FINAL

PROJECT TRAFFIC ANALYSIS REPORT

SR 544 from Martin Luther King Boulevard to SR 17

PROJECT DEVELOPMENT & ENVIRONMENT (PD&E) STUDY

Polk County, Florida

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT ONE

FINANCIAL PROJECT ID: 440273-1-22-01

January 2021

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SECTION 1.0 INTRODUCTION / PURPOSE OF STUDY

The Florida Department of Transportation (FDOT) District One is conducting a Project Development & Environment (PD&E) Study for SR 544 in Polk County. The limits of the PD&E Study extend from Martin Luther King Boulevard to SR 17 and are illustrated in **Figure 1-1**. The widening (i.e., four-laning) of SR 544 is included in the Polk Transportation Planning Organization's adopted 2040 Cost-Feasible Long Range Transportation Plan. The purpose of the PD&E Study is to document the need for capacity, safety, and multimodal improvements within the SR 544 corridor and to determine the specific improvements that should be implemented in this approximately 8.0-mile corridor. The purpose of the SR 544 Project Traffic Analysis Report is to document the existing traffic volumes and peak hour traffic operations, as well as the future year volumes and traffic operations both with and without additional roadway capacity.

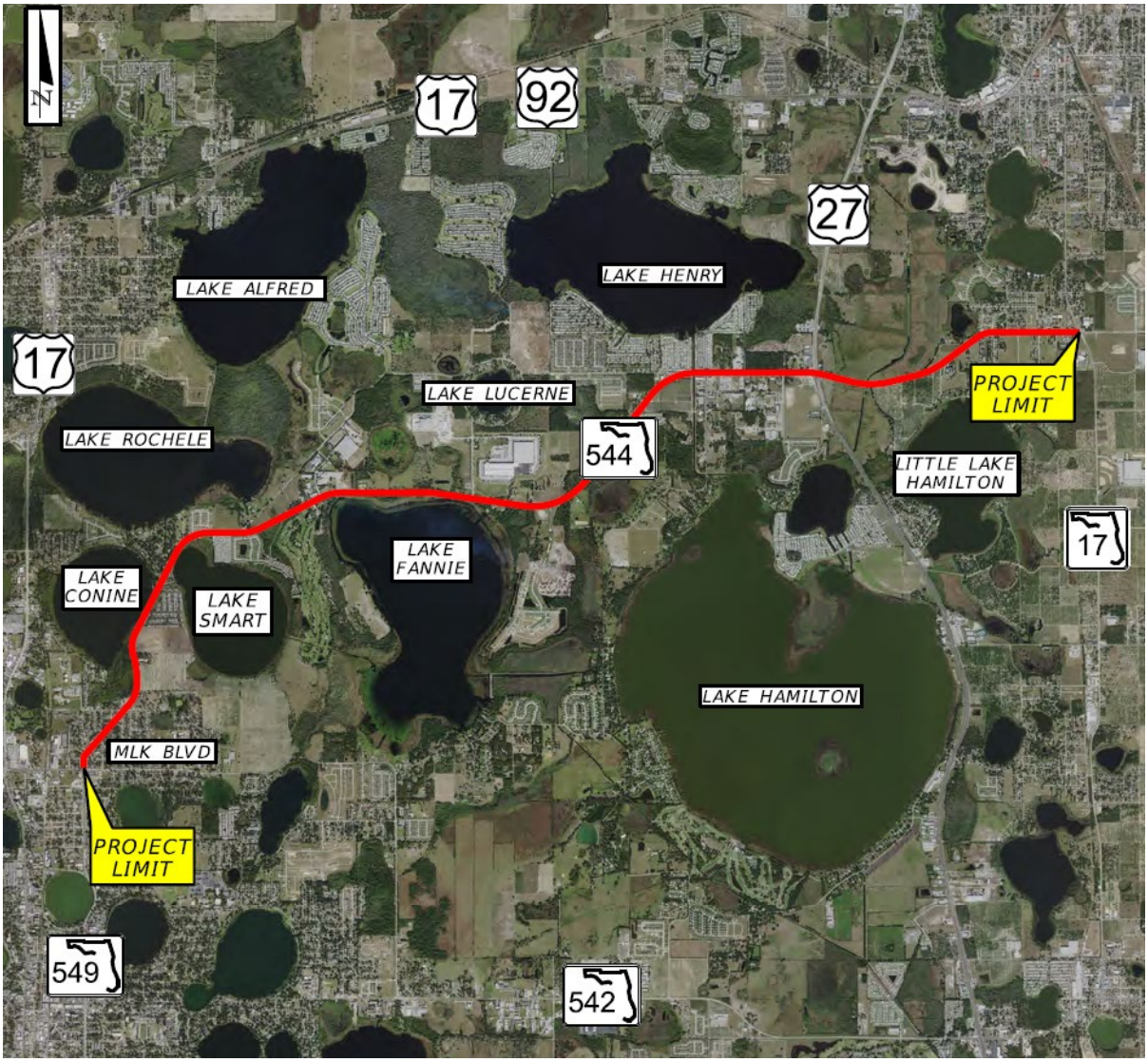

Figure 1-1: Project Location Map

SECTION 2.0 EXISTING CONDITIONS

2.1 Existing Roadway and Intersection Characteristics

SR 544 is a two-lane undivided roadway from Martin Luther King Boulevard to Myrtle Avenue and a four-lane undivided roadway from Myrtle Avenue to SR 17. The portion of SR 544 from Martin Luther King Boulevard to the western end of Old Lucerne Park Road has a north/south alignment; however, east of this location, the study corridor has an east/west alignment. SR 544 is functionally classified as an urban minor arterial from Martin Luther King Boulevard to US 27 and an urban major collector from US 27 to SR 17. The study corridor includes the nine major intersections listed below:

- Martin Luther King Boulevard (Four-legged intersection) – Milepost 3.693
- Avenue Y (Four-legged intersection) – Milepost 4.169
- Old Lucerne Park Road/Lake Smart Estates Drive (Four-legged intersection) – Milepost 5.749
- Lucerne Lake Road (T-intersection to the north) – Milepost 7.284
- Old Lucerne Park Road (T-intersection to the north) – Milepost 8.965
- Lake Hamilton Drive (Four-legged intersection) – Milepost 9.156
- Brenton Manor Avenue (T-intersection to the south) – Milepost 9.661
- US 27 (Four-legged intersection) – Milepost 9.873
- SR 17 (Four-legged intersection) – Milepost 11.647

The Martin Luther King Boulevard, US 27 and SR 17 intersections are signalized intersections. There is a flashing beacon at the Lucerne Lake Road intersection, with flashing yellow displayed on SR 544 and flashing red displayed on the cross street. The other five intersections are all unsignalized intersections that are controlled by stop signs located on the cross streets. **Figure 2-1** depicts the existing intersection laneage.

There are four different posted speed limits within the study corridor. These are 35 mph, 45 mph, 50 mph, and 55 mph. **Table 2-1** summarizes the lengths of the no-passing zones for each of the roadway segments as well as the no-passing zone percentages. Passing is not allowed on SR 544 in either direction from Avenue Y NE to US 27, which represents approximately 72.0% of the total study corridor length.

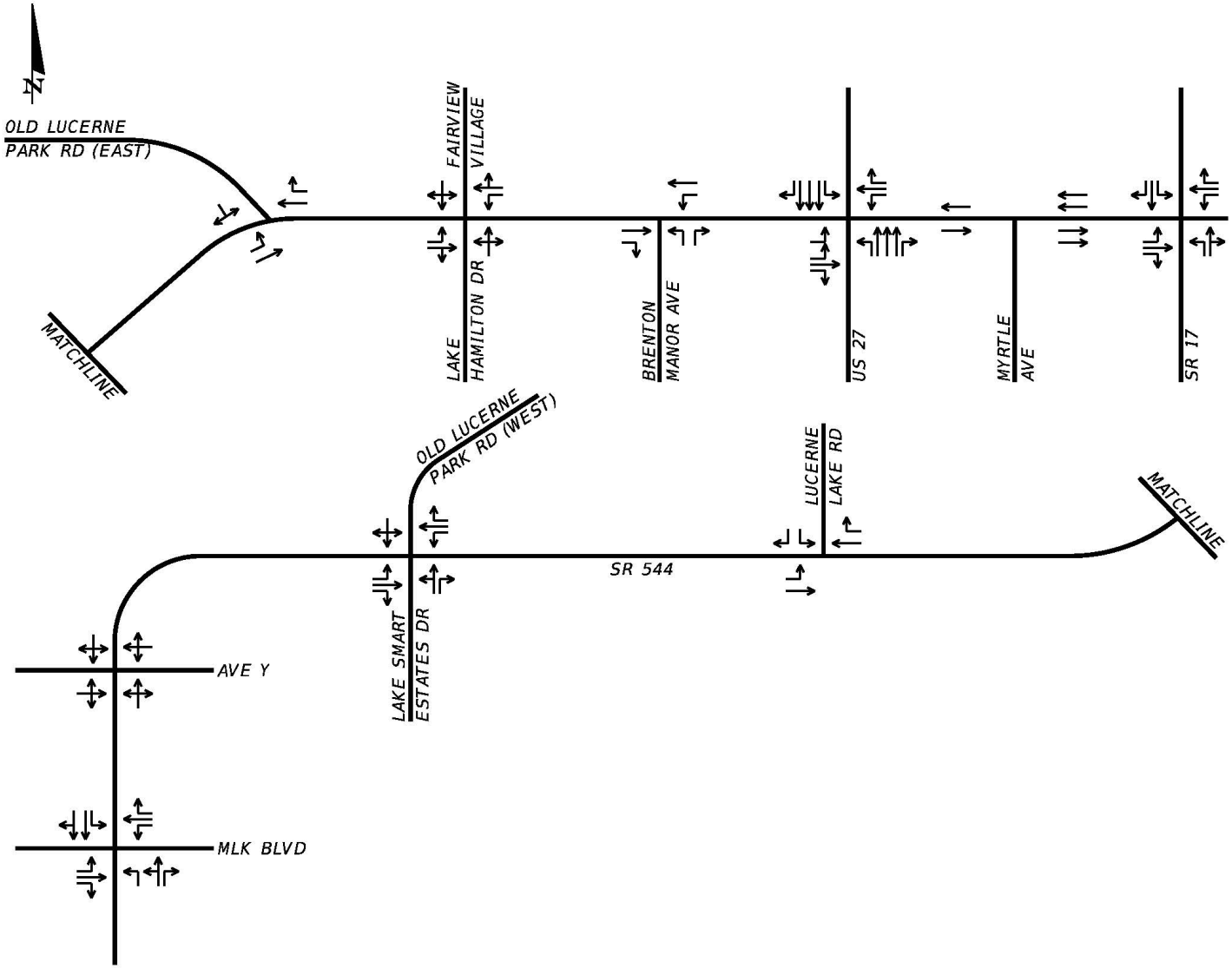

Figure 2-1: Existing Intersection Geometry

Table 2-1: Existing No-Passing Lengths and Percentages

Segment		Total Segment Length (feet)	Northbound/ Eastbound No-Passing Length (feet)	Northbound/ Eastbound % No-Passing	Southbound/ Westbound No-Passing Length (feet)	Southbound/ Westbound % No-Passing
From	To					
Martin Luther King Blvd	Avenue Y NE	2,513	670	26.7%	967	38.5%
Avenue Y NE	Speed Limit Change	4,005	4,005	100.0%	4,005	100.0%
Speed Limit Change	Old Lucerne Park Rd (west end)	4,337	4,337	100.0%	4,337	100.0%
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	8,105	8,105	100.0%	8,105	100.0%
Lucerne Lake Rd	Speed Limit Change	5,967	5,967	100.0%	5,967	100.0%
Speed Limit Change	Old Lucerne Park Rd (east end)	2,909	2,909	100.0%	2,909	100.0%
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	1,008	1,008	100.0%	1,008	100.0%
Lake Hamilton Dr	Benton Manor Ave	2,666	2,666	100.0%	2,666	100.0%
Benton Manor Ave	US 27	1,119	1,119	100.0%	1,119	100.0%
US 27	Speed Limit Change	4,830	1,981	41.0%	4,133	85.6%
Speed Limit Change	Peninsular Dr	2,482	898	36.2%	845	34.0%
Peninsular Dr	SR 17	2,056	0	0.0%	0	0.0%
Martin Luther King Blvd	SR 17	41,997	33,665	80.2%	36,061	85.9%

2.2 Existing Average Annual Daily Traffic (AADT) Volumes

All the existing traffic count data was provided by District One and this data included traffic counts that were conducted specifically for this PD&E study in October 2019. Due to budget limitations, the District One Traffic Operations Department was unable to conduct 2019 traffic counts at all the needed locations; however, there were several previous studies conducted for District One and these included the following:

- SR 544 at Martin Luther King Boulevard (previously known as Avenue T), Avenue U and 1st Street N. Composite Study (May 2018)
- SR 544 at Avenue Y NE (Milepost 4.156) Traffic Signal Warrant Study (June 2016)
- SR 544 at Old Lucerne Park Road/Lake Smart Estates Drive (Milepost 5.749) Composite Study (February 2018)
- SR 544 at Old Lucerne Park Road (Milepost 8.965) Composite Study (March 2018)

All these studies included twenty-four (24)-hour intersection approach volume counts. The approach volume counts were conducted on the following dates:

- SR 544/Martin Luther King Boulevard – April 17, 2018
- SR 544/Avenue Y – February 16, 2016
- SR 544/Old Lucerne Park Road (west end) – January 9, 2018
- SR 544/Old Lucerne Park Road (east end) – January 9, 2018

Twenty-four-hour bi-directional volume counts were conducted by Vanasse Hangen Brustlin (VHB), Inc. on October 1, 2019 at the following five study intersections:

- SR 544/Lucerne Lake Road
- SR 544/Lake Hamilton Drive/Fairview Village Entrance
- SR 544/Brenton Manor Avenue
- SR 544/US 27
- SR 544/SR 17

All of the 24-hour volume counts are provided in **Appendix A**. The 2016, 2018 and 2019 24-hour volume counts were multiplied by weekly seasonal adjustment factors and axle adjustment factors to obtain estimates of the 2016, 2018 and 2019 AADT volumes. The 2016 and 2018 adjustment factors were obtained from the Florida Traffic Online website and are provided in **Appendix A**. There were no axle adjustment factors available for any of the SR 544 cross streets other than US 27, therefore, several assumptions were made. First, it was assumed that with one exception (i.e., Lucerne Lake Road), the daily truck percentage on US 27 was greater than the daily truck percentage on any of the other SR 544 cross streets. Therefore, all the other cross street axle adjustment factors except for Lucerne Lake Road were assumed to be greater than the US 27 axle adjustment factor value of 0.94. Second, it was assumed the daily truck volumes on Avenue Y, the Lake Smart Estates entrance/exit, the Fairview Village entrance/exit and Lake Hamilton Drive were minimal and, therefore, an axle adjustment factor equal to 1.00 was used for these cross streets.

Third, an axle adjustment factor equal to 0.95 was assumed for both Martin Luther King Boulevard and SR 17. Although the daily truck percentages associated with these two roadways are not as high as the daily truck percentages on US 27, they range between 3.8% and 9.4% and indicate that these roadways are serving as secondary truck routes. Fourth, an axle adjustment factor equals to 0.98 was assumed for Old Lucerne Park Road and Brenton Manor Avenue. Based on the lengths of these roadways and the characteristics of the adjacent land uses, the daily truck percentages for these roadways were believed to be lower than the daily percentages for Martin Luther King Boulevard and SR 17 but higher than the daily percentages for Avenue Y and Lake Hamilton Drive. The assumed axle adjustment factor value of 0.98 is higher than the value used for Martin Luther King Boulevard and SR 17 but lower than the value used for Avenue Y and Lake Hamilton Drive. Lastly, Lucerne Lake Road provides access to low density residential development but primarily serves as the entrance/exit roadway for a Wal-Mart distribution center. Since there is a separate entrance/exit roadway for the Wal-Mart employees, all the trucks entering and exiting this facility travel on Lucerne Lake Road. Consequently, it is reasonable to assume the daily truck percentage on this cross street is very high and a low axle adjustment factor would be appropriate for this cross street. An axle adjustment factor equal to 0.81 was assumed for Lucerne Lake Road. This value is the axle adjustment factor for SR 33 and was chosen because SR 33 is also a high-volume truck route that provides direct access to a light industrial distribution center but also provides access to low density residential development.

The 2016, 2018 and 2019 AADT volumes are provided in **Table 2-2** (SR 544 mainline) and **Table 2-3** (SR 544 cross streets).The 2016 and 2018 AADT volume estimates were subsequently multiplied by growth factors to obtain preliminary 2019 AADT volume estimates. The growth factors were obtained by conducting historic growth trend analyses using the FDOT's Traffic Trends software and the AADT volumes for the years 2015 through 2019 obtained from the Florida Traffic Online website. The FDOT traffic count stations that were used included the following:

- Count Station No. 163140 – SR 544 (1st Street N.) south of Martin Luther King Boulevard
- Count Station No. 165151 – Martin Luther King Boulevard west of SR 544

- Count Station No. 164050 – Martin Luther King Boulevard east of SR 544
- Count Station No. 165153 – SR 544 north of Martin Luther King Boulevard
- Count Station No. 160096 – SR 544 south of Lake Conine Drive/Lake Smart Estates
- Count Station No. 160009 – SR 544 east of Old Lucerne Park Road (west end)
- Count Station No. 160275 – SR 544 west of Old Lucerne Park Road (east end)

The growth trend analyses are provided in **Appendix B**. A review of the four growth trend analyses conducted for the SR 544/Martin Luther King Boulevard intersection indicated the AADT volumes at two locations (i.e., Count Stations 163140 and 165151) exhibited no consistent growth trends, resulting in very low R^2 values. However, the R^2 values associated with the trend analyses conducted for Count Stations 164050 and 165153 were both higher than 75%. An average historic traffic growth rate equal to 3.19% per year was calculated using the trend analyses for these two count stations and the 2018 AADT volumes for the four legs of this intersection were multiplied by 1.0319 and used as the initial estimate of the 2019 AADT volumes. The 2016 AADT volumes for the four legs of the Avenue Y intersection were multiplied by 1.0988 and used as the initial estimate of the 2019 AADT volumes. This reflected the use of a 3.19% yearly growth rate for three years.

The growth trend analyses conducted for SR 544 south of Lake Smart Estates and SR 544 east of Old Lucerne Park Road (west end) indicated historic traffic growth rates of 5.77% per year and 5.43% per year, respectively. The 2018 AADT volumes for the west and east legs of the Old Lucerne Park Road (west end) intersection were multiplied by 1.0577 and 1.0543, respectively and were used as the initial estimates of the 2019 AADT volumes. The 2018 AADT volume on the north leg of this intersection was multiplied by 1.0560 and used as the initial estimate of the 2019 AADT volume. The 1.0560 value is the average of the growth rates on the west and east side of Old Lucerne Park Road. The south leg of this intersection is the entrance/exit for Lake Smart Estates, a small single-family residential development. Since this residential development is built-out, the 2019 AADT volume was assumed to be equal to the 2018 AADT volume. The 2018 AADT volumes for the three legs at the Old Lucerne Park Road (east end) intersection were multiplied by 1.0577 and used as the initial estimate of the 2019 AADT volumes. The initial 2019 AADT volume estimates are provided in **Table 2-2** (SR 544 mainline) and **Table 2-3** (SR 544 cross streets).

