782**
Difference	**1**	**2**	**6**	**14**	**0**	**0**	**-18**	**-2**	**-35**	**-55**	**0**
194	1,262	3,056	120	207	0	0	107	112	325	544	3,257
194	**1,010**	**2,446**	**117**	**202**	**0**	**0**	**62**	**107**	**325**	**494**	**3,257**
Difference	**-252**	**-610**	**-3**	**-5**	**0**	**0**	**-45**	**-5**	**0**	**-50**	**0**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

Difference = 2007 Inventory value - 2007 Polk TPO Model value

TABLE 3-5: LAND USE DATA COMPARISON – 2007 (ORIGINAL) VS. 2007 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
204	0	0	0	0	0	0	0	0	0	0	0
204	**0**	**0**	**450**	**776**	**0**	**0**	**0**	**90**	**0**	**90**	**0**
Difference	**0**	**0**	**450**	**776**	**0**	**0**	**0**	**90**	**0**	**90**	**0**
217	1,183	2,220	125	216	0	0	42	413	166	621	0
217	**1,463**	**2,745**	**123**	**213**	**0**	**0**	**2**	**394**	**109**	**505**	**0**
Difference	**280**	**525**	**-2**	**-3**	**0**	**0**	**-40**	**-19**	**-57**	**-116**	**0**
224	0	0	0	0	0	0	0	0	0	0	0
224	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**220**	**220**	**0**
Difference	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**220**	**220**	**0**
225	111	246	500	862	0	0	4	4	27	35	0
225	**111**	**246**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**4**	**0**
Difference	**0**	**0**	**-500**	**-862**	**0**	**0**	**-4**	**-1**	**-26**	**-31**	**0**
228	1,096	3,029	0	0	0	0	106	24	131	261	842
228	**1,115**	**3,082**	**3**	**5**	**0**	**0**	**22**	**23**	**108**	**153**	**842**
Difference	**19**	**53**	**3**	**5**	**0**	**0**	**-84**	**-1**	**-23**	**-108**	**0**
238	86	250	0	0	0	0	212	64	6	282	0
238	**109**	**317**	**240**	**293**	**0**	**0**	**227**	**29**	**6**	**262**	**0**
Difference	**23**	**67**	**240**	**293**	**0**	**0**	**15**	**-35**	**0**	**-20**	**0**
240	243	572	183	261	0	0	47	8	24	79	0
240	**250**	**588**	**153**	**218**	**0**	**0**	**45**	**11**	**29**	**85**	**0**
Difference	**7**	**16**	**-30**	**-43**	**0**	**0**	**-2**	**3**	**5**	**6**	**0**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

Difference = 2007 Inventory value - 2007 Polk TPO Model value

TABLE 3-5: LAND USE DATA COMPARISON – 2007 (ORIGINAL) VS. 2007 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
241	436	989	328	401	0	0	33	6	51	90	0
241	**184**	**417**	**0**	**0**	**0**	**0**	**6**	**7**	**7**	**20**	**0**
235	**200**	**454**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**12**	**0**
423	**0**	**0**	**0**	**0**	**0**	**0**	**795**	**0**	**0**	**795**	**0**
471	**296**	**671**	**948**	**1,159**	**0**	**0**	**16**	**0**	**4**	**20**	**0**
577	**0**	**0**	**432**	**528**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Difference	**244**	**553**	**1,052**	**1,286**	**0**	**0**	**784**	**1**	**-28**	**757**	**0**
250	835	2,285	0	0	0	0	1,321	14	97	1,432	0
250	**829**	**2,269**	**2**	**3**	**0**	**0**	**18**	**172**	**28**	**218**	**0**
576	**17**	**43**	**5**	**9**	**0**	**0**	**350**	**0**	**50**	**400**	**0**
Difference	**11**	**27**	**7**	**12**	**0**	**0**	**-953**	**158**	**-19**	**-814**	**0**
256	349	966	0	0	0	0	15	2	9	26	0
256	**273**	**756**	**0**	**0**	**0**	**0**	**2**	**5**	**7**	**14**	**0**
Difference	**-76**	**-210**	**0**	**0**	**0**	**0**	**-13**	**3**	**-2**	**-12**	**0**
265	1,048	2,843	648	1,455	0	0	888	14	45	947	0
265	**562**	**1,525**	**58**	**130**	**0**	**0**	**24**	**743**	**27**	**794**	**0**
Difference	**-486**	**-1,318**	**-590**	**-1,325**	**0**	**0**	**-864**	**729**	**-18**	**-153**	**0**
275	686	1,929	41	91	0	0	339	149	101	589	0
275	**686**	**1,929**	**41**	**91**	**0**	**0**	**39**	**29**	**21**	**89**	**0**
Difference	**0**	**0**	**0**	**0**	**0**	**0**	**-300**	**-120**	**-80**	**-500**	**0**
276	2	6	0	0	8	14	0	0	4	4	0
276	**16**	**45**	**0**	**0**	**8**	**14**	**0**	**0**	**0**	**0**	**0**
Difference	**14**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**-4**	**-4**	**0**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

Difference = 2007 Inventory value - 2007 Polk TPO Model value

TABLE 3-5: LAND USE DATA COMPARISON – 2007 (ORIGINAL) VS. 2007 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
277	45	135	0	0	0	0	184	21	43	248	0
277	**42**	**126**	**0**	**0**	**0**	**0**	**4**	**22**	**70**	**96**	**0**
Difference	**-3**	**-9**	**0**	**0**	**0**	**0**	**-180**	**1**	**27**	**-152**	**0**
316	187	514	25	62	0	0	23	0	4	27	0
316	**17**	**47**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Difference	**-170**	**-467**	**-25**	**-62**	**0**	**0**	**-23**	**0**	**-4**	**-27**	**0**
317	286	792	58	152	0	0	13	0	4	17	0
317	**201**	**557**	**11**	**29**	**0**	**0**	**1**	**1**	**1**	**3**	**0**
Difference	**-85**	**-235**	**-47**	**-123**	**0**	**0**	**-12**	**1**	**-3**	**-14**	**0**
325	562	1,486	104	236	0	0	35	43	31	109	0
325	**166**	**439**	**15**	**34**	**0**	**0**	**13**	**44**	**6**	**63**	**0**
Difference	**-396**	**-1,047**	**-89**	**-202**	**0**	**0**	**-22**	**1**	**-25**	**-46**	**0**
472	1,089	2,320	64	108	0	0	51	16	28	95	0
472	**645**	**1,374**	**650**	**1,097**	**0**	**0**	**8**	**35**	**58**	**101**	**0**
Difference	**-444**	**-946**	**586**	**989**	**0**	**0**	**-43**	**19**	**30**	**6**	**0**
Total All Zones	12,166	29,835	3,534	6,574	595	1,086	3,779	2,885	3,416	10,080	5,225
	11,171	**27,007**	**5,635**	**9,081**	**1,017**	**1,857**	**1,902**	**3,654**	**3,215**	**8,771**	**5,225**
Difference	**-995**	**-2,828**	**2,101**	**2,507**	**422**	**771**	**-1,877**	**769**	**-201**	**-1,309**	**0**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

Difference = 2007 Inventory value - 2007 Polk TPO Model value

TABLE 3-6: LAND USE DATA COMPARISON – 2007 VS. 2035 (ORIGINAL)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
88	238	648	194	383	183	334	45	1,010	478	1,533	208
88	209	569	320	632	189	345	6	915	309	1,230	208
88	348	1,006	242	479	183	334	45	1,097	593	1,735	208
Difference	139	437	-78	-153	-6	-11	39	182	284	505	0
96	227	454	221	427	0	0	29	44	207	280	136
96	225	450	198	383	0	0	10	38	50	98	136
96	455	954	115	242	0	0	29	46	209	284	136
Difference	230	504	-83	-141	0	0	19	8	159	186	0
105	826	1,931	582	956	404	738	103	574	1,281	1,958	0
105	1,169	2,733	1,013	1,664	676	1,235	74	613	1,241	1,928	0
67	0	0	0	0	144	263	0	9	26	35	0
68	0	0	464	751	0	0	5	0	143	148	0
105	1,128	3,292	585	966	404	738	103	814	1,601	2,518	701
Difference	-41	559	-892	-1,449	-416	-760	24	192	191	407	701
106	694	1,487	165	341	0	0	150	363	181	694	0
106	700	1,500	210	434	0	0	159	362	219	740	0
106	1,385	3,109	80	175	0	0	150	508	348	1,006	701
Difference	685	1,609	-130	-259	0	0	-9	146	129	266	701
181	675	1,677	176	416	0	0	32	4	173	209	782
181	676	1,679	182	430	0	0	14	2	138	154	782
181	881	2,342	183	470	0	0	32	4	155	191	782
Difference	205	663	1	40	0	0	18	2	17	37	0

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

2035 Polk TPO Model value

Difference = 2035 Polk TPO Model value - 2007 Inventory value

TABLE 3-6: LAND USE DATA COMPARISON – 2007 VS. 2035 (ORIGINAL) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
194	1,262	3,056	120	207	0	0	107	112	325	544	3,257
194	**1,010**	**2,446**	**117**	**202**	**0**	**0**	**62**	**107**	**325**	**494**	**3,257**
194	**1,267**	**3,136**	**120**	**207**	**0**	**0**	**107**	**112**	**247**	**466**	**3,257**
Difference	**257**	**690**	**3**	**5**	**0**	**0**	**45**	**5**	**-78**	**-28**	**0**
204	0	0	0	0	0	0	0	0	0	0	0
204	**0**	**0**	**450**	**776**	**0**	**0**	**0**	**90**	**0**	**90**	**0**
204	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Difference	**0**	**0**	**-450**	**-776**	**0**	**0**	**0**	**-90**	**0**	**-90**	**0**
217	1,183	2,220	125	216	0	0	42	413	166	621	0
217	**1,463**	**2,745**	**123**	**213**	**0**	**0**	**2**	**394**	**109**	**505**	**0**
217	**1,200**	**2,454**	**334**	**402**	**0**	**0**	**42**	**434**	**194**	**670**	**701**
Difference	**-263**	**-291**	**211**	**189**	**0**	**0**	**40**	**40**	**85**	**165**	**701**
224	0	0	0	0	0	0	0	0	0	0	0
224	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**220**	**220**	**0**
224	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Difference	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-220**	**-220**	**0**
225	111	246	500	862	0	0	4	4	27	35	0
225	**111**	**246**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**4**	**0**
225	**150**	**295**	**505**	**870**	**0**	**0**	**8**	**4**	**27**	**39**	**0**
Difference	**39**	**49**	**505**	**870**	**0**	**0**	**8**	**1**	**26**	**35**	**0**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

2035 Polk TPO Model value

Difference = 2035 Polk TPO Model value - 2007 Inventory value

TABLE 3-6: LAND USE DATA COMPARISON – 2007 VS. 2035 (ORIGINAL) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
228	1,096	3,029	0	0	0	0	106	24	131	261	842
228	**1,115**	**3,082**	**3**	**5**	**0**	**0**	**22**	**23**	**108**	**153**	**842**
228	**1,101**	**3,316**	**0**	**0**	**0**	**0**	**106**	**24**	**111**	**241**	**842**
Difference	**-14**	**234**	**-3**	**-5**	**0**	**0**	**84**	**1**	**3**	**88**	**0**
238	86	250	0	0	0	0	212	64	6	282	0
238	**109**	**317**	**240**	**293**	**0**	**0**	**227**	**29**	**6**	**262**	**0**
238	**104**	**327**	**5**	**9**	**0**	**0**	**212**	**64**	**6**	**282**	**0**
Difference	**-5**	**10**	**-235**	**-284**	**0**	**0**	**-15**	**35**	**0**	**20**	**0**
240	243	572	183	261	0	0	47	8	24	79	0
240	**250**	**588**	**153**	**218**	**0**	**0**	**45**	**11**	**29**	**85**	**0**
240	**264**	**678**	**38**	**59**	**0**	**0**	**47**	**8**	**24**	**79**	**0**
Difference	**14**	**90**	**-115**	**-159**	**0**	**0**	**2**	**-3**	**-5**	**-6**	**0**
241	436	989	328	401	0	0	33	6	51	90	0
241	**184**	**417**	**0**	**0**	**0**	**0**	**6**	**7**	**7**	**20**	**0**
235	**200**	**454**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**12**	**0**
423	**0**	**0**	**0**	**0**	**0**	**0**	**795**	**0**	**0**	**795**	**0**
471	**296**	**671**	**948**	**1,159**	**0**	**0**	**16**	**0**	**4**	**20**	**0**
577	**0**	**0**	**432**	**528**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
241	**1,044**	**2,340**	**798**	**1,259**	**0**	**0**	**127**	**69**	**125**	**321**	**701**
Difference	**364**	**798**	**-582**	**-428**	**0**	**0**	**-690**	**62**	**102**	**-526**	**701**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

2035 Polk TPO Model value

Difference = 2035 Polk TPO Model value - 2007 Inventory value

TABLE 3-6: LAND USE DATA COMPARISON – 2007 VS. 2035 (ORIGINAL) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
250	835	2,285	0	0	0	0	1,321	14	97	1,432	0
250	**829**	**2,269**	**2**	**3**	**0**	**0**	**18**	**172**	**28**	**218**	**0**
576	**17**	**43**	**5**	**9**	**0**	**0**	**350**	**0**	**50**	**400**	**0**
250	**835**	**2,491**	**0**	**0**	**0**	**0**	**1,321**	**22**	**108**	**1,451**	**0**
Difference	**-11**	**179**	**-7**	**-12**	**0**	**0**	**953**	**-150**	**30**	**833**	**0**
256	349	966	0	0	0	0	15	2	9	26	0
256	**273**	**756**	**0**	**0**	**0**	**0**	**2**	**5**	**7**	**14**	**0**
256	**349**	**1,053**	**0**	**0**	**0**	**0**	**15**	**2**	**9**	**26**	**0**
Difference	**76**	**297**	**0**	**0**	**0**	**0**	**13**	**-3**	**2**	**12**	**0**
265	1,048	2,843	648	1,455	0	0	888	14	45	947	0
265	**562**	**1,525**	**58**	**130**	**0**	**0**	**24**	**743**	**27**	**794**	**0**
265	**1,925**	**5,529**	**808**	**1,943**	**0**	**0**	**2,453**	**286**	**236**	**2,975**	**701**
Difference	**1,363**	**4,004**	**750**	**1,813**	**0**	**0**	**2,429**	**-457**	**209**	**2,181**	**701**
275	686	1,929	41	91	0	0	339	149	101	589	0
275	**686**	**1,929**	**41**	**91**	**0**	**0**	**39**	**29**	**21**	**89**	**0**
275	**747**	**2,283**	**21**	**51**	**0**	**0**	**339**	**184**	**148**	**671**	**0**
Difference	**61**	**354**	**-20**	**-40**	**0**	**0**	**300**	**155**	**127**	**582**	**0**
276	2	6	0	0	8	14	0	0	4	4	0
276	**16**	**45**	**0**	**0**	**8**	**14**	**0**	**0**	**0**	**0**	**0**
276	**758**	**2,116**	**730**	**1,695**	**405**	**740**	**234**	**650**	**905**	**1,789**	**701**
Difference	**742**	**2,071**	**730**	**1,695**	**397**	**726**	**234**	**650**	**905**	**1,789**	**701**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

2035 Polk TPO Model value

Difference = 2035 Polk TPO Model value - 2007 Inventory value

TABLE 3-6: LAND USE DATA COMPARISON – 2007 VS. 2035 (ORIGINAL) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
277	45	135	0	0	0	0	184	21	43	248	0
277	**42**	**126**	**0**	**0**	**0**	**0**	**4**	**22**	**70**	**96**	**0**
277	**45**	**147**	**0**	**0**	**0**	**0**	**184**	**21**	**43**	**248**	**0**
Difference	**3**	**21**	**0**	**0**	**0**	**0**	**180**	**-1**	**-27**	**152**	**0**
316	187	514	25	62	0	0	23	0	4	27	0
316	**17**	**47**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
316	**474**	**1,393**	**25**	**68**	**0**	**0**	**558**	**405**	**4**	**967**	**0**
Difference	**457**	**1,346**	**25**	**68**	**0**	**0**	**558**	**405**	**4**	**967**	**0**
317	286	792	58	152	0	0	13	0	4	17	0
317	**201**	**557**	**11**	**29**	**0**	**0**	**1**	**1**	**1**	**3**	**0**
317	**972**	**2,851**	**148**	**412**	**0**	**0**	**1,930**	**193**	**37**	**2,160**	**0**
Difference	**771**	**2,294**	**137**	**383**	**0**	**0**	**1,929**	**192**	**36**	**2,157**	**0**

LEGEND:

2007 Polk TPO Model value

2007 Inventory value

2035 Polk TPO Model value

Difference = 2035 Polk TPO Model value - 2007 Inventory value

TABLE 3-6: LAND USE DATA COMPARISON – 2007 VS. 2035 (ORIGINAL) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
325	562	1,486	104	236	0	0	35	43	31	109	0
325	**166**	**439**	**15**	**34**	**0**	**0**	**13**	**44**	**6**	**63**	**0**
325	**1,149**	**3,292**	**119**	**292**	**0**	**0**	**117**	**218**	**240**	**575**	**0**
Difference	**983**	**2,853**	**104**	**258**	**0**	**0**	**104**	**174**	**234**	**512**	**0**
472	1,089	2,320	64	108	0	0	51	16	28	95	0
472	**645**	**1,374**	**650**	**1,097**	**0**	**0**	**8**	**35**	**58**	**101**	**0**
472	**1,151**	**2,660**	**64**	**121**	**0**	**0**	**51**	**39**	**58**	**148**	**0**
Difference	**506**	**1,286**	**-586**	**-976**	**0**	**0**	**43**	**4**	**0**	**47**	**0**
Total All Zones	12,166	29,835	3,534	6,574	595	1,086	3,779	2,885	3,416	10,080	5,225
	11,171	**27,007**	**5,635**	**9,081**	**1,017**	**1,857**	**1,902**	**3,654**	**3,215**	**8,771**	**5,225**
	17,732	**47,064**	**4,920**	**9,720**	**992**	**1,812**	**8,210**	**5,204**	**5,428**	**18,842**	**9,431**
Difference	**6,561**	**20,057**	**-715**	**639**	**-25**	**-45**	**6,308**	**1,550**	**2,213**	**10,071**	**4,206**

LEGEND:
2007 Polk TPO Model value
2007 Inventory value
2035 Polk TPO Model value
Difference = 2035 Polk TPO Model value - 2007 Inventory value

There are three Developments of Regional Impact (DRIs) located adjacent to or in close proximity to the SR 33 study corridor. These are the Williams DRI, Polk Commerce Center DRI and the Bridgewater DRI. The Williams DRI is located immediately south of I-4 between SR 33 and Polk Parkway while the Polk Commerce Center DRI is located immediately east of the Polk Parkway between Saddle Creek Road and I-4. A majority of the Bridgewater DRI is located on the west side of SR 33 (between SR 33 and I-4); however, there is also a portion located on the east side of SR 33 (between Old Combee Road and SR 33 to the west of N. Combee Road). In addition, the proposed Rockefeller Group Park of Commerce development is located to the north of SR 33 and to the east of Tomkow Road on the site of the former USA International Speedway.

A comparison of the land use data that is included in these developments and the land use data that is contained in the Polk TPO's 2035 model for those TAZs that comprise the three DRIs and the Rockefeller Group Park of Commerce was also conducted. The results of this comparison indicated that the 2035 model contained significantly lower amounts of land use than the development levels that were contained in the DRI documents. Consequently, there existed a need to revise some of the land use data contained in the 2035 Polk TPO model. The remaining portion of this section provides a summary of the methodologies that were used to revise this land use data as well as the results of the application of these methodologies. The TAZs that are not associated with any of the DRIs are discussed first, followed by a discussion of the TAZs located within the three DRIs.

3.2.3.1 Non DRI Traffic Analysis Zones

The number of single family and multi-family dwelling units included in the original Polk TPO 2007 base year model were subtracted from the number of single family and multi-family dwelling units included in the original Polk TPO 2035 model for TAZ Nos. 88, 96, 106, 181, 194, 204, 217, 224, 225, 228, 240, 256, 265, 275, 277, and 472. This was done to calculate the amount of dwelling unit growth that was projected to occur in each of these TAZs. The number of industrial, commercial and service employees included in the original Polk TPO 2007 base year model were also subtracted from the corresponding number of employees included in the original Polk TPO 2035 model for these same TAZs to calculate the amount of employment growth that was projected to occur in each of these TAZs. The growth in dwelling units and employment was subsequently added to the revised (i.e., inventoried) 2007 dwelling unit and employment values to obtain the revised 2035 values. The revised 2035 single family and multi-family population values were obtained by multiplying the revised 2035 single family and multi-family dwelling units by the original 2007 base year model population/dwelling unit ratios. For those TAZs where the original 2035 multi-family dwelling units were less than the original 2007 multi-family dwelling units, the growth in multi-family dwelling units projected to occur for a neighboring (i.e., adjacent) TAZ was calculated and then added to the inventoried

2007 multi-family dwelling unit values. The TAZs where this procedure was necessary (and the neighboring TAZs from which the multi-family dwelling unit growth was used) are noted in the land use comparison spreadsheet.

This same methodology was also used for TAZ Nos. 67, 68 and 105; however, the original TAZ Nos. 105 and 250 had previously been subdivided to create two new TAZs (i.e., TAZ Nos. 67 and 68). Therefore, the revised 2007 dwelling units and employees in each of the subdivided TAZs was divided by the total number of dwelling units and employees inventoried in 2007 for the original (i.e., undivided) zone to determine the percentage of the total dwelling units and employees contained in each of the subdivided zones. The revised 2035 dwelling units and employees for the original zone (TAZ No. 105) were then allocated to the subdivided zones based on the percentages calculated from the revised 2007 data. The 2007 aerial photography was reviewed to verify that there was adequate developable land area available to accommodate the increases in dwelling units and employment.

3.2.3.2 DRI Traffic Analysis Zones

3.2.3.2.1 Williams DRI

The Williams DRI is contained within TAZ No. 276. This DRI is planned to be implemented in three phases and the original completion years for the three phases were 2010 (Phase 1), 2015 (Phase 2) and 2020 (Phase 3). Given the delay in the initiation of the Phase 1 construction, the completion years for the three phases were subsequently revised by the DRI applicant to 2015, 2020 and 2025. Although the revised implementation schedule still indicates that the entire DRI will be completed well in advance of the year 2035, for the purposes of the SR 33 PD&E study only the land uses associated with Phases 1 and 2 were included in the 2035 travel demand model. At the completion of Phase 2, the following land uses were assumed to be present:

- 2,270 single family dwelling units
- 1,495 multi-family dwelling units
- 1,440,000 square feet of office/research park development
- 1,050,000 square feet of retail development
- 100 hotel rooms
- 1 school

The proposed land uses associated with the Williams DRI are provided in **Appendix G**. The Florida Polytechnic University is separate from the Williams DRI but is also located within TAZ No. 276. The Williams DRI applicant (Williams Acquisition Holdings Company) donated approximately 530 acres of land for this

research/technology-based campus and the construction of the initial buildings began in June of 2012. According to the information contained in the Williams DRI Notice of Proposed Change (NOPC) Transportation Analysis, a student enrollment of approximately 9,100 students is projected to occur by the year 2020 (i.e., the revised completion date for Phase 2 of the Williams DRI). A review of the school data contained in the original 2035 Polk TPO model indicated that the university enrollment had not been accounted for; therefore, an additional 9,100 students were added to TAZ No. 276.

Since the retail and office park development was expressed in terms of square feet while the travel demand model input data is expressed in terms of the number of employees, the square feet of development was converted to an equivalent number of employees. A ratio of 2.5 commercial employees per 1,000 square feet of retail development was used to obtain an estimate of the total number of commercial employees associated with this DRI. A ratio of 3.5 service employees per 1,000 square feet of office/business park/commercial development was used to obtain an estimate of the total number of service employees associated with this DRI. A service employment value of 1 employee per Hotel/Motel room was also included. These land use conversion rates were based on information contained in the September 2008 Final Report titled *Development of a Computer-Based Training Course for the FSUTMS Comprehensive Modeling Workshop.* This yielded values of 2,625 commercial employees and 5,140 service employees.

3.2.3.2.2 Polk Commerce Center DRI

The Polk Commerce Center DRI is contained within TAZ Nos. 316, 317, and 325. This DRI was originally planned to be implemented in three phases and the original completion years for the three phases were 2009 (Phase 1), 2015 (Phase 2) and 2021 (Phase 3). In January of 2009, Phase 3 of this proposed development was eliminated and the completion years for Phases 1 and 2 were revised to 2013 and 2030, respectively. The inclusion of all of Phase 1 and Phase 2 of this development would assume that the entire DRI was built-out by the year 2035 and would not be consistent with the approach that was taken for the Williams DRI. Consequently, it was assumed that Phase 1 and 50.0% of Phase 2 would be completed by the year 2035. Based on this assumption, the following land uses would be present:

- 1,773 single family dwelling units
- 5,108 multi-family dwelling units
- 393,387 square feet of retail development
- 3,969,296 square feet of Business Park Center development

The proposed land uses associated with the Polk Commerce Center DRI are provided in **Appendix G**. The single family and multi-family dwelling units were allocated to TAZ Nos. 316, 317 and 325 in accordance with the dwelling unit distribution provided on Map H – Master Development Plan of the Polk Commerce Center

DRI Substantial Deviation (dated January 12, 2009). A copy of Map H is also provided in **Appendix G**. Areas of low, medium and high density residential land use are delineated on Map H and the single family and multi-family dwelling units were distributed to these three TAZs based on the approximate percentages of each area that are located within each of the three TAZs. Single family dwelling units were only distributed to the TAZs that contained low density residential areas while multi-family dwelling units were only distributed to TAZs that contained medium and/or high density residential areas. A total of 941 single-family dwelling units were allocated to TAZ No. 316 while a total of 832 single family dwelling units were allocated to TAZ No. 317. Multi-family dwelling units were allocated to all three TAZs because Map H indicated that medium and/or high density residential areas were planned for each of these zones. A total of 895 multi-family dwelling units are planned for TAZ No. 316 while 857 multi-family dwelling units are planned for TAZ No. 317. A total of 3,356 multi-family dwelling units are planned for TAZ No. 325.

The square feet of business park and retail development was converted into service and commercial employment using the same ratios of employees/1,000 square feet that were used with the Williams DRI. This yielded values of 983 commercial employees and 13,893 service employees. Map H was also used to distribute the commercial and service employment to the three Polk Commerce Center TAZs. As indicated in this map, the Polk Commerce Center DRI includes areas that are designated Business Park Center (BPC), Mixed Use (MU) and Interchange Land Use (ILU). The square footage of commercial and retail land uses that are planned for each individual TAZ were divided by the total square footage of commercial and retail land use planned for the entire DRI to determine the percentages of the total commercial and retail land uses that are planned to occur in each TAZ. The total number of commercial and service employees were then multiplied by the percentages calculated for each individual TAZ to obtain the number of commercial and service employees to be allocated to each TAZ. The following summarizes the results of these calculations:

SERVICE EMPLOYMENT

- TAZ No. 316 = 28.8% ⟹ 13,893*28.8% = 3,998 employees (25% ILU/33% BPC)
- TAZ No. 317 = 47.9% ⟹ 13,893*47.9% = 6,659 employees (75% ILU/ 34% BPC/100% MU)
- TAZ No. 325 = 23.3% ⟹ 13,893*23.3% = 3,236 employees (33% BPC)

COMMERCIAL EMPLOYMENT

- TAZ No. 316 = 20.9% ⟹ 983*20.9% = 206 employees (25% ILU)
- TAZ No. 317 = 47.9% ⟹ 983*79.1% = 777 employees (75% ILU/100% MU)

3.2.3.2.3 Bridgewater DRI

The Bridgewater DRI is contained within TAZ Nos. 241, 423 and a portion of TAZ No. 238. This DRI was planned to be implemented in three phases and the original completion years for the three phases were

2006 (Phase 1), 2011 (Phase 2) and 2016 (Phase 3). The completion years for the three phases were subsequently revised by the DRI applicant to 2010, 2015 and 2020; however, only a portion of Phase 1 has been constructed as of this date. Although the revised implementation schedule indicates that the entire DRI will be completed well in advance of the year 2035, for the purposes of the SR 33 PD&E study, only the land uses associated with Phases 1 and 2 were included in the 2035 travel demand model. According to the DRI, the following land uses will be present at the end of Phase 2:

- 900 single family dwelling units
- 1,200 multi-family dwelling units
- 700,000 square feet of industrial development
- 2,600,000 square feet of office/business park development
- 355,000 square feet of retail development

The proposed land uses associated with the Bridgewater DRI are provided in **Appendix G**. Although the DRI indicates that there will only be 700,000 square feet of industrial development upon the completion of Phase 2, a review of aerial photography, information contained in the Polk County Property Appraiser's website, and a site visit indicated that approximately 1,500,000 square feet of industrial building floor space currently exists in TAZ No. 423. All of the existing floor space within the Firstpark at Bridgewater Industrial Park is associated with light-industrial/warehousing/distribution land uses. In addition, the total amount of vacant land remaining in TAZ No. 423 that is zoned commercial and the total amount of vacant land in TAZ No. 238 that is zoned Business Park is significantly less than the 2,600,000 square feet of office/business park development identified in the DRI. Consequently, the amounts of industrial and office/business park development were adjusted to more accurately reflect both the existing land uses as well as the current zoning. Based on these adjustments, the following land uses were assumed to be present at the end of Phase 2 of the Bridgewater DRI:

- 900 single family dwelling units
- 1,200 multi-family dwelling units
- 2,279,500 square feet of industrial development
- 1,020,500 square feet of office/business park development
- 355,000 square feet of retail development

All of the existing land uses in TAZ No. 423 are non-residential in nature and none of the remaining vacant acreage is zoned for residential land uses. The area contained within this zone is designated as either Business Park or Interchange Activity Center. Consequently, all of the residential development associated

with the Bridgewater DRI is located in TAZ Nos. 238 and 241. Currently, there are 287 single family dwelling units and 240 multi-family dwelling units located in TAZ No. 241 that were constructed as a portion of Phase 1 of the DRI. Based on a review of existing aerial photography and information from the Property Appraiser's website, it was determined that there are an additional 341 single family platted lots and 55 multi-family platted lots located within TAZ No. 241. The sum of the existing dwelling units and platted lots were subtracted from the total number of dwelling units that are planned to be constructed by the end of Phase 2 to determine the total number of additional single family and multi-family dwelling units that needed to be allocated to TAZ Nos. 238 and 241. The result of these calculations was that an additional 272 single family dwelling units and 905 multi-family dwelling units would be allocated to these two TAZs.

The remaining vacant developable acreage in TAZs 238 and 241 was summed and then the vacant acreage in each of these TAZs was divided by the total vacant acreage for both zones to obtain the percentage of vacant acreage in each zone. The 272 single family dwelling units and 905 multi-family dwelling units were multiplied by these percentages and allocated to these two TAZs. The results of these calculations are summarized below:

- TAZ No. 241 (110.84 Acres) = 31.2% ⟹ 85 single family dwelling units and 282 multi-family dwelling units
- TAZ No. 238 (244.57 Acres) = 68.8% ⟹ 187 single family dwelling units and 623 multi-family dwelling units

TAZ Nos. 235, 471 and 577 were created by subdividing the original TAZ No. 241. Since the revised TAZ No. 241 was used for the Bridgewater DRI, the future growth of these three zones varies slightly from the other non-DRI zones. The same procedure was used to determine the amount of future growth that was available to distribute by subtracting the original 2007 model single family and multi-family dwelling unit values from the original 2035 model single family and multi-family dwelling unit values. It is reasonable to assume that some of this future dwelling unit and population growth would be attributed to the Bridgewater DRI. To account for this, the number of vacant platted single family and multi-family lots was subtracted from the future growth since they were already added to TAZ No. 241. The number of vacant single family lots in TAZ Nos. 471 (23) and 235 (28) were also subtracted from this future growth producing a remainder of 216 single family dwelling units to be allocated. The 216 single family dwelling units were then multiplied by the vacant acreage percentages of each TAZ, (i.e., 13.8% in TAZ No. 471 and 86.2% in TAZ No. 235). This resulted in an additional 30 single family dwelling units being added to TAZ No. 471 and an additional 186 single family dwelling units being added to TAZ No. 235. No single family dwelling units were allocated to TAZ No. 577 because a review of 2010 aerial photography indicated that this zone only contained multi-family

dwelling units. All of the future growth in multi-family dwelling units (847 units) was allocated to TAZ No. 577.

The square feet of commercial and retail development were once again converted into commercial and service employment using the same ratios of employees/1,000 square feet that were used with the previous two DRIs. This yielded values of 888 commercial employees and 3,572 service employees. The same type of procedure that was used to allocate dwelling units was also used to allocate the commercial and service employment; however, the allocation percentages were calculated using the vacant developable acreage in all three TAZs that comprise the Bridgewater DRI (i.e., TAZ Nos. 238, 241 and 423). The results of these calculations are summarized below:

- TAZ No. 241 (110.84 Acres) = 23.7% ⟹ 211 commercial employees and 847 service employees
- TAZ No. 238 (244.57 Acres) = 52.4% ⟹ 465 commercial employees and 1,871 service employees
- TAZ No. 423 (111.67 Acres) = 23.9% ⟹ 212 commercial employees and 854 service employees

Initially, the industrial employees were estimated using a ratio of 1.5 employees/1,000 square feet which yielded a total of 3,419 employees. This represented an increase of 2,397 industrial employees when compared to the 2007 value and this 234.5% increase was not viewed as being reasonable. Although there is currently approximately 1,500,000 square feet of industrial building space in TAZ No. 423, a portion of this is vacant. In 2007, there was approximately 1,060,000 square feet of industrial building space in this zone and approximately 800 employees, which resulted in a ratio of 0.75 employees/1,000 square feet.

Although it is reasonable to assume that the amount of non-vacant industrial building space associated with the Bridgewater DRI will increase over time, the assumption of 100% non-vacant building space in the year 2035 was viewed as being unreasonable. Therefore, the 2035 industrial employees were estimated using a ratio of 0.75 employees/1,000 square feet which yielded a total of 1,710 industrial employees. This is an increase of 688 industrial employees and represents a 67.3% increase over the 28-year period between 2007 and 2035. This amount of future growth in industrial employment was viewed as being more reasonable.