In addition to the seven FDOT count stations previously identified, there are seven other count stations located within the general study area. These include the following:

- Count Station No. 163106 – SR 544 west of Hidden Cove Avenue (i.e., west of Brenton Manor Avenue)
- Count Station No. 160021 – SR 544 southwest of Circle 4 Drive (i.e., east of US 27)
- Count Station No. 164786 – CR 544 (Lake Marion Road) east of SR 17
- Count Station No. 160098 – US 27 north of Hughes Road (i.e., south of SR 544)
- Count Station No. 160097 – US 27 south of US 17-92 (i.e., north of SR 544)
- Count Station No. 160046 – SR 17 (10th Street) south of SR 544
- Count Station No. 165049 – SR 17 (10th Street) north of SR 544

Table 2-2: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Mainline)

Location	Date	Count	SF [1]	AF [2]	AADT [3]	Growth Factor	2019 AADT [4]	2019 AADT [5]	2019 AADT [6]	Average	Final 2019 AADT
South of M. L. King Boulevard [7]	4/17/2018	21,686	0.96	0.95	19,778	1.0319	20,409	20,000	23,000	21,500	**23,000** [8]
North of M. L. King Boulevard [7]	4/17/2018	17,212	0.96	0.95	15,697	1.0319	16,198	16,000	18,800	17,400	**18,800** [9]
South of Avenue Y [7]	2/16/2016	19,748	0.96	0.97	18,389	1.0988	20,206	20,000	n/a		**20,000**
North of Avenue Y [7]	2/16/2016	19,936	0.96	0.97	18,564	1.0988	20,399	20,000	n/a		**20,000**
South of Lake Conine Drive									19,200		**19,200**
West of Old Lucerne Park Road (west end) [7]	1/9/2018	16,214	1.01	0.94	15,394	1.0577	16,282	16,000	n/a		**16,000**
East of Old Lucerne Park Road (west end) [7]	1/9/2018	15,212	1.01	0.94	14,442	1.0543	15,226	15,000	n/a		**15,000**
West of Lucerne Lake Road	10/1/2019	14,506	1.03	0.94	14,045	1.0000	14,045	14,000	14,000	14,000	**14,000**
East of Lucerne Lake Road	10/1/2019	14,608	1.03	0.94	14,143	1.0000	14,143	14,000	n/a		**14,000**
West of Old Lucerne Park Road (east end) [7]	1/9/2018	18,070	1.01	0.94	17,156	1.0706	18,367	18,000	14,000	16,000	**14,000** [10]
East of Old Lucerne Park Road (east end) [7]	1/9/2018	14,682	1.01	0.94	13,939	1.0706	14,923	15,000	n/a		**15,000**
West of Lake Hamilton Drive/Fairview Village	10/1/2019	22,630	1.03	0.94	21,910	1.0000	21,910	22,000	n/a		**22,000**
East of Lake Hamilton Drive/Fairview Village	10/1/2019	20,472	1.03	0.94	19,821	1.0000	19,821	20,000	n/a		**20,000**
West of Brenton Manor Avenue	10/1/2019	23,035	1.03	0.94	22,302	1.0000	22,302	22,000	n/a		**22,000**
East of Brenton Manor Avenue	10/1/2019	23,127	1.03	0.94	22,392	1.0000	22,392	22,000	n/a		**22,000**
West of Hide-A-Way Lane (Hidden Cove Entr)									21,000		**21,000**
West of US 27	10/1/2019	22,701	1.03	0.94	21,979	1.0000	21,979	22,000	n/a		**22,000**
East of US 27	10/1/2019	10,954	1.03	0.94	10,606	1.0000	10,606	11,000	11,000	11,000	**11,000**
West of SR 17	10/1/2019	10,500	1.03	0.94	10,166	1.0000	10,166	10,000	n/a		**10,000**
East of SR 17	10/1/2019	9,534	1.03	0.94	9,231	1.0000	9,231	9,200	8,800	9,000	**9,000**

[1] SF = Weekly Seasonal Adjustment Factor
[2] AF = Axle Adjustment Factor
[3] AADT = Count x SF x AF
[4] 2019 AADT = AADT x Growth Factor
[5] 2019 AADT (rounded)
[6] 2019 AADT obtained from the FDOT Florida Traffic Online website
[7] Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.
[8] FDOT count station value was used because the AADT volume has been greater than 21,000 vpd for the last five years.
[9] FDOT count station value was used because the AADT volume has been greater than 16,000 vpd for the last five years.
[10] FDOT count station value was used because the 2018 AADT volume at this permanent count station was equal to 13,600 vpd.

Table 2-3: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Cross Streets)

Location	Date	Count	SF [1]	AF [2]	AADT [3]	Growth Factor	2019 AADT [4]	2019 AADT [5]	2019 AADT [6]	Average	Final 2019 AADT
M. L. King Boulevard West of SR 544 [7]	4/17/2018	26,560	0.96	0.95	24,223	1.0319	24,995	25,000	25,000	25,000	**25,000**
M. L. King Boulevard East of SR 544 [7]	4/17/2018	13,582	0.96	0.95	12,387	1.0319	12,782	13,000	13,500	13,250	**13,000**
Avenue Y West of SR 544 [7]	2/16/2016	1,960	0.96	1.00	1,882	1.0988	2,068	2,100	n/a		**2,100**
Avenue Y East of SR 544 [7]	2/16/2016	2,174	0.96	1.00	2,087	1.0988	2,293	2,300	n/a		**2,300**
Old Lucerne Park Road (west end) North of SR 544[7]	1/9/2018	3,206	1.01	0.98	3,173	1.0560	3,351	3,400	n/a		**3,400**
Lake Smart Estates Drive South of SR 544[7]	1/9/2018	862	1.01	1.00	871	1.0000	871	870	n/a		**870**
Lucerne Lake Road North of SR 544	10/1/2019	1,730	1.03	0.81	1,443	1.0000	1,443	1,400	n/a		**1,400**
Old Lucerne Park Road (east end) North of SR 544[7]	1/9/2018	5,454	1.01	0.98	5,398	1.0706	5,779	5,800	n/a		**5,800**
Fairview Village North of SR 544	10/1/2019	96	1.03	1.00	99	1.0000	99	100	n/a		**100**
Lake Hamilton Drive South of SR 544	10/1/2019	3,344	1.03	1.00	3,444	1.0000	3,444	3,400	n/a		**3,400**
Brenton Manor Avenue South of SR 544	10/1/2019	2,916	1.03	0.98	2,943	1.0000	2,943	2,900	n/a		**2,900**
US 27 North of SR 544	10/1/2019	45,009	1.04	0.94	44,001	1.0000	44,001	44,000	46,500	45,250	**46,500** [8]
US 27 South of SR 544	10/1/2019	34,554	1.04	0.94	33,780	1.0000	33,780	34,000	39,500	36,750	**39,500** [9]
SR 17 North of SR 544	10/1/2019	10,764	1.03	0.95	10,533	1.0000	10,533	11,000	9,700	10,350	**10,000**
SR 17 South of SR 544	10/1/2019	8,680	1.03	0.95	8,493	1.0000	8,493	8,500	8,300	8,400	**8,400**

Note: Red font denotes assumed values used for this study.

[1] SF = Weekly Seasonal Adjustment Factor
[2] AF = Axle Adjustment Factor
[3] AADT = Count x SF x AF
[4] 2019 AADT = AADT x Growth Factor
[5] 2019 AADT (rounded)
[6] 2019 AADT obtained from the FDOT Florida Traffic Online website
[7] Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.
[8] FDOT count station value was used because the AADT volume has been greater than 44,000 vpd for the last four years.
[9] FDOT count station value was used because the AADT volume has been greater than 34,000 vpd for four of the last five years.

The 2019 AADT volumes associated with the FDOT count stations are provided in **Table 2-2** and **Table 2-3**. The 2019 AADT volumes that were estimated based on the traffic count data provided by the District One Traffic Operations Department were compared to the 2019 AADT volumes associated with the FDOT count stations. For a majority of the locations, the differences between these two 2019 AADT volumes were small and the average of the two 2019 AADT volumes was used as the final estimate of the 2019 AADT volume. It should also be noted that the assumed axle adjustment factor of 0.95 that was used to help derive estimates of the 2019 AADT volumes for Martin Luther King Boulevard and SR 17, produced 2019 AADT volumes that were very close to the 2019 AADT volumes obtained from the FDOT count stations.

However, there were three SR 544 mainline locations where the 2019 FDOT count station AADT volumes were used as the final 2019 AADT volumes. These locations were as follows:

- SR 544 (1st Street N.) south of Martin Luther King Boulevard
- SR 544 north of Martin Luther King Boulevard
- SR 544 west of Old Lucerne Park Road (east end)

A review of the AADT volumes for FDOT Count Station No. 163140 (i.e., SR 544 (1st Street) south of Martin Luther King Boulevard) for the years 2015 through 2019 indicated the AADT volumes have been greater than 21,000 vehicles per day (vpd) for each of the last five years. Similarly, a review of the AADT volumes for FDOT Count Station No. 165153 (i.e., SR 544 north of Martin Luther King Boulevard) for the years 2015 through 2019 indicated the AADT volumes have been greater than 16,000 vehicles per day (vpd) for each of the last five years. Since the 2019 AADT volumes that were estimated based on the traffic count data were lower than the lowest AADT volume reported at each of these two count stations during the last five years (including the 2019 values), it did not seem reasonable to use the average of the two 2019 AADT volumes.

The 2019 AADT volume for SR 544 west of Old Lucerne Park Road (east end) that was estimated based on the traffic count data (i.e., 18,000 vpd) was approximately 29% higher than the 2019 AADT volume associated with FDOT Count Station No. 160275 (i.e., SR 544 west of Old Lucerne Park Road (east end)). In addition, the 2018 AADT volume for this same count station was approximately 13,600 vpd, indicating a very minor increase in AADT volume between 2018 and 2019. Since FDOT Count Station No. 160275 is a permanent (telemetered) count station, the reliability/accuracy of the reported 2019 AADT volume at this location was believed to be much higher than that associated with a 2019 AADT volume estimate based on a single 24-hour traffic count.

There were also two SR 544 cross street locations where the 2019 FDOT count station AADT volume was used as the final 2019 AADT volume. These locations were as follows:

- US 27 north of SR 544
- US 27 south of SR 544

A review of the AADT volumes for FDOT Count Station No. 160097 (i.e., US 27 north of SR 544) for the years 2015 through 2019 indicated the AADT volumes have been greater than 44,000 vpd for the last four years. Similarly, a review of the AADT volumes for FDOT Count Station No. 160098 (i.e., US 27 south of SR 544) for the same five-year period indicated the AADT volumes have been greater than 34,000 vpd for four of the last five years. Since the 2019 AADT volumes that were estimated based on the traffic count data were lower than almost all of the AADT volumes reported at each of these count stations during the last five years (including the 2019 values), it did not seem reasonable to use the average of the two 2019 AADT volumes. The final 2019 AADT volumes are listed in the far-right columns of **Table 2-2** and **Table 2-3**. The 2019 SR 544 mainline AADT volumes within the study corridor range from 10,000 vehicles per day (vpd) to 22,000 vpd. Slightly higher and lower AADT volumes are present just south and east of the PD&E study limits, respectively. The 2019 AADT volumes are also graphically illustrated in **Figure 2-2**. The methodologies and assumptions (and resulting 2019 AADT volumes) were previously documented in the *SR 544 Existing and Design Year AADT Volumes Technical Memorandum (dated June 2, 2020).* This memorandum was previously reviewed by District One and approved on June 4, 2020.

2.3 Existing Daily Truck Volumes and Percentages

Existing (2019) vehicle classification count data for SR 544 was obtained from the FDOT's 2019 Annual Vehicle Classification Report for the following five FDOT Count Stations:

- Count Station No. 165153 – SR 544 north of Martin Luther King Boulevard
- Count Station No. 160096 – SR 544 south of Lake Conine Drive/Lake Smart Estates
- Count Station No. 160009 – SR 544 east of Winter Haven Boulevard
- Count Station No. 160275 – SR 544 west of Old Lucerne Park Road (east end)
- Count Station No. 163106 – SR 544 west of Hidden Cove Avenue (i.e., west of Brenton Manor Avenue)

This vehicle classification count data is provided in **Appendix C**. All five of these count stations are located within the limits of the SR 544 PD&E study. It should be noted that vehicle classification count data was not available for FDOT Count Station No. 160021 (SR 544 southwest of Circle 4 Drive), which is also located within the PD&E study limits. The 2019 daily vehicle composition for these five locations is summarized in **Table 2-4**. The existing daily truck percentages range from approximately 6.9% to approximately 9.7%, while the existing daily truck volumes range from approximately 1,200 trucks to approximately 1,600 trucks. Although there was no 2019 daily truck information available for the portion of SR 544 from US 27 to SR 17, 2018 daily truck information was available for CR 544 (Lake Marion Road) approximately 0.33 miles east of SR 17 and this information is also provided in **Table 2-4**.

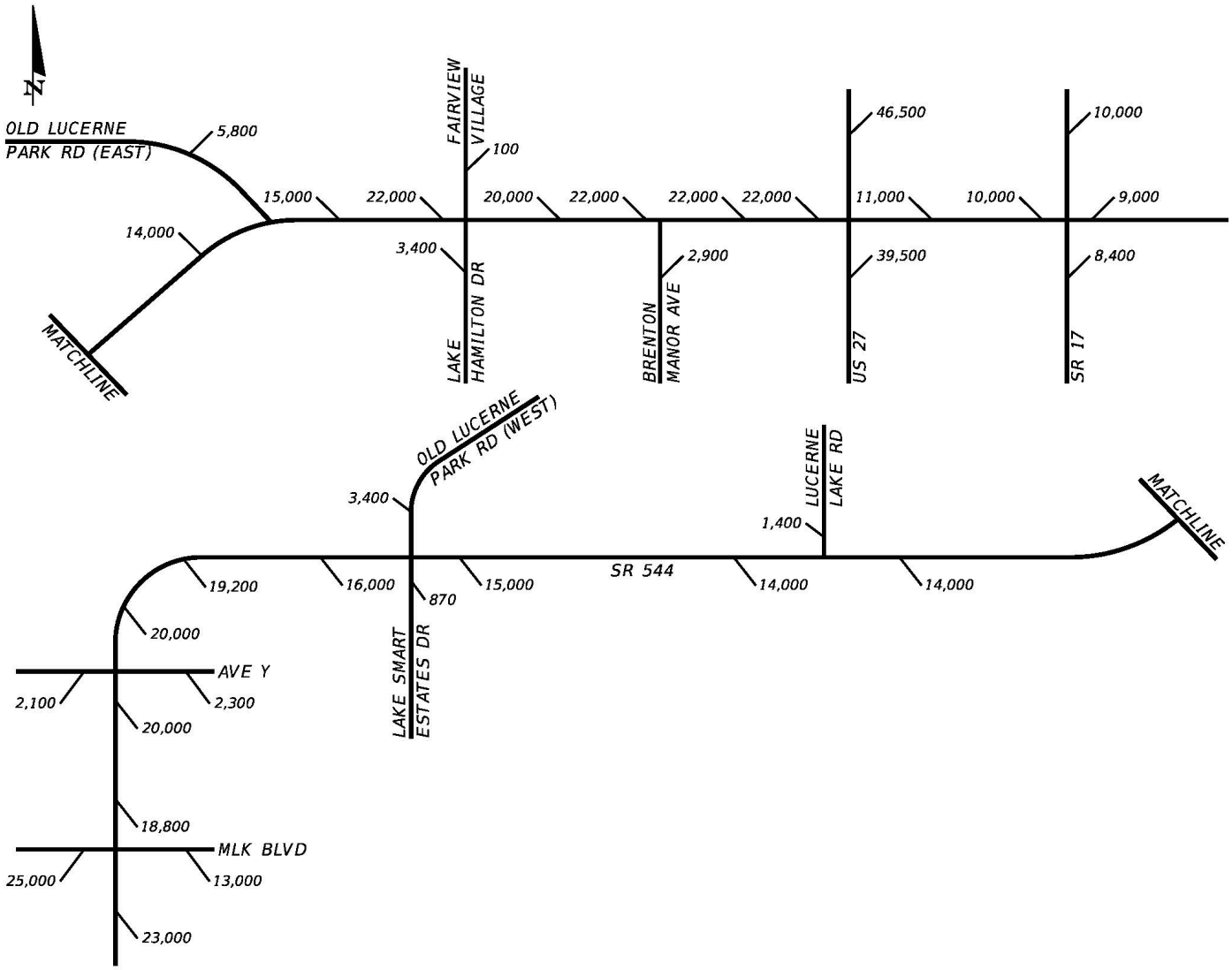

Figure 2-2: Existing (2019) AADT Volumes

Table 2-4: SR 544 Existing Daily Vehicle Composition

Location	Site No.	Milepost	Passenger Vehicles	Passenger Vehicle %	Medium Trucks	Medium Truck %	Heavy Trucks	Heavy Truck %	Total Trucks	Total Truck %	Motorcycles	Motorcycle %	Other	Total Vehicles
Northeast of Ave U NW [1]	165153	3.811	17,113	91.03%	433	2.30%	864	4.60%	1,297	6.90%	173	0.92%	217	18,800
South of Lake Conine Dr [1]	160096	5.012	17,682	92.09%	478	2.49%	975	5.08%	1,453	7.57%	65	0.34%	0	19,200
East of Winter Haven Blvd [1]	160009	6.337	12,712	90.80%	406	2.90%	804	5.74%	1,210	8.64%	78	0.56%	0	14,000
West of Old Lucerne Park Rd [1]	160275	8.760	12,578	89.89%	218	1.56%	1,141	8.15%	1,359	9.71%	43	0.31%	13	13,993
West of Hidden Cove Ave [1]	163106	9.375	19,259	91.71%	375	1.79%	1,217	5.80%	1,592	7.58%	148	0.70%	0	20,999
Southwest of Circle 4 Dr	160021	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11,000
East of SR 17 [2]	164786	0.329	7,422	88.37%	229	2.73%	707	8.42%	936	11.14%	41	0.49%	0	8,399

[1] *Obtained from the 2019 FDOT Vehicle Classification Report*

[2] *Obtained from the 2018 FDOT Vehicle Classification Report*

The 2018 daily truck percentage at this location was 11.14%. Although this daily percentage is significantly higher than the daily percentages on SR 544 from Martin Luther King Boulevard to US 27, the actual daily truck volume at this location (i.e., approximately 940 trucks) is significantly lower than the daily volumes on SR 544 west of SR 17.

2.4 Existing Peak Hour Volumes

Manual turning movement counts were conducted by VHB on October 1, 2019 at the following five study intersections:

- SR 544/Lucerne Lake Road
- SR 544/Lake Hamilton Drive/Fairview Village Entrance
- SR 544/Brenton Manor Avenue
- SR 544/US 27
- SR 544/SR 17

All these intersections were counted during the time periods from 7:00 a.m. to 9:00 a.m., 11:00 a.m. to 2:00 p.m. and 3:00 p.m. to 6:00 p.m. Heavy vehicles (i.e., trucks and buses), pedestrians and bicyclists were also counted at these intersections in addition to passenger vehicles. Eight-hour turning movement counts conducted in earlier years were also provided by District One for the following intersections:

- SR 544/Martin Luther King Boulevard (from 7:00 a.m. to 10:00 a.m., 11:00 a.m. to 1:00 p.m. and 3:00 p.m. to 6:00 p.m.)
- SR 544/Avenue U (from 7:00 a.m. to 10:00 a.m., 11:00 a.m. to 1:00 p.m. and 3:00 p.m. to 6:00 p.m.)
- SR 544/1st Street N (from 7:00 a.m. to 10:00 a.m., 11:00 a.m. to 1:00 p.m. and 3:00 p.m. to 6:00 p.m.)
- SR 544/Avenue Y (from 8:00 a.m. to- 9:00 a.m., 10:00 a.m. to 11:00 a.m. and 1:00 p.m. to 7:00 p.m.)
- SR 544/Old Lucerne Park Road – west end (from 7:00 a.m. to 3:00 p.m.)
- SR 544/Old Lucerne Park Road – east end (from 7:00 a.m. to 9:00 a.m., 10:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m.)

These turning movement counts also included heavy vehicles, pedestrians, and bicyclists. Turning movement count data for the entire two-hour period from 7:00 a.m. to 9:00 a.m. was available for eight of the nine PD&E study intersections. The SR 544/Avenue Y intersection was not counted during the 7:00 a.m. to 8:00 a.m. time period. A review of the a.m. peak hour volumes for the intersections that were counted during the 7:00 a.m. to 9:00 a.m. time period indicated the highest 60-minute volumes usually occurred between 7:15 a.m. and 8:15 a.m.

Turning movement count data for the entire two-hour period from 4:00 p.m. to 6:00 p.m. was also available for seven of the nine PD&E study intersections. The SR 544/Old Lucerne Park Road (west end) intersection was not counted during the 4:00 p.m. to 6:00 p.m. time period and the SR 544/Old Lucerne Park Road (east end) intersection was not counted during the 5:00 p.m. to 6:00 p.m. time period. A review of the p.m. peak hour volumes for the intersections that were counted during the 4:00 p.m. to 6:00 p.m. time period indicated the highest 60-minute volumes primarily occurred between 4:45 p.m. and 5:45 p.m.

In addition, even in those instances when the 7:15 a.m. to 8:15 a.m. and 4:45 p.m. to 5:45 p.m. time periods did not experience the highest 60-minute volumes, the differences between these 60-minute volumes and the highest 60-minute volumes were small. Consequently, the 7:15 a.m. to 8:15 a.m. time period was determined to be the a.m. peak hour for the study corridor and the 4:45 p.m. to 5:45 p.m. time period was determined to be the p.m. peak hour for the study corridor.

Based on the available turning movement count data, there existed a need to derive estimates for the 2019 intersection turning movement volumes at the following locations:

- SR 544/Martin Luther King Boulevard
- SR 544/Avenue Y
- SR 544/Old Lucerne Park Road (west end)
- SR 544/Old Lucerne Park Road (east end**)**

The methodologies and assumptions that were used to derive the 2019 a.m. and p.m. peak hour turning movement volumes for these intersections are described below. It should be noted that these methodologies and assumptions (and resulting peak hour volumes) were previously documented in the *SR 544 Existing Peak Hour Intersection Turning Movement Volumes Technical Memorandum (dated April 28, 2020).* This memorandum was previously reviewed by District One and approved on May 13, 2020.

2.4.1 Avenue Y Intersection - 2019 A.M. Peak Hour Volumes (7:15 a.m. to 8:15 a.m.)

Step 1: The 2018 raw turning movement counts conducted on April 17, 2018 at the Martin Luther King Boulevard, Avenue U, and 1st Street N. intersections for the 8:00 a.m. to 9:00 a.m. and 7:15 a.m. to 8:15 a.m. time periods were multiplied by a weekly seasonal adjustment factor of 0.96. This factor is the weekly seasonal adjustment factor for the week of 4/15/2018 through 4/21/2018 and was obtained from the FDOT's 2018 Peak Season Factor Category Report. The 2018 raw turning movement counts are provided in **Appendix D1**, while the 2018 Peak Season Factor Category Report is included in **Appendix A**. The seasonally adjusted 2018 volumes are provided in **Appendix D1**.

Step 2: Historic growth trend analyses were conducted for all four legs of the Martin Luther King Boulevard intersection using the FDOT's Traffic Trends software and the Average Annual Daily Traffic (AADT) volumes for the years 2015 through 2019 obtained from the Florida Traffic Online website.

The FDOT traffic count stations that were used included the following:

- Count Station No. 163140 (1st Street N. south of Martin Luther King Boulevard)
- Count Station No. 165151 (Martin Luther King Boulevard west of SR 544)
- Count Station No. 164050 (Martin Luther King Boulevard east of SR 544)
- Count Station No. 165153 (SR 544 north of Martin Luther King Boulevard)

The historic growth trend analyses are included in **Appendix B**. A review of the trend analyses indicated the AADT volumes at two locations (i.e., Count Stations 163140 and 165151) exhibited no consistent growth trends, resulting in very low R^2 values. However, the R^2 values associated with the trend analyses conducted for Count Stations 164050 and 165153 were both higher than 75%. An average historic trend growth rate equal to 3.19% was calculated using the trend analyses for these two count stations and the 2018 peak hour volumes were multiplied by 1.0319 and used as the initial estimate of the 2019 a.m. peak hour volumes. The 2019 a.m. peak hour volumes are provided in **Appendix D1.**

Step 3: The 2016 raw turning movement counts conducted on March 3, 2016 at the Avenue Y intersection for the 8:00 a.m. to 9:00 a.m. time period was multiplied by a weekly seasonal adjustment factor of 0.95. This factor is the weekly seasonal adjustment factor for the week of 2/28/2016 through 3/5/2016 and was obtained from the FDOT's 2016 Peak Season Factor Category Report. The 2016 raw turning movement counts are provided in **Appendix D1**, while the 2016 Peak Season Factor Category Report is included in **Appendix A**. The seasonally adjusted 2016 volumes are provided in **Appendix D1**.

Step 4: The 2016 volumes for the 8:00 a.m. to 9:00 a.m. time period at the Avenue Y intersection were multiplied by 1.0988 and used as the initial estimate of the 2019 volumes for this time period. This reflected the use of a 3.19% yearly growth rate for three years. The 2019 volumes are provided in **Appendix D1**.

Step 5: The northbound and southbound approach and departure volumes for the Martin Luther King Boulevard, Avenue U and 1st Street N. intersections were calculated for the 8:00 a.m. to 9:00 a.m. and 7:15 a.m. to 8:15 a.m. time periods using the initial estimates of the 2019 a.m. peak hour volumes. The approach and departure volumes are provided in **Appendix D1**.

Step 6: The northbound departure and northbound approach volumes for adjacent intersections (and the southbound departure and southbound approach volumes for adjacent intersections) were compared and the differences between these volumes were calculated. The reasonability of the volume differences was assessed taking into consideration the number of cross streets and driveways located between adjacent intersections, the length of the cross streets, and the types and densities of the adjacent land uses served by the cross streets and driveways.

Since there are no cross streets or driveways located between the Avenue U and 1st Street N. intersections, the southbound through volume at the Avenue U intersection was decreased by 28

vehicles in the 7:15 a.m. to 8:15 a.m. time period so the southbound approach volume at the Avenue U intersection would be equal to the southbound departure volume at the 1st Street N. intersection. Similarly, the northbound through volume at the 1st Street N. intersection was decreased by two vehicles in the 7:15 a.m. to 8:15 a.m. time period so the northbound departure volume at the Avenue U intersection would be equal to the northbound approach volume at the 1st Street N. intersection.

The difference between the southbound departure volume at the Avenue U intersection and the southbound approach volume at the Martin Luther King Boulevard intersection (i.e., 38 vehicles) was viewed as being too large since there is only one access point between these two intersections (i.e., a driveway on the east side of SR 544 providing access to a gas station/convenience store). Consequently, the southbound through volume at the Martin Luther King Boulevard intersection was increased by 40 vehicles in the 7:15 a.m. to 8:15 a.m. time period.

Step 7: The northbound and southbound approach and departure volumes at the Avenue Y intersection for the 8:00 a.m. to 9:00 a.m. time period was calculated using the initial estimate of the 2019 volumes obtained from Step 4. The approach and departure volumes are provided in **Appendix D1**.

Step 8: The northbound departure volume at the 1st Street N. intersection and the northbound approach volume at the Avenue Y intersection for the 8:00 a.m. to 9:00 a.m. time period was compared and the difference between these two volumes was calculated. This volume difference was viewed as being reasonable given that there are five cross streets located between these two intersections and approximately 25 driveways. The difference between the southbound departure volume at the Avenue Y intersection and the southbound approach volume at the 1st Street N. intersection was also calculated for this same time period and the magnitude of this difference was viewed as being too high. Therefore, the southbound through volume at the Avenue Y intersection was decreased by 30 vehicles.

Step 9: The ratio of the northbound approach volume at the Avenue Y intersection and the northbound departure volume at the 1st Street N. intersection was calculated for the 8:00 a.m. to 9:00 a.m. time period. The northbound departure volume at the 1st Street N. intersection for the 7:15 a.m. to 8:15 a.m. time period was subsequently multiplied by this ratio and used as the estimate of the northbound approach volume at the Avenue Y intersection for the 7:15 a.m. to 8:15 a.m. time period.

Step 10: The ratio of the southbound departure volume at the Avenue Y intersection and the southbound approach volume at the 1st Street N. intersection was calculated for the 8:00 a.m. to 9:00 a.m. time period. The southbound approach volume at the 1st Street N. intersection for the 7:15 a.m. to 8:15 a.m. time period was subsequently multiplied by this ratio and used as the initial estimate of the southbound departure volume at the Avenue Y intersection for the 7:15 a.m. to 8:15 a.m. time period.

Step 11: The 2019 volumes for the 7:15 a.m. to 8:15 a.m. time period for the northbound left-turn, through and right-turn movements at the Avenue Y intersection were calculated by multiplying the 7:15 a.m. to 8:15 a.m. northbound approach volume by the 8:00 a.m. to 9:00 a.m. northbound turning movement percentages. Similarly, the 2019 volumes for the 7:15 a.m. to 8:15 a.m. time period for the southbound through, westbound left-turn and eastbound right-turn movements at the Avenue Y intersection were calculated by multiplying the 7:15 a.m. to 8:15 a.m. southbound departure volume by the 8:00 a.m. to 9:00 a.m. turning movement percentages. The 2019 volumes for the 7:15 a.m. to 8:15 a.m. time period for the other six movements at the Avenue Y intersection were assumed to be equal to the 8:00 a.m. to 9:00 a.m. volumes.

Step 12: The southbound right-turn volume at the Avenue Y intersection was increased by 40 vehicles to reduce the difference between the southbound approach volume at the Avenue Y intersection and the southbound (westbound) departure volume at the Old Lucerne Park Road (west end) intersection. This adjustment was made after the 2019 volumes were estimated for the 7:15 a.m. to 8:15 a.m. time period at the Old Lucerne Park Road (west end) intersection. The final 2019 a.m. peak hour volumes for the 7:15 a.m. to 8:15 a.m. time period is provided in **Appendix D1**.

2.4.2 Avenue Y Intersection - 2019 P.M. Peak Hour Volumes (4:45 p.m. to 5:45 p.m.)

Step 1: The 2018 raw turning movement counts conducted on April 17, 2018 at the Martin Luther King Boulevard, Avenue U, and 1st Street N. intersections for the 4:45 p.m. to 5:45 p.m. time period was multiplied by a weekly seasonal adjustment factor of 0.96. The 2018 raw turning movement counts and the seasonally adjusted 2018 volumes are provided in **Appendix D1**.

Step 2: The 2018 peak hour volumes were multiplied by 1.0319 and used as the initial estimate of the 2019 p.m. peak hour volumes. The 2019 p.m. peak hour volumes are provided in **Appendix D1**.

Step 3: The 2016 raw turning movement counts conducted on March 3, 2016 at the Avenue Y intersection for the 4:45 p.m. to 5:45 p.m. time period was multiplied by a weekly seasonal adjustment factor of 0.95. The 2016 raw turning movement counts and the seasonally adjusted 2016 volumes are provided in **Appendix D1**.

Step 4: The 2016 volumes for the 4:45 p.m. to 5:45 p.m. time period at the Avenue Y intersection were multiplied by 1.0988 and used as the initial estimate of the 2019 volumes for this time period. This reflected the use of a 3.19% yearly growth rate for three years. The 2019 volumes are provided in **Appendix D1**.

Step 5: The northbound and southbound approach and departure volumes at the Martin Luther King Boulevard, Avenue U, 1st Street N. and Avenue Y intersections were calculated using the initial estimates of the 2019 p.m. peak hour volumes. The approach and departure volumes are provided in **Appendix D1**.

Step 6: The northbound departure and northbound approach volumes for adjacent intersections (and the southbound departure and southbound approach volumes at adjacent intersections) were compared and the differences between these volumes were calculated. Since there are no cross streets or driveways located between the Avenue U and 1st Street N. intersections, the northbound through volume at the Avenue U intersection was decreased by 13 vehicles so the northbound departure volume at the Avenue U intersection would be equal to the northbound approach volume at the 1st Street N. intersection. Similarly, the southbound through volume at the Avenue U intersection was increased by 43 vehicles so the southbound departure volume at the 1st Street N. intersection would be equal to the southbound approach volume at the Avenue U intersection.

The difference between the southbound departure volume at the Avenue U intersection and the southbound approach volume at the Martin Luther King Boulevard intersection (i.e., 17 vehicles) was viewed as being slightly too large and therefore, the southbound through volume at the Martin Luther King Boulevard intersection was increased by 10 vehicles. The northbound through volume at the Avenue Y intersection was subsequently decreased by 80 vehicles to reduce the difference between the northbound departure and northbound approach volumes. The difference between the southbound departure volume at the Avenue Y intersection and the southbound approach volume at the 1st Street N. intersection was also calculated and the southbound through volume at the Avenue Y intersection was subsequently increased by 100 vehicles to reduce the difference between the southbound departure and southbound approach volumes.

Step 7: The eastbound left-turn volume at the Avenue Y intersection was increased by 40 vehicles to reduce the difference between the northbound departure volume at the Avenue Y intersection and the northbound (eastbound) approach volume at the Old Lucerne Park Road (west end) intersection. This adjustment was made after the 2019 volumes were estimated for the 4:45 p.m. to 5:45 p.m. time period at the Old Lucerne Park Road (west end) intersection. The final 2019 p.m. peak hour volumes for the 4:45 p.m. to 5:45 p.m. time period is provided in **Appendix D1**.

2.4.3 Old Lucerne Park Road (west end) Intersection - 2019 A.M. Peak Hour Volumes (7:15 a.m. to 8:15 a.m.)

Step 1: The 2018 raw turning movement counts conducted on January 30, 2018 at the Old Lucerne Park Road intersection for the 7:15 a.m. to 8:15 a.m. time period was multiplied by a weekly seasonal adjustment factor of 0.99. This factor is the weekly seasonal adjustment factor for the week of 1/28/2018 through 2/3/2018 and was obtained from the FDOT's 2018 Peak Season Factor Category Report. The 2018 raw turning movement counts and the seasonally adjusted 2018 volumes are provided in **Appendix D2**.

Step 2: A historic growth trend analysis was conducted for SR 544 south of Lake Smart Estates (FDOT Count Station No. 160096) using the FDOT's Traffic Trends software and the Average Annual Daily Traffic (AADT) volumes for the years 2015 through 2019 obtained from the Florida Traffic Online website. The historic growth trend analysis is included in **Appendix B**. An average historic trend growth rate equal to 5.77% was calculated using the trend analyses for this count station and the 2018 peak hour volumes at the Old Lucerne Park Road intersection were

multiplied by 1.0577 and used as the initial estimate of the 2019 a.m. peak hour volumes. The 2019 a.m. peak hour volumes are provided in **Appendix D2**.

Step 3: The 2019 raw turning movement counts conducted on October 1, 2019 at the Lucerne Lake Road intersection for the 7:15 a.m. to 8:15 a.m. time period was multiplied by a weekly seasonal adjustment factor of 1.02. This factor is the weekly seasonal adjustment factor for the week of 9/30/2018 through 10/6/2018. The 2019 raw turning movement counts and the seasonally adjusted 2019 volumes are provided in **Appendix D2**.

Step 4: The northbound departure volume and the southbound approach volume at the Avenue Y intersection were calculated using the estimated 2019 a.m. peak hour volumes. The approach and departure volumes are provided in **Appendix D2**. The westbound and eastbound approach and departure volumes at the Old Lucerne Park Road and Lucerne Lake Road intersections were also calculated and are provided in **Appendix D2**.

Step 5: The differences between the departure volumes and approach volumes at adjacent intersections were calculated and reviewed for reasonableness. The eastbound through volume at the Old Lucerne Park Road intersection was increased by 40 vehicles to reduce the difference between the northbound departure volume at the Avenue Y intersection and the eastbound approach volume at the Old Lucerne Park Road intersection. The southbound right-turn at the Avenue Y intersection was also increased by 40 vehicles to reduce the difference between the westbound departure volume at the Old Lucerne Park Road intersection and the southbound approach volume at the Avenue Y intersection. The final 2019 a.m. peak hour volumes are provided in **Appendix D2**.

2.4.4 Old Lucerne Park Road (west end) Intersection - 2019 P.M. Peak Hour Volumes (4:45 p.m. to 5:45 p.m.)

Step 1: The 2019 peak hour volumes conducted on January 30, 2018 for the Old Lucerne Park Road intersection for the 4:45 p.m. to 5:45 p.m. time period was assumed to be equal to the reciprocal movement volumes for the 7:15 a.m. to 8:15 a.m. time period (e.g., the eastbound left-turn volume during the 4:45 p.m. to 5:45 p.m. time period was equal to the southbound right-turn volume during the 7:15 a.m. to 8:15 a.m. time period). These volumes are provided in **Appendix D2.**

Step 2: The 2019 raw turning movement counts conducted on October 1, 2019 at the SR 544/Lucerne Lake Road intersection for the 4:45 p.m. to 5:45 p.m. time period was multiplied by a weekly seasonal adjustment factor of 1.02. The 2019 raw turning movement counts and the seasonally adjusted 2019 volumes are provided in **Appendix D2**.

Step 3: The northbound departure volume and the southbound approach volume at the Avenue Y intersection were calculated using the estimated 2019 a.m. peak hour volumes. The approach and departure volumes are provided in **Appendix D2**. The westbound and eastbound approach and departure volumes at the Old Lucerne Park Road and Lucerne Lake Road intersections were also calculated and are provided in **Appendix D2**.

Step 4: The differences between the departure volumes and approach volumes at adjacent intersections were calculated and reviewed for reasonableness. No adjustments to these volumes were necessary. The final 2019 p.m. peak hour volumes are provided in **Appendix D2**.

2.4.5 Old Lucerne Park Road (east end) Intersection - 2019 A.M. Peak Hour Volumes (7:15 a.m. to 8:15 a.m.)

Step 1: The 2019 raw turning movement counts conducted on October 1, 2019 at the Lake Hamilton Drive intersection for the 7:15 a.m. to 8:15 a.m. time period was multiplied by a weekly seasonal adjustment factor of 1.02. The 2018 raw turning movement counts and the seasonally adjusted 2019 volumes are provided in **Appendix D3**.

Step 2: The 2018 raw turning movement counts conducted on January 1, 2018 at the Old Lucerne Park Road intersection for the 7:15 a.m. to 8:15 a.m. time period was multiplied by a weekly seasonal adjustment factor of 0.99. The 2018 raw turning movement counts and the seasonally adjusted 2018 volumes are provided in **Appendix D3**.

Step 3: A historic growth trend analysis was conducted for SR 544 west of Old Lucerne Park Road (FDOT Count Station No. 160275) using the FDOT's Traffic Trends software and the Average Annual Daily Traffic (AADT) volumes for the years 2015 through 2019 obtained from the Florida Traffic Online website. The historic growth trend analysis is included in **Appendix B**. An average historic trend growth rate equal to 7.06% was calculated using the trend analyses for this count station and the 2018 peak hour volumes at the Old Lucerne Park Road intersection were multiplied by 1.0706 and used as the initial estimate of the 2019 a.m. peak hour volumes. The 2019 a.m. peak hour volumes are provided in **Appendix D3**.

Step 4: The westbound and eastbound approach and departure volumes at the Old Lucerne Park Road and Lake Hamilton Drive intersections were calculated and are provided in **Appendix D3.**

Step 5: The differences between the departure volumes and approach volumes at these two intersections were calculated and reviewed for reasonableness. The eastbound through volume was subsequently increased by 40 vehicles to reduce the difference between the eastbound departure volume at the Old Lucerne Park Road intersection and the eastbound approach volume at the Lake Hamilton Drive intersection. Similarly, the westbound through volume was also increased by 40 vehicles to reduce the difference between the westbound departure volume at the Lake Hamilton Drive intersection and the westbound approach volume at the Old Lucerne Park Road intersection. The final 2019 a.m. peak hour volumes are provided in **Appendix D3**.

2.4.6 Old Lucerne Park Road (east end) Intersection - 2019 P.M. Peak Hour Volumes (4:45 p.m. to 5:45 p.m.)

Step 1: The 2019 raw turning movement counts conducted on October 1, 2019 at the Lake Hamilton Drive intersection for the 4:00 p.m. to 5:00 p.m. and 4:45 p.m. to 5:45 p.m. time periods

were multiplied by a weekly seasonal adjustment factor of 1.02. The 2019 raw turning movement counts and the seasonally adjusted 2019 volumes are provided in **Appendix D3**.

Step 2: The 2018 raw turning movement counts conducted on January 30, 2018 at the Old Lucerne Park Road intersection for the 4:00 p.m. to 5:00 p.m. time period was multiplied by a weekly seasonal adjustment factor of 0.99. The 2018 raw turning movement counts and the seasonally adjusted 2018 volumes are provided in **Appendix D3**.

Step 3: The 2018 peak hour volumes at the Old Lucerne Park Road intersection for the 4:00 p.m. to 5:00 p.m. time period was multiplied by 1.0706 and used as the initial estimate of the 2019 p.m. peak hour volumes for this time period. The 2019 p.m. peak hour volumes are provided in **Appendix D3**.

Step 4: The ratio of the 4:45 p.m. to 5:45 p.m. westbound departure volume and the 4:00 p.m. to 5:00 p.m. westbound departure volume at the Lake Hamilton Drive intersection was calculated and the 4:00 p.m. to 5:00 p.m. westbound approach volume at the Old Lucerne Park Road intersection was multiplied by this ratio to obtain an estimate of the 4:45 p.m. to 5:45 p.m. westbound approach volume at the Old Lucerne Park Road intersection.

Step 5: The 2019 westbound through and right-turn volumes at the Old Lucerne Park Road intersection for the 4:45 p.m. to 5:45 p.m. time period were calculated by multiplying the 4:45 p.m. to 5:45 p.m. westbound approach volume obtained in Step 4 by the turning movement percentages for the 4:00 p.m. to 5:00 p.m. time period.

Step 6: The ratio of the 4:45 p.m. to 5:45 p.m. eastbound approach volume and the 4:00 p.m. to 5:00 p.m. eastbound approach volume at the Lake Hamilton Drive intersection was calculated and the 4:00 p.m. to 5:00 p.m. eastbound departure volume at the Old Lucerne Park Road intersection was multiplied by this ratio to obtain an estimate of the 4:45 p.m. to 5:45 p.m. eastbound departure volume at the Old Lucerne Park Road intersection.

Step 7: The 2019 eastbound through movement volume and southbound left-turn volume at the Old Lucerne Park Road intersection for the 4:45 p.m. to 5:45 p.m. time period was calculated by multiplying the 4:45 p.m. to 5:45 p.m. eastbound departure volume obtained in Step 4 by the turning movement percentages for the 4:00 p.m. to 5:00 p.m. time period.

Step 8: The ratio of the southbound left-turn volumes for the 4:45 p.m. to 5:45 p.m. and 4:00 p.m. to 5:00 p.m. time periods was calculated. The southbound right-turn volume for the 4:00 p.m. to 5:00 p.m. time period was subsequently multiplied by this ratio to obtain an estimate of the 2019 southbound right-turn volume for the 4:45 p.m. to 5:45 p.m. time period.

Step 9: The ratio of the eastbound through volumes for the 4:45 p.m. to 5:45 p.m. and 4:00 p.m. to 5:00 p.m. time periods was calculated. The eastbound left-turn volume for the 4:00 p.m. to 5:00 p.m. time period was subsequently multiplied by this ratio to obtain an estimate of the 2019 eastbound left-turn volume for the 4:45 p.m. to 5:45 p.m. time period.