A different procedure was also used to allocate the future industrial employees. First, the total number of industrial employees contained in TAZ Nos. 238, 241 and 423 in 2007 (1,022 employees) was subtracted from the total number of industrial employees estimated to be contained in these three zones by the end of Phase 1 and Phase 2 (1,710 employees). Next, the percentage of the total 2007 industrial employment in both TAZ Nos. 238 and 423 that was located in each of these two TAZs was calculated. The future growth in

industrial employment (688 employees) was then multiplied by these two percentages and allocated to TAZ Nos. 238 and 432. A total of 380 industrial employees were added to TAZ No. 238, while a total of 308 industrial employees were added to TAZ No. 423 to represent the future growth in the Firstpark at Bridgewater Industrial Park. No growth in industrial employment was allocated to TAZ No. 241 since this zone's primary land use is residential.

3.2.3.2.4 Rockefeller Group Park of Commerce

The methodology that was used for the non-DRI zones was also initially used for TAZ Nos. 250 and 576. The revised 2007 dwelling units and employees in each of these two TAZs was divided by the total number of dwelling units and employees inventoried in 2007 for the original zone (i.e., TAZ No. 250) to determine the percentage of the total dwelling units and employees contained in each of the subdivided zones. The revised 2035 dwelling units and employees contained within the original TAZ No. 250 were then reallocated to the subdivided zones based on the percentages calculated from the revised 2007 data. The 2007 aerial photography was reviewed to verify that there was adequate developable land area available to accommodate the increases in dwelling units and employment.

The Rockefeller Group Park of Commerce development is located on the 112-acre site of the former USA International Speedway. This planned development is contained within TAZ No. 576 and will consist of approximately 1.2 million square feet of warehousing, distribution and light manufacturing. According to the City of Lakeland, this development is anticipated to be built out by the year 2035. Using a ratio of 1.0 industrial employee/1,000 square feet of industrial development, it was estimated that this development would employ approximately 1,200 industrial employees. These 1,200 industrial employees were subsequently added to TAZ No. 576. Based on the conceptual site plan (a copy of this is provided in **Appendix G**), all of the access to and from this development will be provided on SR 33 and Old Polk City Road east of Tomkow Road.

Table 3-7 provides the revised 2035 land use data (denoted by dark green italics) that was incorporated into the revised 2035 travel demand model. The original 2035 land use data, as well as the original and revised 2007 land use data is also provided in **Table 3-7**. A review of this table indicates that the revised 2035 land use data is significantly higher than the 2035 land use data that was included in the original 2035 model. The largest increases are in multi-family dwelling units (an additional 9,143 dwelling units), multi-family population (an additional 18,795 persons), commercial employment (an additional 3,653 employees), and service employment (an additional 21,383 employees). Although the 2035 industrial employment was reduced by 2,747 employees, the revised total employment value exceeded the original total employment value by 22,289 employees. **Table 3-7** also illustrates that a majority of the increase in 2035 land use data is associated with the three DRIs.

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL	
88	238	648	194	383	183	334	45	1,010	478	1,533	208	
88	**209**	**569**	**320**	**632**	**189**	**345**	**6**	**915**	**309**	**1,230**	**208**	
88	**348**	**1,006**	**242**	**479**	**183**	**334**	**45**	**1,097**	**593**	**1,735**	**208**	
88	***319***	***927***	***368***	***728***	***189***	***345***	***6***	***1,002***	***424***	***1,432***	***208***	
96	227	454	221	427	0	0	29	44	207	280	136	
96	**225**	**450**	**198**	**383**	**0**	**0**	**10**	**38**	**50**	**98**	**136**	
96	**455**	**954**	**115**	**242**	**0**	**0**	**29**	**46**	**209**	**284**	**136**	
96	***453***	***950***	***205***	***431***	***0***	***0***	***10***	***40***	***52***	***102***	***136***	MF from TAZ 181
105	826	1,931	582	956	404	738	103	574	1,281	1,958	0	
105	**1,169**	**2,733**	**1,013**	**1,664**	**676**	**1,235**	**74**	**613**	**1,241**	**1,928**	**0**	
67	**0**	**0**	**0**	**0**	**144**	**263**	**0**	**9**	**26**	**35**	**0**	
68	**0**	**0**	**464**	**751**	**0**	**0**	**5**	**0**	**143**	**148**	**0**	
total	**1,169**	**2,733**	**1,477**	**2,415**	**820**	**1,498**	**79**	**622**	**1,410**	**2,111**	**0**	
105	**1,128**	**3,292**	**585**	**966**	**404**	**738**	**103**	**814**	**1,601**	**2,518**	**701**	
105	***1,471***	***4,094***	***1,016***	***1,674***	***676***	***1,235***	***74***	***842***	***1,522***	***2,438***	***701***	
67	***0***	***0***	***0***	***0***	***144***	***263***	***0***	***20***	***35***	***55***	***0***	
68	***0***	***0***	***464***	***751***	***0***	***0***	***5***	***0***	***173***	***178***	***0***	
total	***1,471***	***4,094***	***1,480***	***2,425***	***820***	***1,498***	***79***	***862***	***1,730***	***2,671***	***701***	
106	694	1,487	165	341	0	0	150	363	181	694	0	
106	**700**	**1,500**	**210**	**434**	**0**	**0**	**159**	**362**	**219**	**740**	**0**	
106	**1,385**	**3,109**	**80**	**175**	**0**	**0**	**150**	**508**	**348**	**1,006**	**701**	
106	***1,391***	***3,122***	***217***	***488***	***0***	***0***	***159***	***507***	***386***	***1,052***	***701***	MF from TAZ 181

LEGEND:

2007 TPO Model value

2007 Inventory value

Original 2035 TPO Model value

Revised 2035 TPO Model value

DRI Zones

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL	
181	675	1,677	176	416	0	0	32	4	173	209	782	
181	**676**	**1,679**	**182**	**430**	**0**	**0**	**14**	**2**	**138**	**154**	**782**	
181	**881**	**2,342**	**183**	**470**	**0**	**0**	**32**	**4**	**155**	**191**	**782**	
181	***882***	***2,344***	***189***	***484***	***0***	***0***	***14***	***2***	***138***	***154***	***782***	
194	1,262	3,056	120	207	0	0	107	112	325	544	3,257	
194	**1,010**	**2,446**	**117**	**202**	**0**	**0**	**62**	**107**	**325**	**494**	**3,257**	
194	**1,267**	**3,136**	**120**	**207**	**0**	**0**	**107**	**112**	**247**	**466**	**3,257**	
194	***1,015***	***2,526***	***117***	***202***	***0***	***0***	***62***	***107***	***325***	***494***	***3,257***	
204	0	0	0	0	0	0	0	0	0	0	0	
204	**0**	**0**	**450**	**776**	**0**	**0**	**90**	**0**	**0**	**90**	**0**	
204	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
204	***0***	***0***	***455***	***785***	***0***	***0***	***94***	***0***	***0***	***94***	***0***	MF/Ind from TAZ 225
217	1,183	2,220	125	216	0	0	42	413	166	621	0	
217	**1,463**	**2,745**	**123**	**213**	**0**	**0**	**2**	**394**	**109**	**505**	**0**	
217	**1,200**	**2,454**	**334**	**402**	**0**	**0**	**42**	**434**	**194**	**670**	**701**	
217	***1,480***	***2,979***	***332***	***399***	***0***	***0***	***2***	***415***	***137***	***554***	***701***	
224	0	0	0	0	0	0	0	0	0	0	0	
224	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**220**	**220**	**0**	
224	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
224	***0***	***0***	***0***	***0***	***0***	***0***	***4***	***0***	***220***	***224***	***0***	Ind/Ser from TAZ 225

LEGEND:

2007 TPO Model value

2007 Inventory value

Original 2035 TPO Model value

Revised 2035 TPO Model value

DRI Zones

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL	
225	111	246	500	862	0	0	4	4	27	35	0	
225	**111**	**246**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**4**	**0**	
225	**150**	**295**	**505**	**870**	**0**	**0**	**8**	**4**	**27**	**39**	**0**	
225	***150***	***295***	***5***	***8***	***0***	***0***	***4***	***3***	***1***	***8***	***0***	
228	1,096	3,029	0	0	0	0	106	24	131	261	842	
228	**1,115**	**3,082**	**3**	**5**	**0**	**0**	**22**	**23**	**108**	**153**	**842**	
228	**1,101**	**3,316**	**0**	**0**	**0**	**0**	**106**	**24**	**111**	**241**	**842**	
228	***1,120***	***3,369***	***8***	***12***	***0***	***0***	***22***	***23***	***136***	***181***	***842***	Serv from TAZ 217; MF from TAZ 225
238	86	250	0	0	0	0	212	64	6	282	0	
238	**109**	**317**	**240**	**293**	**0**	**0**	**227**	**29**	**6**	**262**	**0**	
238	**104**	**327**	**5**	**9**	**0**	**0**	**212**	**64**	**6**	**282**	**0**	
238	***337***	***980***	***863***	***1,553***	***0***	***0***	***607***	***465***	***1,877***	***2,949***	***0***	
240	243	572	183	261	0	0	47	8	24	79	0	
240	**250**	**588**	**153**	**218**	**0**	**0**	**45**	**11**	**29**	**85**	**0**	
240	**264**	**678**	**38**	**59**	**0**	**0**	**47**	**8**	**24**	**79**	**0**	
240	***271***	***694***	***158***	***225***	***0***	***0***	***45***	***11***	***29***	***85***	***0***	MF from TAZ 225

LEGEND:

2007 TPO Model value

2007 Inventory value

Original 2035 TPO Model value

Revised 2035 TPO Model value

DRI Zones

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
241	436	989	328	401	0	0	33	6	51	90	0
241	**184**	**417**	**0**	**0**	**0**	**0**	**6**	**7**	**7**	**20**	**0**
235	**200**	**454**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**12**	**0**
423	**0**	**0**	**0**	**0**	**0**	**0**	**795**	**0**	**0**	**795**	**0**
471	**296**	**671**	**948**	**1,159**	**0**	**0**	**16**	**0**	**4**	**20**	**0**
577	**0**	**0**	**432**	**528**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
total	**680**	**1,542**	**1,380**	**1,687**	**0**	**0**	**817**	**7**	**23**	**847**	**0**
241	**1,044**	**2,340**	**798**	**1,259**	**0**	**0**	**127**	**69**	**125**	**321**	**701**
241	***609***	***1,365***	***337***	***532***	***0***	***0***	***10***	***211***	***854***	***1,075***	***0***
235	***414***	***928***	***0***	***0***	***0***	***0***	***0***	***0***	***51***	***51***	***701***
423	***0***	***0***	***0***	***0***	***0***	***0***	***1,103***	***212***	***854***	***2,169***	***0***
471	***349***	***782***	***948***	***1,492***	***0***	***0***	***18***	***0***	***17***	***35***	***0***
577	***0***	***0***	***847***	***1,336***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
total	***1,372***	***3,075***	***2,132***	***3,360***	***0***	***0***	***1,131***	***423***	***1,776***	***3,330***	***701***

250	835	2,285	0	0	0	0	1,321	14	97	1,432	0
250	**829**	**2,269**	**2**	**3**	**0**	**0**	**18**	**172**	**28**	**218**	**0**
576	**17**	**43**	**5**	**9**	**0**	**0**	**350**	**0**	**50**	**400**	**0**
total	**846**	**2,312**	**7**	**12**	**0**	**0**	**368**	**172**	**78**	**618**	**0**
250	**835**	**2,491**	**0**	**0**	**0**	**0**	**1,321**	**22**	**108**	**1,451**	**0**
250	***829***	***2,269***	***2***	***3***	***0***	***0***	***18***	***180***	***28***	***226***	***0***
576	***17***	***43***	***5***	***9***	***0***	***0***	***1,550***	***0***	***61***	***1,611***	***0***
total	***846***	***2,312***	***7***	***12***	***0***	***0***	***1,568***	***180***	***89***	***1,837***	***0***

LEGEND:

2007 TPO Model value

2007 Inventory value

Original 2035 TPO Model value

Revised 2035 TPO Model value

DRI Zones

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL	
256	349	966	0	0	0	0	15	2	9	26	0	
256	**273**	**756**	**0**	**0**	**0**	**0**	**2**	**5**	**7**	**14**	**0**	
256	**349**	**1,053**	**0**	**0**	**0**	**0**	**15**	**2**	**9**	**26**	**0**	
256	***273***	***756***	***0***	***0***	***0***	***0***	***2***	***5***	***7***	***14***	***0***	
265	1,048	2,843	648	1,455	0	0	888	14	45	947	0	
265	**562**	**1,525**	**58**	**130**	**0**	**0**	**24**	**743**	**27**	**794**	**0**	
265	**1,925**	**5,529**	**808**	**1,943**	**0**	**0**	**2,453**	**286**	**236**	**2,975**	**701**	
265	***1,439***	***4,211***	***218***	***618***	***0***	***0***	***1,589***	***1,015***	***218***	***2,822***	***701***	
275	686	1,929	41	91	0	0	339	149	101	589	0	
275	**686**	**1,929**	**41**	**91**	**0**	**0**	**39**	**29**	**21**	**89**	**0**	
275	**747**	**2,283**	**21**	**41**	**0**	**0**	**339**	**184**	**148**	**671**	**0**	
275	***747***	***2,283***	***41***	***91***	***0***	***0***	***39***	***64***	***68***	***171***	***0***	MF from TAZ 472
276	2	6	0	0	8	14	0	0	4	4	0	
276	**16**	**45**	**0**	**0**	**8**	**14**	**0**	**0**	**0**	**0**	**0**	
276	**758**	**2,116**	**730**	**1,695**	**405**	**740**	**234**	**650**	**905**	**1,789**	**701**	
276	***2,286***	***6,429***	***1,495***	***3,471***	***100***	***175***	***0***	***2,625***	***5,140***	***7,765***	***9,801***	
277	45	135	0	0	0	0	184	21	43	248	0	
277	**42**	**126**	**0**	**0**	**0**	**0**	**4**	**22**	**70**	**96**	**0**	
277	**45**	**147**	**0**	**0**	**0**	**0**	**184**	**21**	**43**	**248**	**0**	
277	***42***	***126***	***0***	***0***	***0***	***0***	***4***	***22***	***70***	***96***	***0***	

LEGEND:

2007 TPO Model value

2007 Inventory value

Original 2035 TPO Model value

Revised 2035 TPO Model value

DRI Zones

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
316	187	514	25	62	0	0	23	0	4	27	0
316	**17**	**47**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
316	**474**	**1,393**	**25**	**68**	**0**	**0**	**558**	**405**	**4**	**967**	**0**
316	***958***	***2,649***	***895***	***2,220***	***0***	***0***	***0***	***206***	***3,998***	***4,204***	***0***
317	286	792	58	152	0	0	13	0	4	17	0
317	**201**	**557**	**11**	**29**	**0**	**0**	**1**	**1**	**1**	**3**	**0**
317	**972**	**2,851**	**148**	**412**	**0**	**0**	**1,930**	**193**	**37**	**2,160**	**0**
317	***1,033***	***2,863***	***857***	***2,246***	***0***	***0***	***1***	***778***	***6,660***	***7,439***	***0***
325	562	1,486	104	236	0	0	35	43	31	109	0
325	**166**	**439**	**15**	**34**	**0**	**0**	**13**	**44**	**6**	**63**	**0**
325	**1,149**	**3,292**	**119**	**292**	**0**	**0**	**117**	**218**	**240**	**575**	**0**
325	***166***	***439***	***3,371***	***7,650***	***0***	***0***	***13***	***44***	***3,242***	***3,299***	***0***
472	1,089	2,320	64	108	0	0	51	16	28	95	0
472	**645**	**1,374**	**650**	**1,097**	**0**	**0**	**8**	**35**	**58**	**101**	**0**
472	**1,151**	**2,660**	**64**	**121**	**0**	**0**	**51**	**39**	**58**	**148**	**0**
472	***707***	***1,714***	***650***	***1,097***	***0***	***0***	***8***	***58***	***88***	***154***	***0***

LEGEND:

2007 TPO Model value

2007 Inventory value

Original 2035 TPO Model value

Revised 2035 TPO Model value

DRI Zones

TABLE 3-7: LAND USE DATA COMPARISON – 2035 (ORIGINAL) VS. 2035 (REVISED) (CONTINUED)

ZONE	SFDU	SFPOP	MFDU	MFPOP	HMDU	HMPOP	IND_EMP	COMM_EMP	SERV_EMP	TOT_EMP	SCHOOL
All zones	12,166	29,835	3,534	6,574	595	1,086	3,779	2,885	3,416	10,080	5,225
	11,171	27,007	5,635	9,081	1,017	1,857	1,992	3,564	3,215	8,771	5,225
	17,732	47,064	4,920	9,710	992	1,812	8,210	5,204	5,428	18,842	9,431
	18,758	*49,136*	*14,063*	*28,505*	*1,109*	*2,018*	*5,463*	*8,857*	*26,811*	*41,131*	*18,531*
Difference	*1,026*	*2,072*	*9,143*	*18,795*	*117*	*206*	*-2,747*	*3,653*	*21,383*	*22,289*	*9,100*
Non-DRI zones	13,231	34,745	3,095	5,975	587	1,072	5,032	3,605	4,111	12,748	8,029
	12,606	*32,702*	*4,450*	*8,005*	*1,009*	*1,843*	*3,711*	*4,316*	*4,118*	*12,145*	*8,029*
Difference	*-625*	*-2,043*	*1,355*	*2,030*	*422*	*771*	*-1,321*	*711*	*7*	*-603*	*0*
DRI zones	4,501	12,319	1,825	3,735	405	740	3,178	1,599	1,317	6,094	1,402
	6,152	*16,434*	*9,613*	*20,500*	*100*	*175*	*1,752*	*4,541*	*22,693*	*28,986*	*10,502*
Difference	*1,651*	*4,115*	*7,788*	*16,765*	*-305*	*-565*	*-1,426*	*2,942*	*21,376*	*22,892*	*9,100*

LEGEND:
2007 TPO Model value
2007 Inventory value
Original 2035 TPO Model value
Revised 2035 TPO Model value
DRI Zones
Difference = Revised 2035 TPO Model value - 2035 Original TPO Model value

3.2.4 Roadway Network Modifications

Several modifications were made to the roadway network coding contained in the original 2007 and 2035 travel demand models. The facility type coding used in the 2007 model for the portion of SR 33 from Old Combee Road to Tomkow Road was revised from Facility Type 35 (undivided unsignalized arterial without turn bays) to Facility Type 31 (undivided unsignalized arterial with turn bays) to account for the exclusive left-turn lanes that currently exist along this portion of SR 33. **Figures 3-19**, **3-20** and **3-21** illustrate the facility types, area types and number of lanes that were used in the revised 2007 model for the study area roadways. The facility type coding used in the 2035 Build Alternative model for this same portion of SR 33 was revised from Facility Type 35 to Facility Type 23 (divided Class Ia signalized arterial). The proposed improvement for this portion of SR 33 is a four-lane divided roadway. Currently, there are traffic signals on SR 33 at the University Boulevard/Firstpark Boulevard N. and Old Combee Road intersections. In addition, it is quite likely that additional traffic signals will be implemented at high volume intersections within the study corridor over the next 20 years (e.g., at the I-4 interchange on-/off-ramps and the N. Combee Road/ Village Lakes Boulevard intersection).

The facility types and number of lanes that were coded in the 2035 model for University Boulevard, Pace Road and Research Way were also modified to more accurately reflect the actual characteristics of these roadways that were constructed within the last two years. University Boulevard and Pace Road were revised from Facility Type 43 (major local undivided roadway without turn bays) to Facility Type 41 (major local divided roadway) and Research Way was revised from Facility Type 43 to Facility Type 44 (other local divided roadway). The laneage on University Boulevard between SR 33 and the eastern intersection at Research Way was revised from two lanes to four lanes while the laneage on Pace Road between the eastern intersection at Research Way and the southbound Polk Parkway on- and off-ramps was revised from two lanes to six lanes. The laneage on Research Way was revised from two lanes to four lanes for a majority of this roadway; however, a small two-lane portion was maintained because the existing four-lane facility does transition to a two-lane roadway with on-street parking between the two Florida Polytechnic University entrance/exits that are currently under construction.

The laneage on the northbound off-ramp, northbound on-ramp, and southbound off-ramp at the Polk Parkway/Pace Road interchange was revised from one lane to two lanes to reflect the current laneage on these ramps. In addition, toll links were coded on the northbound on-ramp and the southbound off-ramp. **Figures 3-22**, **3-23** and **3-24** illustrate the facility types, area types and number of lanes included in the revised 2035 model for the study area roadways. Several modifications were also made to the Polk TPO model SPEEDCAP table for specific facility type/area type combinations. The original speed associated with Facility Type 35/Area Type 31 was increased by 4.0 mph while the original capacity was increased by 10%. The original speed associated with Facility Type 12/Area Type 31 and Facility Type 12/Area Type 33 was increased by 5.0 mph. These modifications were made to both the 2007 and 2035 models.