Step 10: The westbound and eastbound approach and departure volumes at the Old Lucerne Park Road and Lake Hamilton Drive intersections were calculated and are provided in **Appendix D3**.

Step 11: The differences between the departure volumes and approach volumes at these two intersections were calculated and reviewed for reasonableness. The eastbound through volume was subsequently decreased by 40 vehicles to reduce the difference between the eastbound departure volume at the Old Lucerne Park Road intersection and the eastbound approach volume at the Lake Hamilton Drive intersection. The final 2019 a.m. peak hour volumes are provided in **Appendix D3**.

2.4.7 Brenton Manor Avenue, US 27 and SR 17 Intersections - 2019 A.M. and P.M. Peak Hour Volumes

The 2019 raw turning movement counts conducted on October 1, 2019 at the Brenton Manor Avenue, US 27 and SR 17 intersections for the 7:15 a.m. to 8:15 a.m. and 4:45 p.m. to 5:45 p.m. time periods were multiplied by a weekly seasonal adjustment factor of 1.02. The 2019 peak hour raw turning movement counts, and seasonally adjusted volumes are provided in **Appendix D4.**

The 2019 a.m. and p.m. peak hour volumes for the nine PD&E study intersections are graphically depicted in **Figure 2-3** and **Figure 2-4**, respectively.

It should be noted that eight-hour manual bicycle and pedestrian crossing volume counts were also conducted at the following ten locations:

- Avenue U (April 17, 2018)
- 1st Street N. (April 17, 2018)
- 2nd Street (October 1, 2019)
- Ware Avenue (October 1, 2019)
- Avenue X/Cedie Street (October 1, 2019)
- 4th Street (October 1, 2019)
- Lake Fannie Park Entrance/Exit (October 1, 2019)
- Alta Vista Elementary School Entrances/Exits (3 driveways) (October 3, 2019)

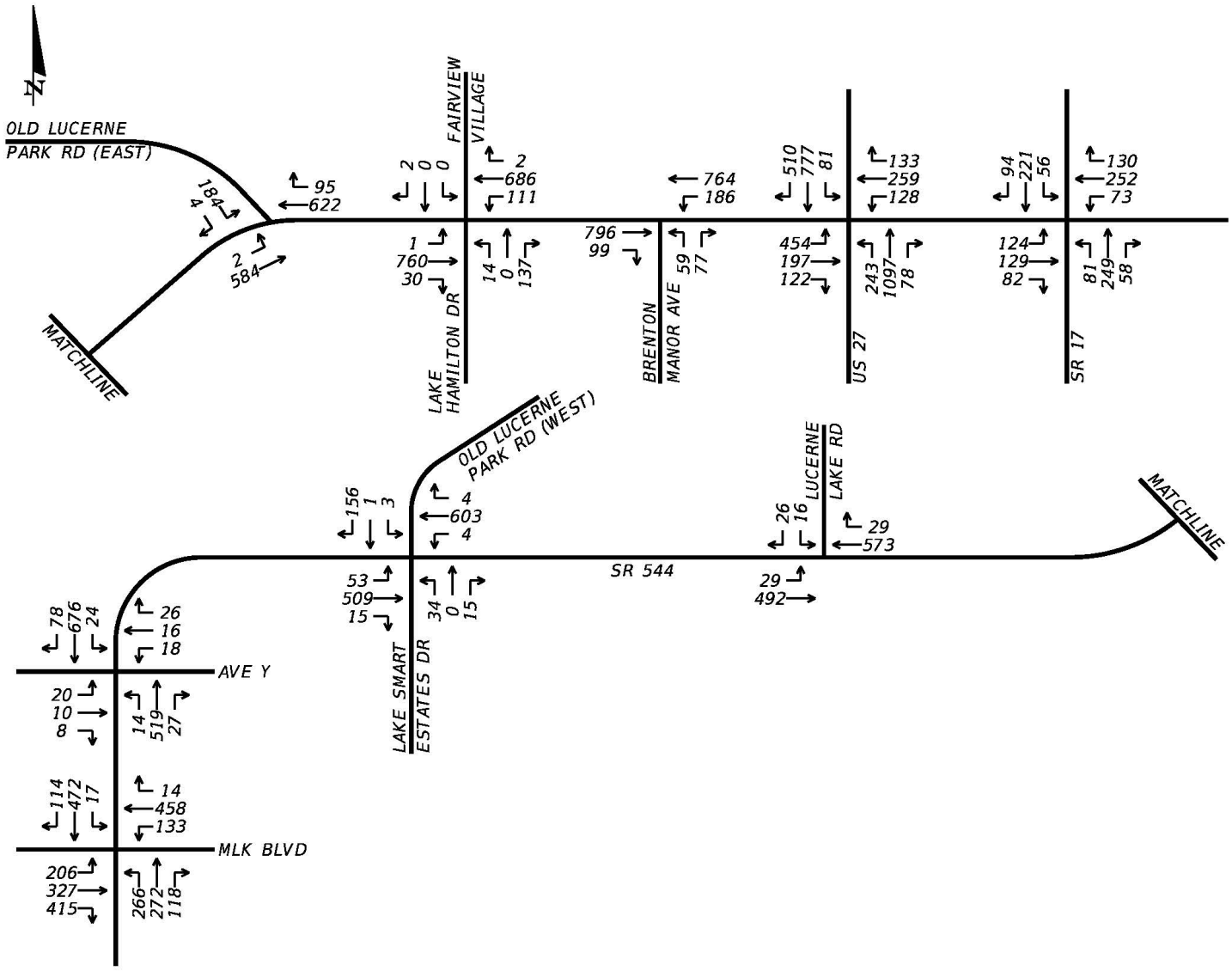

Figure 2-3: Existing (2019) A.M. Peak Hour Intersection Volumes

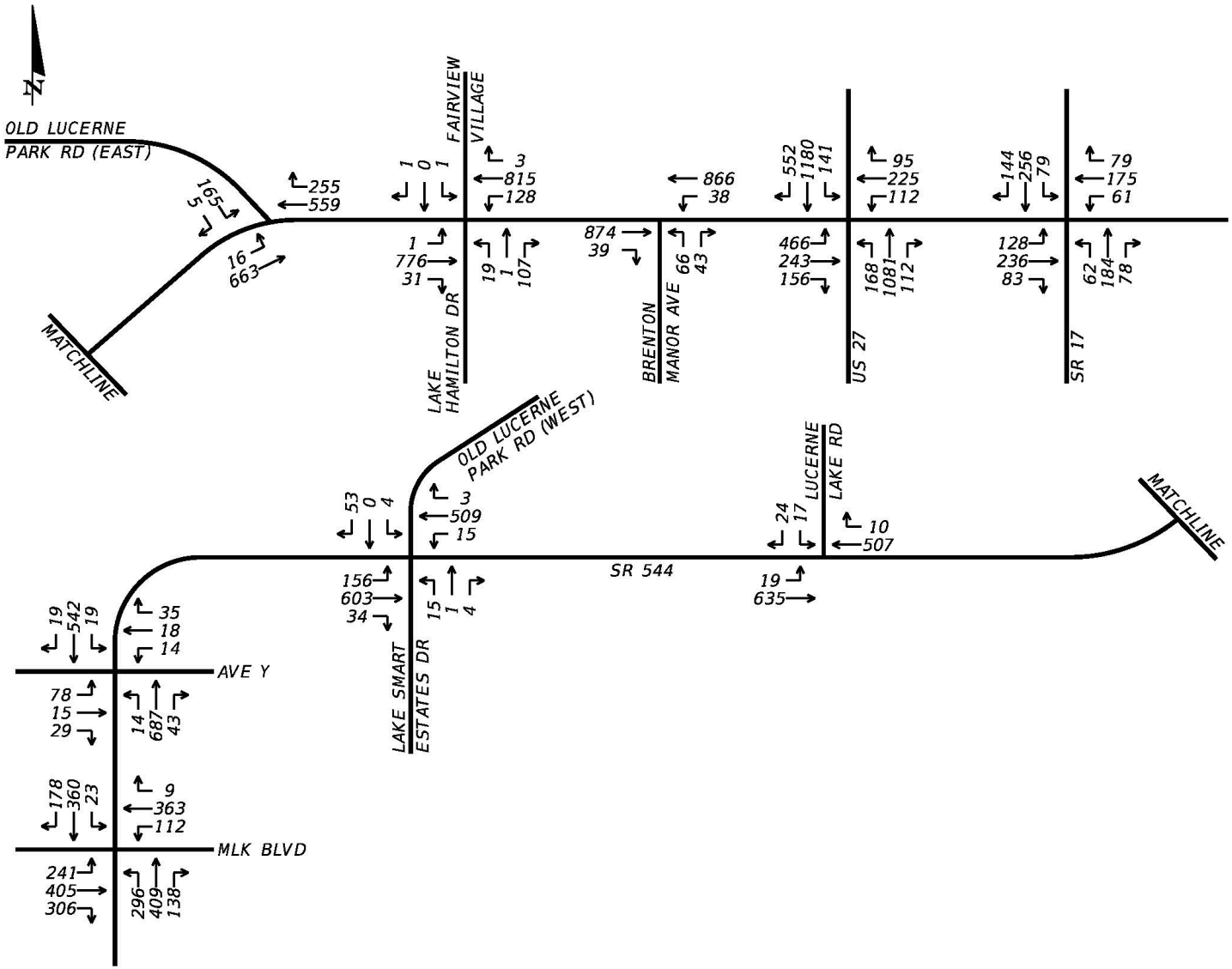

Figure 2-4: Existing (2019) P.M. Peak Hour Intersection Volumes

The eight-hour bicycle and pedestrian crossing volume count data for these ten locations is provided in **Appendix E**.

2.5 Existing Peak Hour Traffic Characteristics

The percentage of the daily traffic volume that occurs in the a.m. and p.m. peak hours (i.e., the K-factor) was calculated for each location on SR 544 where existing traffic count data was available and is summarized in **Table 2-5**. The a.m. peak hour K-factors range from 5.9% to 9.0%, while the p.m. peak hour K-factors range from 6.3% to 8.3%. The overall average a.m. and p.m. peak hour K-factor values for the study corridor are 7.4% and 7.6%, respectively. A review of the K-factor information contained in the FDOT's 2019 Annual Average Daily Traffic Report indicates that a Standard K-factor value of 9.0% is associated with the SR 544 study corridor. This Standard K-factor value is considerably higher than the overall average corridor K-factors for both peak hours.

Table 2-5: Existing (2019) Peak Hour K-Factors

Roadway	Location	24-Hour Volume	AM Peak Hour Volume	K-Factor	PM Peak Hour Volume	K-Factor
SR 544	North of Martin Luther King Blvd [1]	17,212	1,065	6.2%	1,221	7.1%
	South of Ave Y [2]	19,748	N/A	N/A	1,253	6.3%
	North of Ave Y [2]	19,936	N/A	N/A	1,264	6.3%
	West of Old Lucerne Park Rd - west end [1]	16,214	1,270	7.8%	N/A	N/A
	East of Old Lucerne Park Rd - west end [1]	15,212	1,049	6.9%	N/A	N/A
	West of Lucerne Lake Rd	14,506	1,097	7.6%	1,163	8.0%
	East of Lucerne Lake Rd	14,608	1,088	7.4%	1,147	7.9%
	West of Old Lucerne Park Rd - east end [1]	18,070	1,068	5.9%	N/A	N/A
	East of Old Lucerne Park Rd - east end [1]	14,682	1,326	9.0%	N/A	N/A
	West of Lake Hamilton Dr/Fairview Village Entr	22,630	1,667	7.4%	1,795	7.9%
	East of Lake Hamilton Dr/Fairview Village Entr	20,472	1,468	7.2%	1,613	7.9%
	West of Brenton Manor Ave	23,035	1,684	7.3%	1,809	7.9%
	East of Brenton Manor Ave	23,127	1,786	7.7%	1,785	7.7%
	West of US 27	22,701	1,740	7.7%	1,777	7.8%
	East of US 27	10,954	854	7.8%	905	8.3%
	West of SR 17	10,500	746	7.1%	811	7.7%
	Average			**7.4%**		**7.6%**

[1] 2018 values
[2] 2016 values

The percentage of the two-way peak hour volume that occurs in the peak direction during the a.m. and p.m. peak hours (i.e., the D-factors) was also calculated for each location. These D-factors are summarized in **Table 2-6**. The predominant travel directions are westbound/southbound in the a.m. peak hour and northbound/eastbound in the p.m. peak hour. During the a.m. peak hour, the westbound/southbound D-factor ranges from 51.78% to 59.61% and the overall average corridor D-factor is equal to 53.46%. During the p.m. peak hour, the northbound/eastbound D-factor ranges from 50.36% to 63.69% and the overall average corridor D-factor is equal to 53.69%.

Table 2-6: Existing (2019) A.M. and P.M. Peak Hour D-Factors

Roadway	Location	AM Peak Hour				PM Peak Hour			
		Two-Way Volume	Peak Dir Volume	D-Factor	Peak Dir	Two-Way Volume	Peak Dir Volume	D-Factor	Peak Dir
SR 544	North of Martin Luther King Blvd [1]	1,065	568	53.33%	SB	1,221	665	54.46%	NB
	South of Ave Y [2]	N/A	N/A	N/A	N/A	1,253	789	62.97%	NB
	North of Ave Y [2]	N/A	N/A	N/A	N/A	1,264	805	63.69%	NB
	West of Old Lucerne Park Rd - west end [1]	1,270	757	59.61%	WB	N/A	N/A	N/A	N/A
	East of Old Lucerne Park Rd - west end [1]	1,049	584	55.67%	WB	N/A	N/A	N/A	N/A
	West of Lucerne Lake Rd	1,097	587	53.51%	WB	1,163	642	55.20%	EB
	East of Lucerne Lake Rd	1,088	590	54.23%	WB	1,147	640	55.80%	EB
	West of Old Lucerne Park Rd - east end [1]	1,068	553	51.78%	WB	N/A	N/A	N/A	N/A
	East of Old Lucerne Park Rd - east end [1]	1,326	687	51.81%	*EB*	N/A	N/A	N/A	N/A
	West of Lake Hamilton Dr/Fairview Village Entr	1,667	883	52.97%	*EB*	1,795	927	51.64%	*WB*
	East of Lake Hamilton Dr/Fairview Village Entr	1,468	782	53.27%	WB	1,613	820	50.84%	*WB*
	West of Brenton Manor Ave	1,684	877	52.08%	*EB*	1,809	914	50.53%	*WB*
	East of Brenton Manor Ave	1,786	931	52.13%	WB	1,785	899	50.36%	EB
	West of US 27	1,740	978	56.21%	WB	1,777	928	52.22%	*WB*
	East of US 27	854	509	59.60%	WB	905	481	53.15%	EB
	West of SR 17	746	418	56.03%	WB	811	437	53.88%	EB
	Average			53.46%	WB/SB			53.69%	NB/EB

Roadway	Location	AM Peak Hour				PM Peak Hour			
		Two-Way Volume	Peak Dir Volume	D-Factor	Peak Dir	Two-Way Volume	Peak Dir Volume	D-Factor	Peak Dir
Martin Luther King Blvd	West of SR 544	1,803	957	53.08%	EB	1,806	961	53.21%	EB
Martin Luther King Blvd	East of SR 544	1,076	610	56.69%	WB	1,059	571	53.92%	EB
Ave Y	West of SR 544	N/A	N/A	N/A	N/A	126	78	61.90%	EB
Ave Y	East of SR 544	N/A	N/A	N/A	N/A	137	73	53.28%	EB
Old Lucerne Park Rad (west end)	North of SR 544	208	153	73.56%	SB	N/A	N/A	N/A	N/A
Lake Smart Estates Dr	South of SR 544	65	46	70.77%	NB	N/A	N/A	N/A	N/A
Lucerne Lake Rd	North of SR 544	97	56	57.73%	NB	70	41	58.57%	SB
Old Lucerne Park Rd (east end)	North of SR 544	270	178	65.93%	SB	N/A	N/A	N/A	N/A
Lake Hamilton Dr	South of SR 544	303	155	51.16%	SB	280	155	55.36%	SB
Fairview Village Entr	North of SR 544	3	2	66.67%	SB	6	4	66.67%	NB
Brenton Manor Ave	South of SR 544	412	279	67.72%	SB	181	107	59.12%	NB
US 27	North of SR 544	2,994	1,650	55.11%	NB	3,490	1,862	53.35%	SB
US 27	South of SR 544	2,414	1,389	57.54%	NB	2,768	1,413	51.05%	SB
SR 17	North of SR 544	857	493	57.53%	NB	851	469	55.11%	SB
SR 17	South of SR 544	749	380	50.73%	NB	709	392	55.29%	SB

[1] 2018 values
[2] 2016 values

The a.m. and p.m. peak hour truck percentages were calculated for each individual movement at the nine PD&E study intersections based on the peak hour turning movement count data. The peak hour truck volumes and percentages are summarized in **Table 2-7**.

Table 2-8 summarizes the peak hour volumes and the peak 15-minute volumes used to calculate the existing intersection peak hour factors (PHF's). The a.m. PHF's range from approximately 0.86 to approximately 0.96, with an overall average corridor value of approximately 0.91. The p.m. PHF's range from approximately 0.93 to approximately 0.98, with an average overall corridor value of approximately 0.96. It should be noted that several of the PHF's had to be estimated because existing traffic count data was not available for several intersections for the 7:15 a.m. to 8:15 a.m. and/or 4:45 p.m. to 5:45 p.m. time period. The a.m. PHF for the Avenue Y intersection was estimated using the following procedure:

Step 1: The 2018 PHF's for the Martin Luther King Boulevard, Avenue U and 1st Street N. intersections were calculated for both the 7:15 a.m. to 8:15 a.m. and 8:00 a.m. to 9:00 a.m. time periods.

Step 2: The ratio of the 7:15 a.m. to 8:15 a.m. PHF and the 8:00 a.m. to 9:00 a.m. PHF was calculated for all three intersections and the average ratio was subsequently calculated. The average ratio was equal to approximately 0.94.

Step 3: The 2016 PHF for the Avenue Y intersection was calculated for the 8:00 to 9:00 a.m. time period and this value was multiplied by 0.94 to obtain a 2019 7:15 a.m. to 8:15 a.m. PHF equal to approximately 0.87.

Table 2-7: Existing (2019) A.M. and P.M. Peak Hour Truck Volumes and Percentages

Intersection	Movement	AM Peak Hour (7:15 - 8:15)			PM Peak Hour (4:45 -5:45)		
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %
Martin Luther King Blvd	NB LT	269	7	2.6%	299	0	0.0%
	NB TH	275	11	4.0%	413	3	0.7%
	NB RT	119	1	0.8%	139	0	0.0%
	NB APPROACH	663	19	2.9%	851	3	0.4%
	SB LT	17	7	41.2%	23	0	0.0%
	SB TH	436	10	2.3%	353	3	0.8%
	SB RT	115	12	10.4%	180	15	8.3%
	SB APPROACH	568	29	5.1%	556	18	3.2%
	WB LT	134	5	3.7%	113	2	1.8%
	WB TH	462	10	2.2%	366	6	1.6%
	WB RT	14	2	14.3%	9	0	0.0%
	WB APPROACH	610	17	2.8%	488	8	1.6%
	EB LT	208	12	5.8%	243	13	5.3%
	EB TH	330	7	2.1%	409	9	2.2%
	EB RT	419	6	1.4%	309	3	1.0%
	EB APPROACH	957	25	2.6%	961	25	2.6%
Avenue Y [1]	NB LT	12	0	0.0%	13	0	0.0%
	NB TH	447	39	8.7%	735	17	2.3%
	NB RT	23	1	4.3%	41	0	0.0%
	NB APPROACH	482	40	8.3%	789	17	2.2%
	SB LT	23	0	0.0%	18	0	0.0%
	SB TH	692	36	5.2%	423	24	5.7%
	SB RT	36	2	5.6%	18	0	0.0%
	SB APPROACH	751	38	5.1%	459	24	5.2%
	WB LT	17	0	0.0%	13	0	0.0%
	WB TH	15	0	0.0%	17	0	0.0%
	WB RT	25	1	4.0%	34	1	2.9%
	WB APPROACH	57	1	1.8%	64	1	1.6%
	EB LT	19	2	10.5%	36	2	5.6%
	EB TH	10	1	10.0%	14	0	0.0%
	EB RT	8	0	0.0%	28	0	0.0%
	EB APPROACH	37	3	8.1%	78	2	2.6%
Old Lucerne Park Rd (West End)	NB LT	32	0	0.0%	N/A	N/A	N/A
	NB TH	0	0	0.0%	N/A	N/A	N/A
	NB RT	14	0	0.0%	N/A	N/A	N/A
	NB APPROACH	46	0	0.0%	N/A	N/A	N/A
	SB LT	3	0	0.0%	N/A	N/A	N/A
	SB TH	1	0	0.0%	N/A	N/A	N/A
	SB RT	149	4	2.7%	N/A	N/A	N/A
	SB APPROACH	153	4	2.6%	N/A	N/A	N/A
	WB LT	4	0	0.0%	N/A	N/A	N/A
	WB TH	576	30	5.2%	N/A	N/A	N/A
	WB RT	4	0	0.0%	N/A	N/A	N/A
	WB APPROACH	584	30	5.1%	N/A	N/A	N/A
	EB LT	51	4	7.8%	N/A	N/A	N/A
	EB TH	448	26	5.8%	N/A	N/A	N/A
	EB RT	14	0	0.0%	N/A	N/A	N/A
	EB APPROACH	513	30	5.8%	N/A	N/A	N/A

Table 2-7: Existing (2019) A.M. and P.M. Peak Hour Truck Volumes and Percentages (Cont.)

Intersection	Movement	AM Peak Hour (7:15 - 8:15)			PM Peak Hour (4:45 -5:45)		
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %
Lucerne Lake Rd	SB LT	16	11	68.8%	17	8	47.1%
	SB RT	25	9	36.0%	24	8	33.3%
	SB APPROACH	41	20	48.8%	41	16	39.0%
	WB TH	562	13	2.3%	497	22	4.4%
	WB RT	18	15	83.3%	10	6	60.0%
	WB APPROACH	580	28	4.8%	507	28	5.5%
	EB LT	28	11	39.3%	19	6	31.6%
	EB TH	482	17	3.5%	623	18	2.9%
	EB APPROACH	510	28	5.5%	642	24	3.7%
Old Lucerne Park Rd (Eest End) [4]	SB LT	174	13	7.5%	126	8	6.3%
	SB RT	4	0	0.0%	4	0	0.0%
	SB APPROACH	178	13	7.3%	130	8	6.2%
	WB TH	549	43	7.8%	480	31	6.5%
	WB RT	90	8	8.9%	219	5	2.3%
	WB APPROACH	639	51	8.0%	699	36	5.2%
	EB LT	2	1	50.0%	12	0	0.0%
	EB TH	513	40	7.8%	537	35	6.5%
	EB APPROACH	515	41	8.0%	549	35	6.4%
Lake Hamilton Dr	NB LT	14	1	7.1%	19	1	5.3%
	NB TH	0	0	0.0%	1	0	0.0%
	NB RT	134	6	4.5%	105	2	1.9%
	NB APPROACH	148	7	4.7%	125	3	2.4%
	SB LT	0	0	0.0%	1	0	0.0%
	SB TH	0	0	0.0%	0	0	0.0%
	SB RT	2	0	0.0%	1	0	0.0%
	SB APPROACH	2	0	0.0%	2	0	0.0%
	WB LT	109	0	0.0%	125	4	3.2%
	WB TH	673	44	6.5%	799	29	3.6%
	WB RT	2	0	0.0%	3	0	0.0%
	WB APPROACH	784	44	5.6%	927	33	3.6%
	EB LT	1	0	0.0%	1	0	0.0%
	EB TH	745	53	7.1%	761	32	4.2%
	EB RT	29	1	3.4%	30	2	6.7%
	EB APPROACH	775	54	7.0%	792	34	4.3%
Brenton Manor Ave	NB LT	58	5	8.6%	65	2	3.1%
	NB RT	75	5	6.7%	42	0	0.0%
	NB APPROACH	133	10	7.5%	107	2	1.9%
	WB LT	182	3	1.6%	37	0	0.0%
	WB TH	749	43	5.7%	849	33	3.9%
	WB APPROACH	931	46	4.9%	886	33	3.7%
	EB TH	780	60	7.7%	857	43	5.0%
	EB RT	97	4	4.1%	38	1	2.6%
	EB APPROACH	877	64	7.3%	895	44	4.9%

Table 2-7: Existing (2019) A.M. and P.M. Peak Hour Truck Volumes and Percentages (Cont.)

Intersection	Movement	AM Peak Hour (7:15 - 8:15)			PM Peak Hour (4:45 -5:45)		
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %
US 27	NB LT	238	5	2.1%	165	8	4.8%
	NB TH	1,075	80	7.4%	1,060	78	7.4%
	NB RT	76	6	7.9%	110	1	0.9%
	NB APPROACH	1,389	91	6.6%	1,335	87	6.5%
	SB LT	79	13	16.5%	138	10	7.2%
	SB TH	762	88	11.5%	1,157	62	5.4%
	SB RT	500	31	6.2%	541	25	4.6%
	SB APPROACH	1,341	132	9.8%	1,836	97	5.3%
	WB LT	125	11	8.8%	110	7	6.4%
	WB TH	254	9	3.5%	221	9	4.1%
	WB RT	130	13	10.0%	93	9	9.7%
	WB APPROACH	509	33	6.5%	424	25	5.9%
	EB LT	445	31	7.0%	457	23	5.0%
	EB TH	193	16	8.3%	238	5	2.1%
	EB RT	120	9	7.5%	153	17	11.1%
	EB APPROACH	758	56	7.4%	848	45	5.3%
SR 17	NB LT	79	9	11.4%	61	6	9.8%
	NB TH	244	6	2.5%	180	5	2.8%
	NB RT	57	2	3.5%	76	3	3.9%
	NB APPROACH	380	17	4.5%	317	14	4.4%
	SB LT	55	5	9.1%	77	0	0.0%
	SB TH	217	10	4.6%	251	6	2.4%
	SB RT	92	14	15.2%	141	6	4.3%
	SB APPROACH	364	29	8.0%	469	12	2.6%
	WB LT	72	3	4.2%	60	1	1.7%
	WB TH	247	16	6.5%	172	9	5.2%
	WB RT	127	8	6.3%	77	2	2.6%
	WB APPROACH	446	27	6.1%	309	12	3.9%
	EB LT	122	13	10.7%	125	3	2.4%
	EB TH	126	20	15.9%	231	6	2.6%
	EB RT	80	7	8.8%	81	4	4.9%
	EB APPROACH	328	40	12.2%	437	13	3.0%

[1] *Turning movement count data was not available for the 7:15 to 8:15 a.m. time period. The 8:00 to 9:00 a.m. time period was used for this location.*

[4] *Turning movement count data was not available for the 4:45 to 5:45 p.m. time period. The 4:00 to 5:00 p.m. time period was used for this location.*

Table 2-8: Existing (2019) Intersection Peak Hour Factors

Intersection (Year)	AM Peak Hour (7:15 to 8:15 a.m.)			PM Peak Hour (4:45 to 5:45 p.m.)			PHF Ratio [1]
	Total Volume	Peak 15-Minute Volume	PHF	Total Volume	Peak 15-Minute Volume	PHF	
Martin Luther King Blvd (2018)	2,800	802	0.873	2,856	756	0.944	1.082
Avenue Y NE (2019) [2]	1,436	412	0.872	1,513	407	0.929	1.066
Old Lucerne Park Rd - west end (2018) [3]	1,297	359	0.903	1,297	340	0.954	1.056
Lucerne Lake Rd (2019)	1,141	309	0.923	1,190	304	0.979	1.060
Old Lucerne Park Rd -east end (2018) [4]	1,332	369	0.902	1,663	436	0.953	1.056
Lake Hamilton Dr (2019)	1,709	456	0.937	1,846	480	0.961	1.026
Brenton Manor Ave (2019)	1,941	524	0.926	1,888	494	0.955	1.032
US 27 (2019)	3,997	1,044	0.957	4,469	1,139	0.981	1.025
SR 17 (2019)	1,518	439	0.864	1,532	403	0.950	1.099
Average			**0.906**			**0.956**	1.056

[1] *PHF Ratio = (PM PHF)/(AM PHF)*

[2] *The a.m. and p.m. peak hour values are the estimated 2019 values.*

[3] *The p.m. peak hour values are the estimated 2018 values.*

[4] *The p.m. peak hour values are the estimated 2019 values.*

The p.m. PHF for the Avenue Y intersection was estimated using the following procedure:

Step 1: The 2018 PHF's for the Martin Luther King Boulevard, Avenue U and 1st Street N. intersections were calculated for the 4:45 p.m. to 5:45 p.m. time period and the average of these three values was calculated. This average value was equal to approximately 0.93.

Step 2: The 2016 PHF for the Avenue Y intersection was calculated for the 4:45 p.m. to 5:45 p.m. time period and this value was equal to approximately 0.93. Since the 2016 PHF was approximately equal to the average 2018 PHF for the other three intersections located to the south of Avenue Y, this value was used as the 2019 PHF for the Avenue Y intersection.

The p.m. PHF values for the two Old Lucerne Park Road intersections were estimated using the following procedure:

Step 1: The ratio of the 4:45 p.m. to 5:45 p.m. PHF and the 7:15 a.m. to 8:15 a.m. PHF was calculated for the other seven PD&E study intersections and then the average ratio was subsequently calculated. The average ratio was equal to approximately 1.06.

Step 2: The 2018 PHF's for the Old Lucerne Park Road intersections for the 7:15 a.m. to 8:15 a.m. time period was multiplied by 1.06 to obtain 2019 4:45 p.m. to 5:45 p.m. PHF's equal to approximately 0.95.

2.6 Existing (2019) Peak Hour Traffic Operations

The existing conditions (2019) peak hour roadway segment level of service analyses were conducted using the two-lane highway module of the Highway Capacity Software (HCS). As previously discussed, the peak hour truck percentages and the overall average corridor PHF's were calculated based on the peak hour intersection turning movement counts. The design speed was assumed to be five mph higher than the posted speed limit and was used as the estimated base free flow speed. The no-passing zone percentages that were summarized in **Table 2-1** were also used to conduct the existing conditions two-lane highway segment analyses. With two exceptions, all of the roadway segments were analyzed as Class I highway segments. Class I two-lane highways are daily commuter routes and/or primary connectors of major traffic generators and serve mostly long-distance trips (or provide the connections between facilities that serve long distance trips. Drivers expect to travel at relatively high speeds on this type of two-lane highway. The segment of SR 544 between Martin Luther King Boulevard and Avenue Y was analyzed as a Class III two-lane highway segment. Class III two-lane highways are highways serving moderately developed areas where local traffic often mixes with long distance through traffic. This type of two-lane highway has a higher density of unsignalized roadside access points and is often accompanied by a reduced speed limit. This segment of SR 544 has a posted speed limit of 35 mph and approximately 40 access points. The easternmost portion of SR 544 (i.e., from Peninsular Drive to SR 17) is a four-lane undivided roadway and therefore, was analyzed as multilane highway.

Five of the eight roadway segments have a constant speed limit throughout the entire segment. The average peak hour directional volumes were calculated for each of these segments and used to conduct the analyses. Two different speed limits are posted within each of the following roadway segments:

- Between Avenue Y and Old Lucerne Park Road (west) – 45 mph and 55 mph
- Between Lucerne Lake Road and Old Lucerne Park Road (east) – 50 mph and 55 mph
- Between US 27 and SR 17 – 45 mph and 55 mph

These three segments were further sub-divided and separate analyses were conducted using the different posted speed limits. As stated previously, a multilane highway segment analysis was conducted for the portion of SR 544 between Peninsular Drive and SR 17. **Table 2-9** summarizes the existing (2019) roadway segment operational analysis results for each travel direction including the average travel speed, percent of free flow speed, percent time-spent-following and level of service. The percent time-spent-following is the average percentage of the time that vehicles must travel in platoons behind slower vehicles due to the inability to pass.

On Class I two-lane highways, average travel speed and delay due to passing restrictions are both important to drivers. Therefore, level of service for a Class I roadway is defined in terms of both average travel speed and percent time-spent-following. Level of Service E for a Class I two-lane highway is defined to be average travel speeds less than or equal to 40 mph and/or percent time-spent-following values greater than 80 percent. On Class III highways, high speeds are not expected and passing restrictions are also not a major concern of drivers. For this type of two-lane roadway, drivers would like to make steady progress at or near the speed limit. Consequently, level of service for a Class III roadway is defined by the percent of free flow speed. Level of Service E for a Class III two-lane highway is defined to be percent free flow speeds less than or equal to 66.7 percent.

All roadway segments are operating at Level of Service E or better during both peak hours. At Level of Service E, demand is approaching capacity and passing on Class I highways becomes extremely difficult. On Class III highways, speed is less than two-thirds of the free flow speed. In the a.m. peak hour, five segments are operating at Level of Service D or better for both travel directions. In the p.m. peak hour, four segments are operating at Level of Service D or better for both travel directions. The four-lane undivided segment between Peninsular Drive and SR 17 is currently operating at Level of Service A in both travel directions during both peak hours. It should be noted that the percent of free flow speed and the percent time-spent-following are not calculated for multilane highway segments because level of service for this type of roadway is defined on the basis of density (i.e., passenger cars per mile per lane), which is a measure of the proximity of vehicles to each other in the traffic stream. The HCS existing conditions segment analysis summary sheets are provided in **Appendix F1**.

Table 2-9: Existing (2019) Peak Hour Roadway Segment Operational Analysis Summary

AM Peak Hour													
From	To	No. of Lanes	Posted Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB % FFS [2]	NB/EB PTSF [3]	NB/EB LOS [4]	SB/WB Volume	SB/WB ATS [1]	SB/WB % FFS [2]	SB/WB PTSF [3]	SB/WB LOS [4]
Martin Luther King Blvd	Avenue Y	2	35	526	19.7	65.7%	68.6%	E	653	19.7	65.7%	77.7%	E
Avenue Y	Speed Limit Change	2	45	565	36.0	73.9%	73.2%	E	778	35.5	72.7%	84.4%	E
Speed Limit Change	Old Lucerne Park Rd (west end)	2	55	577	44.5	77.4%	73.6%	D	793	43.9	76.4%	85.2%	E
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	2	55	524	47.8	80.6%	73.0%	D	606	47.4	80.0%	78.8%	D
Lucerne Lake Rd	Speed Limit Change	2	55	508	47.7	80.8%	72.1%	D	602	47.2	80.0%	79.1%	D
Speed Limit Change	Old Lucerne Park Rd (east end)	2	50	586	40.7	77.2%	76.1%	D	626	40.6	76.9%	79.1%	D
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	2	50	780	38.1	73.0%	84.3%	E	710	38.2	73.2%	80.6%	E
Lake Hamilton Dr	Brenton Manor Ave	2	50	896	34.2	68.5%	87.2%	E	812	34.3	68.6%	84.2%	E
Brenton Manor Ave	US 27	2	50	823	33.8	67.3%	84.2%	E	981	33.7	67.0%	88.9%	E
US 27	Speed Limit Change	2	55	355	49.8	84.8%	57.0%	C	519	48.2	82.1%	75.9%	D
Speed Limit Change	Peninsular Dr	2	45	345	39.9	83.1%	58.3%	E	473	40.6	82.5%	68.9%	D
Peninsular Dr	SR 17	4	45	335	46.9	N/A	N/A	A	426	45.6	N/A	N/A	A
PM Peak Hour													
From	To	No. of Lanes	Posted Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB % FFS [2]	NB/EB PTSF [3]	NB/EB LOS [4]	SB/WB Volume	SB/WB ATS [1]	SB/WB % FFS [2]	SB/WB PTSF [3]	SB/WB LOS [4]
Martin Luther King Blvd	Avenue Y	2	35	702	19.4	64.7%	76.5%	E	573	19.5	65.0%	70.9%	E
Avenue Y	Speed Limit Change	2	45	800	35.7	73.2%	83.6%	E	580	36.3	74.5%	72.5%	E
Speed Limit Change	Old Lucerne Park Rd (west end)	2	55	793	44.4	77.3%	83.7%	E	577	45.0	78.3%	72.5%	D
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	2	55	634	47.4	80.0%	78.4%	D	529	48.0	81.0%	71.8%	D
Lucerne Lake Rd	Speed Limit Change	2	55	653	47.0	79.7%	80.3%	E	517	47.7	80.9%	70.5%	D
Speed Limit Change	Old Lucerne Park Rd (east end)	2	50	679	40.7	77.2%	79.4%	D	564	41.1	77.8%	72.6%	D
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	2	50	818	37.7	72.2%	83.4%	E	825	37.7	72.1%	83.7%	E
Lake Hamilton Dr	Brenton Manor Ave	2	50	899	34.0	68.1%	85.7%	E	939	34.0	68.0%	86.9%	E
Brenton Manor Ave	US 27	2	50	891	34.4	68.5%	85.2%	E	925	34.4	68.4%	86.7%	E
US 27	Speed Limit Change	2	55	496	49.4	84.0%	70.3%	D	432	48.8	83.1%	66.1%	D
Speed Limit Change	Peninsular Dr	2	45	471	39.6	82.5%	68.2%	E	407	40.9	83.1%	62.6%	D
Peninsular Dr	SR 17	4	45	446	45.6	N/A	N/A	A	381	46.9	N/A	N/A	A

[1] *ATS = Average travel speed (miles/hour)*

[2] *% FFS = Percent free-flow speed*

[3] *PTSF = Percent time-spent-following*

[4] *LOS = Level of service*

N/A = Not applicable (These values are not estimated for multilane highways. Level of service is based on density.)

The existing conditions (2019) peak hour signalized intersection level of service analyses were conducted using the SYNCHRO software and the analysis results are summarized in . The Martin Luther King Boulevard intersection and the US 27 intersection are currently operating at Level of Service D overall during both the a.m. and p.m. peak hours. In addition, all the individual movements at these two intersections are operating at Level of Service E or better during both peak hours. The SR 17 intersection is currently operating at Level of Service C overall during both peak hours and all of the individual movements are operating at Level of Service C or better. The SYNCHRO analysis summary sheets are provided in **Appendix F2**.

The existing conditions (2019) peak hour unsignalized intersection level of service analyses was conducted using the unsignalized intersection module of the HCS and the analysis results are also summarized in . All of the SR 544 left-turn movements at the unsignalized intersections are operating at Level of Service B or better during both peak hours; however, many of the cross-street left-turn and through movements are operating at Level of Service F during one or both peak hours. The HCS unsignalized intersection analysis summary sheets are also provided in **Appendix F2**.

Table 2-10: Existing (2019) Peak Hour Intersection Operational Analysis Summary

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		V/C Ratio	Average Delay	Level of Service	V/C Ratio	Average Delay	Level of Service
Martin Luther King Blvd (Signalized)	**NB LT**	0.59	43.1	D	0.52	37.9	D
	NB TH	0.71	47.8	D	0.83	52.2	D
	NB RT	0.25	6.8	A	0.23	2.5	A
	SB LT	0.08	40.1	D	0.08	42.3	D
	SB TH	0.95	69.2	E	0.91	63.1	E
	SB RT	0.95	69.2	E	0.91	63.1	E
	EB LT	0.85	56.1	E	0.77	45.9	D
	EB TH	0.86	63.0	E	0.91	66.6	E
	EB RT	0.64	7.8	A	0.50	6.6	A
	WB LT	0.71	47.6	D	0.75	58.6	E
	WB TH	0.82	57.0	E	0.61	48.6	D
	WB RT	0.82	57.0	E	0.61	48.6	D
	ALL	0.76	48.1	D	0.85	46.8	D
Avenue Y	**NB LT**	0.02	9.7	A	0.02	8.7	A
	SB LT	0.03	8.8	A	0.02	9.4	A
	EB LT	0.47	74.3	F	1.20	223.6	F
	EB TH	0.47	74.3	F	1.20	223.6	F
	EB RT	0.47	74.3	F	1.20	223.6	F
	WB LT	0.44	73.2	F	0.32	54.2	F
	WB TH	0.44	73.2	F	0.32	54.2	F
	WB RT	0.06	12.8	B	0.09	14.8	B
Old Lucerne Park Rd (West End)	NB LT	0.59	122.6	F	0.23	68.9	F
	NB TH	0.59	122.6	F	0.23	68.9	F
	NB RT	0.03	12.0	B	0.01	12.5	B
	SB LT	0.42	19.4	C	0.16	16.2	C
	SB TH	0.42	19.4	C	0.16	16.2	C
	SB RT	0.42	19.4	C	0.16	16.2	C
	EB LT	0.07	9.3	A	0.16	9.2	A
	WB LT	0.00	8.6	A	0.02	8.9	A
Lucerne Lake Rd	SB LT	0.07	20.0	C	0.06	18.5	C
	SB RT	0.07	14.0	B	0.05	12.5	B
	EB LT	0.04	9.8	A	0.02	9.1	A
Old Lucerne Park Rd (East End)	SB LT	0.69	39.7	E	0.58	32.0	D
	SB RT	0.69	39.7	E	0.58	32.0	D
	EB LT	0.00	10.6	B	0.02	9.6	A
Lake Hamilton Dr	NB LT	0.70	51.0	F	0.87	101.4	F
	NB TH	0.70	51.0	F	0.87	101.4	F
	NB RT	0.70	51.0	F	0.87	101.4	F
	SB LT	0.01	13.5	B	0.05	91.0	F
	SB TH	0.01	13.5	B	0.05	91.0	F
	SB RT	0.01	13.5	B	0.05	91.0	F
	EB LT	0.00	9.1	A	0.00	9.5	A
	WB LT	0.15	10.3	B	0.17	10.5	B
Brenton Manor Ave	NB LT	1.51	475.2	F	0.95	189.4	F
	NB RT	0.24	18.4	C	0.13	17.4	C
	WB LT	0.26	11.2	B	0.05	10.0	B
US 27 (Signalized)	NB LT	0.83	63.0	E	0.79	75.5	E
	NB TH	0.68	31.4	C	0.64	34.1	C
	NB RT	0.15	16.3	B	0.19	13.7	B
	SB LT	0.59	60.6	E	0.70	68.1	E
	SB TH	0.74	39.6	D	0.69	35.4	D
	SB RT	0.98	55.2	E	0.77	24.1	C
	EB LT	0.86	56.2	E	0.87	65.0	E
	EB TH	0.46	34.7	C	0.55	44.2	D
	EB RT	0.31	22.2	C	0.43	36.2	D
	WB LT	0.39	23.9	C	0.40	31.0	C
	WB TH	0.85	63.7	E	0.84	74.1	E
	WB RT	0.47	30.3	C	0.38	33.7	C
	ALL	0.75	42.5	D	0.77	41.0	D
SR 17 (Signalized)	NB LT	0.23	14.4	B	0.19	14.4	B
	NB TH	0.59	26.4	C	0.60	28.0	C
	NB RT	0.59	26.4	C	0.60	28.0	C
	SB LT	0.19	13.9	B	0.23	14.6	B
	SB TH	0.47	24.7	C	0.56	27.9	C
	SB RT	0.24	14.6	B	0.33	13.7	B
	EB LT	0.50	21.3	C	0.31	15.9	B
	EB TH	0.39	25.3	C	0.52	27.0	C
	EB RT	0.26	18.4	B	0.20	11.6	B
	WB LT	0.21	14.6	B	0.17	14.0	B
	WB TH	0.71	33.5	C	0.40	24.6	C
	WB RT	0.38	18.4	B	0.19	14.9	B
	ALL	0.61	23.4	C	0.55	21.9	C

Note: Bold font denotes SR 544 movements

2.7 Crash History

Two sets of crash data were provided by FDOT District One. The first data set covered the time period from January 1, 2014 to December 31, 2019 and the source of this data was the FDOT's Crash Analysis Reporting System (CARS). The second data set also covered the time period from January 1, 2014 to December 31, 2019 and the source of this data was Signal Four Analytics (Signal4).