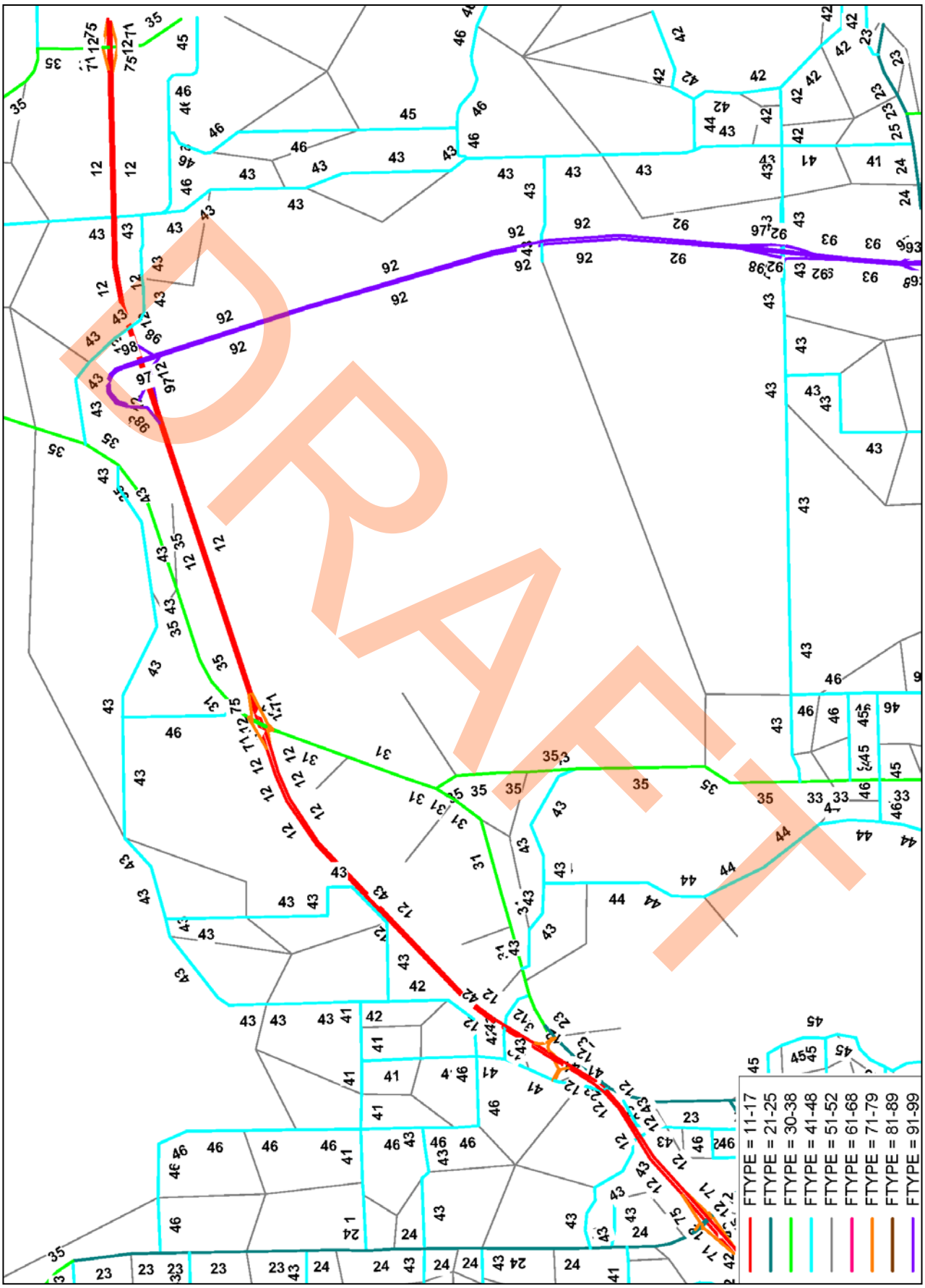


FIGURE 3-19: REVISED POLK TPO 2007 MODEL – FACILITY TYPES

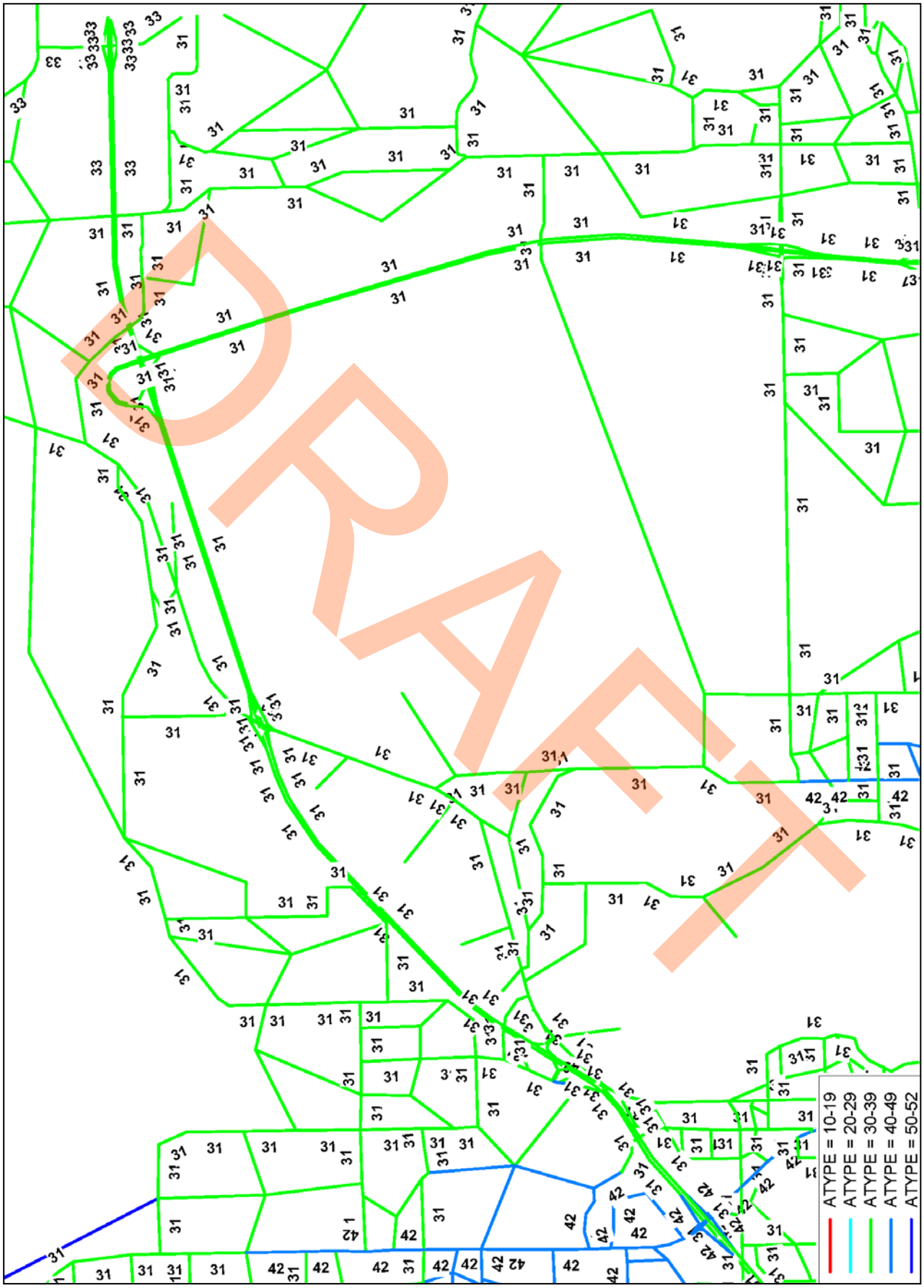


FIGURE 3-20: REVISED POLK TPO 2007 MODEL – AREA TYPES

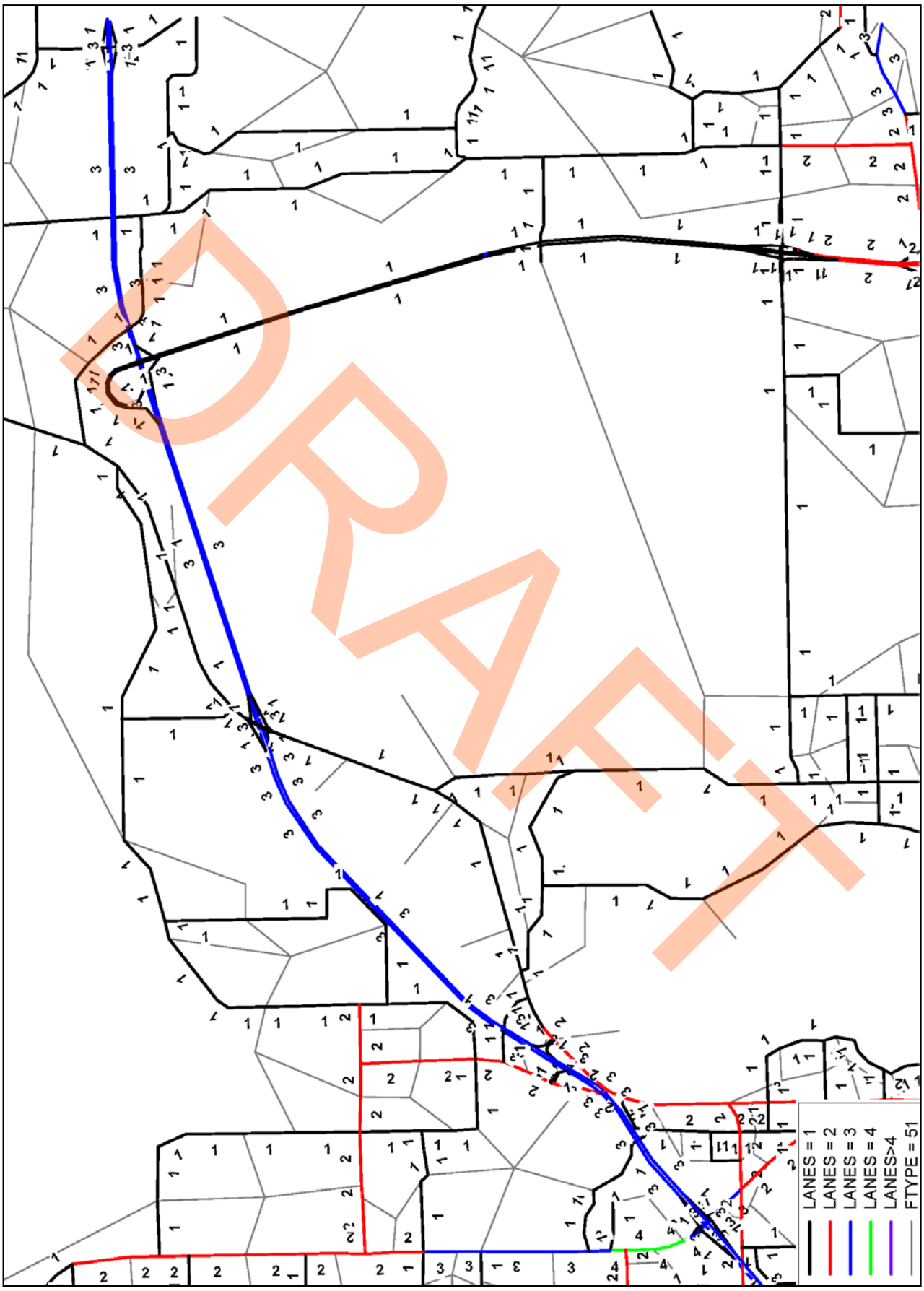


FIGURE 3-21: REVISED POLK TPO 2007 MODEL – NUMBER OF DIRECTIONAL LANES

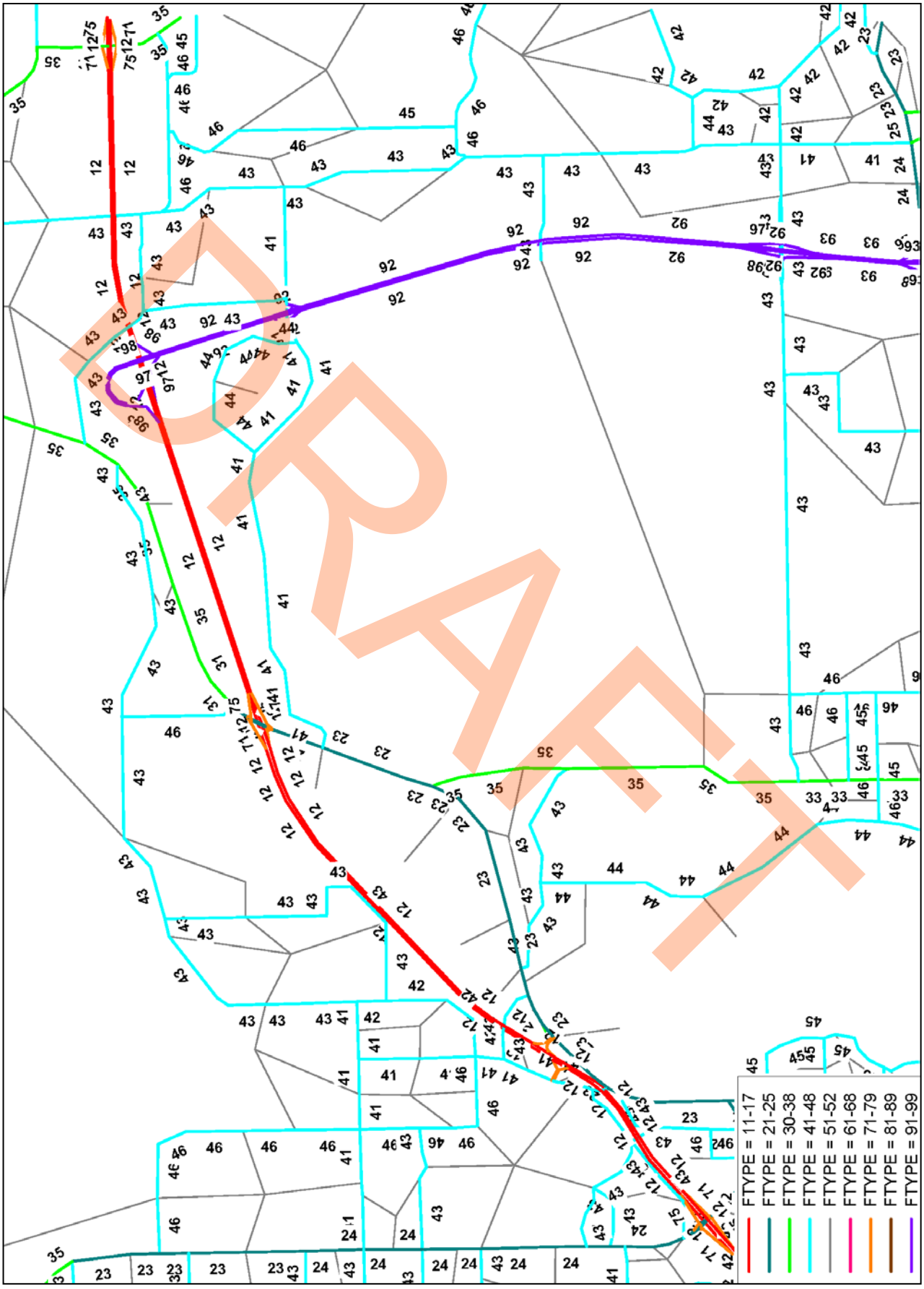


FIGURE 3-22: REVISED POLK TPO 3035 MODEL – BUILD ALTERNATIVE FACILITY TYPES

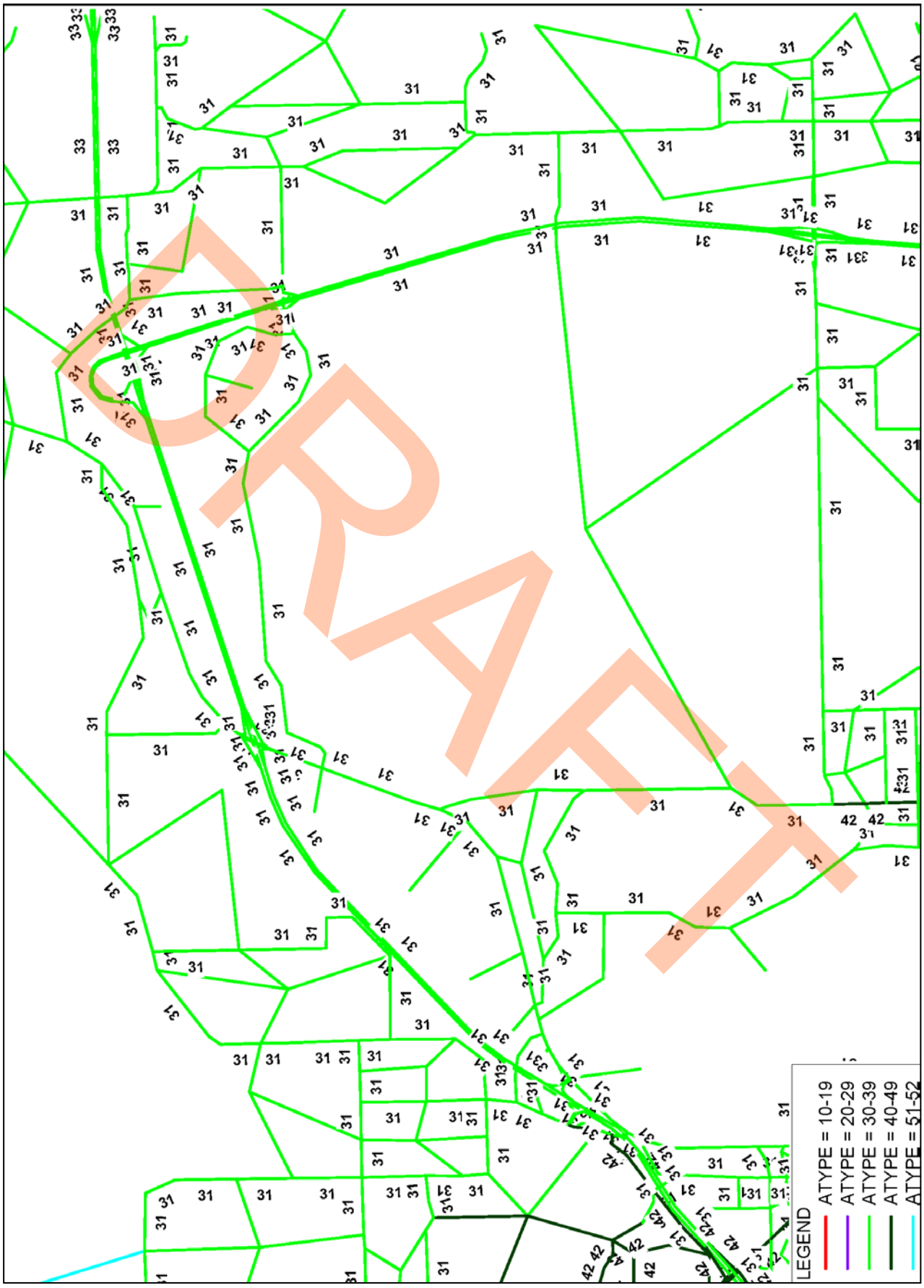


FIGURE 3-23: REVISED POLK TPO 3035 MODEL – BUILD ALTERNATIVE AREA TYPES

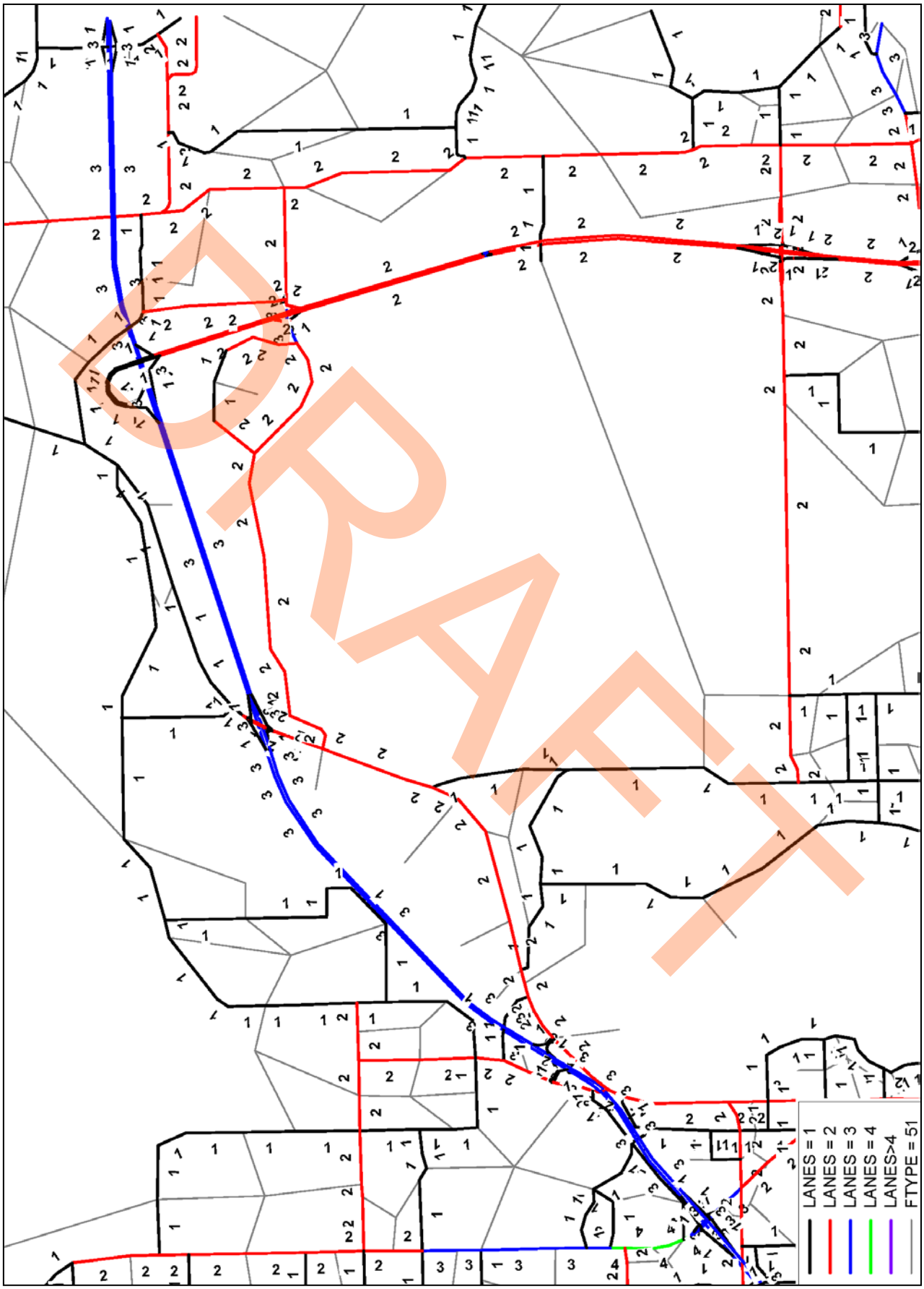


FIGURE 3-24: REVISED POLK TPO 3035 MODEL – BUILD ALTERNATIVE NUMBER OF DIRECTIONAL LANES

3.3 Validation Accuracy of the Revised Base Year Model

The revised 2007 base year model was run and the 2007 PSWADT volumes were converted to AADT volumes. **Table 3-8** provides a comparison of the revised 2007 model AADT volumes, the original 2007 model AADT volumes, and the actual 2007 AADT volumes. Roadway network plots of the revised 2007 model AADT volumes are also provided in **Appendix H**. A review of this table indicates that the revised 2007 model volumes are closer to the actual 2007 volumes for four of the five locations. There is only one location where the revised 2007 model volume is further from the actual 2007 volume than the original 2007 model volume. This location is on SR 33 north of I-4. This is a direct result of subdividing the original TAZ No. 250 and creating a new TAZ (No. 576) with a centroid connector onto SR 33 east of Tomkow Road. Since the original 2007 model does not include any centroid connections to either SR 33 or Old Polk City Road for the existing land uses located north of SR 33 and east of Tomkow Road, all trips made to TAZ No. 250 via I-4 (including the ones that are actually destined for the land uses east of Tomkow Road) must travel north on Tomkow Road and then west on Old Polk City Road to access the centroid connector on Old Polk City Road. In the revised 2007 model, the original TAZ No. 250 was subdivided and a new TAZ (No. 576) was created. The boundaries of TAZ No. 576 are SR 33 (to the south and east), Old Polk City Road (to the north), and Tomkow Road (to the east). This new TAZ has two centroid connectors – one that connects to SR 33 and one that connects to Old Polk City Road. Consequently, all of the trips that are made to the existing land uses east of Tomkow Road (between SR 33 and Old Polk City Road) via I-4 have more direct access and a shorter travel distance with the revised model. In essence, the original 2007 model is artificially suppressing the volume on SR 33 north of I-4 due to the size of the original TAZ No. 250 and the failure to account for the existing access on SR 33 east of Tomkow Road.

TABLE 3-8: 2007 AADT VOLUME COMPARISON – ORIGINAL TPO MODEL VS. REVISED TPO MODEL

Roadway	Location	2007 Actual	2007 Original TPO Model		2007 Revised TPO Model	
		AADT Volume	AADT Volume	% Difference	AADT Volume	% Difference
SR 33	South of I-4	9,300	4,600	-50.5%	6,800	-26.9%
	North of I-4	12,100	14,300	18.2%	15,100	24.8%
I-4	West of SR 33	75,000	69,400	-7.5%	73,000	-2.7%
	East of SR 33	68,500	64,200	-6.3%	68,500	0.0%
N. Combee Road	South of SR 33	6,900	4,000	-42.0%	5,700	-17.4%

3.4 Reasonableness of the Revised 2035 Model AADT Volumes

The revised 2035 model was run and the 2035 PSWADT volumes were converted to AADT volumes. **Table 3-9** provides a comparison of the revised 2035 Build Alternative AADT volumes and the original 2035 Build Alternative AADT volumes. Roadway network plots of the revised 2035 Build Alternative model AADT volumes are also provided in **Appendix H**. The 2012 AADT volumes that were derived from the PD&E study traffic counts are also included in **Table 3-9**. This table indicates that significantly higher AADT volumes are projected for the study corridor with the revised 2035 model. The revised 2035 model AADT volumes on SR 33 are between 7,300 vpd and 16,600 vpd higher than the original 2035 model AADT volumes.

Growth trend analyses were conducted for SR 33 using historic AADT volumes obtained from FDOT Count Station Nos. 160118 and 160027. These count stations are located on SR 33 just south and just north of the I-4/SR 33 interchange. These growth trend analyses were conducted based on the AADT volumes recorded for the years 1997 through 2011 as well as the 2012 AADT volumes estimated from the PD&E study traffic counts. The growth trend analyses yielded 2035 AADT volumes equal to 13,000 vpd (south of I-4) and 16,600 vpd (north of I-4). The 2035 volume for SR 33 south of I-4 represents a 24% increase over the existing (2012) volume while the 2035 volume for SR 33 north of I-4 represents a 34% increase over this same 23-year time period. Copies of these two growth trend analyses are contained in **Appendix I**. It should be noted, however, that the R^2 values associated with these growth trend analyses are extremely low (i.e., 25.7% and 33.8%, respectively). This statistic measures how well the linear growth trend equation (i.e., the straight line) "fits" the data points. A review of the graphs of the growth trend analyses indicates that many of the data points (i.e., the historic volumes) are either higher or lower than the volumes that were estimated from the growth trend equation.

As stated earlier, significant increases in both population and employment are projected to occur between 2012 and 2035 for several of the TAZs in the vicinity of the study corridor. Given the magnitude of the projected growth in study area population and employment, the 2035 AADT volumes projected for the SR 33 study corridor using the revised 2035 Polk TPO model were viewed as being reasonable.

The revised 2035 model AADT volumes on the I-4 mainline and the SR 33 interchange on- and off-ramps are also higher than the original 2035 model AADT volumes. The 2035 AADT volumes on the I-4 mainline west and east of SR 33 are projected to be 13,600 vpd and 10,000 vpd higher, respectively with the revised 2035 model. Compared to the 2012 AADT volumes for these two locations, the revised 2035 model AADT volumes represent increases of approximately 61% (or 2.6%/year).

TABLE 3-9: 2035 BUILD ALTERNATIVE AADT VOLUME COMPARISON – ORIGINAL TPO MODEL VS. REVISED TPO MODEL

Roadway	Segment		AADT Volume		
	From	To	Existing (2012)	Original 2035 TPO Model - Build Alt.	Revised 2035 TPO Model - Build Alt.
SR 33	Old Combee Road N.	Old Combee Road S.	18,700	39,500	49,250
	Old Combee Road S.	Lake Luther Road	8,200	24,500	33,400
	Lake Luther Road	N. Combee Road	5,900	15,300	28,500
	N. Combee Road	University Boulevard	9,950	20,500	32,900
	University Boulevard	I-4 EB Ramps	10,500	12,100	28,700
	I-4 EB Ramps	I-4 WB Ramps	11,800	13,600	26,700
	I-4 WB Ramps	Tomkow Road	12,400	14,900	22,200
	Tomkow Road	E . Of Tomkow Road	9,400	11,100	14,500
University Boulevard	SR 33	Reasearch Way W.	630	12,900	38,600
Tomkow Road	SR 33	Old Polk City Road	2,500	3,800	7,700
Old Combee Road	Lake Parker Drive	SR 33	10,500	16,100	15,400
N Combee Road	Old Combee Road	SR 33	8,200	3,800	12,550
I-4 *	CR 582/SR 33	SR 33	70,000 (1)	99,400	113,000
	SR 33	Polk Parkway E.	68,000 (1)	99,200	109,200
I-4 Ramps *	EB Off-Ramp		3,400	4,000	9,100
	EB On-Ramp		2,800	3,900	7,100
	WB Off-Ramp		2,800	3,900	7,300
	WB On-Ramp		4,250	4,000	9,100

(1) These volumes were obtained from the FDOT traffic online database.

(*) The 2035 AADT volumes for these locations were derived using an MOCF equal to 0.94.

Growth trend analyses were also conducted for I-4 using historic AADT volumes obtained from FDOT Count Station Nos. 160114 and 160113. These count stations are located on I-4 to the west and east of the I-4/SR 33 interchange. These growth trend analyses were conducted based on the AADT volumes recorded for the years 1997 through 2012. The growth trend analyses yielded 2035 AADT volumes equal to 94,700 vpd (west of SR 33) and 97,100 vpd (east of SR 33). The 2035 volume for I-4 west of SR 33 represents a 28% increase over the 23-year period while the 2035 volume for I-4 east of SR 33 represents a 43% increase over this same time period. Copies of these two growth trend analyses are also contained in **Appendix I**.

Although the 2035 I-4 mainline volumes estimated from the growth trend analyses compare favorably to the 2035 volumes estimated from the original 2035 Polk TPO model, the 2035 I-4 ramp volumes estimated from

the original Polk TPO model are not significantly higher than the 2012 ramp volumes. Since the historic growth trend analysis methodology is unable to take into account the impact of future land use growth on future travel demand, and significant increases in future year population and employment are projected to occur for several TAZs in the study area; the 2035 AADT volumes projected for the I-4 mainline and the I-4/SR 33 interchange ramps using the revised 2035 Polk TPO model were once again viewed as being the most reasonable future year projections.

3.5 Development of Design Year (2036) and Opening Year (2016) Traffic Volumes

The design year established for the SR 33 PD&E study is 2036, therefore, the design year AADT volumes were derived by extrapolation using the existing (2012) and revised 2035 model AADT volumes. **Table 3-10** contains the 2036 AADT volumes for the roadways that were coded in the Polk TPO model. As stated earlier, the Polk TPO model does not include all of the local roadways that intersect SR 33 within the study corridor limits; however, the revised model does include four centroid connectors that are all located on the north side of SR 33. These centroid connectors are associated with TAZ Nos. 235, 241, 423, and 471. Each of these centroid connectors represents two or more local roadways depending on the number of actual roadway connections that exist within each of these TAZs.

The methodology that was used to estimate the design year AADT volumes for Huron Way and Village Lakes Boulevard is as follows:

- Step 1 – The 2012 AADT volumes for Huron Way and Village Lakes Boulevard were summed.
- Step 2 – The 2036 AADT volume for both roadways combined was estimated by extrapolation using the combined 2012 AADT volume and the 2035 AADT volume on the centroid connector associated with TAZ No. 241.
- Step 3 – The combined 2036 AADT volume was distributed to the two existing roadways in proportion to their 2012 AADT volumes.

This same type of methodology was used to estimate the design year AADT volumes for Firstpark Boulevard N. and Firstpark Boulevard S. The only difference was the extrapolation was conducted using the 2035 AADT volume on the centroid connector associated with TAZ No. 423.

A slightly different methodology was used to estimate the design year AADT volume for Lake Luther Road and this methodology is as follows:

- Step 1 – The 2012 AADT volumes for Deeson Pointe Boulevard, Wood Circle W., Wood Circle E., Lake Deeson Village Mobile Home Park, Sunset Way, and Lake Luther Road were summed.

- Step 2 – The 2035 AADT volumes on the centroid connectors associated with TAZ Nos. 235 and 471 were summed.
- Step 3 - The combined 2036 AADT volume for all six roadways was estimated by extrapolation using the combined 2012 and 2035 AADT volumes.
- Step 4 – The 2012 AADT volumes for Deeson Pointe Boulevard, Wood Circle W., Wood Circle E., Lake Deeson Village Mobile Home Park, and Sunset Way were subtracted from the combined 2036 AADT volume. The remaining portion of the combined 2036 AADT volume was assigned to Lake Luther Road.

TABLE 3-10: DESIGN YEAR (2036) AADT VOLUMES FOR ROADWAYS CODED IN THE POLK TPO MODEL

Roadway	Segment		2012	2035 Revised TPO Model [1]	2036 [1]
	From	To			
SR 33	W. of Old Combee Road S.	Old Combee Road S.	18,700	49,250	50,600
	Old Combee Road S.	Lake Luther Road	8,200	33,400	34,500
	Lake Luther Road	N. Combee Road	5,900	28,500	29,500
	N. Combee Road	University Boulevard	9,950	32,900	33,900
	University Boulevard	I-4 EB Ramps	10,500	28,700	29,500
	I-4 EB Ramps	I-4 WB Ramps	11,800	26,700	27,300
	I-4 WB Ramps	Tomkow Road	12,400	22,200	22,600
	Tomkow Rd	E. of Tomkow Road	9,400	14,500	14,700
University Boulevard	SR 33	Research Way W.	630	38,600	40,300
Tomkow Road	SR 33	Old Polk City Rd	2,500	7,700	7,900
Old Combee Road	Lake Parker Drive	SR 33	10,500	15,400	15,500
N. Combee Road	Old Combee Road	SR 33	8,200	12,550	12,700
I-4 *	CR 582	SR 33	70,000 [2]	113,000	114,800
	SR 33	Polk Parkway E.	68,000 [2]	109,200	111,000
I-4 Ramps *	EB Off-Ramp		3,800 [3]	9,100	9,300
	EB On-Ramp		2,800	7,100	7,300
	WB Off-Ramp		2,800	7,300	7,500
	WB On-Ramp		3,800 [3]	9,100	9,300

[1] Rounded volumes
[2] Volumes obtained from the FDOT traffic online database.
[3] Average of the EB off-ramp volume and the WB on-ramp volume.
[*] The 2035 AADT Volumes for these locations were derived using a MOCF equal to 0.94.

This methodology was used to account for the fact that the land uses accessed via Deeson Pointe Boulevard, Wood Circle W., Wood Circle E., Lake Deeson Village Mobile Home Park, and Sunset Way are in essence built-out today with no real potential for future development. As a result, it was assumed that the AADT volumes on these five roads would remain constant in the future. In contrast, much of the area contained within the boundaries of TAZ No. 235 is currently undeveloped and Lake Luther Road provides the access to this area. Consequently, the future growth in AADT volumes was assigned to Lake Luther Road. **Table 3-11** summarizes the 2036 AADT volumes for the roadways that were not coded in the Polk TPO model. This table indicates that the AADT volumes on Spanish Oaks Boulevard and Long Lake Circle were also assumed to remain constant in the future. Spanish Oaks Boulevard provides direct access to a small residential development (i.e., Spanish Oaks) that is almost built-out. Long Lake Circle provides direct access to a small gated residential development (i.e., the Landings) that is built-out.

TABLE 3-11: DESIGN YEAR (2036) AADT VOLUMES FOR ROADWAYS NOT CODED IN THE POLK TPO MODEL

Roadway	2012 AADT	Total 2012 AADT	2035 Centroid Connector AADT [1]	2036 Centroid Connector AADT [2]	2036 AADT	Roadway
Deeson Pointe Boulevard	990	3,920	7,700	12,000	990	Deeson Pointe Boulevard
Wood Circle W.	200		N/A		200	Wood Circle W.
Wood Circle E.	110				110	Wood Circle E.
Lake Deeson Village MHP	490				490	Lake Deeson Village MHP
Sunset Way	130				130	Sunset Way
Lake Luther Road	2,000		3,900		10,100	Lake Luther Road
Spanish Oaks Boulevard	400	400	N/A	N/A	400	Spanish Oaks Boulevard
Long Lake Circle	1,400	1,400			1,400	Long Lake Circle
Huron Way	1,000	2,050	12,600	13,100	6,400	Huron Way
Village Lakes Boulevard	1,050				6,700	Village Lakes Boulevard
Firstpark Boulevard S.	500	2,300	9,200	9,500	2,100	Firstpark Boulevard S.
Firstpark Boulevard N.	1,800				7,400	Firstpark Boulevard N.

[1] Rounded volumes obtained from the revised TPO Model

[2] Rounded volumes based on extrapolation

An opening year of 2016 was also established for the PD&E study and the opening year AADT volumes were derived through interpolation using the existing (2012) and revised 2035 model AADT volumes. **Table 3-12** summarizes the 2012, 2016 and 2036 AADT volumes for the roadways that were coded in the Polk TPO model. **Table 3-13** summarizes the 2012, 2016 and 2036 AADT volumes for the roadways that were not coded in the Polk TPO model.

TABLE 3-12: EXISTING AND FUTURE YEAR AADT VOLUMES FOR ROADWAYS CODED IN THE POLK TPO MODEL

Roadway	Segment		2012	2016 [1]	2036 [1]
	From	To			
SR 33	W. of Old Combee Road S.	Old Combee Road S.	18,700	24,000	50,600
	Old Combee Road S.	Lake Luther Road	8,200	12,600	34,500
	Lake Luther Road	N. Combee Road	5,900	9,800	29,500
	N. Combee Road	University Boulevard	9,950	13,900	33,900
	University Boulevard	I-4 EB Ramps	10,500	13,700	29,500
	I-4 EB Ramps	I-4 WB Ramps	11,800	14,400	27,300
	I-4 WB Ramps	Tomkow Road	12,400	14,100	22,600
	Tomkow Road	E. of Tomkow Road	9,400	10,300	14,700
University Boulevard	SR 33	Research Way W.	630	7,200	40,300
Tomkow Road	SR 33	Old Polk City Road	2,500	3,400	7,900
Old Combee Road	Lake Parker Drive	SR 33	10,500	11,300	15,500
N. Combee Road	Old Combee Road	SR 33	8,200	9,000	12,700
I-4*	CR 582	SR 33	70,000 [2]	77,400	114,800
	SR 33	Polk Parkway E.	68,000 [2]	75,200	111,000
I-4 Ramps*	EB Off-Ramp		3,800 [3]	4,700	9,300
	EB On-Ramp		2,800	3,500	7,300
	WB Off-Ramp		2,800	3,600	7,500
	WB On-Ramp		3,800 [3]	4,700	9,300

[1] Rounded Volumes.
[2] Volumes obtained from the FDOT traffic online database.
[3] Average of the EB off-ramp and the WB on-ramp volume.
[*] The 2035 AADT Volumes for these locations were derived using a MOCF equal to 0.94.

TABLE 3-13: EXISTING AND FUTURE YEAR AADT VOLUMES FOR ROADWAYS NOT CODED IN THE POLK TPO MODEL

Roadway	2012	2016 [1]	2036 [1]
Deeson Pointe Boulevard	990	990	990
Wood Circle W.	200	200	200
Wood Circle E.	110	110	110
Lake Deeson Village MHP	490	490	490
Sunset Way	130	130	130
Lake Luther Road	2,000	3,350	10,100
Spanish Oaks Boulevard	400	400	400
Long Lake Circle	1,400	1,400	1,400
Huron Way	1,000	1,900	6,400
Village Lakes Boulevard	1,050	2,000	6,700
Firstpark Boulevard S.	500	800	2,100
Firstpark Boulevard N.	1,800	2,700	7,400

[1] Rounded volumes

The TURNS5 software was used to obtain an initial estimate of the future year a.m. and p.m. peak hour volumes. The 2012 and 2035 AADT volumes were used along with a K-factor of 9.0%, D-factors of 53.0% (for I-4) and 55.4% (for SR 33), and the existing peak hour turning movement percentages. The TURNS5 output is provided in **Appendix J**. The 2036 a.m. and p.m. peak hour volumes estimated by the TURNS5 software were subsequently reviewed for reasonableness. Based on this review it was determined that manual adjustments to the output were appropriate for the following reasons:

- To increase individual movement volumes that were estimated to be less than the adjusted 2012 volumes;
- To reduce individual movement volumes that were estimated to be significantly higher than the 2012 volumes (if this significant increase was not viewed as being reasonable);
- To eliminate any differences between departure volumes and approach volumes at adjacent intersections; or
- To better reflect the design year peak hour K- and D-factors on the I-4 mainline and the interchange on- and off-ramps.

The revised (i.e., adjusted) 2036 a.m. peak hour volumes are graphically illustrated in **Figures 3-25** and **3-26**, while the revised 2036 p.m. peak hour volumes are graphically illustrated in **Figures 3-27** and **3-28**. The 2016 a.m. and p.m. peak hour volumes were derived by interpolating between the 2012 peak hour volumes and the revised 2036 peak hour volumes. The 2016 a.m. peak hour volumes are graphically illustrated in **Figures 3-29** and **3-30**, while the 2016 p.m. peak hour volumes are graphically illustrated in **Figures 3-31** and **3-32**.