The first step in the analysis process involved identifying the duplicate crashes (i.e., those crashes that were included in both data sets) and removing these from the CARS data. There was a total of 497 crashes included in the CARS database; however, 392 of these were also included in the Signal4 database. Therefore, the CARS database contained 105 unique crashes that were not included in the Signal4 database. An additional review of these 105 crashes indicated that 11 were located outside of the study corridor, so they were also removed from the CARS database. The initial Signal4 database contained 862 crashes; however, a review of these crashes indicated that 127 were located outside the study corridor. These crashes were typically associated with one of the following categories:

- Parking lot crashes;
- SR 544 cross street crashes at locations greater than 300 feet from SR 544; or
- Crashes at intersections that were not located on SR 544

These crashes were removed from the Signal4 database. Based on these initial screenings, there were a total of 829 crashes that occurred within the SR 544 study corridor during the six-year period from 2014 through 2019. There were two fatal crashes resulting in two fatalities and 274 injury crashes resulting in 446 injuries. The remaining 553 crashes were property damage only crashes. **Table 2-11** summarizes the number of crashes that occurred during each of the six years, as well as the number of fatalities and injuries. **Table 2-12** summarizes the types of crashes that occurred, and the percentages associated with these crash types. Rear-end crashes and left turn/angle crashes are the most frequently occurring crash types, accounting for approximately 67% of the total crashes. **Table 2-13** summarizes the lighting and surface conditions. Approximately 72% of the crashes occurred during daylight conditions and approximately 15% occurred during dark lighted conditions. Approximately 82% of the crashes occurred on dry surface conditions while approximately 13% occurred on wet surface conditions. **Table 2-14** summarizes the locations of the crashes. Any crash located within 300 feet of an intersection was assumed to be influenced by the intersection. The largest numbers of crashes were associated with the three existing signalized intersections. The US 27 intersection had 205 crashes, followed by the Martin Luther King Boulevard intersection (168 crashes) and the SR 17 intersection (80 crashes). Approximately 55% of the total crashes occurred at these three intersections.

Table 2-11: Number of Crashes by Year and Severity

Year	Total Fatal Crashes	Total Fatalities	Total Injury Crashes	Total Injuries	Total Property Damage Crashes	Total Crashes
2014	0	0	50	89	64	114
2015	0	0	40	55	90	130
2016	1	1	46	80	97	144
2017	0	0	49	85	106	155
2018	1	1	43	71	107	151
2019	0	0	46	66	89	135
Total	2	2	274	446	553	829

Table 2-12: Number of Crashes by Crash Type

Crash Type	Total No. of Crashes	% of Total
Rear-End	374	45.1%
Left-Turn/Angle	182	22.0%
Sideswipe (Same Direction)	68	8.2%
Overturn/Rollover	45	5.4%
Head-On	19	2.3%
Right-Turn	9	1.1%
Sideswipe (Opposite Direction)	8	1.0%
Pedestrian	4	0.5%
Bicycle	3	0.4%
Hit Fixed Object	2	0.2%
Other/Unknown	115	13.9%
Total	829	100.0%

Table 2-13: Number of Crashes by Lighting and Surface Conditions

Lighting Condition	Total No. of Crashes	% of Total
Daylight	593	71.5%
Dark (Lighted)	123	14.8%
Dark (Non-Lighted)	47	5.7%
Dawn/Dusk	38	4.6%
Unknown	28	3.4%
Total	829	100.0%
Surface Condition	**Total No. of Crashes**	**% of Total**
Dry	677	81.7%
Wet	110	13.3%
Unknown	42	5.1%
Total	829	100.0%

Table 2-14: Number of Crashes by Intersection Location

Location	Total No. of Crashes	Location	Total No. of Crashes
US 27	**205**	5th Street	3
Martin Luther King Boulevard	**168**	Hide-A-Way Lane	3
SR 17	**80**	**Brenton Manor Avenue**	**3**
Avenue Y	**45**	Gardenia Drive	3
Old Lucerne Park Road (west)	**32**	Jacaranda Avenue	3
2nd Street	26	Myrtle Street	3
Lake Hamilton Drive	**16**	Spencer Shores Drive	3
1st Street	14	LaVista Drive	2
Conine Drive	14	Winter Haven Boulevard	2
Avenue U	13	Azaela Drive	2
Old Lucerne Park Road (East)	**10**	Ixora Drive	2
Vista Del Lago Drive	9	Crest Drive	2
Peninsular Drive	7	Wildflower Drive	2
Avenue X	7	Circle 4 Drive	1
Rochelle Drive	7	Hibiscus Drive	1
Cedie Street	6	Lakeside Landings Boulevard	1
Ware Avenue	6	9th Street	1
Lucerne Lake Road	**6**	Scenic Drive	1
4th Street	6	Verano Drive	1
Winter Ridge Boulevard	4	Sioux Drive	1
4th Street NE	4	> 300 feet from an intersection	104
Total	**685**	**Total**	**144**

Table 2-15 summarizes the number of crashes and the number of injuries that occurred for each of the six years at the following nine study intersections:

- Martin Luther King Boulevard
- Avenue Y
- Old Lucerne Park Road (west end)
- Lucerne Lake Road
- Old Lucerne Park Road (west end)
- Lake Hamilton Drive
- Brenton Manor Avenue
- US 27
- SR 17

These nine intersections had a total of 565 crashes and 310 injuries. This represents approximately 68% of the total crashes and approximately 70% of the total injuries for the entire study corridor. The total number of crashes at these nine intersections increased each year between 2014 and 2018, followed by a decrease in 2019. In addition, the number of crashes occurring at the SR 17 intersection has continued to increase through 2019.

The total number of injuries at these nine intersections has decreased each year between 2016 and 2019; however, the SR 17 intersection experienced a significant increase in injuries in 2019. It should also be noted that one of the two fatalities that occurred within the SR 544 study corridor, occurred at the US 27 intersection. This pedestrian fatality occurred in 2016.

Table 2-15: Total Number of Crashes and Injuries by Year – Study Intersections

Crashes							
Intersection	2014	2015	2016	2017	2018	2019	Total
US 27	37	29	26	36	43	34	205
Martin Luther King Blvd	25	35	40	32	28	8	168
SR 17	2	6	10	17	17	28	80
Avenue Y	5	9	12	4	3	12	45
Old Lucerne Park Rd (West)	0	1	6	9	8	8	32
Lake Hamilton Dr	0	1	4	3	5	3	16
Old Lucerne Park Rd (East)	2	5	1	0	1	1	10
Lucerne Lake Rd	0	2	0	1	2	1	6
Brenton Manor Ave	0	1	0	1	1	0	3
Total	**71**	**89**	**99**	**103**	**108**	**95**	**565**
Injuries							
Intersection	2014	2015	2016	2017	2018	2019	Total
US 27 *	40	9	30	31	22	18	150
Martin Luther King Blvd	13	11	16	3	7	2	52
SR 17	4	1	1	7	6	15	34
Avenue Y	4	2	14	3	1	5	29
Old Lucerne Park Rd (West)	0	1	3	6	8	7	25
Lake Hamilton Dr	0	0	0	2	4	0	6
Old Lucerne Park Rd (East)	0	5	2	0	3	1	11
Lucerne Lake Rd	0	2	0	0	0	0	2
Brenton Manor Ave	0	0	0	0	1	0	1
Total	**61**	**31**	**66**	**52**	**52**	**48**	**310**

**There was also one pedestrian fatality at this intersection in 2016*

Table 2-16 summarizes the crash frequencies and crash rates for the nine study intersections. The crash frequencies range from 0.50 crashes per year (at the Brenton Manor Avenue intersection) to 34.17 crashes per year (at the US 27 intersection), while the crash rates range from 0.06 crashes per million entering vehicles (at the Brenton Manor Avenue intersection) to 1.95 crashes per million entering vehicles (at the SR 17 intersection). **Table 2-16** also summarizes the number of fatal and injury crashes, as well as the number of property damage only (PDO) crashes that occurred at each of these nine intersections.

Table 2-17 through **Table 2-25** summarize the specific types of crashes that occurred at each of the nine study intersections. Although rear-end crashes were the most frequently occurring crash type at most of these intersections, left-turn/angle crashes were the predominant crash type at

both the Avenue Y and Old Lucerne Park Road (west end) intersections. There were also six bicycle crashes and five pedestrian crashes that occurred within the SR 544 study corridor. The years and locations of these crashes are listed below:

- 2014 – At the Avenue U intersection (bicyclist)
- 2014 – At the 2nd Street intersection (bicyclist)
- 2014 – At the Ware Avenue intersection (bicyclist)
- 2014 – At the US 27 intersection (bicyclist)
- 2015 – 200 feet north of the US 27 intersection (bicyclist)
- 2016 – At the US 27 intersection (pedestrian) *fatality
- 2017 – 192 feet west of the Martin Luther King Boulevard intersection (bicyclist)
- 2017 – 964 feet east of the Lucerne Lake Road intersection (pedestrian)
- 2017 – 431 feet north of the Conine Drive intersection (pedestrian)
- 2018 – 273 feet west of the Gardenia Drive intersection (pedestrian)
- 2018 – Unknown Location (pedestrian)

The only location that experienced more than one bicycle/pedestrian crash during the six-year period was the US 27 intersection. This intersection experienced two bicycle crashes and one fatal pedestrian crash in the three-year period from 2014 to 2016.

Table 2-16: Crash Frequency and Rate – Study Intersections

Intersection	Severity	No. of Crashes	% of Total	Total Daily Entering Volume	No. of Crashes Per Year	Total Crash Rate [1]
Martin Luther King Blvd	Fatal + Injury	38	22.62%	39,900	28.00	1.92
	PDO	130	77.38%			
	Total	168	100.00%			
Avenue Y	Fatal + Injury	20	44.44%	22,200	7.50	0.93
	PDO	25	55.56%			
	Total	45	100.00%			
Old Lucerne Park Rd (west end)	Fatal + Injury	15	46.88%	17,650	5.33	0.83
	PDO	17	53.13%			
	Total	32	100.00%			
Lucerne Lake Rd	Fatal + Injury	3	50.00%	14,700	1.00	0.19
	PDO	3	50.00%			
	Total	6	100.00%			
Old Lucerne Park Rd (east end)	Fatal + Injury	5	50.00%	17,400	1.67	0.26
	PDO	5	50.00%			
	Total	10	100.00%			
Lake Hamilton Dr	Fatal + Injury	4	25.00%	22,750	2.67	0.32
	PDO	12	75.00%			
	Total	16	100.00%			
Brenton Manor Ave	Fatal + Injury	1	33.33%	23,450	0.50	0.06
	PDO	2	66.67%			
	Total	3	100.00%			
US 27	Fatal + Injury	77	37.56%	59,500	34.17	1.57
	PDO	128	62.44%			
	Total	205	100.00%			
SR 17	Fatal + Injury	21	26.25%	18,700	13.33	1.95
	PDO	59	73.75%			
	Total	80	100.00%			

[1] Crashes per million entering vehicles

Table 2-17: Total Number of Crashes by Year and Type – Martin Luther King Boulevard Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End	10	18	20	11	12	5	76
Left-Turn/Angle	6	6	8	4	9	1	34
Sideswipe (same dir.)	2	3	4	5	3	1	18
Sideswipe (opp. dir.)							0
Off-Road/Rollover	1	1	1				3
Head-On	1		1	2			4
Right-Turn							0
Pedestrian							0
Bicycle				1			1
Unknown/Other	5	7	6	9	4	1	32
Total	**25**	**35**	**40**	**32**	**28**	**8**	**168**

Table 2-18: Total Number of Crashes by Year and Type – Avenue Y Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End	3	2	2	2	1	3	13
Left-Turn/Angle	2	6	9	2	2	5	26
Sideswipe (same dir.)						2	2
Sideswipe (opp. dir.)							0
Off-Road/Rollover			1				1
Head-On							0
Right-Turn						1	1
Pedestrian							0
Bicycle							0
Unknown/Other		1				1	2
Total	**5**	**9**	**12**	**4**	**3**	**12**	**45**

Table 2-19: Total Number of Crashes by Year and Type – Old Lucerne Park Road (West) Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End		1	5	3	3	2	14
Left-Turn/Angle			1	5	5	6	17
Sideswipe (same dir.)							0
Sideswipe (opp. dir.)							0
Off-Road/Rollover							0
Head-On							0
Right-Turn							0
Pedestrian							0
Bicycle							0
Unknown/Other				1			1
Total	**0**	**1**	**6**	**9**	**8**	**8**	**32**

Table 2-20: Total Number of Crashes by Year and Type – Lucerne Lake Road Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End		1		1	1	1	4
Left-Turn/Angle		1			1		2
Sideswipe (same dir.)							0
Sideswipe (opp. dir.)							0
Off-Road/Rollover							0
Head-On							0
Right-Turn							0
Pedestrian							0
Bicycle							0
Unknown/Other							0
Total	**0**	**2**	**0**	**1**	**2**	**1**	**6**

Table 2-21: Total Number of Crashes by Year and Type – Old Lucerne Park Road (East) Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End	2	1					3
Left-Turn/Angle		2	1		1		4
Sideswipe (same dir.)							0
Sideswipe (opp. dir.)							0
Off-Road/Rollover							0
Head-On		1				1	2
Right-Turn							0
Pedestrian							0
Bicycle							0
Unknown/Other		1					1
Total	**2**	**5**	**1**	**0**	**1**	**1**	**5**

Table 2-22: Total Number of Crashes by Year and Type – Lake Hamilton Drive Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End			1	1	4		6
Left-Turn/Angle		1	1	2	1		5
Sideswipe (same dir.)							0
Sideswipe (opp. dir.)							0
Off-Road/Rollover							0
Head-On						1	1
Right-Turn						2	2
Pedestrian							0
Bicycle							0
Unknown/Other			2				2
Total	**0**	**1**	**4**	**3**	**5**	**3**	**16**

Table 2-23: Total Number of Crashes by Year and Type – Brenton Manor Avenue Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End		1					1
Left-Turn/Angle							0
Sideswipe (same dir.)							0
Sideswipe (opp. dir.)							0
Off-Road/Rollover							0
Head-On							0
Right-Turn							0
Pedestrian							0
Bicycle							0
Unknown/Other				1	1		2
Total	**0**	**1**	**0**	**1**	**1**	**0**	**3**

Table 2-24: Total Number of Crashes by Year and Type – US 27 Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End	19	15	9	17	27	21	108
Left-Turn/Angle	7	2	9	6	2	4	30
Sideswipe (same dir.)	3	2	3	5	10	3	26
Sideswipe (opp. dir.)		1					1
Off-Road/Rollover	1	1	1	1	1	3	8
Head-On	1	3		2			6
Right-Turn				1	1	2	4
Pedestrian			1				1
Bicycle	1	1					2
Unknown/Other	5	4	3	4	2	1	19
Total	**37**	**29**	**26**	**36**	**43**	**34**	**205**

Table 2-25: Total Number of Crashes by Year and Type – SR 17 Intersection

Crash Type	2014	2015	2016	2017	2018	2019	Total
Rear-End	1	1	7	11	8	10	38
Left-Turn/Angle	1	2	2	3	4	12	24
Sideswipe (same dir.)				2	1	4	7
Sideswipe (opp. dir.)					1		1
Off-Road/Rollover			1			1	2
Head-On					1		1
Right-Turn							0
Pedestrian							0
Bicycle							0
Unknown/Other		3		1	2	1	7
Total	**2**	**6**	**10**	**17**	**17**	**28**	**80**

SECTION 3.0 TRAFFIC FORECASTING/FUTURE YEAR TRAFFIC VOLUMES

3.1 Opening Year (2025) and Design Year (2045) AADT Volumes

This section summarizes the development of the opening year (2025) and design year (2045) AADT volumes for the SR 544 study corridor. The first step in the development of the design year (2045) AADT volumes involved conducting a subarea validation of the Base Year (2010) District One Regional Planning Model (D1RPM). The subarea validation was conducted by RS&H, Inc. under a Districtwide Planning Contract and used the version of the D1RPM that was previously validated for the US 27 Corridor Study. The details associated with the SR 544 subarea model validation were documented in a Technical Memorandum (dated November 26, 2019) prepared by RS&H and provided to the SR 544 PD&E study team by the District One Systems Planning Office. A copy of this technical memorandum is provided in **Appendix H**.

The next step in the development of the design year (2045) AADT volumes involved conducting a series of travel demand model runs using the 2040 D1RPM. The revisions to the base year (2010) D1RPM model network that were made during the subarea model validation were incorporated into the 2040 D1RPM and the following four alternatives were coded and run:

- No-Build Alternative – Existing laneage on SR 544 from Martin Luther King Boulevard to SR 17
- Build Alternative No. 1 – Four-lane divided roadway on SR 544 from Martin Luther King Boulevard to SR 17
- Build Alternative No. 2 – Four-lane divided roadway on SR 544 from Avenue Y to SR 17 and a two-lane undivided roadway from Martin Luther King Boulevard to Avenue Y
- Build Alternative No. 3 – Four-lane divided roadway on SR 544 from north of Avenue Y to SR 17, a two-lane undivided roadway from Martin Luther King Boulevard to north of Avenue Y and a new four-lane divided roadway connecting Martin Luther King Boulevard (west of SR 544) and SR 544 (north of Avenue Y)

These alternatives are graphically depicted in **Figure 3-1** through **Figure 3-4**. The No-Build Alternative was modeled to document the need for additional capacity (i.e., lanes) within the SR 544 study corridor. A No-Build Alternative was initially modeled by RS&H; however, a review of the SR 544 network coding indicated that the portion of SR 544 from Peninsular Drive to SR 17 was coded as a two-lane undivided roadway. Since this portion of the study corridor is currently a four-lane undivided roadway, the facility type and laneage were revised to reflect this existing condition and the No-Build Alternative was run again. Build Alternative No. 1 was modeled because the Polk Transportation Planning Organization's (TPO's) Adopted 2040 Long Range Transportation Plan (LRTP) includes the four-laning of SR 544 from Martin Luther King Boulevard to SR 17 as a cost-feasible highway improvement.

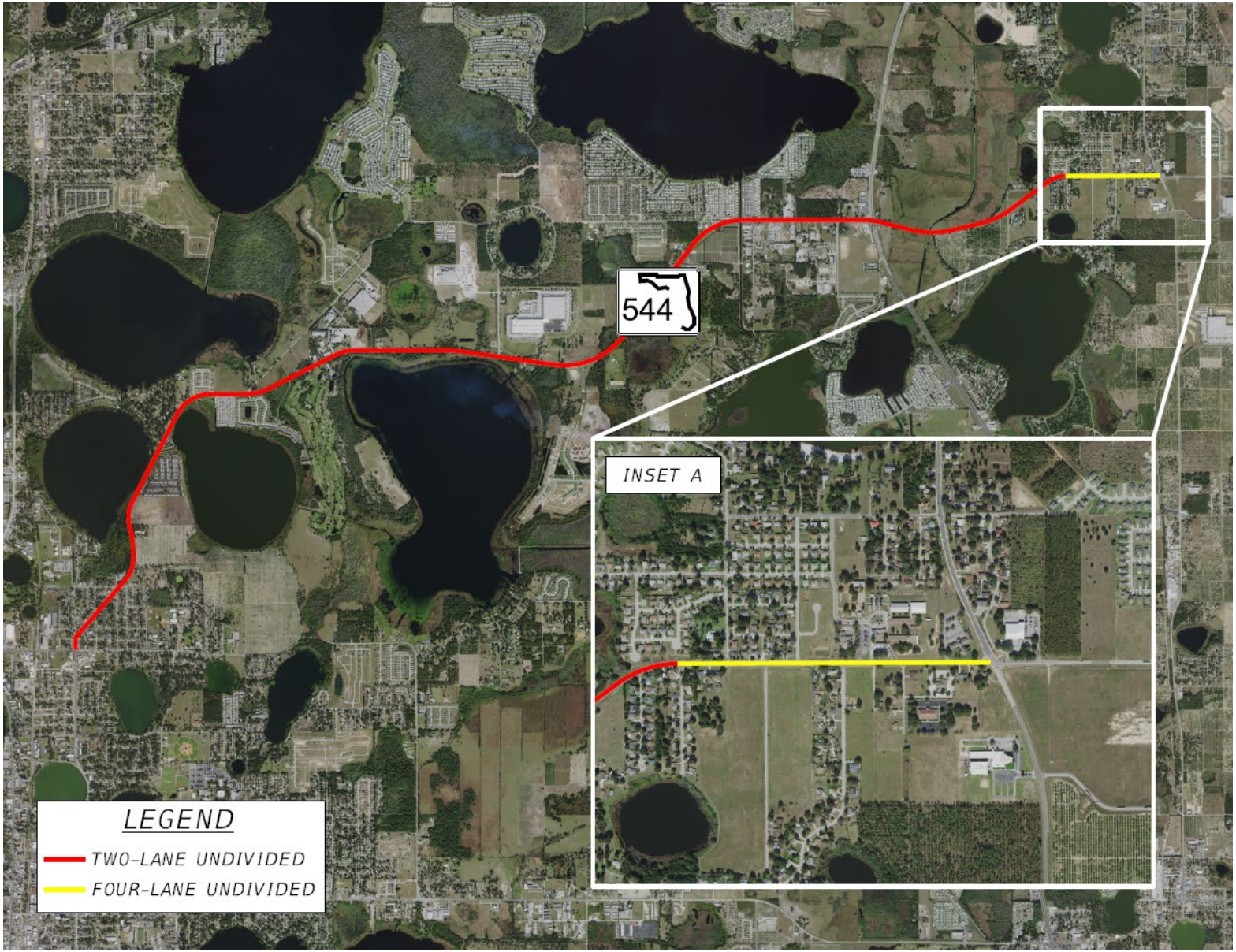

Figure 3-1: No-Build Alternative

Figure 3-2: Build Alternative No. 1

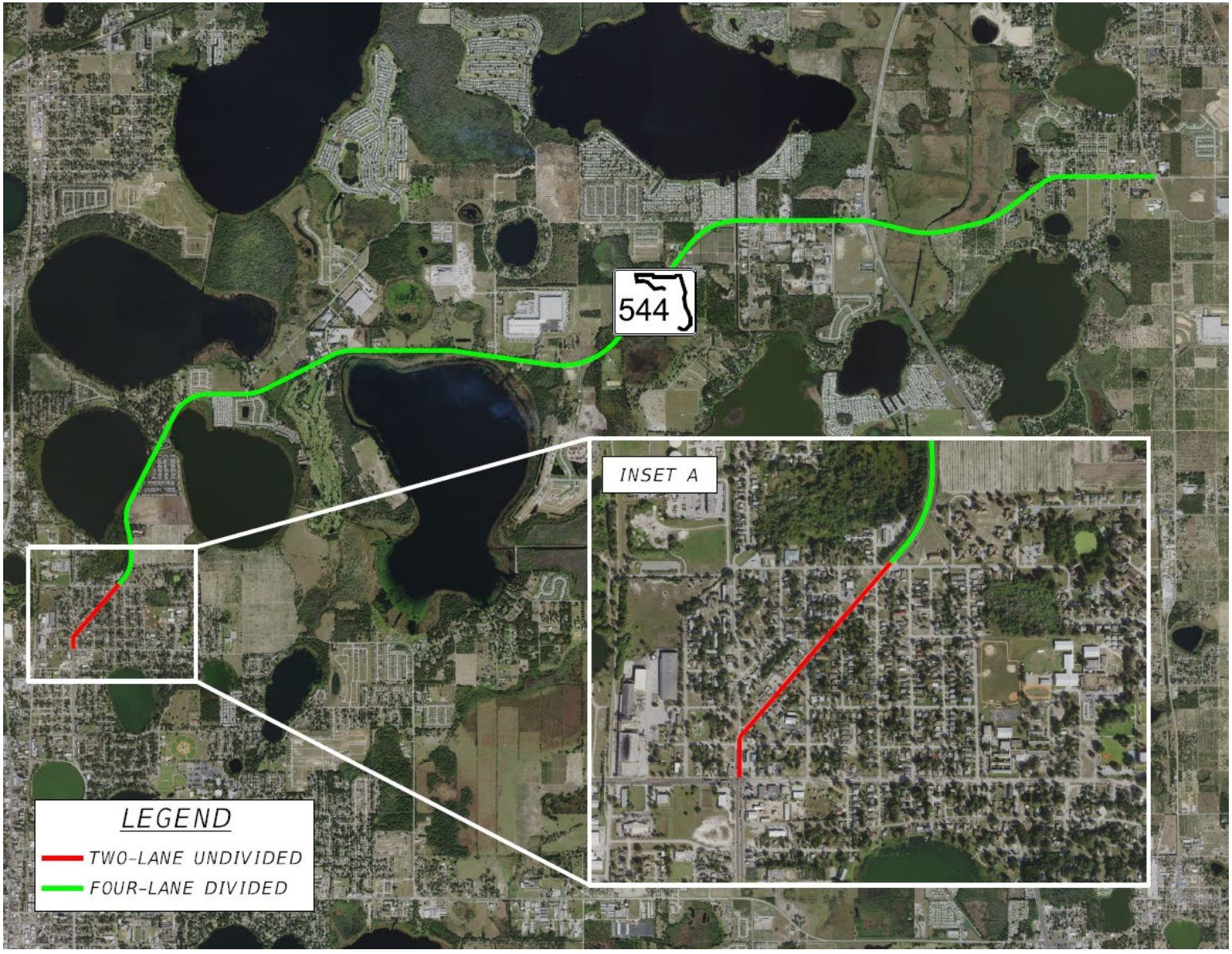

Figure 3-3: Build Alternative No. 2

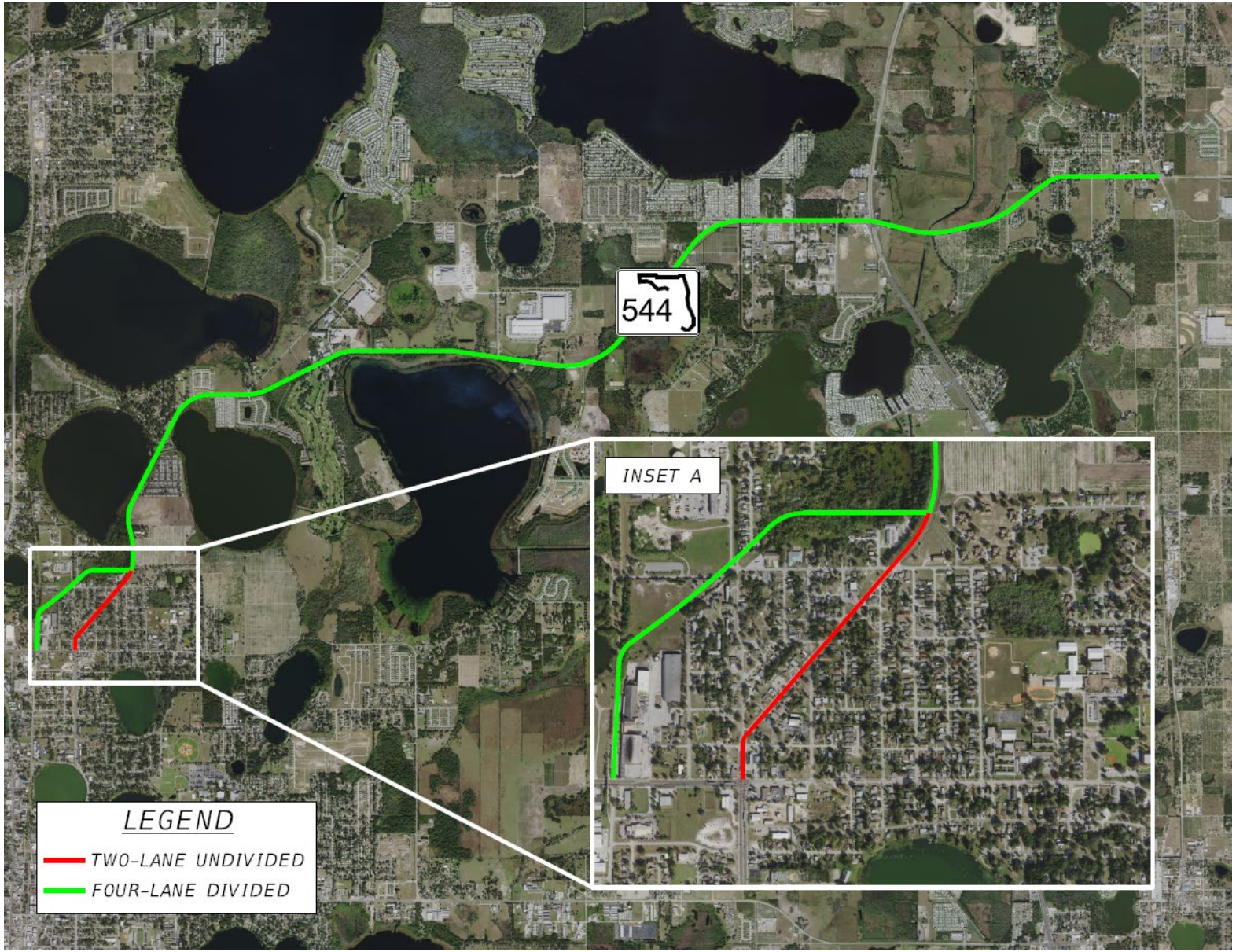

Figure 3-4: Build Alternative No. 3

Build Alternative No. 2 was modeled to evaluate the impact of not four-laning the portion of SR 544 from Martin Luther King Boulevard to Avenue Y. The existing right-of-way in this portion of the study corridor is only 50 feet and the construction of a four-lane roadway will require additional right-of-way and result in impacts to some of the existing residential land uses in the Florence Villa community. Finally, Build Alternative No. 3 was modeled to assess the impact of constructing a four-lane bypass around the Florence Villa Community. The 2040 AADT volumes obtained from the Build Alternative No. 2 travel demand model run provide an initial indication as to whether the southernmost portion of the SR 544 study corridor is expected to operate overcapacity without the four-laning. Similarly, the 2040 AADT volumes obtained from the Build Alternative No. 3 travel demand model run provide an initial indication as to whether the construction of a new bypass roadway is expected to divert enough vehicles from the southernmost portion of the SR 544 study corridor to allow the existing roadway to operate at an acceptable level of service.

Table 3-1 provides a comparison of the 2040 Peak Season Weekday Average Daily Traffic (PSWADT) volumes that were obtained from the four-travel demand model runs. The 2040 PSWADT volume plots are also provided in **Appendix H**. The 2040 AADT volumes were derived by multiplying the 2040 PSWADT volumes by the Polk County Model Output Conversion Factor (MOCF) value of 0.95. The 2040 AADT volumes are also provided in **Table 3-1**. A review of the 2040 AADT volumes indicated the following:

- The 2040 AADT volumes on SR 544 from Martin Luther King Boulevard to SR 17 are projected to range from approx. 18,000 vpd to approx. 30,000 vpd with the No-Build Alternative.
- If four lanes are provided on SR 544 either throughout the entire study corridor (Build Alternative No. 1) or from Avenue Y to SR 17 (Build Alternative No. 2), the 2040 AADT volumes on the portion of SR 544 from Avenue Y to US 27 are projected to be significantly higher than the No-Build Alternative volumes (approx. 14,000 vpd to 17,000 vpd higher). This indicates that a significant number of vehicles are avoiding traveling on this portion of SR 544 with the No-Build Alternative due to the overcapacity conditions.
- The additional traffic that is projected on the portion of SR 544 from Avenue Y to US 27 with the four-lane Build Alternatives is primarily coming from US 27 to the north (approx. 6,000 vpd), SR 544 to the south of Martin Luther King Boulevard (approx. 6,000 vpd) and SR 544 just west of SR 17 (approx. 2,000 vpd).
- If SR 544 is four-laned from Ave Y to SR 17 but the portion of SR 544 from Martin Luther King Boulevard to Avenue Y is not four-laned and the bypass is not constructed, the 2040 AADT volume on Ave Y to the west of SR 544 is projected to increase by 9,000 vpd (i.e., from 2,000 vpd to 11,000 vpd). This could have negative impacts on the local roads on the west side of SR 544 in the Florence Villa community.
- A potential four-lane bypass road connecting Martin Luther King Boulevard to SR 544 (north of Ave Y) diverts a significant amount of traffic from the portion of SR 544 located in Florence Villa (i.e., approximately 19,000 vpd). This is almost 50% of the AADT volume on SR 544 to the north of the bypass.
- The 2040 AADT volume on the portion of SR 544 from 1st Street N. to Ave Y is approximately 19,000 vpd with Build Alternative No. 3. This volume will likely still result in

the need for four lanes on the portion of SR 544 from Martin Luther King Boulevard to the bypass (which could result in the need to classify this portion of SR 544 as a "constrained roadway"). However, if the portion of SR 544 from Martin Luther King Boulevard to Avenue Y remains as a two-lane undivided roadway, the peak hour traffic operations on this portion of SR 544 will be better with the bypass alternative (Build Alternative No. 3) than with Build Alternative No. 2.

The 2040 AADT volumes estimated for each of the four alternatives were compared to the existing (2019) AADT volumes and average yearly traffic growth rates were calculated. The 2019 and 2040 AADT volumes, along with the average yearly growth rates for this 21-year time period are provided in **Table 3-2** (SR 544 mainline) and **Table 3-3** (SR 544 cross streets). The overall average SR 544 corridor mainline growth rates ranged from 2.33% per year (for the No-Build Alternative) to 5.87% per year (for Build Alternative No. 1). A preliminary estimate of the design year (2045) AADT volumes was derived via extrapolation using the 2019 and 2040 AADT volumes. These 2045 AADT volumes are also provided in **Table 3-2** and **Table 3-3**. The 2045 AADT volumes were compared to the 2040 AADT volumes and average yearly traffic growth rates for this 5-year time period were also calculated. These growth rates are also provided in **Table 3-2** and **Table 3-3**. The overall average SR 544 corridor mainline growth rates for this five-year period ranged from 1.40% per year (for the No-Build Alternative) to 2.68% per year (for Build Alternative No. 1).

Since the 2040 AADT volumes for all three Build Alternatives represent very high overall growth in traffic volumes (i.e., between 5.20 % per year and 5.87% per year), the 2040 land use data was compared to the 2015 land use data for the 17 Traffic Analysis Zones (TAZ's) located immediately adjacent to the SR 544 study corridor.

Table 3-4 provides a comparison of the number of dwelling units in each of the 17 TAZ's for 2015 and 2040, as well as the overall total. The total dwelling units in 2040 reflect an overall increase of 10,327 dwelling units, which represents an average yearly increase of 6.97 % per year. **Table 3-4** also provides a comparison of the number of employees in each of the 17 TAZ's for 2015 and 2040, as well as the overall total. The total employees in 2040 reflect an overall increase of 6,849 employees, which represents an average yearly increase of 6.77 % per year. When compared to the forecasted growth in residential and non-residential land use, the forecasted growth in daily traffic volumes was consistent with the land use growth.

Table 3-1: Preliminary 2040 Daily Traffic Volumes

Roadway	From	To	2040 PSWADT Volume				2040 AADT Volume							
			No-Build Alt	Build Alt 1	Build Alt 2	Build Alt 3	No-Build Alt	No-Build Alt [1]	Build Alt 1	Build Alt 1 [1]	Build Alt 2	Build Alt 2 [1]	Build Alt 3	Build Alt 3 [1]
SR 544	South of MLK Blvd	MLK Blvd	30,941	36,384	34,975	34,507	29,394	29,000	34,565	35,000	33,226	33,000	32,782	33,000
SR 544	MLK Blvd	1st St N	26,152	45,513	31,700	24,443	24,844	25,000	43,237	43,000	30,115	30,000	23,221	23,000
SR 544	1st St N	Ave Y NE	21,486	40,291	25,154	19,641	20,412	20,000	38,276	38,000	23,896	24,000	18,659	19,000
SR 544	Ave Y NE	Possible Future Bypass	24,331	41,656	38,632	22,701	23,114	23,000	39,573	40,000	36,700	37,000	21,566	22,000
SR 544	Possible Future Bypass	Old Lucerne Park Rd (west end)	24,331	41,656	38,632	41,131	23,114	23,000	39,573	40,000	36,700	37,000	39,074	39,000
SR 544	Old Lucerne Park Rd (west end)	Lucerne Lake Rd	18,452	35,329	33,507	35,476	17,529	18,000	33,563	34,000	31,832	32,000	33,702	34,000
SR 544	Lucerne Lake Rd	Old Lucerne Park Rd (east end)	23,566	40,057	38,625	40,258	22,388	22,000	38,054	38,000	36,694	37,000	38,245	38,000
SR 544	Old Lucerne Park Rd (east end)	W. Lake Hamilton Dr	28,116	42,958	41,844	43,126	26,710	27,000	40,810	41,000	39,752	40,000	40,970	41,000
SR 544	W. Lake Hamilton Dr	US 27	31,411	46,706	45,674	46,886	29,840	30,000	44,371	44,000	43,390	43,000	44,542	45,000
SR 544	US 27	Peninsular Dr	23,397	27,241	27,128	27,415	22,227	22,000	25,879	26,000	25,772	26,000	26,044	26,000
SR 544	Peninsular Dr	SR 17	29,264	31,564	31,206	31,545	27,801	28,000	29,986	30,000	29,646	30,000	29,968	30,000
MLK Blvd	West of Possible Future Bypass	Possible Future Bypass	50,272	50,493	51,435	56,536	47,758	48,000	47,968	48,000	48,863	49,000	53,709	54,000
MLK Blvd	Possible Future Bypass	SR 544	44,745	48,661	42,378	39,003	42,508	43,000	46,228	46,000	40,259	40,000	37,053	37,000
MLK Blvd	SR 544	East of SR 544	24,135	23,671	24,257	23,771	22,928	23,000	22,487	22,000	23,044	23,000	22,582	23,000
Ave Y NE	West of SR 544	SR 544	4,414	2,153	11,644	1,961	4,193	4,200	2,045	2,000	11,062	11,000	1,863	1,900
Ave Y NE	SR 544	East of SR 544	8,575	9,148	8,633	9,165	8,146	8,100	8,691	8,700	8,201	8,200	8,707	8,700
Possible Future Bypass	MLK Blvd	SR 544	N/A	N/A	N/A	20,139	N/A	N/A	N/A	N/A	N/A	N/A	19,132	19,000
Old Lucerne Park Rd (west end)			7,269	7,448	6,285	6,777	6,906	6,900	7,076	7,100	5,971	6,000	6,438	6,400
Old Lucerne Park Rd (east end)			6,687	5,099	5,430	5,057	6,353	6,400	4,844	4,800	5,159	5,200	4,804	4,800
Lake Hamilton Dr	South of SR 544	SR 544	6,818	6,605	6,646	6,615	6,477	6,500	6,275	6,300	6,314	6,300	6,284	6,300
US 27	South of SR 544	SR 544	65,735	63,697	63,822	63,924	62,448	62,000	60,512	61,000	60,631	61,000	60,728	61,000
US 27	SR 544	North of SR 544	74,519	81,487	80,814	81,900	70,793	71,000	77,413	77,000	76,773	77,000	77,805	78,000
SR 17	South of SR 544	SR 544	20,485	21,485	21,478	21,197	19,461	19,000	20,411	20,000	20,404	20,000	20,137	20,000
SR 17	SR 544	North of SR 544	19,277	19,813	19,678	19,836	18,313	18,000	18,822	19,000	18,694	19,000	18,844	19,000

PSWADT = Peak Season Weekday Average Daily Traffic/AADT = Average Annual Daily Traffic

2040 AADT volume derived by multiplying the 2040 PSWADT volume obtained from the D1RPM by the Model Output Conversion Factor (MOCF) = 0.95.