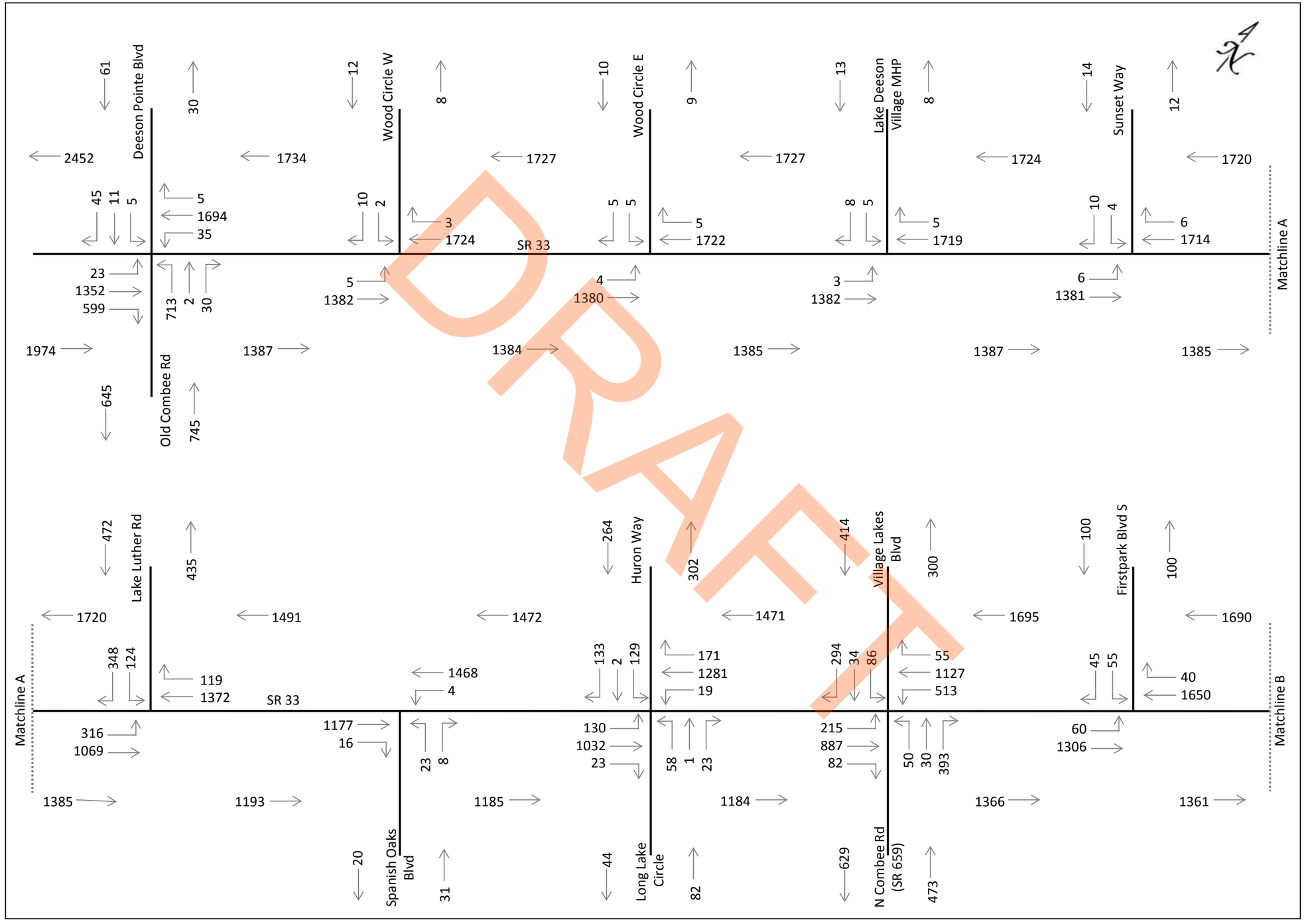


FIGURE 3-25: DESIGN YEAR (2036) AM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

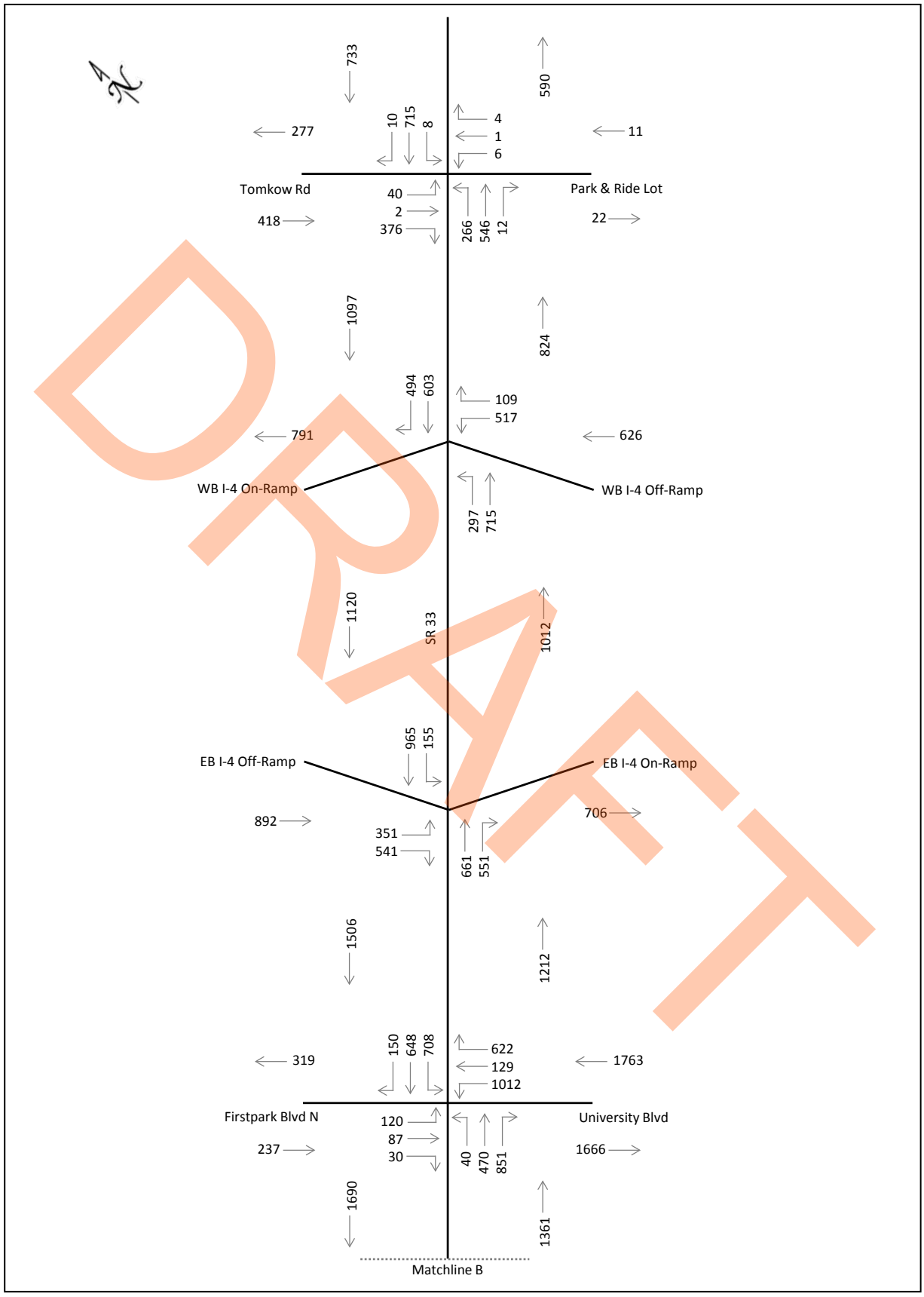


FIGURE 3-26: DESIGN YEAR (2036) AM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

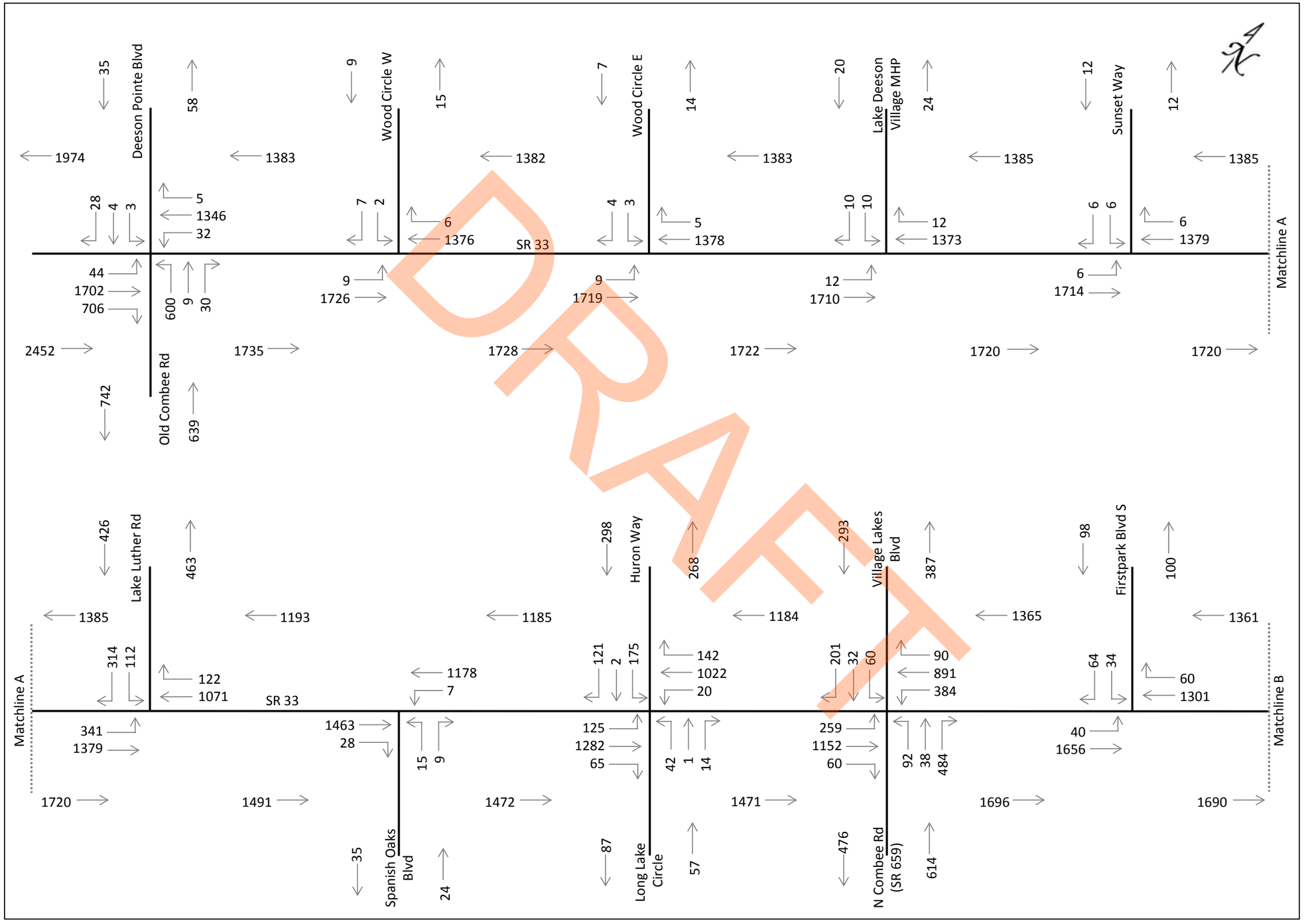


FIGURE 3-27: DESIGN YEAR (2036) PM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

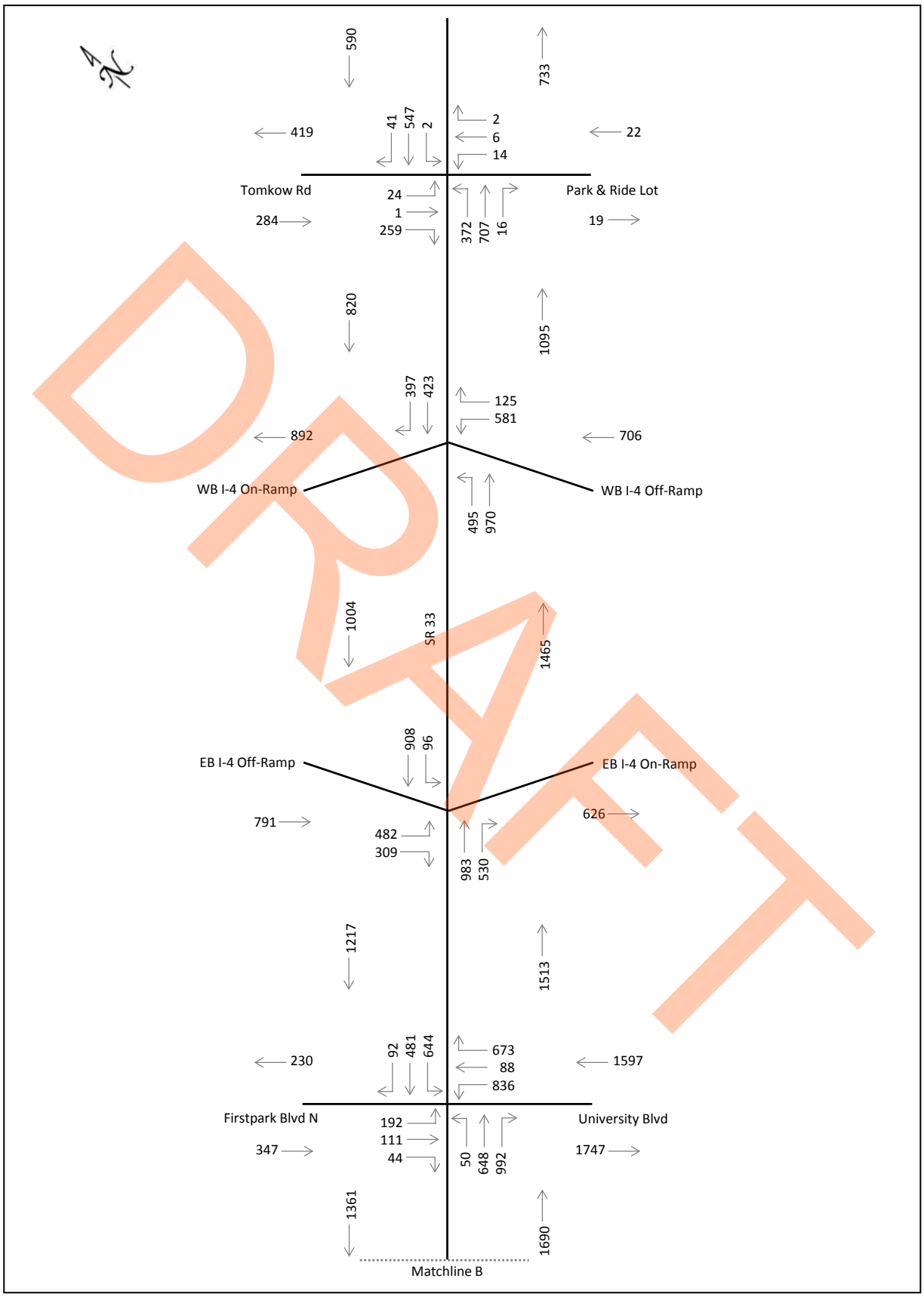


FIGURE 3-28: DESIGN YEAR (2036) PM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

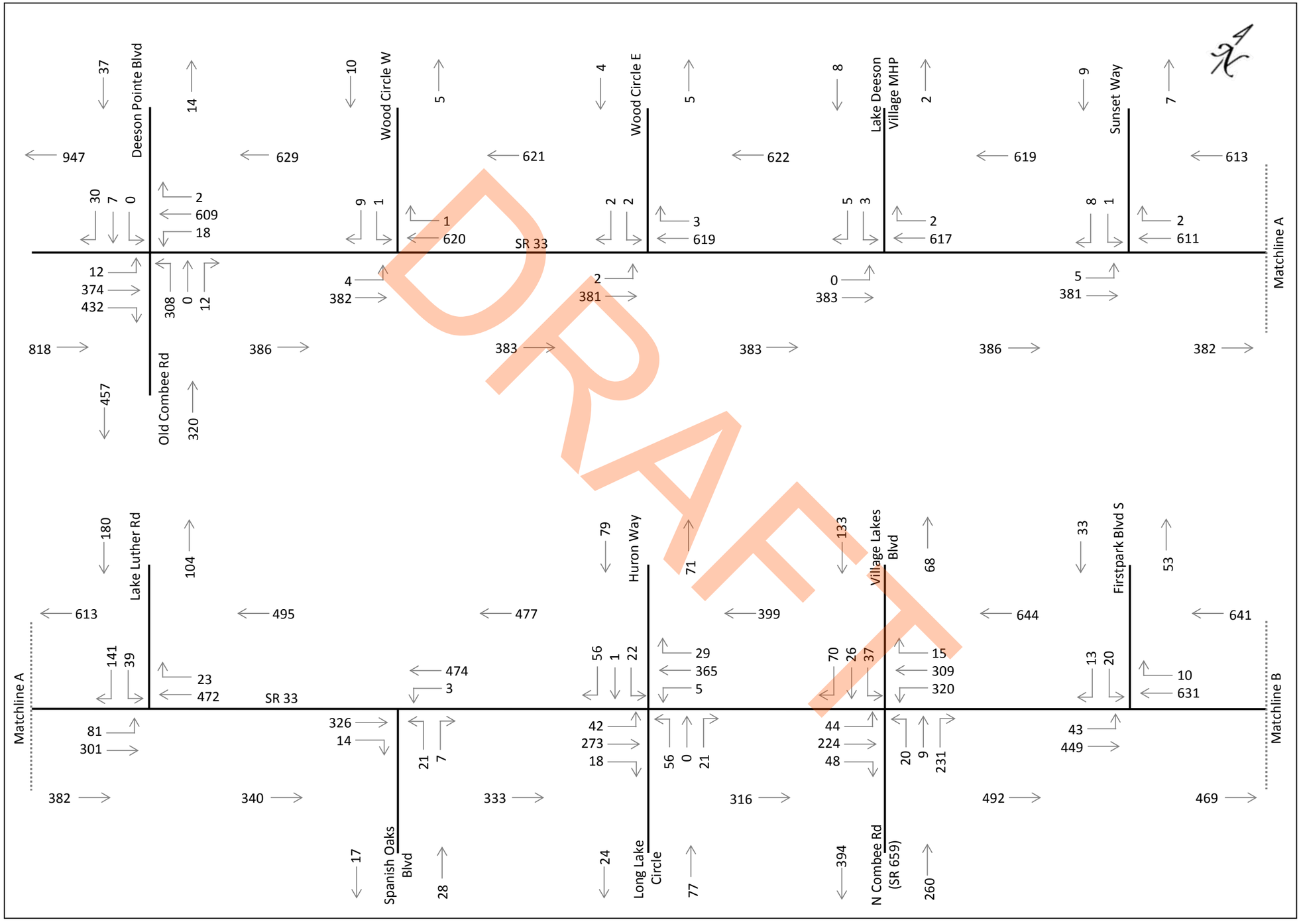


FIGURE 3-29: OPENING YEAR (2016) AM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

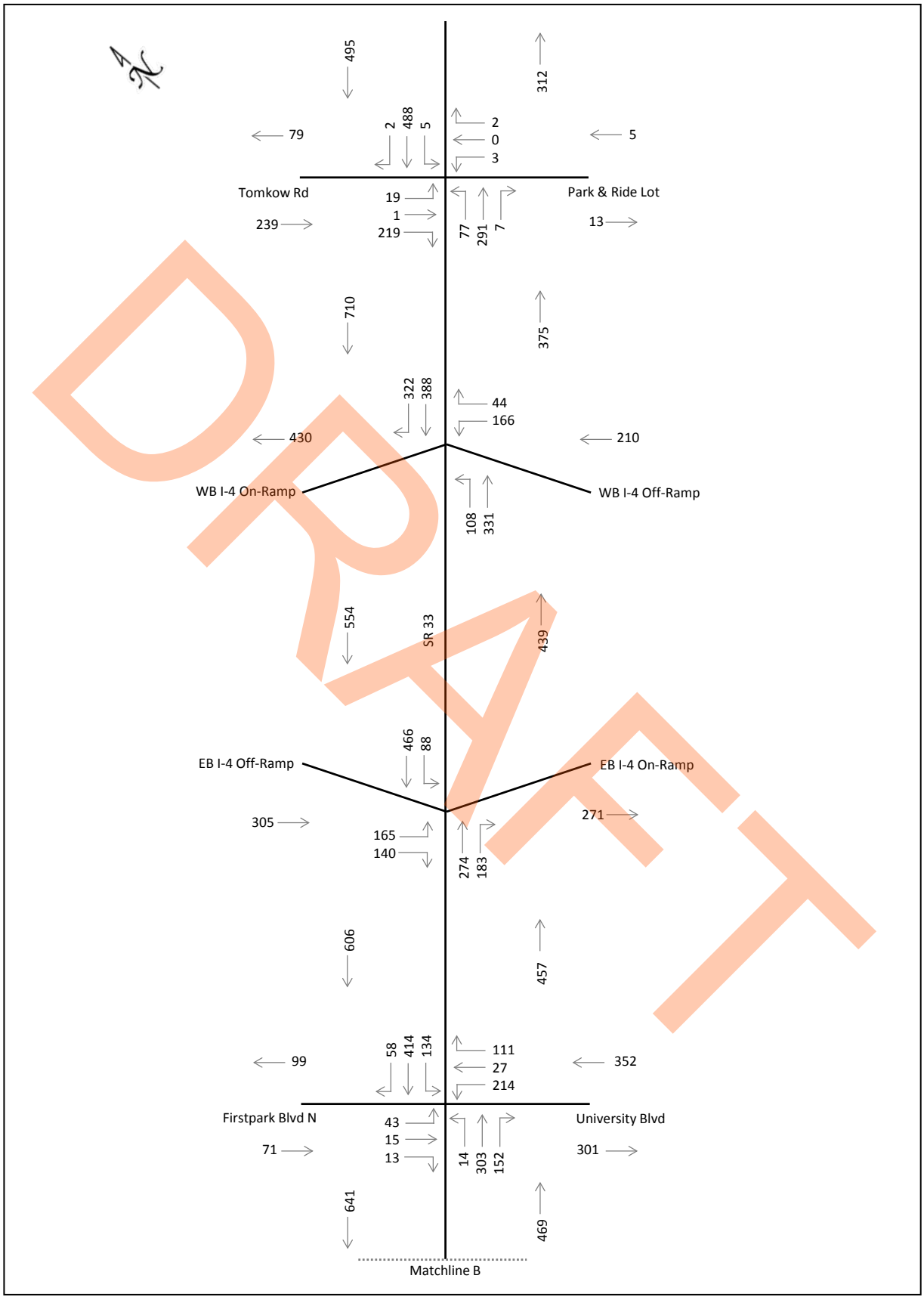


FIGURE 3-30: OPENING YEAR (2016) AM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

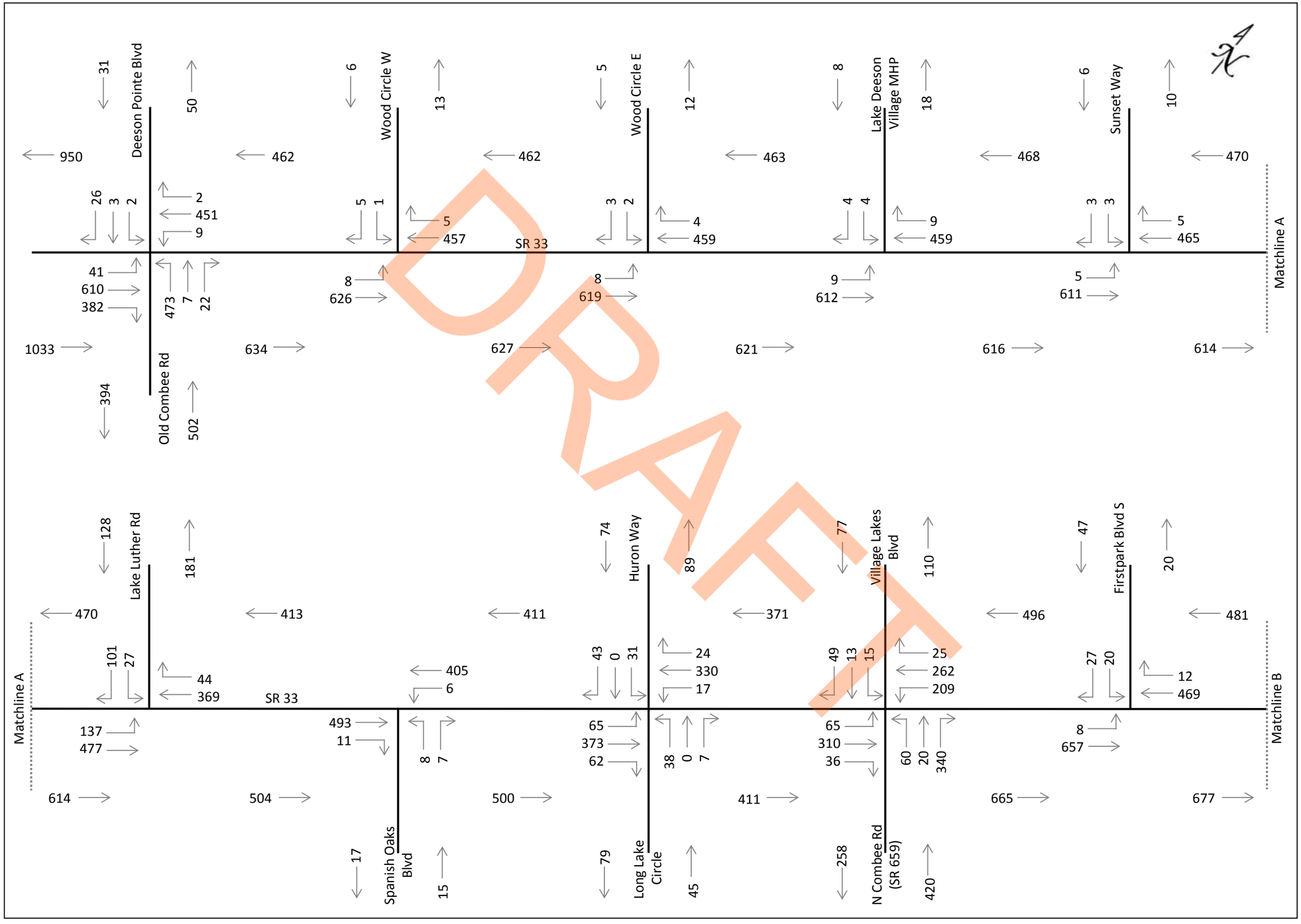


FIGURE 3-31: OPENING YEAR (2016) PM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

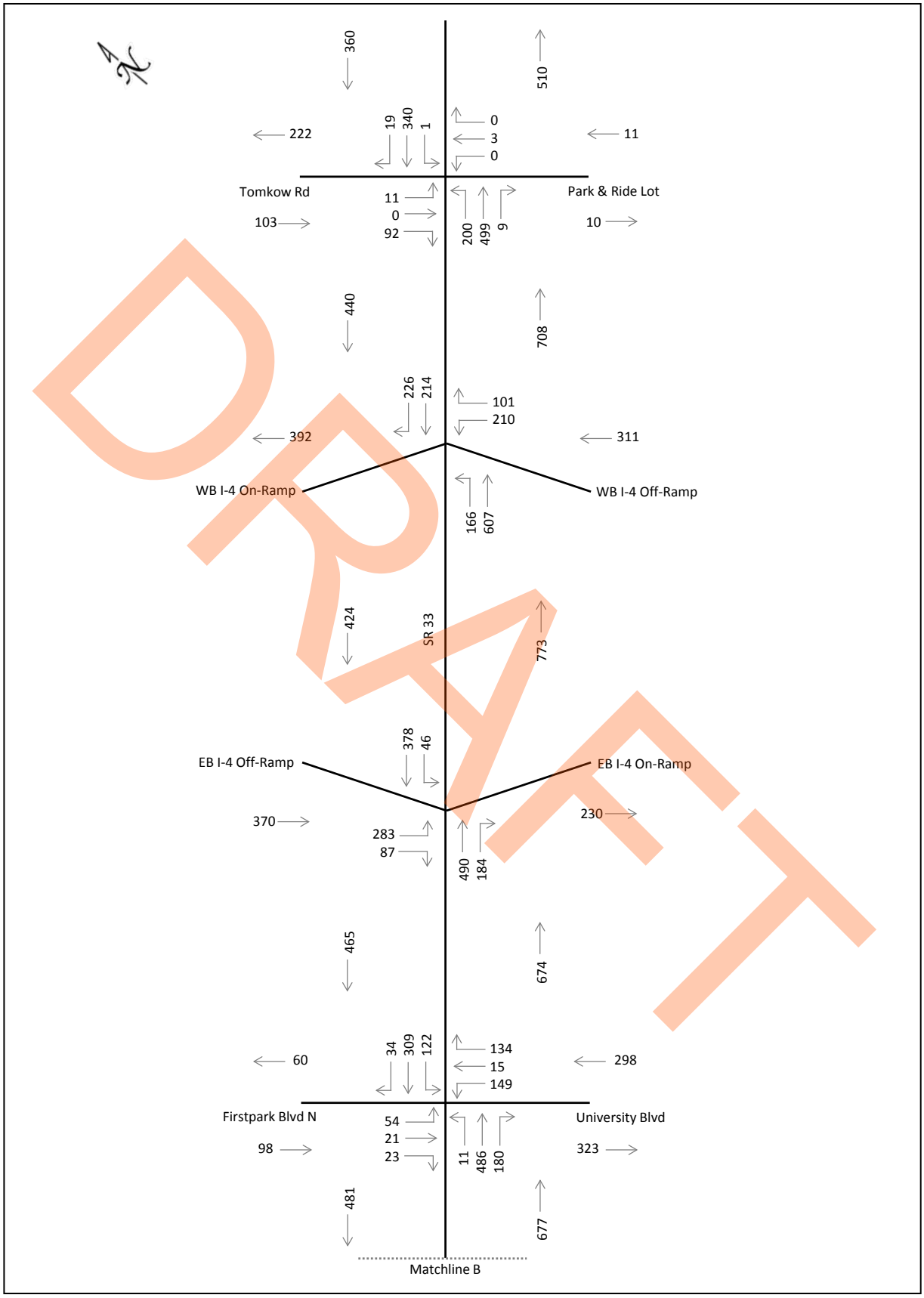


FIGURE 3-32: OPENING YEAR (2016) PM PEAK HOUR VOLUMES – NO-BUILD ALTERNATIVE

4.0 NO-BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSES

4.1 Opening Year (2016) Level of Service Analyses

Roadway segment LOS analyses were conducted for the No-Build Alternative using the 2010 HCS. The opening year (2016) LOS analyses were conducted using the same peak hour truck percentages and PHFs that were used to conduct the existing conditions analyses. **Table 4-1** summarizes the results of the opening year two-lane highway segment analyses for both the a.m. and p.m. peak hours.

In the a.m. peak hour, LOS E operations are projected to occur in the peak travel direction on the roadway segments between N. Combee Road/Village Lakes Boulevard and University Boulevard/Firstpark Boulevard N. and between the westbound I-4 on-/off-ramps and Tomkow Road. LOS D or better operations are projected to occur in the off-peak travel direction on both of these segments. All of the other roadway segments are projected to operate at LOS D or better in both travel directions. In the p.m. peak hour, LOS E operations are projected to occur in the peak travel direction on the four roadway segments located between N. Combee Road/Village Lakes Boulevard and Tomkow Road. LOS D or better operations are projected to occur in the off-peak travel direction on all four of these segments. The portion of SR 33 between Old Combee Road/Deeson Pointe Boulevard and N. Combee Road/Village Lakes Boulevard is projected to operate at LOS D or better in both travel directions. The opening year peak hour No-Build Alternative roadway segment analyses are provided in **Appendix K**.

The opening year intersection analyses were conducted using the same PHFs that were included in the existing conditions analyses. The results of the peak hour unsignalized intersection analyses are summarized in **Table 4-2**. With one exception, all of the left-turn movements from SR 33 are projected to operate at LOS A during both peak hours. The eastbound left-turn movement from SR 33 onto Wood Circle E. is projected to operate at LOS B during the a.m. peak hour. A majority of the cross street movements are projected to operate at LOS D or better during both peak hours; however, there are several cross street movements that are projected to operate at LOS E or F. These include the following:

- Eastbound Village Lakes Boulevard left-turn and through movements (both peak hours);
- Westbound N. Combee Road left-turn and through movements (both peak hours);
- Eastbound Firstpark Boulevard N. left-turn movement (both peak hours);
- Westbound University Boulevard left-turn movement (both peak hours);
- Eastbound I-4 off-ramp left-turn movement (both peak hours);
- Eastbound I-4 off-ramp right-turn movement (p.m. peak hour only);
- Westbound I-4 off-ramp left-turn movement (both peak hours);
- Westbound I-4 off-ramp right-turn movement (p.m. peak hour only); and
- Northbound left-turn, through and right-turn movements from the park-and-ride lot (p.m. peak hour only).

TABLE 4-1: OPENING YEAR (2016) PEAK HOUR ROADWAY SEGMENT OPERATIONS – NO-BUILD ALTERNATIVE

AM PEAK HOUR								
Segment		Two-Way Volume	Directional Volume	V/C [1]	PTSF [2]	ATS [3]	% FFS [4]	LOS [5]
From	To							
Old Combee Road/ Deeson Pointe Boulevard	Lake Luther Road	1,005	621 (WB)	0.44	78.3%	37.6	78.3%	C
			384 (EB)	0.27	60.9%	38.1	79.4%	C
Lake Luther Road	Spanish Oaks Boulevard	835	495 (WB)	0.35	63.9%	41.1	82.1%	C
			340 (EB)	0.24	57.3%	41.4	82.8%	C
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	810	477 (WB)	0.34	75.1%	49.8	83.0%	D
			333 (EB)	0.24	61.4%	50.1	83.6%	C
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	715	399 (SB)	0.29	70.2%	50.2	83.6%	D
			316 (NB)	0.23	60.3%	51.0	85.0%	C
N. Combee Road/ Village Lakes Boulevard	Firstpark Boulevard N./ University Boulevard	1,124	643 (SB)	0.42	80.4%	52.9	81.7%	E
			481 (NB)	0.32	68.9%	53.4	82.4%	D
Firstpark Boulevard N./ University Boulevard	EB I-4 On-/Off-Ramps	1,063	606 (SB)	0.39	79.1%	52.9	82.0%	D
			457 (NB)	0.30	68.1%	53.5	83.0%	D
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	993	554 (SB)	0.36	77.1%	53.9	83.0%	D
			439 (NB)	0.29	66.6%	54.5	83.8%	D
WB I-4 On-/Off-Ramps	Tomkow Road	1,085	710 (SB)	0.46	82.8%	52.8	81.3%	E
			375 (NB)	0.25	58.6%	54.1	83.2%	C
PM PEAK HOUR								
Segment		Two-Way Volume	Directional Volume	V/C [1]	PTSF [2]	ATS [3]	% FFS [4]	LOS [5]
From	To							
Old Combee Road/ Deeson Pointe Boulevard	Lake Luther Road	1,087	465 (WB)	0.31	65.3%	38.1	79.3%	C
			622 (EB)	0.41	75.1%	37.8	78.8%	C
Lake Luther Road	Spanish Oaks Boulevard	917	413 (WB)	0.27	55.8%	41.4	82.7%	C
			504 (EB)	0.33	69.7%	41.0	81.9%	C
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	911	411 (WB)	0.27	66.1%	50.2	83.6%	D
			500 (EB)	0.33	75.0%	48.8	81.3%	D
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	782	371 (SB)	0.24	64.2%	50.9	84.8%	C
			411 (NB)	0.27	69.6%	50.3	83.8%	D
N. Combee Road/ Village Lakes Boulevard	Firstpark Boulevard N./ University Boulevard	1,160	489 (SB)	0.31	68.4%	53.4	82.5%	D
			671 (NB)	0.42	81.6%	52.8	81.5%	E
Firstpark Boulevard N./ University Boulevard	EB I-4 On-/Off-Ramps	1,139	465 (SB)	0.30	66.7%	53.3	82.6%	D
			674 (NB)	0.43	81.7%	52.5	81.3%	E
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	1,197	424 (SB)	0.27	61.8%	53.5	82.3%	C
			773 (NB)	0.49	85.2%	52.3	80.5%	E
WB I-4 On-/Off-Ramps	Tomkow Road	1,148	440 (SB)	0.28	64.2%	53.8	82.7%	C
			708 (NB)	0.45	83.7%	52.8	81.3%	E

[1] Volume-to-Capacity Ratio

[2] Percent Time Spent Following

[3] Average Travel Speed (miles/hour)

[4] Percent of Free-Flow Speed

[5] Level of Service

TABLE 4-2: OPENING YEAR (2016) PEAK HOUR UNSIGNALIZED INTERSECTION OPERATIONS – NO-BUILD ALTERNATIVE

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
Wood Circle W.	Eastbound	L	0.00	9.2	A	0.01	8.4	A
	Southbound	L/R	0.06	15.1	C	0.03	13.4	B
Wood Circle E.	Eastbound	L/T	0.00	10.3	B	0.01	8.4	A
	Southbound	L/R	0.04	23.9	C	0.02	16.6	C
Lake Deeson Village MHP	Eastbound	L/T	0.00	0.0	N/A	0.01	8.4	A
	Southbound	L/R	0.05	17.6	C	0.04	19.2	C
Sunset Way	Eastbound	L/T	0.01	9.1	A	0.00	8.4	A
	Southbound	L/R	0.03	14.7	B	0.03	17.4	C
Lake Luther Road	Eastbound	L/T	0.10	9.0	A	0.14	8.8	A
	Southbound	L/R	0.72	34.5	D	0.36	19.4	C
Spanish Oaks Boulevard	Westbound	L/T	0.00	8.6	A	0.01	8.5	A
	Northbound	L	0.09	20.3	C	0.05	19.3	C
	Northbound	R	0.01	10.6	B	0.02	11.9	B
Huron Way/ Long Lake Circle	Eastbound	L/T/R	0.29	16.9	C	0.28	19.3	C
	Westbound	L/T/R	0.45	30.8	D	0.29	28.4	D
	Northbound	L	0.05	8.4	A	0.06	8.3	A
	Southbound	L	0.00	8.0	A	0.02	8.4	A
North Combee Road/ Village Lakes Boulevard	Eastbound	L	1.00	270.9	F	0.69	225.9	F
	Eastbound	T	0.34	61.9	F	0.16	36.2	E
	Eastbound	R	0.12	10.9	B	0.11	10.4	B
	Westbound	L/T	0.47	103.4	F	0.88	135.1	F
	Westbound	R	0.33	12.1	B	0.57	17.0	C
	Northbound	L	0.04	8.2	A	0.05	8.0	A
	Southbound	L	0.29	9.2	A	0.19	8.9	A
Firstpark Boulevard S.	Eastbound	L	0.20	33.9	D	0.12	25.4	D
	Eastbound	R	0.05	13.8	B	0.06	11.6	B
	Northbound	L	0.05	9.2	A	0.01	8.4	A
Firstpark Boulevard North/ University Boulevard	Eastbound	L	1.11	260.9	F	2.48	860.7	F
	Eastbound	T/R	0.20	25.2	D	0.39	30.0	D
	Westbound	L	2.03	545.9	F	2.89	942.3	F
	Westbound	T	0.20	31.6	D	0.18	31.2	D
	Westbound	R	0.19	11.2	B	0.48	17.1	C
	Northbound	L	0.01	8.4	A	0.01	8.5	A
	Southbound	L	0.14	9.0	A	0.14	9.7	A
I-4 EB Ramps	Eastbound	L	0.68	36.7	E	0.94	70.8	F
	Eastbound	R	0.36	15.9	C	0.16	57.1	F
	Southbound	L	0.08	8.1	A	0.05	8.7	A
I-4 WB Ramps	Westbound	L	0.66	41.1	E	1.07	125.8	F
	Westbound	R	0.07	10.8	B	0.26	90.2	F
	Northbound	L	0.12	9.3	A	0.14	8.3	A
Tomkow Road	Eastbound	L	0.08	8.7	A	0.18	8.7	A
	Westbound	L	0.00	7.9	A	0.00	8.5	A
	Northbound	L/T/R	0.08	35.0	D	0.29	59.7	F
	Southbound	L/T/R	0.58	22.2	C	0.29	16.4	C

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

Several of these movements are projected to operate at or over capacity and these include the eastbound left-turn from Village Lakes Boulevard (in the a.m. peak hour), the eastbound left-turn from Firstpark Boulevard N. (in both peak hours), the westbound left-turn from University Boulevard (in both peak hours), and the westbound left-turn from the I-4 off-ramp (in the p.m. peak hour). The average p.m. peak hour vehicle delays for the eastbound and westbound I-4 off-ramp left-turn movements were estimated with the HCS software to be approximately 71 seconds/vehicle and 126 seconds/vehicle. In contrast, the average p.m. peak hour vehicle delays for the eastbound and westbound right-turn movements were estimated with the HCS software to be approximately 12 seconds/vehicle and 16 seconds/vehicle.

The approach that was used in the existing conditions analysis to obtain a more reasonable estimate of the eastbound off-ramp right-turn vehicle delay in the p.m. peak hour was also used to estimate the p.m. peak hour right-turn vehicle delays in the opening year analyses. Since the westbound left-turn movement is projected to operate over capacity in the p.m. peak hour, this methodology was utilized for the westbound right-turn movement as well as the eastbound right-turn movement. The analysis results indicated that the overall average eastbound and westbound approach delays were estimated to be 57.1 seconds/vehicle and 90.2 seconds/vehicle, respectively. The use of these delay values as estimates for the right-turn vehicle delays was viewed as being more reasonable considering the magnitude of the p.m. peak hour v/c ratios for the left-turn movements and the amount of left-turn storage provided between SR 33 and the entrances to the channelized right-turn lanes. The No-Build Alternative opening year peak hour unsignalized intersection analysis summary sheets are provided in **Appendix K**.

Signalized intersection analyses were conducted for the Old Combee Road/Deeson Pointe Boulevard intersection and the University Boulevard/Firstpark Boulevard N. intersection. As stated earlier, the existing University Boulevard/Firstpark Boulevard N. intersection is currently operating as a two-way stop controlled intersection because the traffic signal that was installed as part of the University Boulevard construction is currently displaying flashing yellow for SR 33 and flashing red for University Boulevard/Firstpark Boulevard N. Based on the results of the unsignalized intersection analysis that was conducted for this location it was assumed that this intersection would be operating under full signal control by the year 2016.

The results of the signalized intersection analyses are summarized in **Table 4-3**. Both of these intersections are projected to operate at LOS C overall during the a.m. and p.m. peak hours. In addition, all of the individual movements are projected to operate at LOS D or better during both peak hours. It should be noted that the laneage used to conduct the analysis of the Old Combee Road/Deeson Pointe Boulevard intersection in the No-Build Alternative is different from the laneage used in the existing conditions analysis.

TABLE 4-3: OPENING YEAR (2016) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – NO-BUILD ALTERNATIVE

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at Old Combee Road/Deeson Pointe Boulevard							
Eastbound SR 33	Left	0.03	12.6	B	0.09	13.6	B
	Thru	0.29	17.4	B	0.46	20.9	C
	Right	0.54	11.2	B	0.42	9.0	A
	Approach	N/A	14.1	B	N/A	16.2	B
Westbound SR 33	Left	0.04	11.7	B	0.02	13.8	B
	Thru	0.47	19.3	B	0.34	19.6	B
	Right	0.00	15.1	B	0.00	16.8	B
	Approach	N/A	19.1	B	N/A	19.5	B
Northbound Old Combee Road	Left	0.65	40.8	D	0.69	38.2	D
	Thru	0.05	34.8	C	0.09	31.1	C
	Right	0.05	34.8	C	0.09	31.1	C
	Approach	N/A	40.6	D	N/A	37.8	D
Southbound Deeson Pointe Boulevard	Left	0.28	42.0	D	0.28	43.8	D
	Thru	0.28	42.0	D	0.28	43.8	D
	Right	0.28	42.0	D	0.28	43.8	D
	Approach	N/A	42.0	D	N/A	43.8	D
Overall Intersection		N/A	21.1	C	N/A	22.7	C
SR 33 at University Boulevard/Firstpark Boulevard N.							
Eastbound Firstpark Boulevard N.	Left	0.18	30.5	C	0.16	30.1	C
	Thru	0.15	39.5	D	0.23	40.0	D
	Right	0.15	39.5	D	0.23	40.0	D
	Approach	N/A	34.0	C	N/A	34.6	C
Westbound University Boulevard	Left	0.59	35.0	D	0.40	32.0	C
	Thru	0.13	39.4	D	0.07	39.1	D
	Right	0.28	28.9	C	0.33	29.4	C
	Approach	N/A	33.4	C	N/A	31.2	C
Northbound SR 33	Left	0.03	12.5	B	0.02	11.0	B
	Thru	0.47	21.7	C	0.71	27.3	C
	Right	0.21	12.5	B	0.22	12.6	B
	Approach	N/A	18.5	B	N/A	23.1	C
Southbound SR 33	Left	0.25	12.2	B	0.27	14.6	B
	Thru	0.64	25.2	C	0.45	21.5	C
	Right	0.09	11.6	B	0.06	11.4	B
	Approach	N/A	21.0	C	N/A	19.0	B
Overall Intersection		N/A	23.7	C	N/A	24.2	C

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

At the time the SR 33 traffic counts were conducted, this intersection was under construction due to the widening of SR 33 from the eastbound CR 582/SR 33 interchange ramps to just north of the Old Combee Road/Deeson Pointe Boulevard intersection. The opening year and design year No-Build Alternative analyses include the additional laneage that was recently constructed at the Old Combee Road/Deeson Pointe Boulevard intersection. The current intersection laneage is as follows:

- Eastbound SR 33 – One left-turn lane, two through lanes and one right-turn lane;
- Westbound SR 33 – One left-turn lane, two through lanes and one right-turn lane;
- Northbound Old Combee Road – Two left-turn lanes and one shared through/right-turn lane; and
- Southbound Deeson Pointe Boulevard – One shared left-turn/through/right-turn lane.

The No-Build Alternative opening year peak hour signalized intersection analysis summary sheets are also provided in **Appendix K**.

4.2 Design Year (2036) Level of Service Analyses

The design year (2036) roadway segment LOS analyses were conducted for the No-Build Alternative using peak hour truck percentages of 5.0% (from Old Combee Road to N. Combee Road) and 7.0% (from N. Combee Road to Tomkow Road), along with a PHF of 0.95. **Table 4-4** summarizes the results of the design year roadway segment analyses for both the a.m. and p.m. peak hours. The SR 33 roadway segments located between Old Combee Road/Deeson Pointe Boulevard and Lake Luther Road and between N. Combee Road/Village Lakes Boulevard and University Boulevard/Firstpark Boulevard N. are projected to operate at LOS F in both travel directions during both the a.m. and p.m. peak hours. The other six roadway segments are all projected to operate at LOS E in both travel directions during both peak hours. Therefore, the entire study corridor is projected to operate at unacceptable levels of service in the design year. These results demonstrate the need to widen SR 33 to four lanes from Old Combee Road/Deeson Pointe Boulevard to Tomkow Road so that LOS D or better operations can be provided on this roadway through the year 2036. The design year peak hour No-Build Alternative roadway segment analysis summary sheets are provided in **Appendix L**.

The design year (2036) peak hour unsignalized intersection analyses were also conducted using a PHF of 0.95. The results of the a.m. and p.m. peak hour unsignalized intersection analyses are summarized in **Table 4-5**. With one exception, all of the left-turn movements from SR 33 are projected to operate at LOS D or better during both peak hours. The eastbound left-turn movement from SR 33 onto Lake Luther Road is projected to operate at LOS E in the a.m. peak hour. In contrast, a majority of the cross street left-turn, through, and right-turn movements are projected to operate at LOS F during both peak hours. The only

TABLE 4-4: DESIGN YEAR (2036) PEAK HOUR ROADWAY SEGMENT OPERATIONS – NO-BUILD ALTERNATIVE

AM PEAK HOUR								
Segment		Two-Way Volume	Directional Volume	V/C [1]	PTSF [2]	ATS [3]	% FFS [4]	LOS [5]
From	To							
Old Combee Road/ Deeson Pointe Blvd	Lake Luther Road	3,112	1,726 (WB)	1.07	97.6%	22.2	46.3%	F
			1,386 (EB)	0.86	93.7%	22.2	46.3%	F
Lake Luther Road	Spanish Oaks Boulevard	2,684	1,491 (WB)	0.92	93.6%	27.7	55.4%	E
			1,193 (EB)	0.74	90.9%	27.7	55.4%	E
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	2,657	1,472 (WB)	0.91	95.5%	37.4	62.4%	E
			1,185 (EB)	0.73	91.8%	37.6	62.6%	E
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	2,655	1,471 (SB)	0.91	95.5%	37.4	62.3%	E
			1,184 (NB)	0.73	91.6%	37.6	62.7%	E
N. Combee Road/ Village Lakes Boulevard	Firstpark Boulevard N./ University Boulevard	3,056	1,693 (SB)	1.05	97.9%	39.2	60.3%	F
			1,363 (NB)	0.84	94.2%	39.0	60.3%	F
Firstpark Boulevard N./ University Boulevard	EB I-4 On-/Off-Ramps	2,718	1,506 (SB)	0.93	96.2%	41.3	64.0%	E
			1,212 (NB)	0.75	92.4%	41.5	64.3%	E
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	2,132	1,120 (SB)	0.69	91.1%	46.4	71.4%	E
			1,012 (NB)	0.63	88.3%	46.5	71.5%	E
WB I-4 On-/Off-Ramps	Tomkow Road	1,921	1,097 (SB)	0.68	90.3%	47.9	73.7%	E
			824 (NB)	0.51	83.2%	48.2	74.1%	E
PM PEAK HOUR								
Segment		Two-Way Volume	Directional Volume	V/C [1]	PTSF [2]	ATS [3]	% FFS [4]	LOS [5]
From	To							
Old Combee Road/ Deeson Pointe Blvd	Lake Luther Road	3,109	1,384 (WB)	0.86	93.9%	22.2	46.3%	F
			1,725 (EB)	1.07	97.4%	22.2	46.3%	F
Lake Luther Road	Spanish Oaks Boulevard	2,684	1,193 (WB)	0.74	90.0%	27.7	55.4%	E
			1,491 (EB)	0.92	94.8%	27.7	55.4%	E
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	2,657	1,185 (WB)	0.73	91.6%	37.6	62.6%	E
			1,472 (EB)	0.91	95.7%	37.3	62.1%	E
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	2,655	1,184 (SB)	0.73	91.7%	37.6	62.6%	E
			1,471 (NB)	0.91	95.4%	37.4	62.4%	E
N. Combee Road/ Village Lakes Boulevard	Firstpark Boulevard N./ University Boulevard	3,056	1,363 (SB)	0.84	94.1%	39.1	60.4%	F
			1,693 (NB)	1.05	98.0%	38.9	60.1%	F
Firstpark Boulevard N./ University Boulevard	EB I-4 On-/Off-Ramps	2,730	1,217 (SB)	0.75	92.5%	41.4	64.2%	E
			1,513 (NB)	0.94	96.3%	41.2	63.8%	E
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	2,469	1,004 (SB)	0.62	87.8%	44.0	67.7%	E
			1,465 (NB)	0.91	94.8%	43.7	67.2%	E
WB I-4 On-/Off-Ramps	Tomkow Road	1,915	820 (SB)	0.51	83.1%	48.2	74.2%	E
			1,095 (NB)	0.68	90.3%	48.0	73.8%	E

[1] Volume-to-Capacity Ratio

[2] Percent Time Spent Following

[3] Average Travel Speed (miles/hour)

[4] Percent of Free-Flow Speed

[5] Level of Service

TABLE 4-5: DESIGN YEAR (2036) PEAK HOUR UNSIGNALIZED INTERSECTION OPERATIONS – NO-BUILD ALTERNATIVE

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
Wood Circle W.	Eastbound	L	0.01	15.7	C	0.02	12.8	B
	Southbound	L/R	0.30	129.7	F	0.24	131.1	F
Wood Circle E.	Eastbound	L/T	0.01	15.7	C	0.02	12.8	B
	Southbound	L/R	0.56	349.9	F	0.32	231.9	F
Lake Deeson Village MHP	Eastbound	L/T	0.01	15.6	C	0.03	12.9	B
	Southbound	L/R	0.59	304.6	F	1.54	857.4	F
Sunset Way	Eastbound	L/T	0.02	15.7	C	0.01	12.8	B
	Southbound	L/R	0.50	225.0	F	0.63	358.0	F
Lake Luther Road	Eastbound	L/T	0.81	41.3	E	0.66	23.4	C
	Southbound	L/R	70.86	32,468.0	F	40.64	18,498.0	F
Spanish Oaks Boulevard	Westbound	L/T	0.01	11.5	B	0.02	13.6	B
	Northbound	L	1.14	507.2	F	0.75	381.6	F
	Northbound	R	0.04	22.5	C	0.06	32.3	D
Huron Way/ Long Lake Circle	Eastbound	L/T/R	19.79	8,978.0	F	24.08	10,948.0	F
	Westbound	L/T/R	28.67	14,794.0	F	11.80	6,274.0	F
	Northbound	L	0.32	17.3	C	0.23	13.4	B
	Southbound	L	0.03	10.8	B	0.04	12.7	B
N. Combee Road/ Village Lakes Boulevard	Eastbound	L	*	**	F	*	**	F
	Eastbound	T	*	**	F	33.00	21,067.0	F
	Eastbound	R	1.36	229.9	F	0.67	36.3	E
	Westbound	L/T	*	**	F	*	**	F
	Westbound	R	1.31	192.6	F	2.35	654.8	F
	Northbound	L	0.41	16.0	C	0.41	14.2	B
	Southbound	L	0.82	29.9	D	0.77	30.7	D
Firstpark Boulevard S.	Eastbound	L	8.14	4,240.0	F	3.50	1,867.0	F
	Eastbound	R	0.47	68.5	F	0.38	37.8	E
	Northbound	L	0.19	18.1	C	0.09	13.6	B
I-4 EB Ramps	Eastbound	L	3.58	1,249.0	F	5.34	2,040.0	F
	Eastbound	R	2.01	792.4	F	1.06	1,284.0	F
	Southbound	L	0.19	10.0	B	0.15	11.5	B
I-4 WB Ramps	Westbound	L	9.22	3,832.0	F	*	**	F
	Westbound	R	0.28	3,171.0	F	0.47	***	F
	Northbound	L	0.34	10.9	B	0.48	11.3	B
Tomkow Road	Eastbound	L	0.34	11.6	B	0.42	11.6	B
	Westbound	L	0.01	8.6	A	0.00	9.2	A
	Northbound	L/T/R	*	**	F	2.00	1,145.0	F
	Southbound	L/T/R	2.19	592.0	F	1.90	475.8	F

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] 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.

*** No estimate of delay is provided since the v/c ratio for the westbound left-turn movement is infinite.

cross street movements that are not projected to operate at LOS F during both peak hours are the following:

- Northbound Spanish Oaks Boulevard right-turn movement;
- Eastbound Firstpark Boulevard S. right-turn movement (LOS E in the p.m. peak hour); and
- Village Lakes Boulevard right-turn movement (LOS E in the p.m. peak hour).

It should be noted that although the HCS analysis results indicated the westbound right-turn movement from the I-4 off-ramp was projected to operate at LOS C in the a.m. peak hour and LOS D in the p.m. peak hour, the actual vehicle delay and LOS would be significantly worse than this due to the severe overcapacity conditions projected for the westbound left-turn movement and the inadequate length of the westbound right-turn lane. The HCS software was unable to calculate a v/c ratio for the p.m. peak hour westbound left-turn movement since there is no capacity available for this movement. Similarly, even though the HCS analysis results indicated that the eastbound right-turn movement from the I-4 off-ramp was projected to operate at LOS F during both peak hours, the magnitude of the actual vehicle delays would be greater than the HCS estimates due to the severe overcapacity conditions projected for the eastbound left-turn movement and the inadequate length of the eastbound right-turn lane.

Although a majority of the cross street movements are projected to operate at LOS F, the peak hour volumes associated with some of the LOS F movements are low and as a result, the v/c ratios are projected to be less than 1.00. A review of the 2036 peak hour volumes and v/c ratios indicates that the most significant operational problems are projected to occur for the following movements:

- Southbound Lake Luther Road left-turn and right-turn movements;
- Eastbound Huron Way left-turn, through, and right-turn movements;
- Eastbound Village Lakes Boulevard left-turn, through, and right-turn movements;
- Westbound N. Combee Road left-turn, through, and right-turn movements;
- Eastbound Firstpark Boulevard S. left-turn movement;
- Eastbound I-4 off-ramp left-turn and right-turn movements;
- Westbound I-4 off-ramp left-turn and right-turn movements; and
- Southbound Tomkow Road left-turn, through, and right-turn movements.

Although the implementation of traffic signals at one or more of these unsignalized intersections would reduce the cross street movement delays, this would also increase the delays experienced by the SR 33 movements. In addition, the implementation of traffic signals would not eliminate the LOS E and F conditions that are projected to occur on the SR 33 roadway segments. The No-Build Alternative design year peak hour unsignalized intersection analysis summary sheets are provided in **Appendix L**.

The design year (2036) peak hour signalized intersection analyses that were conducted for the Old Combee Road/Deeson Pointe Boulevard intersection and the University Boulevard/Firstpark Boulevard N. intersection used PHF's of 0.95 and 0.97, respectively. A slightly higher PHF value was used for the University Boulevard/Firstpark Boulevard N. signalized intersection analyses due to the overcapacity conditions that were expected to occur on both SR 33 and University Boulevard/Firstpark Boulevard N. in the design year. The results of the signalized intersection analyses are summarized in **Table 4-6**. Although the Old Combee Road/Deeson Pointe Boulevard intersection is projected to operate at LOS D overall during both the a.m. and p.m. peak hours, the University Boulevard/Firstpark Boulevard N. intersection is projected to operate at LOS F overall during both peak hours. The following movements at this intersection are projected to have v/c ratios greater than 1.00 during both peak hours:

- Westbound University Boulevard left-turn movement
- Northbound SR 33 through movement
- Southbound SR 33 left-turn movement

The high v/c ratios that are projected to occur at this intersection in the design year support the use of a high PHF since traffic flow becomes relatively uniform (constant) throughout the peak hour when an intersection is overcapacity. The No-Build Alternative design year peak hour signalized intersection analysis summary sheets are also provided in **Appendix L**.

4.3 Failure Year Level of Service Analyses

Additional roadway segment LOS analyses were conducted for the No-Build Alternative to identify the approximate years when LOS D operations would no longer be expected to occur on the four segments between Old Combee Road/Deeson Pointe Boulevard and N. Combee Road/Village Lakes Boulevard. The peak hour volumes that were used to conduct these additional analyses were derived by interpolating between the opening year and design year peak hour volumes. The analyses were conducted in an iterative manner until LOS E operations were first obtained. **Table 4-7** summarizes the results of the interim year No-Build Alternative roadway segment analyses. All four of these segments are projected to operate at LOS E sometime between the years 2019 and 2028. The two segments between Spanish Oaks Boulevard and N. Combee Road/Village Lakes Boulevard are projected to begin operating at LOS E during the 2019-2020 time frame, while the two segments between Old Combee Road/Deeson Pointe Boulevard and Spanish Oaks Boulevard are not projected to begin operating at LOS E until the 2023-2028 time frame. The interim year peak hour No-Build Alternative roadway segment analysis summary sheets are provided in **Appendix M**.

TABLE 4-6: DESIGN YEAR (2036) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – NO BUILD ALTERNATIVE

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at Old Combee Road/Deeson Pointe Boulevard							
Eastbound SR 33	Left	0.17	34.3	C	0.20	20.0	C
	Thru	0.79	31.8	C	0.98	46.2	D
	Right	0.55	8.1	A	0.67	10.6	B
	Approach	N/A	24.6	C	N/A	35.5	D
Westbound SR 33	Left	0.18	24.4	C	0.21	29.5	C
	Thru	1.00	55.9	E	0.78	26.3	C
	Right	0.01	17.3	B	0.01	14.4	B
	Approach	N/A	55.2	E	N/A	26.3	C
Northbound Old Combee Road	Left	0.96	79.7	E	0.96	77.5	E
	Thru	0.09	45.1	D	0.13	43.2	D
	Right	0.09	45.1	D	0.13	43.2	D
	Approach	N/A	78.2	E	N/A	75.4	E
Southbound Deeson Pointe Boulevard	Left	0.61	74.9	E	0.36	58.9	E
	Thru	0.61	74.9	E	0.36	58.9	E
	Right	0.61	74.9	E	0.36	58.9	E
	Approach	N/A	74.9	E	N/A	58.9	E
Overall Intersection		N/A	45.9	D	N/A	38.5	D
SR 33 at University Boulevard/Firstpark Boulevard N.							
Eastbound Firstpark Boulevard N.	Left	0.96	137.3	F	1.33	256.7	F
	Thru	0.89	112.8	F	1.42	302.3	F
	Right	0.89	112.8	F	1.42	302.3	F
	Approach	N/A	125.2	F	N/A	277.1	F
Westbound University Boulevard	Left	1.71	372.5	F	1.46	266.6	F
	Thru	0.23	36.1	D	0.16	36.6	D
	Right	0.72	24.0	C	0.80	30.5	C
	Approach	N/A	224.9	F	N/A	154.4	F
Northbound SR 33	Left	0.24	44.4	D	0.20	38.5	D
	Thru	1.36	241.1	F	1.61	344.1	F
	Right	1.09	121.0	F	1.23	187.0	F
	Approach	N/A	160.2	F	N/A	242.8	F
Southbound SR 33	Left	1.50	279.9	F	1.39	236.1	F
	Thru	0.96	67.9	E	0.67	36.8	D
	Right	0.25	23.6	C	0.16	21.5	C
	Approach	N/A	163.1	F	N/A	141.1	F
Overall Intersection		N/A	182.9	F	N/A	190.6	F

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

TABLE 4-7: INTERIM YEAR PEAK HOUR ROADWAY SEGMENT OPERATIONS – NO-BUILD ALTERNATIVE

Segment		First Year for LOS E	Peak Hour	Two-Way Volume	Directional Volume	V/C [1]	PTSF [2]	ATS [3]	% FFS [4]	LOS [5]
From	To									
Old Combee Road/ Deeson Pointe Boulevard	Lake Luther Road	2023	AM	1,743	1,008 (WB) 735 (EB)	0.68 0.50	89.2% 80.9%	32.0 32.1	66.6% 66.8%	E D
Lake Luther Road	Spanish Oaks Boulevard	2028	PM	1,977	1,096 (WB) 881 (EB)	0.69 0.56	88.9% 81.9%	33.1 33.1	66.2% 66.2%	E E
Spanish Oaks Boulevard	Huron Way/ Long Lake Circle	2019	PM	1,173	646 (WB) 527 (EB)	0.42 0.34	80.5% 72.2%	47.8 48.5	79.7% 80.9%	E D
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	2020	AM	1,103	613 (SB) 490 (NB)	0.43 0.34	80.4% 71.3%	47.8 48.5	79.7% 80.8%	E D

[1] Volume-to-Capacity Ratio

[2] Percent Time Spent Following

[3] Average Travel Speed (miles/hour)

[4] Percent of Free-Flow Speed

[5] Level of Service

5.0 BUILD ALTERNATIVE LEVEL OF SERVICE ANALYSES

5.1 Design Year (2036) Level of Service Analyses

A preliminary access management plan was developed for the SR 33 study corridor. The type of median opening to be provided at each of the intersections that were analyzed with the Build Alternative is as follows:

- Old Combee Road/Deeson Pointe Boulevard– Full Median Opening
- Wood Circle W. – Full Median Opening
- Wood Circle E. – No Median Opening (Right-In/Right-Out Only)
- Lake Deeson Village Mobile Home Park Entrance/Exit – No Median Opening (Right-In/Right-Out Only)
- Sunset Way – No Median Opening (Right-In/Right-Out Only)
- Lake Luther Road – Full Median Opening
- Spanish Oaks Boulevard – Directional Median Opening (Westbound SR 33 Left-Turn)
- Huron Way/Long Lake Circle – Full Median Opening
- N. Combee Road/Village Lakes Boulevard – Full Median Opening
- Firstpark Boulevard S. – Directional Median Opening (Northbound SR 33 Left-Turn)
- Firstpark Boulevard N./University Boulevard – Full Median Opening
- Eastbound I-4 On-/Off-Ramps – Full Median Opening
- Westbound I-4 On-/Off-Ramps – Full Median Opening
- Park-and-Ride Lot Entrance/Exit - Directional Median Opening (Westbound SR 33 Left-Turn)
- Relocated Tomkow Road/Auto Auction Entrance/Exit – Full Median Opening

The design year (2036) a.m. and p.m. peak hour volumes that were previously developed for the No-Build Alternative intersections were manually redistributed to reflect the median openings associated with the preliminary access management plan. The design year a.m. and p.m. peak hour volumes illustrated in **Figures 5-1**, **5-2**, **5-3**, and **5-4** reflect the redistribution that was conducted based on the access management plan.

The existing Tomkow Road intersection and the existing entrance/exit to the park-and-ride lot are both currently located within the existing limited access right-of-way for the I-4 interchange. The Tomkow Road intersection is located approximately 720 feet north/east of the beginning of the southbound SR 33 right-turn lane onto westbound I-4. Similarly, the park-and-ride lot entrance/exit is located approximately 775 feet north/east of the westbound I-4 right-turn lane onto northbound SR 33. The recommended diamond

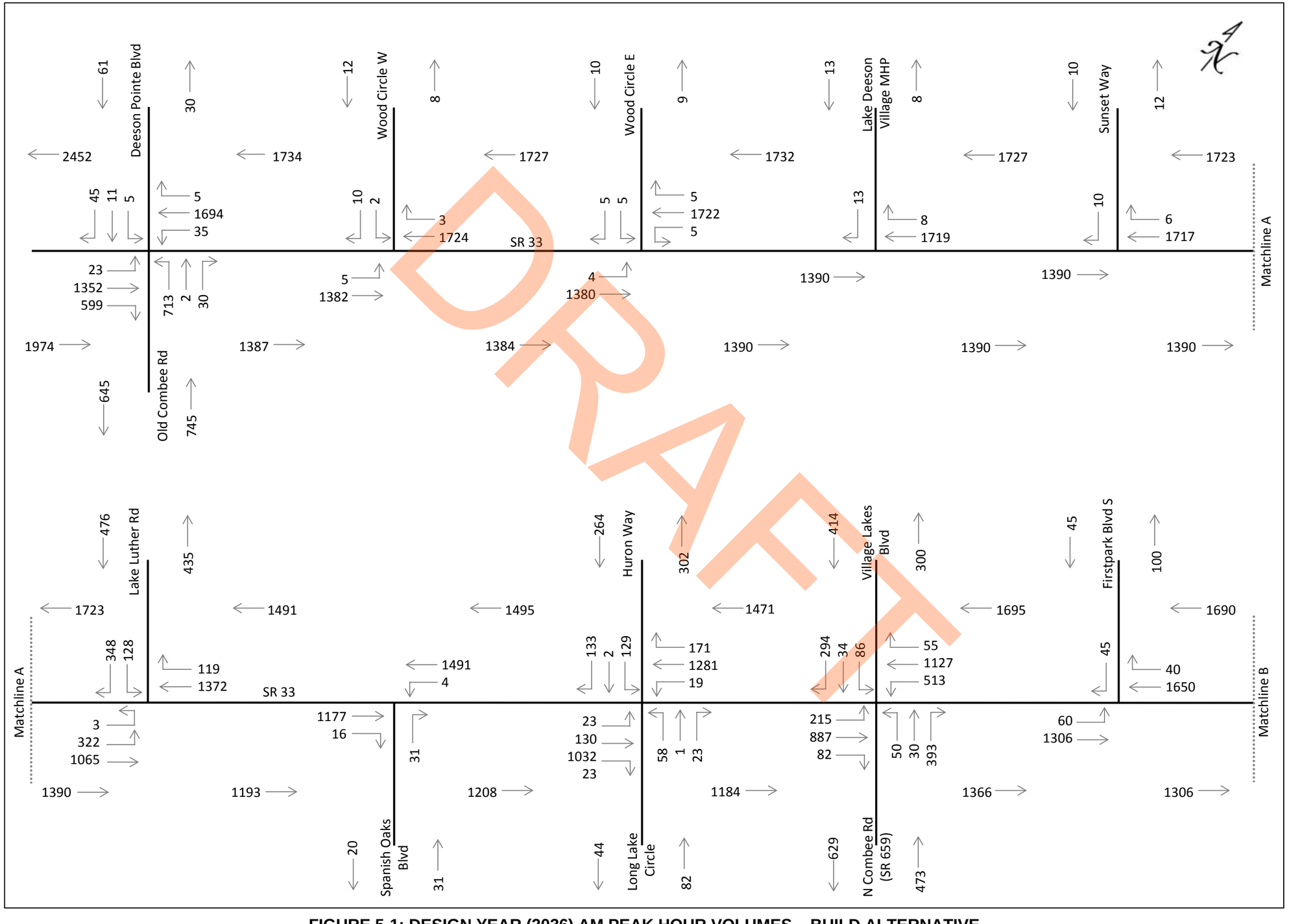


FIGURE 5-1: DESIGN YEAR (2036) AM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

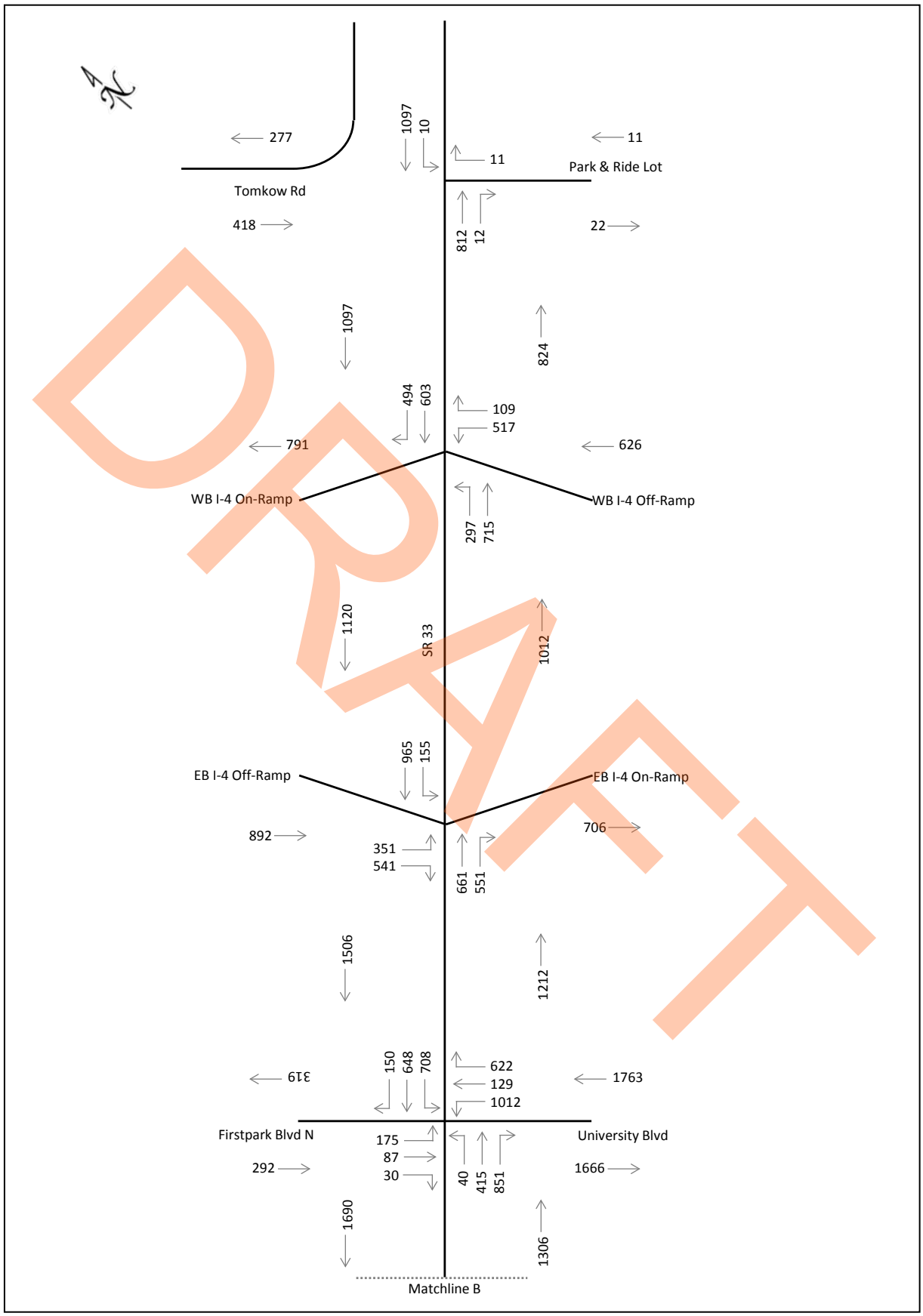


FIGURE 5-2: DESIGN YEAR (2036) AM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

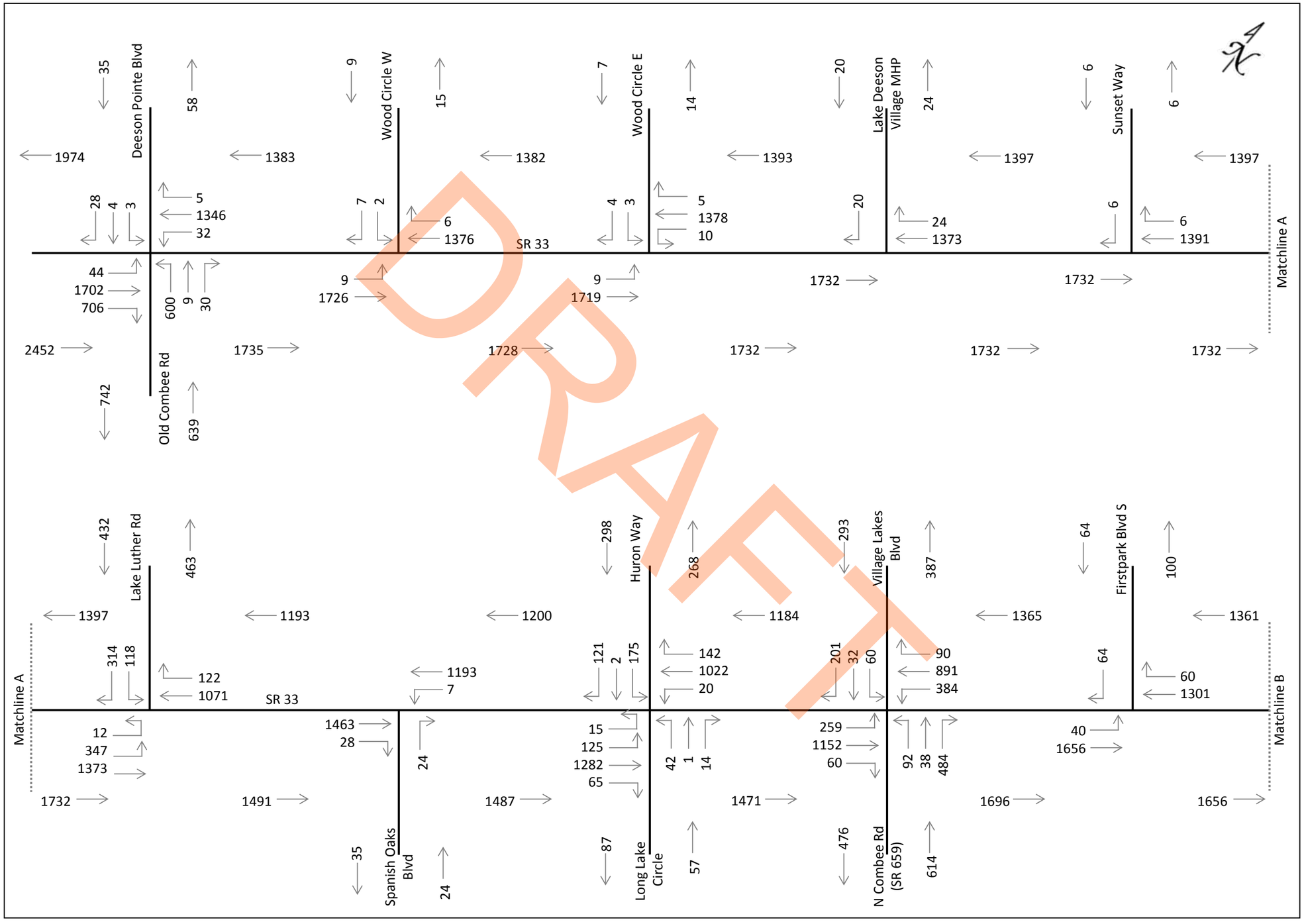


FIGURE 5-3: DESIGN YEAR (2036) PM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

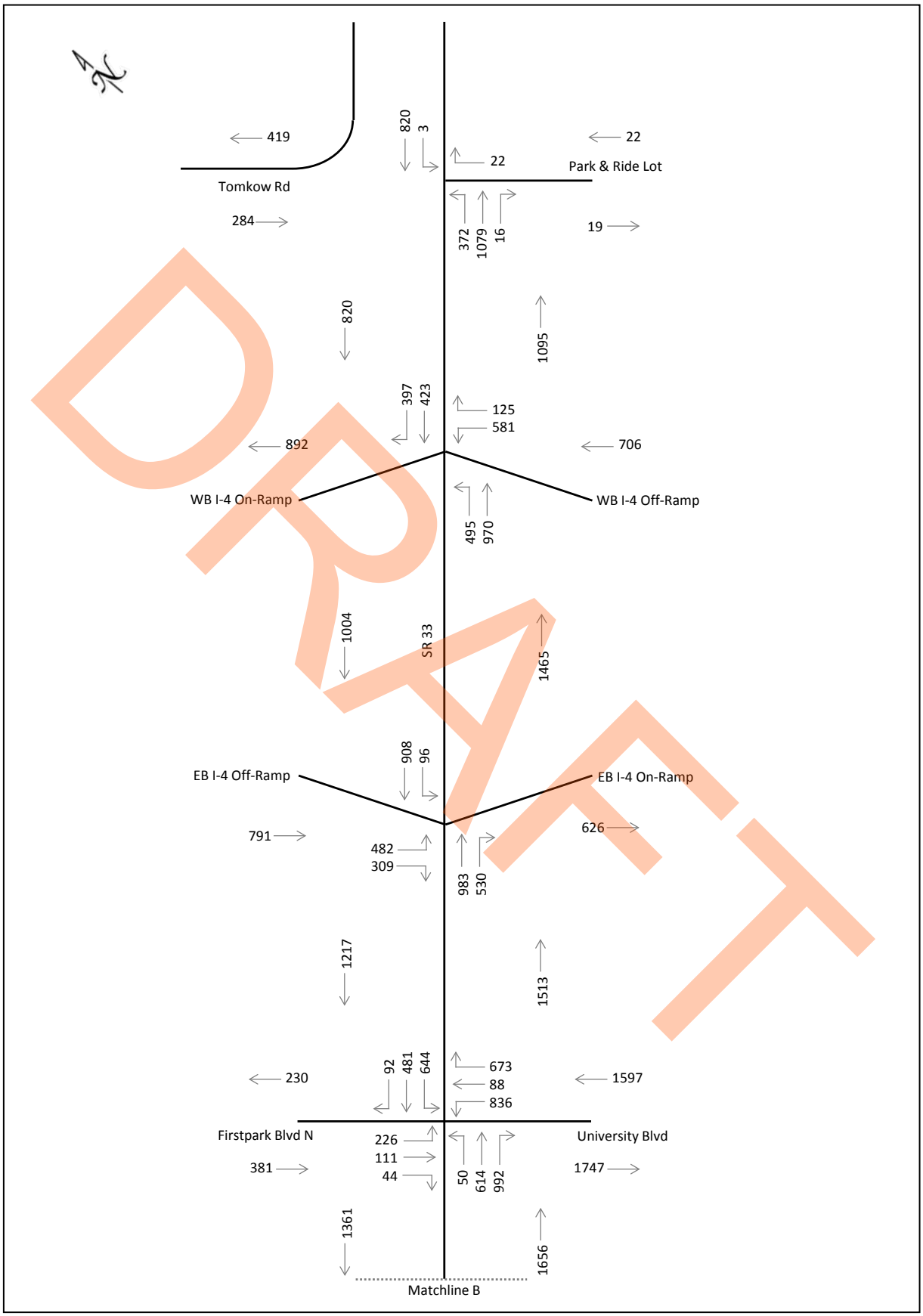


FIGURE 5-4: DESIGN YEAR (2036) PM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

interchange improvement concept that was developed as a part of the PD&E study relocates the southbound SR 33 right-turn lane and the westbound I-4 right-turn lane further to the north/east of their current junctions with the SR 33 mainline. The beginning of the southbound SR 33 right-turn lane is located at the existing Tomkow Road intersection while the stop bar for the westbound I-4 right-turn lane is located approximately 715 feet to the south/west of the park-and-ride lot access.

Although signalization of the westbound I-4 right-turn lane and the Tomkow Road intersection (in combination with prohibiting any right-turn-on-red movements) would eliminate any high-speed merging and weaving conflicts between the right-turn vehicles and the northbound/southbound SR 33 vehicles; the close proximity of these right-turn lanes to the existing Tomkow Road intersection precludes the ability to provide drivers with adequate advanced signing for both Tomkow Road and the westbound I-4 on-ramp. Consequently, the Build Alternative also includes a realignment of Tomkow Road. Approximately 240 feet north of the existing intersection, Tomkow Road is realigned to run parallel to SR 33 within the existing right-of-way that exists on the north side of SR 33. The realigned Tomkow Road intersects SR 33 directly across from the easternmost active entrance/exit to the Auto Auction which is approximately 1,450 feet east of the existing Tomkow Road intersection.

Although the Auto Auction property has three connections to SR 33, the easternmost connection is gated and is not currently used by this business. A full median opening is proposed for the relocated Tomkow Road intersection while the westernmost Auto Auction entrance/exit would have right-in/right-out only access. A westbound directional median opening is also proposed for the park-and-ride lot entrance to accommodate left-turn movements into this facility. This directional median opening eliminates the need to accommodate U-turn movements at the westbound I-4 ramp terminal intersection.

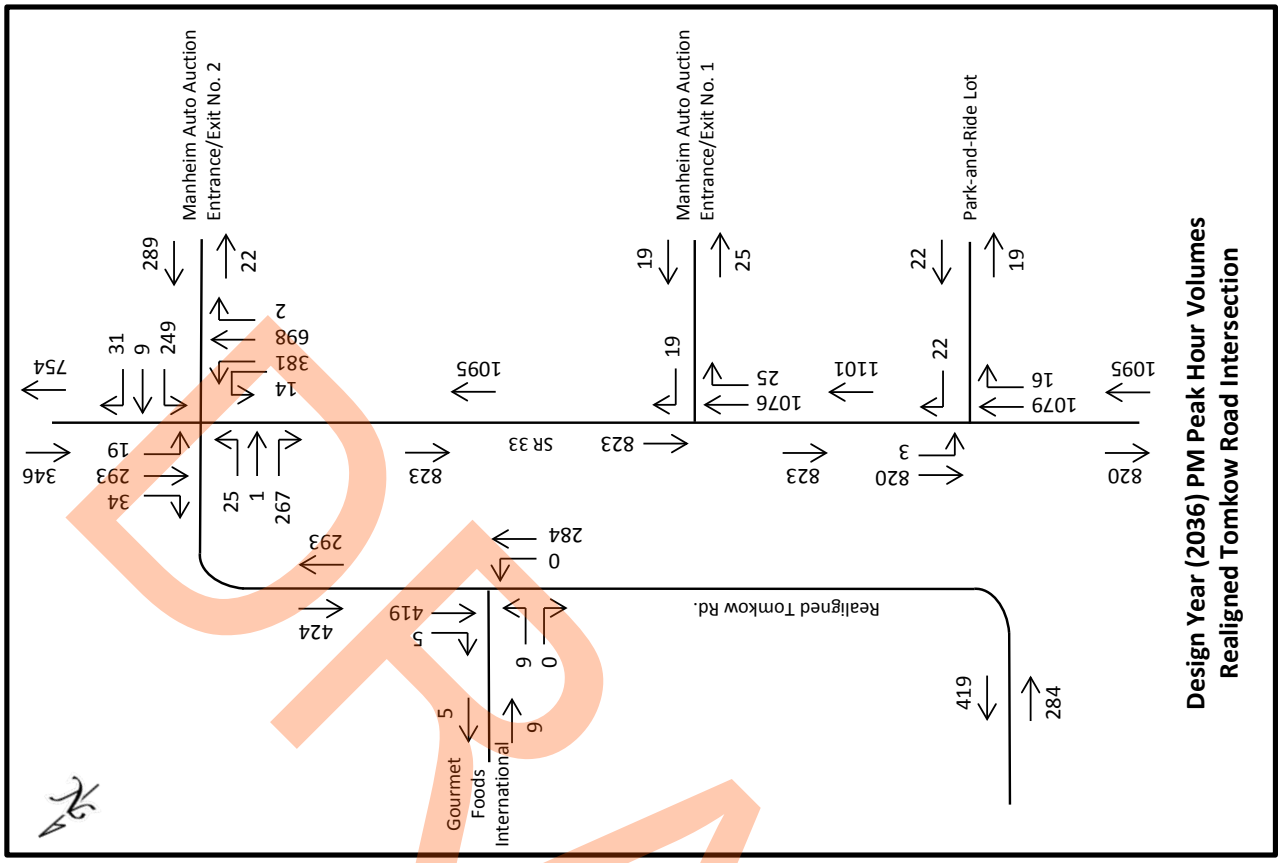
The peak hour volumes that were used to conduct the relocated Tomkow Road intersection analysis were derived by manually redistributing several of the design year peak hour volumes that were previously used to conduct the Tomkow Road intersection analysis for the No-Build Alternative. In addition, a 1.5% per year growth rate was applied to the existing peak hour Auto Auction turning movement volumes to derive the design year peak hour volumes for this land use. Several of these volumes were also manually redistributed to reflect the relocation of the Tomkow Road intersection and the right-in/right-out only access provided at the western entrance/exit to the Auto Auction. Since a.m. peak hour turning movement counts were not conducted at the Auto Auction driveways, only a p.m. peak hour analysis was conducted for this intersection. As stated earlier in **Section 2.3** of this report, the auction does not start until 2:00 p.m. and consequently, the volume of traffic entering and exiting this facility during the a.m. peak hour is significantly

lower than the p.m. peak hour. Therefore, the design year a.m. peak hour traffic operations would be expected to be better than the p.m. peak hour traffic operations at this intersection. The design year (2036) p.m. peak hour volumes that were used to conduct the analysis of the relocated Tomkow Road intersection are graphically illustrated in **Figure 5-5** along with the p.m. peak hour volumes that were initially used to conduct the redistribution.

Design year (2036) peak hour unsignalized intersection analyses were conducted using a PHF of 0.95. The results of the a.m. and p.m. peak hour unsignalized intersection analyses are summarized in **Table 5-1**. With one exception, all of the SR 33 left-turn (and U-turn) movements are projected to operate at LOS D or better during both peak hours and a majority of these SR 33 movements are projected to operate at LOS C or better. The eastbound left-turn movement from SR 33 onto Lake Luther Road is projected to operate at LOS E in the a.m. peak hour. A majority of the cross street left-turn and through movements are projected to operate at LOS F during both peak hours. The only cross street left-turn movements that are not projected to operate at LOS F during both peak hours are located at Wood Circle W. and Wood Circle E.

It should be noted that although the HCS analysis results indicated the westbound right-turn movement from the I-4 off-ramp was projected to operate at LOS B during the a.m. and p.m. peak hours, LOS F operations would be expected to occur for this movement due to the severe overcapacity conditions projected for the westbound left-turn movement. The westbound left-turn movement is projected to operate significantly overcapacity during both of the peak hours (with v/c ratios greater than 5.00) and the 95th-percentile queue lengths for this movement are estimated to be 59 vehicles and 75 vehicles, respectively. The westbound left-turn queues would be expected to block the access to the existing westbound right-turn lane for long periods of time and, as a result, the average peak hour vehicle delays for the westbound right-turn movement would be expected to result in LOS F operations for this movement as well. A similar situation would be expected to occur during the peak hours for the eastbound I-4 off-ramp right-turn movement. Consequently, the eastbound and westbound I-4 off-ramp approach delays were viewed as being more reasonable estimates of the right-turn movement delays and these values are included in **Table 5-1**.

With two exceptions, all of the cross street approach lanes that are projected to operate at LOS F are also projected to have v/c ratios that are much greater than 1.00. The westbound shared left/through/right lane on Long Lake Circle is projected to operate at LOS F with a v/c ratio equal to 0.83 in the p.m. peak hour while the southbound shared left/through lane on Tomkow Road is projected to operate at LOS F with a v/c ratio equal to 0.35 in the p.m. peak hour. The design year unsignalized intersection analyses conducted for the Build Alternative are provided in **Appendix N**.



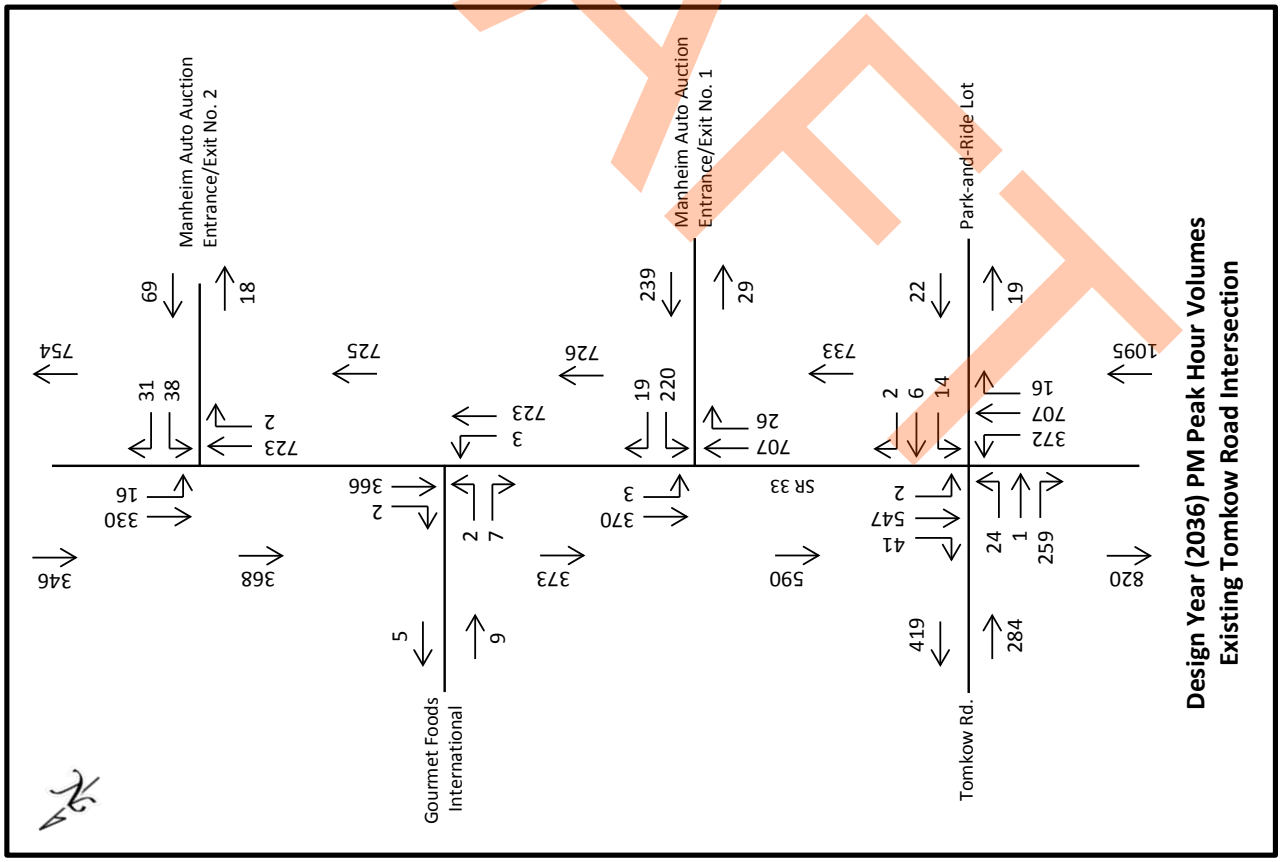


FIGURE 5-5: DESIGN YEAR (2036) PM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

TABLE 5-1: DESIGN YEAR (2036) PEAK HOUR UNSIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
Wood Circle W.	Eastbound	L	0.01	15.7	C	0.02	12.8	B
	Southbound	L/R	0.05	21.4	C	0.03	18.6	C
Wood Circle E.	Eastbound	L	0.01	15.7	C	0.02	12.8	B
	Westbound	U	0.01	12.7	B	0.03	15.7	C
	Southbound	L/R	0.07	32.5	D	0.04	23.7	C
Lake Deeson Village MHP	Southbound	R	0.04	16.1	C	0.05	14.0	B
Sunset Way	Southbound	R	0.03	16.0	C	0.01	13.6	B
Lake Luther Road	Eastbound	L	0.85	47.5	E	0.71	26.3	D
	Westbound	L	0.00	0.0	N/A	0.00	0.0	N/A
	Southbound	L/R	5.88	2,294.0	F	3.88	1,372.0	F
Spanish Oaks Boulevard	Westbound	L	0.01	11.5	B	0.02	13.6	B
	Northbound	R	0.07	12.9	B	0.06	14.7	B
Huron Way/ Long Lake Circle	Eastbound	L/T/R	*	**	F	2.22	622.5	F
	Westbound	L/T/R	*	**	F	0.83	160.5	F
	Northbound	L	0.39	18.9	C	0.27	13.9	B
	Southbound	L	0.03	10.8	B	0.04	12.7	B
N. Combee Road/ Village Lakes Boulevard	Eastbound	L	*	**	F	*	**	F
	Eastbound	T	*	**	F	*	**	F
	Eastbound	R	0.62	23.6	C	0.36	14.6	B
	Westbound	L/T	*	**	F	*	**	F
	Westbound	R	0.71	25.1	D	1.06	86.7	F
	Northbound	L	0.42	16.4	C	0.42	14.4	B
	Southbound	L	0.83	32.3	D	0.79	33.1	D
Firstpark Boulevard S.	Eastbound	R	0.15	18.0	C	0.15	14.3	B
	Northbound	L	0.19	18.7	C	0.09	13.9	B
I-4 EB Ramps	Eastbound	L	2.82	890.6	F	3.23	1,063.0	F
	Eastbound	R	1.04	396.3	F	0.57	655.5	F
	Southbound	L	0.19	10.1	B	0.16	11.7	B
I-4 WB Ramps	Westbound	L	5.28	2,009.0	F	17.46	7,621.0	F
	Westbound	R	0.17	1,663.0	F	0.24	6,278.0	F
	Northbound	L	0.34	11.0	B	0.48	11.4	B
Park-and-Ride Lot	Westbound	L	0.01	9.6	A	0.00	10.9	B
	Northbound	R	0.02	10.8	B	0.04	12.2	B
Relocated Tomkow Road/ Auto Auction	Eastbound	L	N/A	N/A	N/A	0.35	9.7	A
	Westbound	L	N/A	N/A	N/A	0.02	9.2	A
	Northbound	L/T/R	N/A	N/A	N/A	5.22	2,042.0	F
	Southbound	L/T	N/A	N/A	N/A	0.35	75.1	F
	Southbound	R	N/A	N/A	N/A	0.32	11.0	B

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] 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.

The results of the design year unsignalized intersection analyses indicate that high cross street delays are projected to occur if the existing two-way stop control is maintained at the following intersections:

- Lake Luther Road
- Huron Way/Long Lake Circle
- N. Combee Road/Village Lakes Boulevard
- Eastbound I-4 On-/Off-Ramps
- Westbound I-4 On-/Off-Ramps
- Relocated Tomkow Road/Auto Auction Entrance/Exit

Signalized intersection analyses were subsequently conducted for these six intersections, as well as the Old Combee Road/Deeson Point Boulevard and University Boulevard/Firstpark Boulevard N. intersections to determine whether acceptable traffic operations could be expected to occur in the design year with the implementation of traffic signals. The results of the signalized intersection analyses are summarized in **Table 5-2** and the signalized intersection analyses are provided in **Appendix N**. All of the intersections listed in this table are projected to operate at LOS D or better overall during the a.m. and p.m. peak hours with traffic signal control. The recommended design year intersection geometrics are graphically illustrated in **Figure 5-6** and **Figure 5-7**.

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 SR 33 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 phase of the project and will be based on the results of a more detailed traffic signal warrant study to be conducted by the FDOT.

The design year (2036) roadway segment LOS analyses were conducted for the Build Alternative using the urban street segment module of the 2010 HCS and the results are summarized in **Table 5-3**. All of the roadway segments are projected to operate at the LOS D or better during both peak hours. In addition, the overall study corridor travel speeds are indicative of LOS C operations.

TABLE 5-2: DESIGN YEAR (2036) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at Old Combee Road/Deeson Pointe Boulevard							
Eastbound SR 33	Left	0.15	31.5	C	0.20	20.0	B
	Thru	0.79	31.3	C	0.99	48.3	D
	Right	0.54	7.8	A	0.67	11.0	B
	Approach	N/A	24.2	C	N/A	37.0	D
Westbound SR 33	Left	0.17	23.8	C	0.21	29.5	C
	Thru	0.93	35.0	C	0.77	26.4	C
	Right	0.01	17.1	B	0.01	14.6	B
	Approach	N/A	34.7	C	N/A	26.4	C
Northbound Old Combee Road	Left	0.96	79.7	E	0.96	77.5	E
	Thru	0.09	45.1	D	0.13	43.2	D
	Right	0.09	45.1	D	0.13	43.2	D
	Approach	N/A	78.2	E	N/A	75.4	E
Southbound Deeson Pointe Boulevard	Left	0.64	78.4	E	0.34	58.3	E
	Thru	0.64	78.4	E	0.34	58.3	E
	Right	0.64	78.4	E	0.34	58.3	E
	Approach	N/A	78.4	E	N/A	58.3	E
Overall Intersection		N/A	37.9	D	N/A	39.4	D
SR 33 at Lake Luther Road							
Eastbound SR 33	Left	0.94	58.7	E	0.94	61.0	E
	Thru	0.49	9.9	A	0.67	15.2	B
	Approach	N/A	21.3	C	N/A	24.7	C
Westbound SR 33	Thru	0.92	33.8	C	0.83	38.6	D
	Right	0.93	34.7	C	0.83	39.0	D
	Approach	N/A	34.2	C	N/A	38.8	D
Southbound Lake Luther Road	Left	1.21	159.2	F	0.94	67.6	E
	Right	1.21	159.2	F	0.94	67.6	E
	Approach	N/A	159.2	F	N/A	67.6	E
Overall Intersection		N/A	46.8	D	N/A	35.2	D

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

TABLE 5-2: DESIGN YEAR (2036) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE (CONTINUED)

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at Huron Way/Long Lake Circle							
Eastbound SR 33	Left	0.70	47.8	D	0.86	67.1	E
	Thru	0.69	23.5	C	0.96	40.0	D
	Right	0.03	15.9	B	0.10	18.2	B
	Approach	N/A	26.4	C	N/A	41.6	D
Westbound SR 33	Left	0.12	41.9	D	0.12	41.1	D
	Thru	0.97	40.0	D	0.75	26.7	C
	Right	0.29	20.4	C	0.23	19.3	B
	Approach	N/A	37.8	D	N/A	26.1	C
Northbound Long Lake Circle	Left	0.49	43.4	D	0.38	43.4	D
	Thru	0.49	43.4	D	0.38	43.4	D
	Right	0.49	43.4	D	0.38	43.4	D
	Approach	N/A	43.4	D	N/A	43.4	D
Southbound Huron Way	Left	0.91	68.3	E	0.91	65.7	E
	Thru	0.91	68.3	E	0.91	65.7	E
	Right	0.91	68.3	E	0.91	65.7	E
	Approach	N/A	68.3	E	N/A	65.7	E
Overall Intersection		N/A	36.2	D	N/A	38.0	D
SR 33 at N. Combee Road/Village Lakes Boulevard							
Northbound SR 33	Left	0.68	29.4	C	0.68	21.7	C
	Thru	0.85	43.3	D	0.96	42.8	D
	Right	0.18	30.4	C	0.11	25.1	C
	Approach	N/A	39.9	D	N/A	38.3	D
Southbound SR 33	Left	0.67	42.2	D	0.58	43.3	D
	Thru	0.81	32.2	C	0.59	24.5	C
	Right	0.09	20.6	C	0.11	12.5	B
	Approach	N/A	34.9	C	N/A	29.0	C
Westbound N. Combee Road	Left	0.29	44.0	D	0.47	45.6	D
	Thru	0.29	44.0	D	0.47	45.6	D
	Right	0.67	31.3	C	0.90	52.8	D
	Approach	N/A	33.5	C	N/A	51.3	D
Eastbound Village Lakes Boulevard	Left	0.42	49.0	D	0.37	50.9	D
	Thru	0.16	47.0	D	0.19	49.7	D
	Right	0.81	53.5	D	0.64	45.8	D
	Approach	N/A	52.0	D	N/A	47.3	D
Overall Intersection		N/A	38.1	D	N/A	37.8	D

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

TABLE 5-2: DESIGN YEAR (2036) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE (CONTINUED)

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at University Boulevard/Firstpark Boulevard N.							
Northbound SR 33	Left	0.52	66.2	E	0.29	44.3	D
	Thru	0.72	55.5	E	0.81	58.6	E
	Right	0.52	14.6	B	0.63	13.7	B
	Approach	N/A	31.4	C	N/A	33.3	C
Southbound SR 33	Left	0.94	67.9	E	0.90	65.5	E
	Thru	0.53	34.1	C	0.35	27.6	C
	Right	0.11	19.0	B	0.02	15.7	B
	Approach	N/A	50.0	D	N/A	48.8	D
Westbound University Boulevard	Left	0.93	56.9	E	0.92	61.9	E
	Thru	0.23	34.9	C	0.18	37.7	D
	Right	0.57	21.6	C	0.69	20.9	C
	Approach	N/A	44.9	D	N/A	45.7	D
Eastbound Firstpark Boulevard N.	Left	0.51	49.7	D	0.64	53.0	D
	Thru	0.69	71.7	E	0.82	84.3	F
	Right	0.69	71.7	E	0.82	84.3	F
	Approach	N/A	58.1	E	N/A	65.3	E
Overall Intersection		N/A	43.8	D	N/A	43.8	D
SR 33 at I-4 Eastbound Off-Ramp							
Northbound SR 33	Left	0.60	19.6	B	0.65	14.8	B
	Thru	0.00	0.0	N/A	0.00	0.0	N/A
	Approach	N/A	19.6	B	N/A	14.8	B
Southbound SR 33	Thru	0.25	8.0	A	0.24	8.9	A
	Right	0.48	7.7	A	0.45	7.2	A
	Approach	N/A	7.7	A	N/A	7.4	A
Eastbound I-4 Off-Ramp	Left	0.49	23.7	C	0.68	26.6	C
	Right	0.56	24.6	C	0.16	21.7	C
	Approach	N/A	24.1	C	N/A	25.8	C
Overall Intersection		N/A	15.4	B	N/A	14.4	B

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

TABLE 5-2: DESIGN YEAR (2036) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE (CONTINUED)

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at I-4 Westbound Off-Ramp							
Northbound SR 33	Left	0.42	23.1	C	0.70	27.1	C
	Thru	0.35	6.2	A	0.48	7.7	A
	Approach	N/A	11.2	B	N/A	14.3	B
Southbound SR 33	Thru	0.57	19.9	B	0.39	19.0	B
	Right	0.00	0.0	N/A	0.00	0.0	N/A
	Approach	N/A	19.9	B	N/A	19.0	B
Westbound I-4 Off-Ramp	Left	0.73	28.0	C	0.82	32.0	C
	Right	0.17	21.7	C	0.21	22.0	C
	Approach	N/A	27.4	C	N/A	31.0	C
Overall Intersection		N/A	17.8	B	N/A	19.3	B
SR 33 at Tomkow Road (Realigned)							
Eastbound SR 33	Left	N/A	N/A	N/A	0.65	14.8	B
	Thru	N/A	N/A	N/A	0.38	8.3	A
	Right	N/A	N/A	N/A	0.00	6.4	A
	Approach	N/A	N/A	N/A	N/A	10.6	B
Westbound SR 33	Left	N/A	N/A	N/A	0.05	10.8	B
	Thru	N/A	N/A	N/A	0.16	7.1	A
	Right	N/A	N/A	N/A	0.04	6.6	A
	Approach	N/A	N/A	N/A	N/A	7.2	A
Northbound Auto Auction Driveway	Left	N/A	N/A	N/A	0.59	23.6	C
	Thru	N/A	N/A	N/A	0.59	23.6	C
	Right	N/A	N/A	N/A	0.59	23.6	C
	Approach	N/A	N/A	N/A	N/A	23.6	C
Southbound Tomkow Road	Left	N/A	N/A	N/A	0.05	18.4	B
	Thru	N/A	N/A	N/A	0.05	18.4	B
	Right	N/A	N/A	N/A	0.65	29.5	C
	Approach	N/A	N/A	N/A	N/A	28.5	C
Overall Intersection		N/A	N/A	N/A	N/A	14.5	B

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

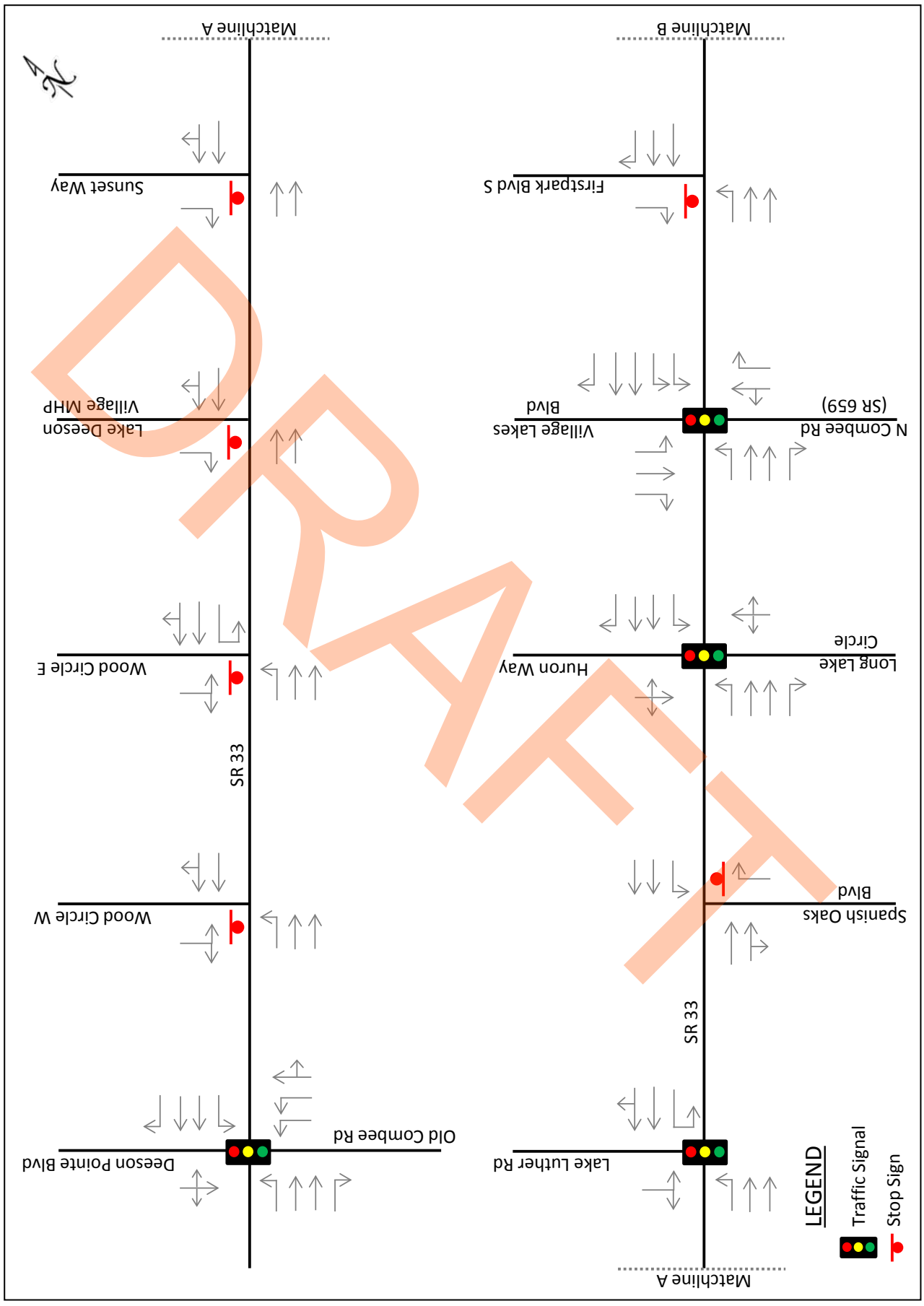


FIGURE 5-6: DESIGN YEAR (2036) RECOMMENDED INTERSECTION GEOMETRY – BUILD ALTERNATIVE

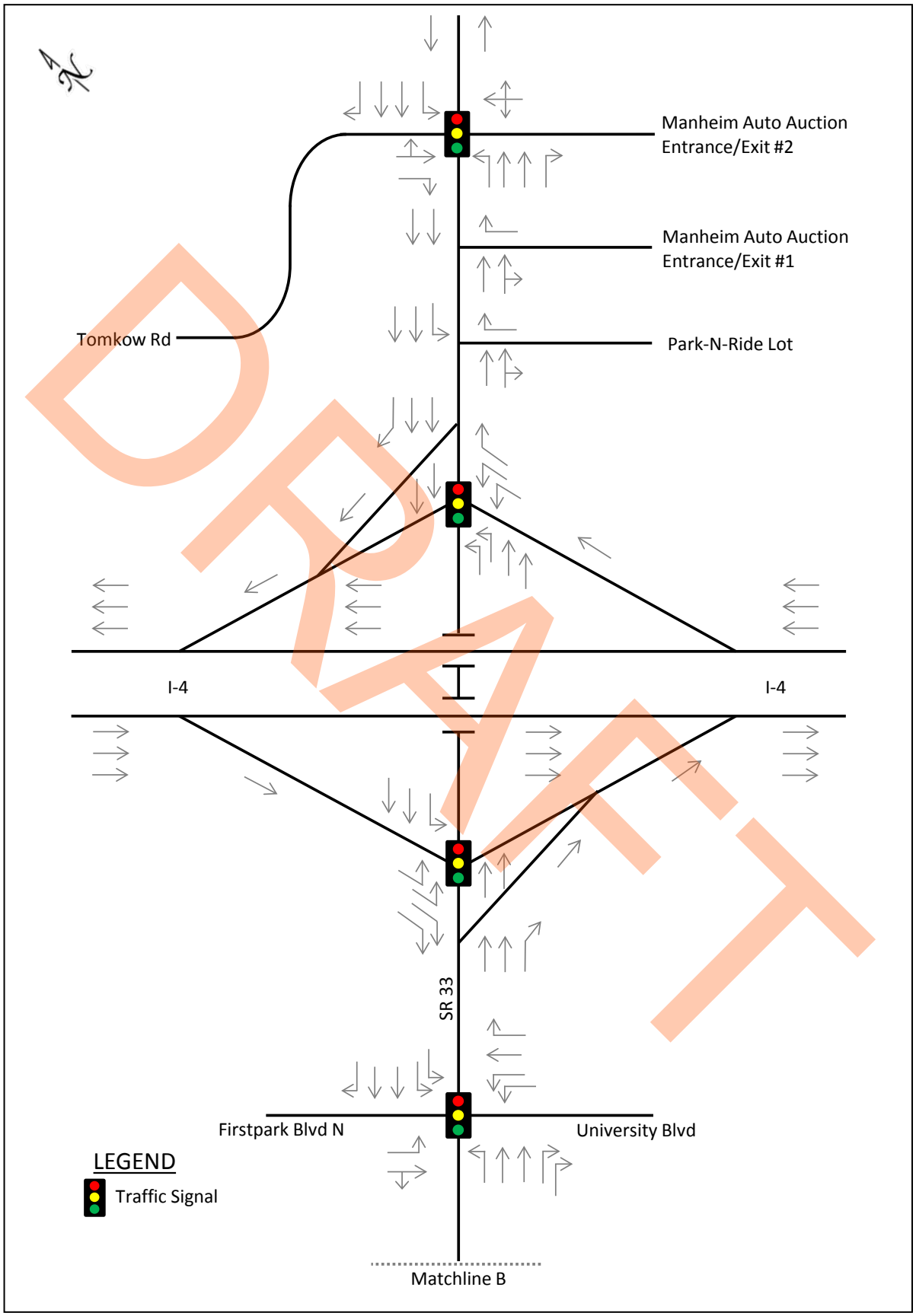


FIGURE 5-7: DESIGN YEAR (2036) RECOMMENDED INTERCHANGE/INTERSECTION GEOMETRY – BUILD ALTERNATIVE

TABLE 5-3: DESIGN YEAR (2036) PEAK HOUR ROADWAY SEGMENT OPERATIONS – BUILD ALTERNATIVE

Segment		AM Peak Hour			PM Peak Hour		
From	To	Travel Speed		LOS	Travel Speed		LOS
Old Combee Road	Lake Luther Road	EB	36.1	B	EB	32.4	C
		WB	24.1	D	WB	27.3	C
Lake Luther Road	Huron Way/ Long Lake Circle	EB	26.4	C	EB	20.5	D
		WB	22.2	D	WB	20.9	D
Huron Way/ Long Lake Circle	N. Combee Road/ Village Lakes Boulevard	NB	28.4	C	NB	28.4	C
		SB	29.1	C	SB	33.4	B
N. Combee Road/ Village Lakes Boulevard	University Boulevard/ Firstpark Boulevard N.	NB	28.2	C	NB	27.5	C
		SB	33.7	B	SB	36.3	B
University Boulevard/ Firstpark Boulevard N.	EB I-4 On-/Off-Ramps	NB	29.8	C	NB	32.2	C
		SB	23.7	D	SB	26.2	C
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	NB	25.2	C	NB	23.4	D
		SB	23.6	D	SB	24.2	D
WB I-4 On-/Off-Ramps	Relocated Tomkow Road/ Auto Auction Driveway	N/A		N/A	EB	37.6	B
					WB	30.8	C
Overall Corridor		EB/NB	29.0	C	EB/NB	28.5	C
		WB/SB	27.3	C	WB/SB	29.6	C

5.2 Opening Year (2016) Level of Service Analyses

The opening year (2016) a.m. and p.m. peak hour intersection volumes that were previously developed for the No-Build Alternative were also manually redistributed to reflect the median openings associated with the preliminary access management plan. The opening year a.m. and p.m. peak hour volumes illustrated in **Figures 5-8**, **5-9**, **5-10**, and **5-11** reflect the redistribution that was conducted based on the preliminary access management plan. The opening year (2016) p.m. peak hour volumes that were used to conduct the analysis of the relocated Tomkow Road intersection are graphically illustrated in **Figure 5-12**. The results of the a.m. and p.m. peak hour unsignalized intersection analyses are summarized in **Table 5-4**. With one exception, all of the left-turn movements from SR 33 are projected to operate at LOS A during both peak hours. The eastbound left-turn movement from SR 33 onto Wood Circle E. is projected to operate at LOS B during the a.m. peak hour. A majority of the cross street movements are projected to operate at LOS D or better during both peak hours; however, there are several cross street movements that are projected to operate at LOS E or F. These include the following:

- Eastbound Village Lakes Boulevard left-turn movement;
- Eastbound Village Lakes Boulevard through movement (a.m. peak hour only);
- Westbound N. Combee Road left-turn and through movements;
- Eastbound I-4 off-ramp left-turn movement (p.m. peak hour only);
- Westbound I-4 off-ramp left-turn and right-turn movements (p.m. peak hour only); and
- Northbound left-turn, through and right-turn movements from the Auto Auction entrance/exit (p.m. peak hour only).

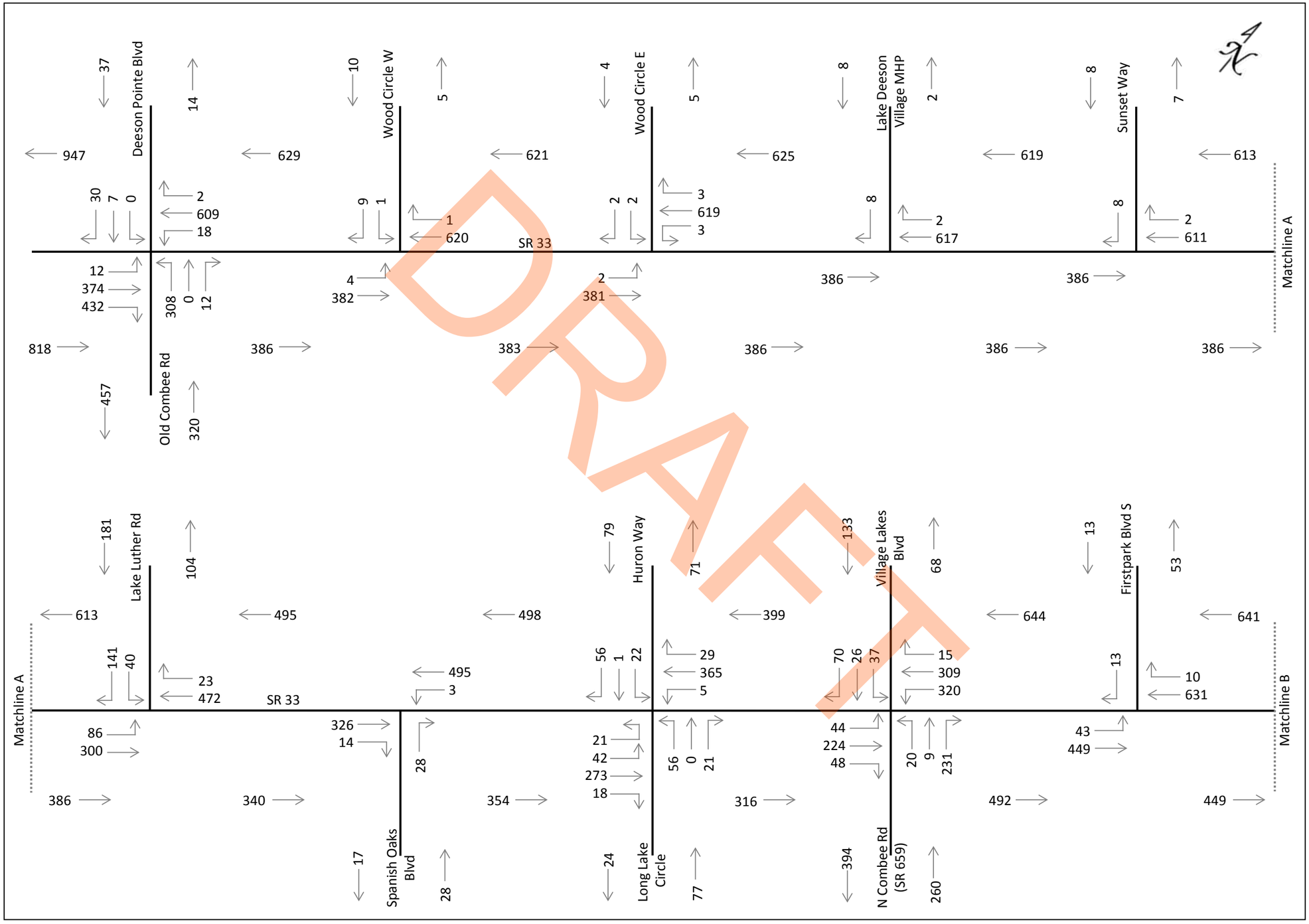


FIGURE 5-8: OPENING YEAR (2016) AM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

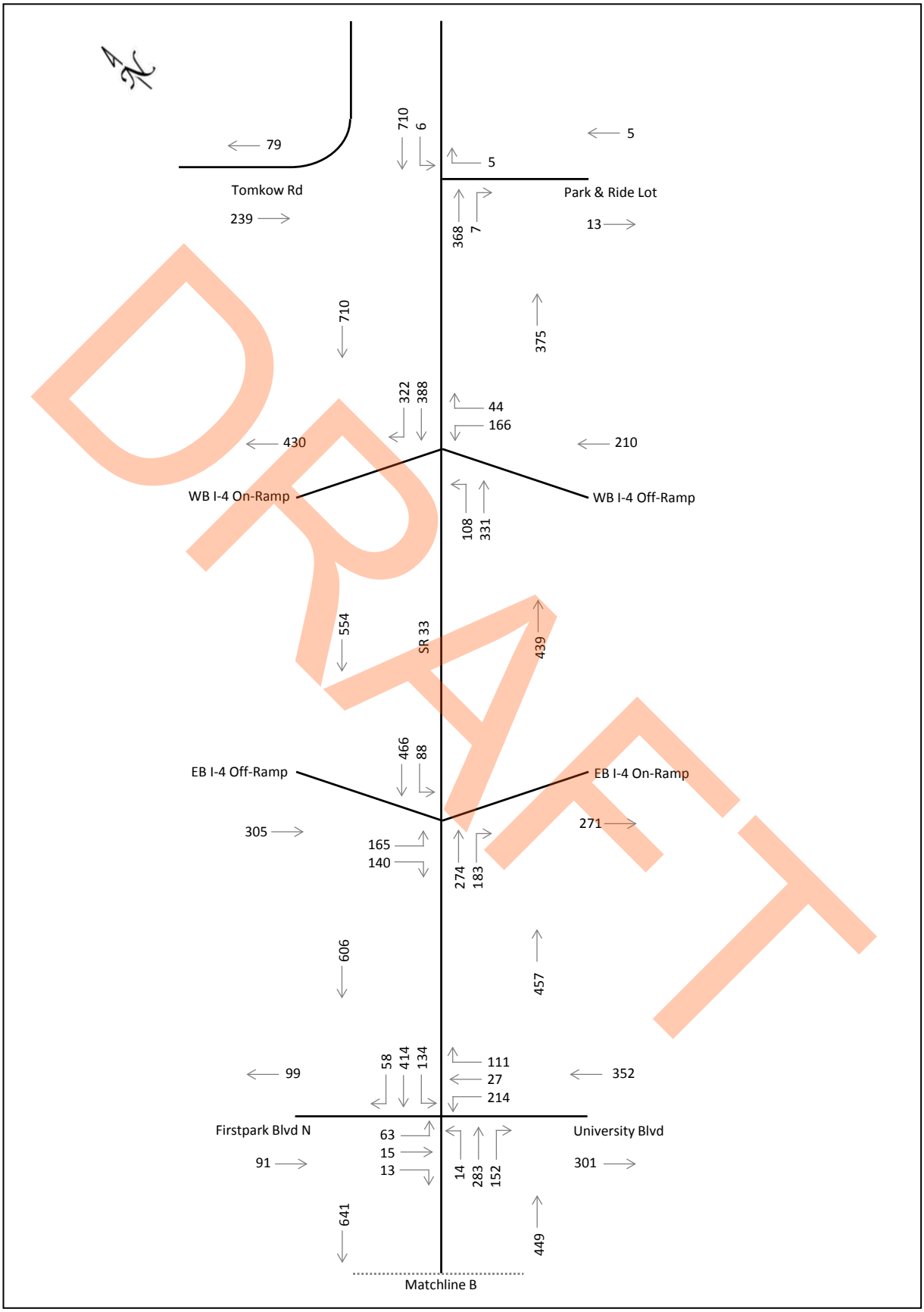


FIGURE 5-9: OPENING YEAR (2016) AM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

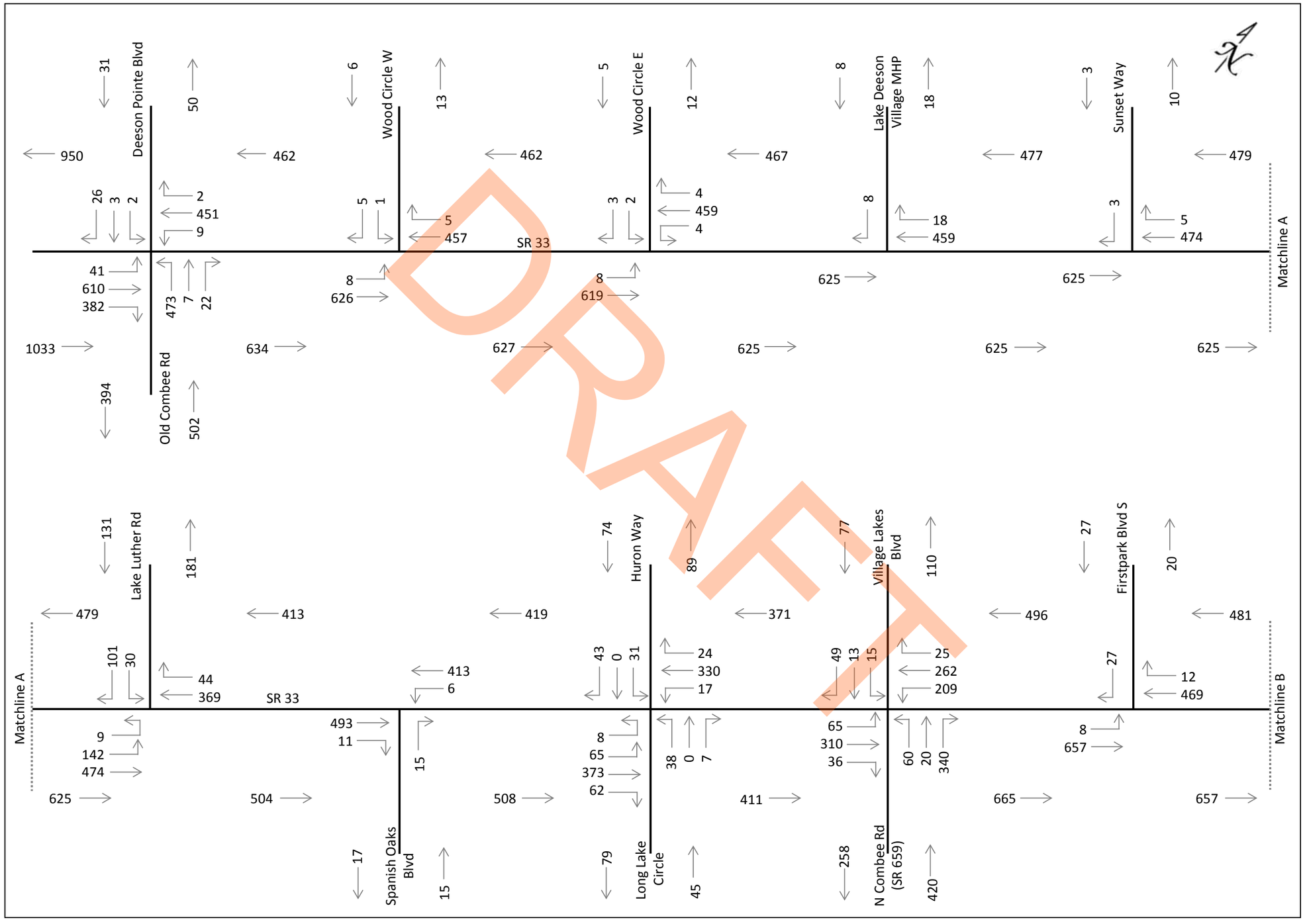


FIGURE 5-10: OPENING YEAR (2016) PM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

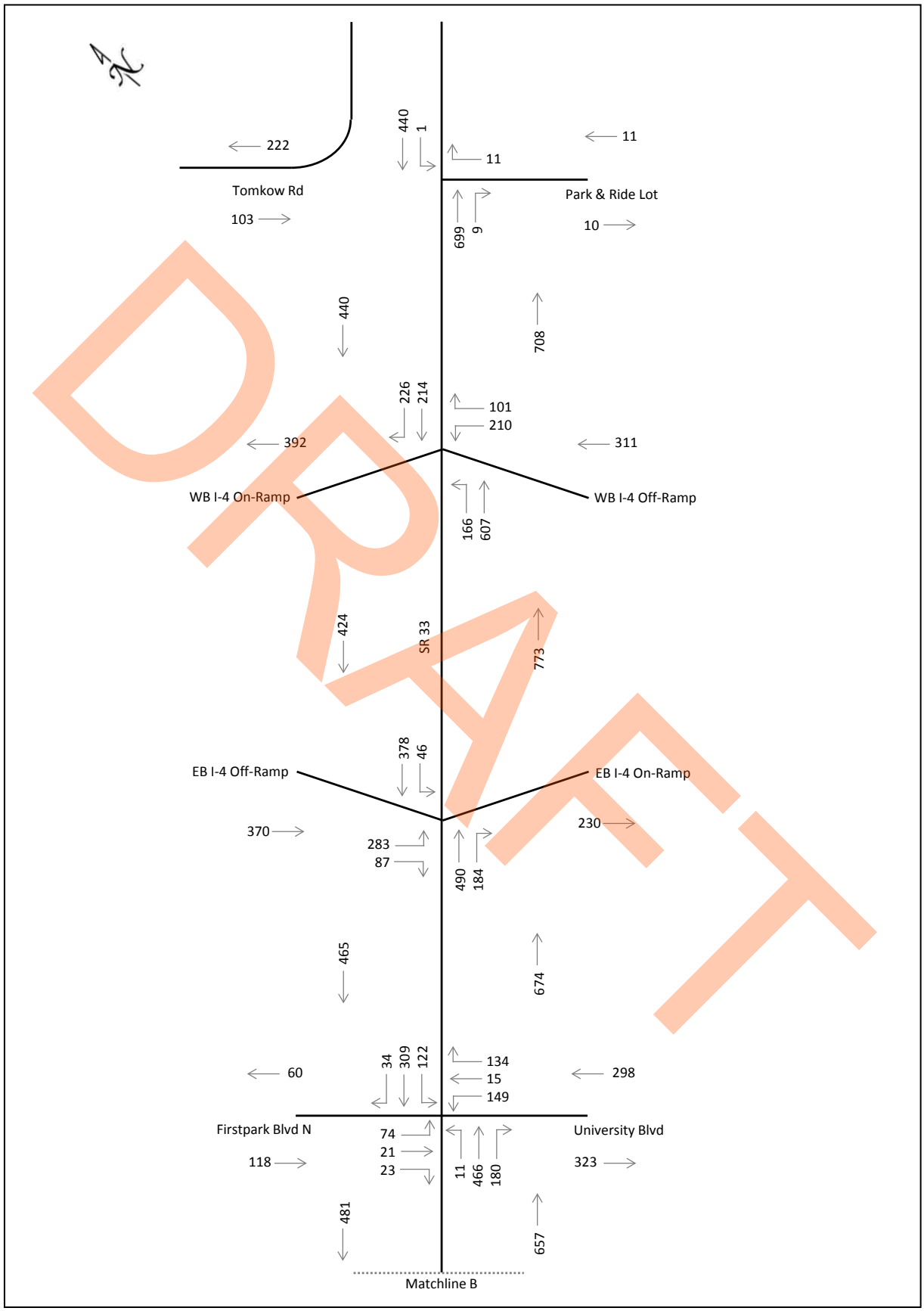
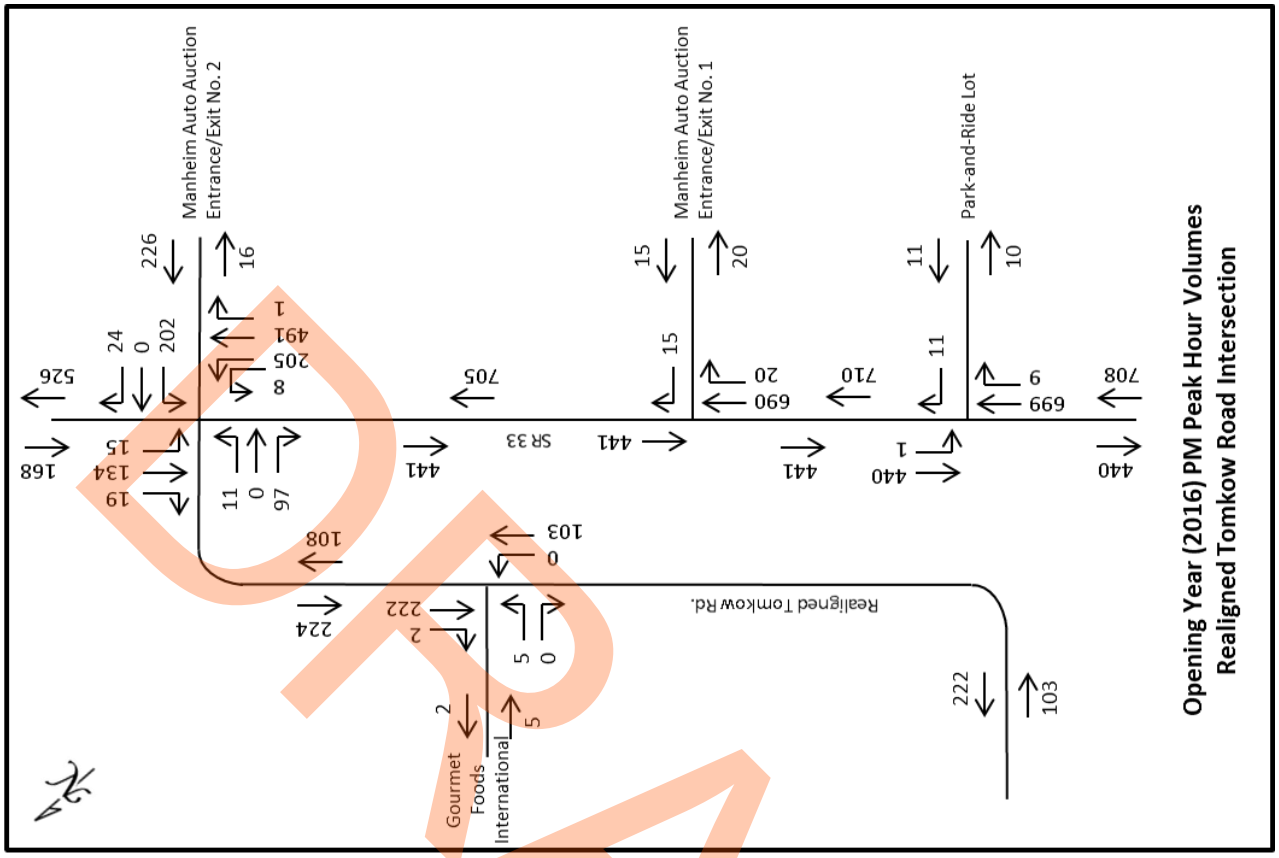


FIGURE 5-11: OPENING YEAR (2016) PM PEAK HOUR VOLUMES – BUILD ALTERNATIVE



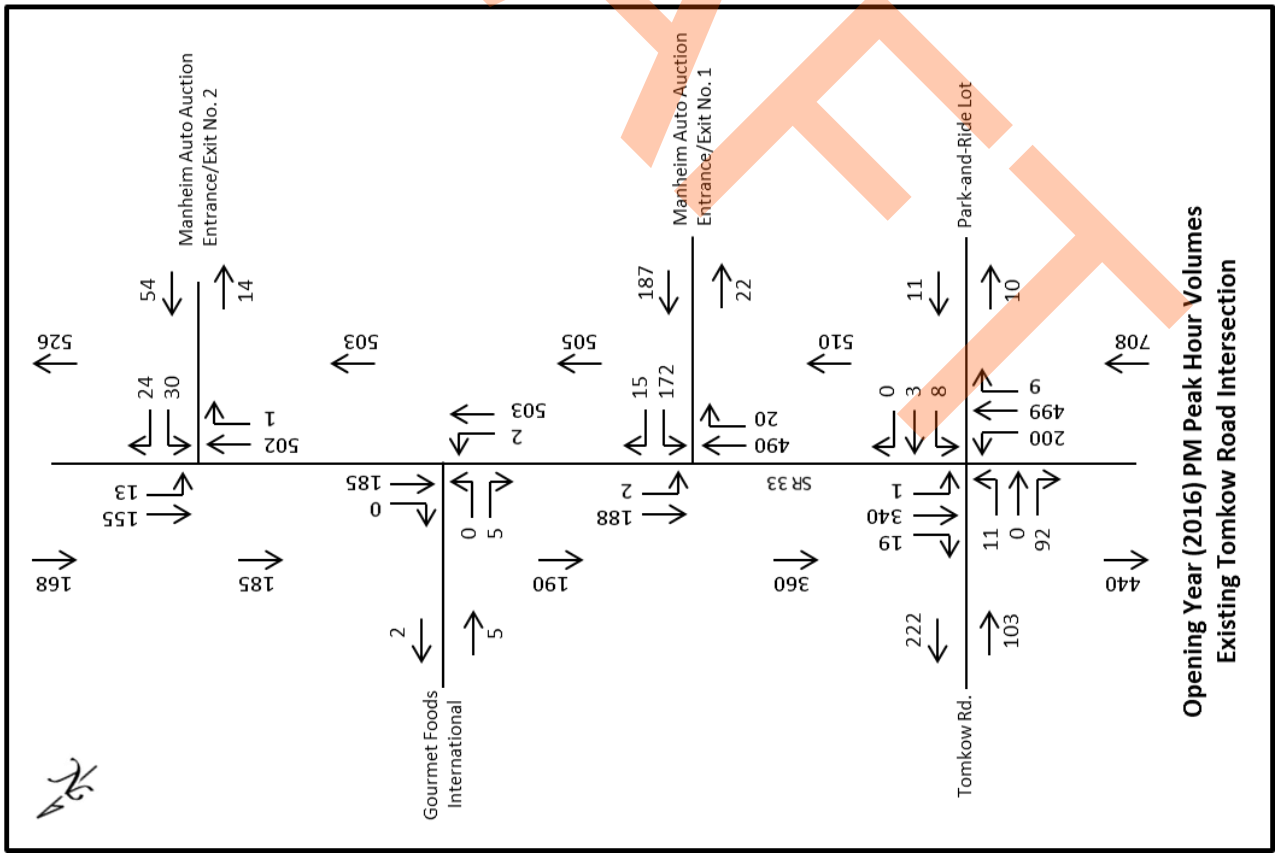


FIGURE 5-12: OPENING YEAR (2016) PM PEAK HOUR VOLUMES – BUILD ALTERNATIVE

TABLE 5-4: OPENING YEAR (2016) PEAK HOUR UNSIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
Wood Circle W.	Eastbound	L	0.00	9.2	A	0.01	8.4	A
	Southbound	L/R	0.04	11.0	B	0.02	10.3	B
Wood Circle E.	Eastbound	L	0.00	11.0	B	0.01	8.4	A
	Westbound	L	0.00	8.2	A	0.00	8.9	A
	Southbound	L/R	0.02	14.8	B	0.01	11.5	B
Lake Deeson Village MHP	Southbound	R	0.02	10.4	B	0.01	9.7	A
Sunset Way	Southbound	R	0.01	10.4	B	0.01	9.7	A
Lake Luther Road	Eastbound	L	0.10	9.1	A	0.15	8.8	A
	Westbound	L	0.00	0.0	N/A	0.00	0.0	N/A
	Southbound	L/R	0.46	16.0	C	0.24	12.8	B
Spanish Oaks Boulevard	Westbound	L	0.00	8.8	A	0.01	8.5	A
	Northbound	R	0.04	9.4	A	0.03	9.9	A
Huron Way/ Long Lake Circle	Eastbound	L/T/R	0.20	12.2	B	0.17	12.6	B
	Westbound	L/T/R	0.25	16.0	C	0.16	16.5	C
	Northbound	L	0.07	8.5	A	0.07	8.3	A
	Southbound	L	0.00	8.0	A	0.02	8.4	A
N. Combee Road/ Village Lakes Boulevard	Eastbound	L	0.42	59.4	F	0.26	55.9	F
	Eastbound	T	0.22	35.9	E	0.11	24.4	C
	Eastbound	R	0.10	9.6	A	0.09	9.4	A
	Westbound	L/T	0.25	45.2	E	0.45	36.7	E
	Westbound	R	0.29	10.8	B	0.46	13.0	B
	Northbound	L	0.04	8.3	A	0.05	7.9	A
	Southbound	L	0.29	9.3	A	0.19	8.9	A
Firstpark Boulevard S.	Eastbound	R	0.03	10.6	B	0.04	9.7	A
	Northbound	L	0.05	9.2	A	0.01	8.4	A
I-4 EB Ramps	Eastbound	L	0.64	32.7	D	0.76	36.6	E
	Eastbound	R	0.26	11.9	B	0.13	10.5	B
	Southbound	L	0.08	8.1	A	0.05	8.8	A
I-4 WB Ramps	Westbound	L	0.55	28.3	D	1.10	136.4	F
	Westbound	R	0.06	9.6	A	0.17	11.3	B
	Northbound	L	0.13	9.6	A	0.14	8.4	A
Park-and-Ride Lot	Westbound	L	0.01	8.1	A	0.00	9.2	A
	Northbound	R	0.01	9.3	A	0.04	10.5	B
Relocated Tomkow Road/ Auto Auction	Eastbound	L	N/A	N/A	N/A	0.16	8.0	A
	Westbound	L	N/A	N/A	N/A	0.01	8.5	A
	Northbound	L/T/R	N/A	N/A	N/A	1.81	421.5	F
	Southbound	L/T	N/A	N/A	N/A	0.05	20.7	C
	Southbound	R	N/A	N/A	N/A	0.12	9.1	A

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

Four of these movements are projected to operate over capacity and these are the westbound left-turn movement at the I-4 off-ramp and the northbound left-turn, through, and right-turn movements from the Auto Auction entrance/exit. Currently, the northbound approach at this intersection consists of a single shared lane for all three movements. The conversion of the western Auto Auction entrance/exit to right-in/right-out only access will require all of the left-turn movements into and out of the Auto Auction to be made at the eastern entrance/exit. In addition, the realignment of Tomkow Road directly across from the eastern Auto Auction entrance/exit will create a four-legged intersection. Since auctions currently only occur one day each week (Wednesdays) the installation of a traffic signal at this location may not be necessary.

Although LOS E and F conditions are projected to occur for several cross street movements at the N. Combee Road/Village Lakes Boulevard intersection, it should be noted that the average peak hour vehicle delays for these movements are all estimated to be less than 60 seconds/vehicle. It should also be noted that acceptable levels of service are projected to occur for the southbound SR 33 left-turn movement during both peak hours with only one southbound left-turn lane.

A preliminary planning-level signal warrant analysis was conducted to identify the approximate time period when traffic signals may be warranted at several of the study corridor intersections. This preliminary analysis was based on Warrant No. 1 (Eight-Hour Vehicular Volume) and Warrant No. 2 (Four-Hour Vehicular Volume) only. An existing year (2012) signal warrant analysis was conducted for the eastbound and westbound I-4 ramp terminal intersections and the N. Combee Road/Village Lakes Boulevard intersection. Since the posted speed limit for the portion of SR 33 between N. Combee Road/Village Lakes Boulevard and Tomkow Road is 60 mph, the 70.0% volume thresholds were used to conduct the analyses.

The existing traffic volumes at all three intersections satisfy both Warrant 1 and Warrant 2. Although the 70.0% threshold volumes were used to conduct these signal warrant analyses, it should be noted that the existing traffic volumes at the eastbound and westbound I-4 ramp terminal intersections are high enough to also satisfy both of these warrants at the 100.0% level. The existing traffic volumes at the N. Combee Road/Village Lakes Boulevard intersection are also high enough to satisfy Warrant 2 at the 100.0% level. Copies of the existing year traffic signal warrant summary sheets are provided in **Appendix O**.

An opening year (2016) signal warrant analysis was also conducted for the Lake Luther Road and Huron Way/Long Lake Circle intersections. The future year hourly traffic volumes were derived using the following methodology:

Step 1 – The existing (2012) 24-hour intersection approach volumes were reviewed and tabulated to identify the eight highest hours for each intersection.

Step 2 – Each hourly approach volume was divided by the corresponding 24-hour approach volume to determine the percentage of the 24-hour approach volume that occurs during each of the eight highest hours.

Step 3 – The opening year AADT volumes associated with each leg of the intersection were divided by two (to obtain the opening year 24-hour intersection approach volumes) and then multiplied by the existing hourly percentages to obtain estimates of the opening year hourly approach volumes.

These calculations are summarized in tabular format in **Appendix O**. The results of the opening year signal warrant analyses indicated that the 2016 hourly volumes estimated for the Huron Way/Long Lake Circle intersection did not satisfy either Warrant 1 or Warrant 2 at the 70.0% level. The 2016 hourly volumes estimated for the Lake Luther Road intersection also did not satisfy Warrant 1 but did satisfy Warrant 2 at the 70.0% level. Copies of the opening year traffic signal warrant summary sheets are also provided in **Appendix O**.

Opening year (2016) signalized intersection analyses were conducted for the following five intersections:

- Old Combee Road/Deeson Pointe Boulevard;
- N. Combee Road/Village Lakes Boulevard;
- University Boulevard/Firstpark Boulevard N.;
- The eastbound I-4 on-/off-ramps; and
- The westbound I-4 on-/off-ramps.

The results of the signalized intersection analyses are summarized in **Table 5-5**. All five of these intersections are projected to operate at LOS C or better overall during the a.m. and p.m. peak hours. In addition, all of the individual movements are projected to operate at LOS D or better during both peak hours. It should be noted that the opening year peak hour signalized intersection analysis that was conducted for the N. Combee Road/Village Lakes Boulevard intersection only included a single left-turn lane on southbound SR 33. Although the results of the design year peak hour signalized intersection analyses indicated that dual southbound left-turn lanes would be required by the year 2036, dual left-turn lanes are not required in the opening year. Similarly, the opening year peak hour signalized intersection analysis that was conducted for the University Boulevard/Firstpark Boulevard N. intersection only included a single left-turn lane on westbound University Boulevard and a single right-turn lane on northbound SR 33. The Build Alternative opening year peak hour signalized intersection analysis summary sheets are also provided in **Appendix P**.

TABLE 5-5: OPENING YEAR (2016) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at Old Combee Road/Deeson Pointe Boulevard							
Eastbound SR 33	Left	0.03	17.6	B	0.10	16.7	B
	Thru	0.40	25.9	C	0.59	27.2	C
	Right	0.60	15.4	B	0.48	10.9	B
	Approach	N/A	20.2	C	N/A	20.7	C
Westbound SR 33	Left	0.03	17.7	B	0.02	17.6	B
	Thru	0.37	25.6	C	0.31	23.7	C
	Right	0.00	22.5	C	0.00	21.1	C
	Approach	N/A	25.4	C	N/A	23.6	C
Northbound Old Combee Road	Left	0.48	33.5	C	0.64	34.0	C
	Thru	0.04	30.0	C	0.09	28.0	C
	Right	0.04	30.0	C	0.09	28.0	C
	Approach	N/A	33.4	C	N/A	33.6	C
Southbound Deeson Pointe Boulevard	Left	0.18	37.3	D	0.25	41.8	D
	Thru	0.18	37.3	D	0.25	41.8	D
	Right	0.18	37.3	D	0.25	41.8	D
	Approach	N/A	37.3	D	N/A	41.8	D
Overall Intersection		N/A	24.6	C	N/A	25.0	C
SR 33 at N. Combee Road/Village Lakes Boulevard							
Northbound SR 33	Left	0.49	45.0	D	0.56	43.0	D
	Thru	0.42	32.9	C	0.63	33.5	C
	Right	0.20	31.1	C	0.17	28.7	C
	Approach	N/A	34.3	C	N/A	34.6	C
Southbound SR 33	Left	0.78	40.3	D	0.54	33.9	C
	Thru	0.24	18.1	B	0.21	20.9	C
	Right	0.02	16.4	B	0.04	19.5	B
	Approach	N/A	29.1	C	N/A	26.3	C
Westbound N. Combee Road	Left	0.09	32.6	C	0.24	33.0	C
	Thru	0.09	32.6	C	0.24	33.0	C
	Right	0.39	16.7	B	0.60	21.8	C
	Approach	N/A	18.5	B	N/A	24.0	C
Eastbound Village Lakes Boulevard	Left	0.22	41.6	D	0.09	41.0	D
	Thru	0.15	41.2	D	0.08	40.9	D
	Right	0.27	35.6	D	0.16	31.6	C
	Approach	N/A	38.4	D	N/A	35.0	D
Overall Intersection		N/A	29.6	C	N/A	29.6	C

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

TABLE 5-5: OPENING YEAR (2016) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE (CONTINUED)

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at University Boulevard/Firstpark Boulevard N.							
Northbound SR 33	Left	0.06	17.9	B	0.05	14.8	B
	Thru	0.41	17.9	B	0.58	16.8	B
	Right	0.46	3.1	A	0.48	3.1	A
	Approach	N/A	12.9	B	N/A	13.0	B
Southbound SR 33	Left	0.57	30.7	C	0.47	29.2	C
	Thru	0.45	17.5	B	0.27	14.4	B
	Right	0.15	15.7	B	0.08	13.4	B
	Approach	N/A	20.3	C	N/A	18.2	B
Westbound University Boulevard	Left	0.45	18.2	B	0.35	18.9	B
	Thru	0.06	18.8	B	0.04	21.0	C
	Right	0.23	4.6	A	0.32	3.7	A
	Approach	N/A	13.9	B	N/A	12.2	B
Eastbound Firstpark Boulevard N.	Left	0.20	16.1	B	0.18	18.0	B
	Thru	0.07	18.8	B	0.14	21.4	C
	Right	0.07	18.8	B	0.14	21.4	C
	Approach	N/A	17.0	B	N/A	19.3	B
Overall Intersection		N/A	16.1	B	N/A	14.6	B
SR 33 at I-4 Eastbound Off-Ramp							
Northbound SR 33	Thru	0.28	11.4	B	0.50	12.9	B
	Right	0.00	0.0	N/A	0.00	0.0	N/A
	Approach	N/A	11.4	B	N/A	12.9	B
Southbound SR 33	Left	0.16	7.3	A	0.11	7.9	A
	Thru	0.27	6.2	A	0.20	5.9	A
	Approach	N/A	6.4	A	N/A	6.2	A
Eastbound I-4 Off-Ramp	Left	0.23	19.6	B	0.38	20.5	C
	Right	0.28	20.0	B	0.18	19.4	B
	Approach	N/A	19.8	B	N/A	20.2	C
Overall Intersection		N/A	11.2	B	N/A	12.8	B

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

TABLE 5-5: OPENING YEAR (2016) PEAK HOUR SIGNALIZED INTERSECTION OPERATIONS – BUILD ALTERNATIVE (CONTINUED)

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C [1]	Delay [2]	LOS [3]	V/C [1]	Delay [2]	LOS [3]
SR 33 at I-4 Westbound Off-Ramp							
Northbound SR 33	Left	0.30	23.0	C	0.30	20.0	B
	Thru	0.23	6.0	A	0.41	7.0	A
	Approach	N/A	10.2	B	N/A	9.7	A
Southbound SR 33	Thru	0.38	15.8	B	0.23	17.5	B
	Right	0.00	0.0	N/A	0.00	0.0	N/A
	Approach	N/A	15.8	B	N/A	17.5	B
Westbound I-4 Off-Ramp	Left	0.25	19.7	B	0.28	19.9	B
	Right	0.13	19.2	B	0.30	20.1	C
	Approach	N/A	19.6	B	N/A	20.0	B
Overall Intersection		N/A	13.9	B	N/A	13.0	B

[1] Volume-to-Capacity Ratio

[2] Average Delay (seconds/vehicle)

[3] Level of Service

The results of the opening year (2016) Build Alternative roadway segment analyses are summarized in **Table 5-6**. All of the roadway segments are projected to operate at LOS C or better during both peak hours and the overall corridor is projected to operate at LOS B. The Build Alternative opening year peak hour roadway segment analysis summary sheets are also provided in **Appendix P**.

TABLE 5-6: OPENING YEAR (2016) PEAK HOUR ROADWAY SEGMENT OPERATIONS – BUILD ALTERNATIVE

Segment		AM Peak Hour			PM Peak Hour		
From	To	Travel Speed		LOS	Travel Speed		LOS
Old Combee Road	N. Combee Road/ Village Lakes Boulevard	EB	38.8	B	EB	38.4	B
		WB	40.6	B	WB	41.1	B
N. Combee Road/ Village Lakes Boulevard	University Boulevard/ Firstpark Boulevard N.	NB	39.3	B	NB	39.4	B
		SB	39.1	B	SB	38.2	B
University Boulevard/ Firstpark Boulevard N.	EB I-4 On-/Off-Ramps	NB	31.4	B	NB	30.3	B
		SB	31.1	C	SB	33.1	B
EB I-4 On-/Off-Ramps	WB I-4 On-/Off-Ramps	NB	25.7	C	NB	24.4	C
		SB	23.7	C	SB	24.1	C
WB I-4 On-/Off-Ramps	Relocated Tomkow Rd./ Auto Auction Driveway	N/A		N/A	EB	35.1	B
					WB	31.8	C
Overall Corridor		EB/NB	36.9	B	EB/NB	36.3	B
		WB/SB	37.4	B	WB/SB	36.9	B

5.3 Design Year (2036) Queue Lengths

Preliminary design year queue length estimates were derived for the SR 33 left-turn, through and right-turn movements for the following six intersections:

- Lake Luther Road
- Huron Way/Long Lake Circle
- N. Combee Road/Village Lakes Boulevard
- University Boulevard/Firstpark Boulevard N.
- Eastbound I-4 on-/off-ramps
- Westbound I-4 on-/off-ramps

The queue lengths were estimated using the FDOT's Plans Preparation Manual (PPM) methodology, as well as results from the 2010 HCS analyses, and the two independent estimates are summarized in **Tables 5-7** and **5-8**. This information should be used to help determine the most appropriate lengths for the exclusive turn-lanes at each of these intersections. The queue storage lengths that are provided should be long enough to minimize the possibility of turning vehicles stopping in the adjacent through lanes. In addition, consideration should also be given to minimizing the potential for through vehicle queues to extend back and block the access to the exclusive turn lanes. Design year queue lengths were not estimated for the Old Combee Road/Deeson Pointe Boulevard signalized intersection, because intersection improvements were recently constructed as a part of the four-laning of SR 33 at the southern end of the PD&E study corridor.

The 2013 Florida Intersection Design Guide states that at unsignalized intersections, the storage length (exclusive of taper) may be based on the number of turning vehicles likely to arrive in an average two-minute period within the peak hour; however, space for at least two passenger cars should be provided. If the truck volume is more than 10.0% of the total volume, provisions should be made for at least one car and one truck. Although the design year peak hour truck percentages used in this study are less than 10.0%, Section 2.13.2 of the July 2013 PPM states that a minimum queue length of 100 feet (i.e., four vehicles) should be provided at low volume intersections located in urban areas. Based on the use of a WB-62FL design vehicle (i.e., a Florida Interstate Semitrailer), a minimum left-turn queue storage length of 100 feet is recommended for the unsignalized intersections.

TABLE 5-7: DESIGN YEAR (2036) AM PEAK HOUR QUEUE LENGTH ESTIMATES – BUILD ALTERNATIVE

Intersection	Movement	Volume	G/C Ratio	Cycle Length	No. of Lanes	Per Lane Volume	Percent Trucks	Adj. Factor	Calculated Queue Length[1]	Rounded Queue Length[2]	50th % Queue based on HCS output	Calculated Queue Length[3]	Rounded Queue Length[2]
Lake Luther Road	EB LT	325	0.65	120	1	325	0.05	2	199.06	200	11.7	585	600
	EB TH	1065	0.67	120	2	532.5	0.05	2	307.52	325	6.1	305	325
	WB UT	0	0.47	120	1	0	0.05	2	0.00	0	0.0	0	0
	WB TH/RT	1491	0.47	120	2	745.5	0.05	2	691.45	700	19.9	995	1000
Huron Way/ Long Lake Circle	NB LT	153	0.13	100	1	153	0.05	2	194.12	200	3.9	195	200
	NB TH	1032	0.44	100	2	516	0.05	2	421.40	425	9.1	455	475
	NB RT	23	0.44	100	1	23	0.00	2	17.89	25	0.3	15	25
	SB LT	19	0.09	100	1	19	0.00	2	24.01	25	0.4	20	25
	SB TH	1281	0.40	100	2	640.5	0.05	2	560.44	575	16.1	805	825
	SB RT	171	0.40	100	1	171	0.05	2	149.63	150	2.6	130	150
N. Combee Road/ Village Lakes Boulevard	NB LT	215	0.43	120	1	215	0.05	2	214.46	225	4.1	205	225
	NB TH	887	0.31	120	2	443.5	0.05	2	535.53	550	12.5	625	625
	NB RT	82	0.31	120	1	82	0.05	2	99.02	100	1.7	85	100
	SB LT	513	0.24	120	2	256.5	0.07	2	347.64	350	6.9	345	350
	SB TH	1127	0.42	120	2	563.5	0.07	2	582.85	600	14.1	705	725
	SB RT	55	0.42	120	1	55	0.05	2	55.83	75	0.9	45	50
University Boulevard/ Firstpark Boulevard N.	NB LT	40	0.05	140	1	40	0.07	2	79.06	100	1.5	75	75
	NB TH	415	0.19	140	2	207.5	0.07	2	349.69	350	7.4	370	375
	NB RT	851	0.53	140	2	425.5	0.07	2	416.08	425	5.6	280	300
	SB LT	708	0.24	140	2	354	0.07	2	559.75	575	14.1	705	725
	SB TH	648	0.38	140	2	324	0.07	2	417.94	425	8.8	440	450
	SB RT	150	0.49	140	1	150	0.07	2	159.16	175	1.3	65	75
EB I-4 On-/Off-Ramps	EB LT	351	0.23	70	2	175.5	0.07	2	140.58	150	2.5	125	125
	EB RT	541	0.23	70	2	270.5	0.07	2	216.67	225	2.4	120	125
	NB TH	661	0.34	70	2	330.5	0.07	2	226.92	250	4.0	200	200
	NB RT	551	N/A	70	1	551	0.07	2	0.00	0	0.0	0	0
	SB LT	155	0.60	70	1	155	0.07	2	64.50	75	0.7	35	50
	SB TH	965	0.63	70	2	482.5	0.07	2	185.72	200	2.7	135	150
WB I-4 On-/Off-Ramps	WB LT	517	0.23	70	2	258.5	0.07	2	207.06	225	4.2	210	225
	WB RT	109	0.23	70	1	109	0.07	2	87.31	100	0.7	35	50
	NB LT	297	0.23	70	2	148.5	0.07	2	118.95	125	1.9	95	100
	NB TH	715	0.63	70	2	357.5	0.07	2	137.60	150	1.7	85	100
	SB TH	603	0.33	70	2	301.5	0.07	2	210.14	225	3.7	185	200
	SB RT	494	N/A	70	1	494	0.07	2	0.00	0	0.0	0	0

[1] Calculated Queue Length = [Per Lane Volume x (I-G/C Ratio) x (1 + Percent Trucks) x Adjustment Factor x 25]/(3600/Cycle Length)]

[2] Rounded up to the next highest 25-foot increment

[3] Calculated Queue Length = 2 x 25 x (50th-percentile back of queue estimate based on 2010 HCS analysis)

TABLE 5-8: DESIGN YEAR (2036) PM PEAK HOUR QUEUE LENGTH ESTIMATES – BUILD ALTERNATIVE

Intersection	Movement	Volume	G/C Ratio	Cycle Length	No. of Lanes	Per Lane Volume	Percent Trucks	Adj. Factor	Calculated Queue Length[1]	Rounded Queue Length[2]	50th % Queue based on HCS output	Calculated Queue Length[3]	Rounded Queue Length[2]
Lake Luther Road	EB LT	359	0.61	120	1	359	0.05	2	245.02	250	13.7	685	700
	EB TH	1373	0.62	120	2	686.5	0.05	2	456.52	475	11.1	555	575
	WB UT	0	0.00	120	1	0	0.05	2	0.00	0	0.0	0	0
	WB TH/RT	1193	0.42	120	2	596.5	0.05	2	605.45	625	16.3	815	825
Huron Way/ Long Lake Circle	NB LT	140	0.10	100	1	140	0.05	2	183.75	200	4.5	225	225
	NB TH	1282	0.41	100	2	641	0.05	2	551.53	575	16.3	815	825
	NB RT	65	0.41	100	1	65	0.00	2	53.26	75	0.9	45	50
	SB LT	20	0.10	100	1	20	0.00	2	25.00	25	0.4	20	25
	SB TH	1022	0.41	100	2	511	0.05	2	439.67	450	10.0	500	500
	SB RT	142	0.41	100	1	142	0.05	2	122.18	125	2.1	105	125
N. Combee Road/ Village Lakes Boulevard	NB LT	259	0.48	120	1	259	0.05	2	235.69	250	4.4	220	225
	NB TH	1152	0.37	120	2	576	0.05	2	635.04	650	17.3	865	875
	NB RT	60	0.37	120	1	60	0.05	2	66.15	75	1.1	55	75
	SB LT	384	0.21	120	2	192	0.07	2	270.50	275	5.1	255	275
	SB TH	891	0.46	120	2	445.5	0.07	2	429.02	450	9.1	455	475
	SB RT	90	0.56	120	1	90	0.05	2	69.30	75	1.1	55	75
University Boulevard/ Firstpark Boulevard N.	NB LT	50	0.23	140	1	50	0.07	2	80.10	100	1.5	75	75
	NB TH	614	0.24	140	2	307	0.07	2	485.44	500	11.6	580	600
	NB RT	992	0.53	140	2	496	0.07	2	485.02	500	6.2	310	325
	SB LT	644	0.23	140	2	322	0.07	2	515.85	525	12.5	625	625
	SB TH	481	0.42	140	2	240.5	0.07	2	290.22	300	5.5	275	275
	SB RT	92	0.53	140	1	92	0.07	2	89.96	100	0.3	15	25
EB I-4 On-/Off-Ramps	EB LT	482	0.23	70	2	241	0.07	2	193.04	200	3.8	190	200
	EB RT	309	0.23	70	2	154.5	0.07	2	123.76	125	0.6	30	50
	NB TH	983	0.47	70	2	491.5	0.07	2	270.99	275	5.0	250	250
	NB RT	530	N/A	70	1	530	0.07	2	0.00	0	0.0	0	0
	SB LT	96	0.60	70	1	96	0.07	2	39.95	50	0.4	20	25
	SB TH	908	0.63	70	2	454	0.07	2	174.75	175	2.4	120	125
WB I-4 On-/Off-Ramps	WB LT	581	0.23	70	2	290.5	0.07	2	232.69	250	5.1	255	275
	WB RT	125	0.23	70	1	125	0.07	2	100.13	100	0.9	45	50
	NB LT	495	0.23	70	2	247.5	0.07	2	198.25	200	3.7	185	200
	NB TH	970	0.63	70	2	485	0.07	2	186.68	200	2.8	140	150
	SB TH	423	0.33	70	2	211.5	0.07	2	147.41	150	2.4	120	125
	SB RT	397	N/A	70	1	397	0.07	2	0.00	0	0.0	0	0

[1] Calculated Queue Length = [Per Lane Volume x (I-G/C Ratio) x (1 + Percent Trucks) x Adjustment Factor x 25]/(3600/Cycle Length)]

[2] Rounded up to the next highest 25-foot increment

[3] Calculated Queue Length = 2 x 25 x (50th-percentile back of queue estimate based on 2010 HCS analysis)

6.0 SUMMARY

This Project Traffic Report was prepared in support of the FDOT District One SR 33 Project Development & Environment (PD&E) Study. The limits of the PD&E Study extend from Old Combee Road/Deeson Pointe Boulevard to north of Tomkow Road in Polk County. The purpose of the SR 33 Project Traffic Report 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 levels of service in the future.

The existing SR 33 roadway is a two-lane undivided facility. The results of the existing conditions two-lane highway segment analyses indicate that with two exceptions, all of the SR 33 roadway segments are operating at LOS D or better in both the peak and off-peak travel directions during the peak hours. LOS E conditions are occurring on the segment between the westbound I-4 on-/off-ramps and Tomkow Road in the peak travel directions (i.e., southbound in the a.m. peak hour and northbound in the p.m. peak hour). The current LOS standard for the SR 33 study corridor is LOS D, and therefore, a majority of the existing study corridor is operating at an acceptable LOS.

Future year daily and peak hour traffic projections for the SR 33 study corridor were estimated with the use of the Polk County 2035 travel demand model and the FDOT's TURNS5 software. The daily and peak hour traffic volumes were developed for an assumed opening year of 2016 and a design year of 2036. The results of the opening year peak hour roadway segment analyses conducted for the No-Build Alternative indicate that LOS E operations are projected to occur in the peak travel direction on the roadway segments between N. Combee Road/Village Lakes Boulevard and University Boulevard/Firstpark Boulevard N. and between the westbound I-4 on-/off-ramps and Tomkow Road in the a.m. peak hour. In the p.m. peak hour, LOS E operations are projected to occur in the peak travel direction on the four roadway segments located between N. Combee Road/Village Lakes Boulevard and Tomkow Road. The results of the design year peak hour roadway segment analyses conducted for the No-Build Alternative indicate that LOS E or F operations are projected to occur in both travel directions throughout the entire study corridor. Consequently, there exists a need to widen the SR 33 corridor to accommodate the projected future year traffic volumes.

The results of the design year peak hour roadway segment analyses conducted for the Build Alternative indicate that if the existing SR 33 facility is improved to a four-lane divided roadway, the entire roadway is projected to operate at LOS D or better. The intersection geometry that is recommended for the 14 intersections that were included in the SR 33 Project Traffic Report is summarized in **Figures 6-1** and **6-2**. **Appendix Q** of this Project Traffic Report provides the traffic input data that will be used to conduct the noise impact analysis for the PD&E study.

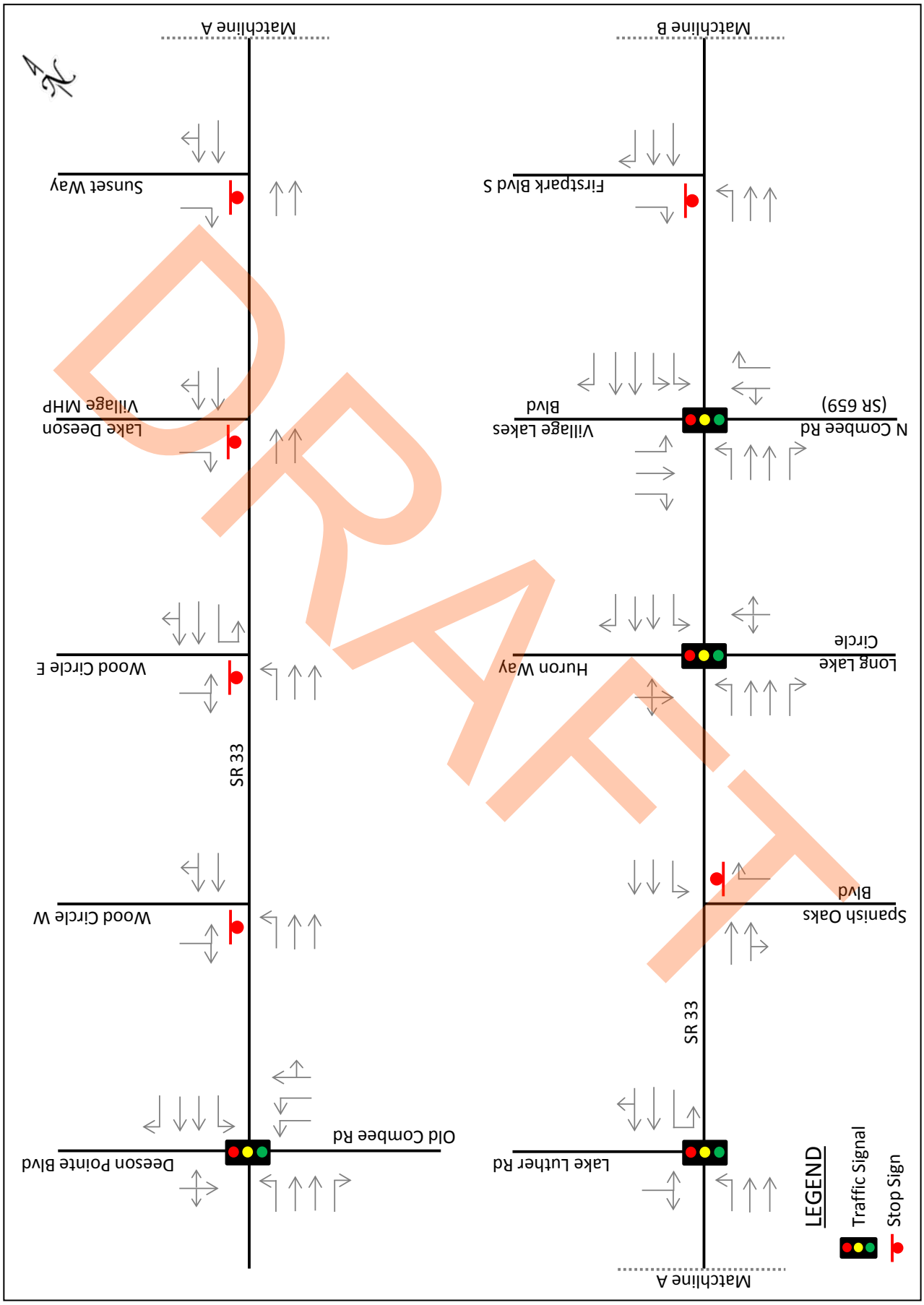


FIGURE 6-1: DESIGN YEAR (2036) RECOMMENDED INTERSECTION GEOMETRY – BUILD ALTERNATIVE

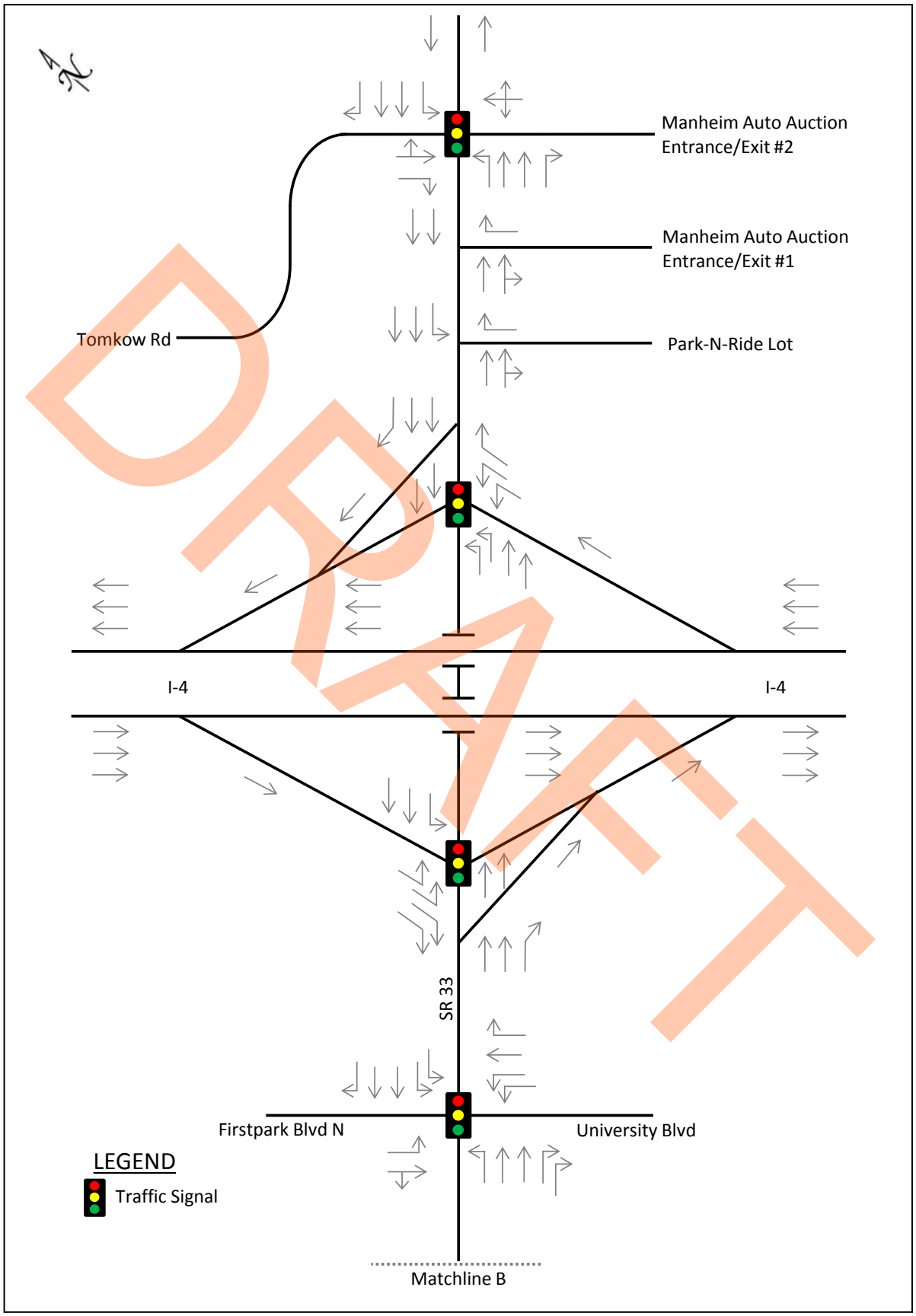


FIGURE 6-2: DESIGN YEAR (2036) RECOMMENDED INTERCHANGE/INTERSECTION GEOMETRY – BUILD ALTERNATIVE

APPENDIX A

2012 Bi-Directional Volume and Vehicle Classification Count Data

APPENDIX B

2012 Weekly and Axle Adjustment Factors

APPENDIX C

2012 Peak Hour Intersection Turning Movement Count Data

APPENDIX D

2012 Historical AADT Reports and
Vehicle Classification History Reports

APPENDIX E

Existing Conditions (2012) Traffic Analysis Summary Sheets

APPENDIX F

Original 2007 and 2035 TPO Model AADT Volume Plots

APPENDIX G

DRI Land Use Data

APPENDIX H

Revised 2007 and 2035 TPO Model AADT Volume Plots

APPENDIX I

Historic Growth Trend Analyses

APPENDIX J

TURNS5 Output Data

APPENDIX K

Opening Year (2016) Traffic Analysis Summary Sheets – No-Build Alternative

APPENDIX L

Design Year (2036) Traffic Analysis Summary Sheets – No-Build Alternative

APPENDIX M

Interim Year Roadway Segment Analysis Summary Sheets –
No-Build Alternative

APPENDIX N

Design Year (2036) Traffic Analysis Summary Sheets – Build Alternative

APPENDIX O

Preliminary Traffic Signal Warrant Analysis Summary Sheets

APPENDIX P

Opening Year (2016) Traffic Analysis Summary Sheets – Build Alternative

APPENDIX Q

Traffic Data for Noise Analysis