[1] 2040 AADT (Rounded)

No-Build Alternative - Two-lane undivided road from MLK Blvd to Peninsular Dr and four-lane undivided road from Peninsular Dr to SR 17

Build Alternative 1 - Four-lane divided road from MLK Blvd to SR 17

Build Alternative 2 - Two-lane undivided road from MLK Blvd to Ave Y NE and four-lane divided road from Ave Y NE to SR 17

Build Alternative 3 - Two-lane undivided road from MLK Blvd to north of Ave Y NE, four-lane divided road from north of Ave Y NE to SR 17, and new four-lane bypass road from MLK Blvd to SR 544 (just north of Ave Y)

Table 3-2: Existing and Future Year SR 544 Mainline AADT Volumes

Location	Existing 2019	No-Build Alternative					Build Alternative No. 1					Build Alternative No. 2					Build Alternative No. 3				
		2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr	2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr	2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr	2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr
South of M. L. King Boulevard	23,000	29,000	1.24%	*30,429*	30,000	0.69%	35,000	2.48%	*37,857*	38,000	1.71%	33,000	2.07%	*35,381*	35,000	1.21%	33,000	2.07%	*35,381*	35,000	1.21%
North of M. L. King Boulevard	18,800	25,000	1.57%	*26,476*	26,000	0.80%	43,000	6.13%	*48,762*	49,000	2.79%	30,000	2.84%	*32,667*	33,000	2.00%	23,000	1.06%	*24,000*	24,000	0.87%
South of Avenue Y	20,000	20,000	0.00%	*20,000*	20,000	0.00%	38,000	4.29%	*42,286*	42,000	2.11%	24,000	0.95%	*24,952*	25,000	0.83%	19,000	-0.24%	*18,762*	19,000	0.00%
North of Avenue Y	20,000	23,000	0.71%	*23,714*	24,000	0.87%	40,000	4.76%	*44,762*	45,000	2.50%	37,000	4.05%	*41,048*	41,000	2.16%	39,000	4.52%	*43,524*	44,000	2.56%
West of Old Lucerne Park Road (west end)	16,000	23,000	2.08%	*24,667*	25,000	1.74%	40,000	7.14%	*45,714*	46,000	3.00%	37,000	6.25%	*42,000*	42,000	2.70%	39,000	6.85%	*44,476*	44,400	2.77%
East of Old Lucerne Park Road (west end)	15,000	18,000	0.95%	*18,714*	19,000	1.11%	34,000	6.03%	*38,524*	39,000	2.94%	32,000	5.40%	*36,048*	36,000	2.50%	34,000	6.03%	*38,524*	39,000	2.94%
West of Lucerne Lake Road	14,000	17,000	1.02%	*17,714*	18,000	1.18%	33,000	6.46%	*37,524*	38,000	3.03%	32,000	6.12%	*36,286*	36,000	2.50%	34,000	6.80%	*38,762*	39,000	2.94%
East of Lucerne Lake Road	14,000	22,000	2.72%	*23,905*	24,000	1.82%	38,000	8.16%	*43,714*	44,000	3.16%	37,000	7.82%	*42,476*	42,000	2.70%	38,000	8.16%	*43,714*	44,000	3.16%
West of Old Lucerne Park Road (east end)	14,000	22,000	2.72%	*23,905*	24,000	1.82%	38,000	8.16%	*43,714*	44,000	3.16%	37,000	7.82%	*42,476*	42,000	2.70%	38,000	8.16%	*43,714*	44,000	3.16%
East of Old Lucerne Park Road (east end)	15,000	27,000	3.81%	*29,857*	30,000	2.22%	41,000	8.25%	*47,190*	47,000	2.93%	40,000	7.94%	*45,952*	46,000	3.00%	41,000	8.25%	*47,190*	47,000	2.93%
West of Lake Hamilton Drive/Fairview Village	22,000	27,000	1.08%	*28,190*	28,000	0.74%	41,000	4.11%	*45,524*	46,000	2.44%	40,000	3.90%	*44,286*	44,000	2.00%	41,000	4.11%	*45,524*	46,000	2.44%
East of Lake Hamilton Drive/Fairview Village	20,000	30,000	2.38%	*32,381*	32,000	1.33%	44,000	5.71%	*49,714*	50,000	2.73%	43,000	5.48%	*48,476*	48,000	2.33%	45,000	5.95%	*50,952*	51,000	2.67%
West of Brenton Manor Avenue	22,000	30,000	1.73%	*31,905*	32,000	1.33%	44,000	4.76%	*49,238*	49,000	2.27%	43,000	4.55%	*48,000*	48,000	2.33%	45,000	4.98%	*50,476*	50,000	2.22%
East of Brenton Manor Avenue	22,000	30,000	1.73%	*31,905*	32,000	1.33%	44,000	4.76%	*49,238*	49,000	2.27%	43,000	4.55%	*48,000*	48,000	2.33%	45,000	4.98%	*50,476*	50,000	2.22%
West of US 27	22,000	30,000	1.73%	*31,905*	32,000	1.33%	44,000	4.76%	*49,238*	49,000	2.27%	43,000	4.55%	*48,000*	48,000	2.33%	45,000	4.98%	*50,476*	50,000	2.22%
East of US 27	11,000	22,000	4.76%	*24,619*	25,000	2.73%	26,000	6.49%	*29,571*	30,000	3.08%	26,000	6.49%	*29,571*	30,000	3.08%	26,000	6.49%	*29,571*	30,000	3.08%
West of SR 17	10,000	28,000	8.57%	*32,286*	32,000	2.86%	30,000	9.52%	*34,762*	35,000	3.33%	29,000	9.05%	*33,524*	34,000	3.45%	30,000	9.52%	*34,762*	35,000	3.33%
East of SR 17	9,000	15,000	3.17%	*16,429*	16,000	1.33%	16,000	3.70%	*17,667*	18,000	2.50%	16,000	3.70%	*17,667*	18,000	2.50%	16,000	3.70%	*17,667*	18,000	2.50%
Average			**2.33%**			**1.40%**		**5.87%**			**2.68%**		**5.20%**			**2.37%**		**5.36%**			**2.40%**

Table 3-3: Existing and Future Year SR 544 Cross Street Volumes

Location	Existing 2019	No-Build Alternative					Build Alternative No. 1					Build Alternative No. 2					Build Alternative No. 3				
		2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr	2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr	2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr	2040[1]	2019-2040 Yr % Incr	2045[2]	2045[3]	2040-2045 Yr % Incr
M. L. King Boulevard West of SR 544	25,000	43,000	3.43%	*47,286*	47,000	1.86%	46,000	4.00%	*51,000*	51,000	2.17%	40,000	2.86%	*43,571*	44,000	2.00%	37,000	2.29%	*39,857*	40,000	1.62%
M. L. King Boulevard East of SR 544	13,000	23,000	3.66%	*25,381*	25,000	1.74%	22,000	3.30%	*24,143*	24,000	1.82%	23,000	3.66%	*25,381*	25,000	1.74%	23,000	3.66%	*25,381*	25,000	1.74%
Avenue Y West of SR 544	2,100	4,200	4.76%	*4,700*	4,700	2.38%	2,000	-0.23%	*1,976*	2,000	0.00%	11,000	20.18%	*13,119*	13,000	3.64%	1,900	-0.45%	*1,852*	1,900	0.00%
Avenue Y East of SR 544	2,300	8,100	12.01%	*9,481*	9,500	3.46%	8,700	13.25%	*10,224*	10,000	2.99%	8,200	12.22%	*9,605*	9,600	3.41%	8,700	13.25%	*10,224*	10,000	2.99%
Old Lucerne Park Road (west end) North of SR 544	3,400	6,900	4.90%	*7,733*	7,700	2.32%	7,100	5.18%	*7,981*	8,000	2.54%	6,000	3.64%	*6,619*	6,600	2.00%	6,400	4.20%	*7,114*	7,100	2.19%
Lucerne Lake Road North of SR 544	1,400	17,000	53.06%	*20,714*	21,000	4.71%	17,000	53.06%	*20,714*	21,000	4.71%	17,000	53.06%	*20,714*	21,000	4.71%	17,000	53.06%	*20,714*	21,000	4.71%
Old Lucerne Park Road (east end) North of SR 544	5,800	6,400	0.49%	*6,543*	6,500	0.31%	4,800	-0.82%	*4,562*	4,600	-0.83%	5,200	-0.49%	*5,057*	5,100	-0.38%	4,800	-0.82%	*4,562*	4,600	-0.83%
Lake Hamilton Drive South of SR 544	3,400	6,500	4.34%	*7,238*	7,200	2.15%	6,300	4.06%	*6,990*	7,000	2.22%	6,300	4.06%	*6,990*	7,000	2.22%	6,300	4.06%	*6,990*	7,000	2.22%
US 27 North of SR 544	46,500	71,000	2.51%	*76,833*	77,000	1.69%	77,000	3.12%	*84,262*	84,000	1.82%	77,000	3.12%	*84,262*	84,000	1.82%	78,000	3.23%	*85,500*	86,000	2.05%
US 27 South of SR 544	39,500	62,000	2.71%	*67,357*	67,000	1.61%	61,000	2.59%	*66,119*	66,000	1.64%	61,000	2.59%	*66,119*	66,000	1.64%	61,000	2.59%	*66,119*	66,000	1.64%
SR 17 North of SR 544	10,000	18,000	3.81%	*19,905*	20,000	2.22%	19,000	4.29%	*21,143*	21,000	2.11%	19,000	4.29%	*21,143*	21,000	2.11%	19,000	4.29%	*21,143*	21,000	2.11%
SR 17 South of SR 544	8,400	19,000	6.01%	*21,524*	22,000	3.16%	20,000	6.58%	*22,762*	23,000	3.00%	20,000	6.58%	*22,762*	23,000	3.00%	20,000	6.58%	*22,762*	23,000	3.00%

[1] *2040 AADT volume derived by multiplying the 2040 PSWADT volume obtained from the D1RPM by the Model Output Conversion Factor (MOCF) = 0.95.*

[2] *2045 AADT volume derived by extrapolation using the 2019 and 2040 AADT volumes.*

[3] *2045 AADT volume (rounded)*

Table 3-4: SR 544 Corridor Land Use Data Comparison

2040 TAZ No.	2045 TAZ No.	Location of Traffic Analysis Zones on the East Side/South Side of SR 544	2015 DUs	2040 DUs	2045 DUs	DIFF [1]	2015 EMP	2040 EMP	2045 EMP	DIFF [2]
413	413	South of MLK Blvd	357	433	391	-42	128	579	198	-381
692	704	Between MLK Blvd & Ave Y NE	643	877	731	-146	270	956	399	-557
422	422	Between Ave Y NE & Lake Smart	375	647	1,154	507	38	127	124	-3
442	442	Between Old Lucerne Park Rd (west & east ends)	902	2,446	3,490	1,044	89	295	228	-67
671	683	Between Lake Hamilton Dr & US 27	216	212	333	121	210	1,306	762	-544
494	503	Between US 27 & SR 17	358	642	1,267	625	110	183	488	305
294	294	East of SR 17	0	0	0	0	0	488	218	-270
2040 TAZ No.	**2045 TAZ No.**	**Location of Traffic Analysis Zones on the West Side/North Side of SR 544**	**2015 DUs**	**2040 DUs**	**2045 DUs**	**DIFF [1]**	**2015 EMP**	**2040 EMP**	**2045 EMP**	**DIFF [2]**
405	405	South of MLK Blvd	269	336	348	12	327	740	466	-274
691	703	Between MLK Blvd & Ave Y NE	127	206	135	-71	35	414	110	-304
409	409	Between Ave Y NE & Conine Dr	103	184	133	-51	83	251	83	-168
438	438	Between Conine Dr & Old Lucerne Park Rd (west)	324	3,031	1,176	-1,855	88	1,235	510	-725
670	682	Between Old Lucerne Park Rd (west) & Lucerne Lake Rd	63	192	393	201	176	550	385	-165
672	684	Between Lucerne Lake Rd & Old Lucerne Park Rd (east)	113	739	562	-177	1,104	2,103	1,127	-976
446	446	Between Old Lucerne Park Rd (east) & US 27	760	3,812	2,351	-1,461	529	590	1,102	512
486	495	Between US 27 & Peninsular Dr	722	1,159	1,914	755	473	686	1,302	616
497	506	Between Peninsular Dr & SR 17	122	159	122	-37	169	255	169	-86
505	514	East of SR 17	475	1,181	738	-443	219	139	219	80
Total			**5,929**	**16,256**	**15,238**	**-1,018**	**4,048**	**10,897**	**7,890**	**-3,007**
Avg. Yearly Increase (using 2015 as the base)				**6.97%**	**5.23%**			**6.77%**	**3.16%**	

DU = Dwelling Unit
EMP = Employment
DIFF = 2045 Dwelling Units - 2040 Dwelling Units
DIFF = 2045 Employment - 2040 Employment

The high overall growth in total dwelling units projected by the Polk TPO for the SR 544 study corridor was also compared to the overall growth in total population projected for Polk County by the Bureau of Economics and Business Research (BEBR). The BEBR Polk County population projections are provided in **Appendix I**. The total Polk County population as of April 1, 2019 was estimated to be approximately 690,600, while the medium and high 2040 total population estimates were 893,100 and 1,029,200, respectively. These 2040 population estimates represent average yearly growth rates of approximately 1.39% per year and 2.23% per year, respectively. Therefore, the projected yearly growth in dwelling units for the SR 544 study corridor is approximately three times higher than the highest projected yearly growth in population for the entire county.

The 2040 land use data was also compared to the 2045 land use data for the 17 TAZ's located immediately adjacent to the SR 544 study corridor. The 2045 land use data was developed by the Polk TPO in support of the 2045 LRTP update that is currently ongoing. The 2045 dwelling units and employment are provided in **Table 3-4**. The total dwelling units in 2045 reflect an overall increase of 9,309 dwelling units (compared to the 2015 total), which represents an average yearly increase of 5.23 % per year. In addition, the 2045 total dwelling units are 1,018 dwelling units less than the 2040 total dwelling units. The total employees in 2045 reflect an overall increase of 3,842 employees (compared to the 2015 total), which represents an average yearly increase of 3.16 % per year. In addition, the 2045 total employment is 3,007 employees less than the 2040 total employment.

Currently, there is some undeveloped land located within the 17 TAZ's that are adjacent to the SR 544 study corridor, and hence, there exists the possibility of future residential and non-residential development occurring within the corridor. However, the amount of dwelling units and employment included in the 2040 D1RPM socioeconomic data set for these 17 TAZ's was viewed as being excessive. Although the 2045 socioeconomic data that was developed in support of the Polk TPO's 2045 LRTP update was viewed as being a more reasonable future growth scenario for the SR 544 study corridor, the TPO is not scheduled to adopt the 2045 LRTP until December 2020. Consequently, there exists the possibility that the current version of the 2045 socioeconomic data developed for the SR 544 study corridor could still be revised, although it is probably unlikely that this data would be subsequently increased to the 2040 levels. To avoid overestimating the design year AADT volumes for the SR 544 study corridor, and possibly triggering the need for six lanes in certain portions of the corridor, the 2040 AADT volumes obtained from the current D1RPM were used as the design year (2045) AADT volumes for the PD&E study. This recommendation was made to District One in the *SR 544 Existing and Design Year AADT Volumes Technical Memorandum (dated June 2, 2020)* and was approved on June 4, 2020.

Table 3-5 (SR 544 mainline) and **Table 3-6** (SR 544 cross streets) provide a comparison of the 2019 and 2045 AADT volumes based on the recommendation discussed above. The average yearly growth rates for the 26-year time period were calculated and are also provided in **Table 3-5** and **Table 3-6**. The overall average SR 544 corridor mainline growth rates range from 1.88% per year (for the No-Build Alternative) to 4.74% per year (for Build Alternative No. 1). The overall average mainline traffic growth rates for the Build Alternatives are lower than the average yearly increase in corridor dwelling units but higher than the average yearly increase in corridor employment for the 30-year time period from 2015 to 2045 (based on the TPO's 2045 data). It is anticipated that the use of these 2045 AADT volumes for the SR 544 PD&E study will provide a higher level of compatibility with the final 2045 AADT volumes that will be established by the conclusion of the Polk TPO's 2045 LRTP Update. The final 2045 AADT volumes are also graphically illustrated in **Figure 3-5** through **Figure 3-8**.

Table 3-5: SR 544 Final 2045 Mainline AADT Volumes

Location	2019 AADT	No-Build Alternative 2045 AADT	No-Build Alternative 2019-2045 Yr % Incr	Build Alternative No. 1 2045 AADT	Build Alternative No. 1 2019-2045 Yr % Incr	Build Alternative No. 2 2045 AADT	Build Alternative No. 2 2019-2045 Yr % Incr	Build Alternative No. 3 2045 AADT	Build Alternative No. 3 2019-2045 Yr % Incr
South of M. L. King Boulevard	23,000	29,000	1.00%	35,000	2.01%	33,000	1.67%	33,000	1.67%
North of M. L. King Boulevard	18,800	25,000	1.27%	43,000	4.95%	30,000	2.29%	23,000	0.86%
South of Avenue Y	20,000	20,000	0.00%	38,000	3.46%	24,000	0.77%	19,000	-0.19%
North of Avenue Y	20,000	23,000	0.58%	40,000	3.85%	37,000	3.27%	39,000	3.65%
West of Old Lucerne Park Road (west end)	16,000	23,000	1.68%	40,000	5.77%	37,000	5.05%	39,000	5.53%
East of Old Lucerne Park Road (west end)	15,000	18,000	0.77%	34,000	4.87%	32,000	4.36%	34,000	4.87%
West of Lucerne Lake Road	14,000	17,000	0.82%	33,000	5.22%	32,000	4.95%	34,000	5.49%
East of Lucerne Lake Road	14,000	22,000	2.20%	38,000	6.59%	37,000	6.32%	38,000	6.59%
West of Old Lucerne Park Road (east end)	14,000	22,000	2.20%	38,000	6.59%	37,000	6.32%	38,000	6.59%
East of Old Lucerne Park Road (east end)	15,000	27,000	3.08%	41,000	6.67%	40,000	6.41%	41,000	6.67%
West of Lake Hamilton Drive/Fairview Village	22,000	27,000	0.87%	41,000	3.32%	40,000	3.15%	41,000	3.32%
East of Lake Hamilton Drive/Fairview Village	20,000	30,000	1.92%	44,000	4.62%	43,000	4.42%	45,000	4.81%
West of Brenton Manor Avenue	22,000	30,000	1.40%	44,000	3.85%	43,000	3.67%	45,000	4.02%
East of Brenton Manor Avenue	22,000	30,000	1.40%	44,000	3.85%	43,000	3.67%	45,000	4.02%
West of US 27	22,000	30,000	1.40%	44,000	3.85%	43,000	3.67%	45,000	4.02%
East of US 27	11,000	22,000	3.85%	26,000	5.24%	26,000	5.24%	26,000	5.24%
West of SR 17	10,000	28,000	6.92%	30,000	7.69%	29,000	7.31%	30,000	7.69%
East of SR 17	9,000	15,000	2.56%	16,000	2.99%	16,000	2.99%	16,000	2.99%
Average			**1.88%**		**4.74%**		**4.20%**		**4.33%**

Table 3-6: SR 544 Final 2045 Cross Street Volumes

Location	2019 AADT	No-Build Alternative 2045 AADT	No-Build Alternative 2019-2045 Yr % Incr	Build Alternative No. 1 2045 AADT	Build Alternative No. 1 2019-2045 Yr % Incr	Build Alternative No. 2 2045 AADT	Build Alternative No. 2 2019-2045 Yr % Incr	Build Alternative No. 3 2045 AADT	Build Alternative No. 3 2019-2045 Yr % Incr
M. L. King Boulevard West of SR 544	25,000	43,000	2.77%	46,000	3.23%	40,000	2.31%	37,000	1.85%
M. L. King Boulevard East of SR 544	13,000	23,000	2.96%	22,000	2.66%	23,000	2.96%	23,000	2.96%
Avenue Y West of SR 544	2,100	4,200	3.85%	2,000	-0.18%	11,000	16.30%	1,900	-0.37%
Avenue Y East of SR 544	2,300	8,100	9.70%	8,700	10.70%	8,200	9.87%	8,700	10.70%
Old Lucerne Park Road (west end) North of SR 544	3,400	6,900	3.96%	7,100	4.19%	6,000	2.94%	6,400	3.39%
Lucerne Lake Road North of SR 544	1,400	17,000	42.86%	17,000	42.86%	17,000	42.86%	17,000	42.86%
Old Lucerne Park Road (east end) North of SR 544	5,800	6,400	0.40%	4,800	-0.66%	5,200	-0.40%	4,800	-0.66%
Fairview Village North of SR 544	100	100	0.00%	100	0.00%	100	0.00%	100	0.00%
Lake Hamilton Drive South of SR 544	3,400	6,500	3.51%	6,300	3.28%	6,300	3.28%	6,300	3.28%
Brenton Manor Avenue South of SR 544	2,900	5,400	3.32%	5,400	3.32%	5,400	3.32%	5,400	3.32%
US 27 North of SR 544	46,500	71,000	2.03%	77,000	2.52%	77,000	2.52%	78,000	2.61%
US 27 South of SR 544	39,500	62,000	2.19%	61,000	2.09%	61,000	2.09%	61,000	2.09%
SR 17 North of SR 544	10,000	18,000	3.08%	19,000	3.46%	19,000	3.46%	19,000	3.46%
SR 17 South of SR 544	8,400	19,000	4.85%	20,000	5.31%	20,000	5.31%	20,000	5.31%

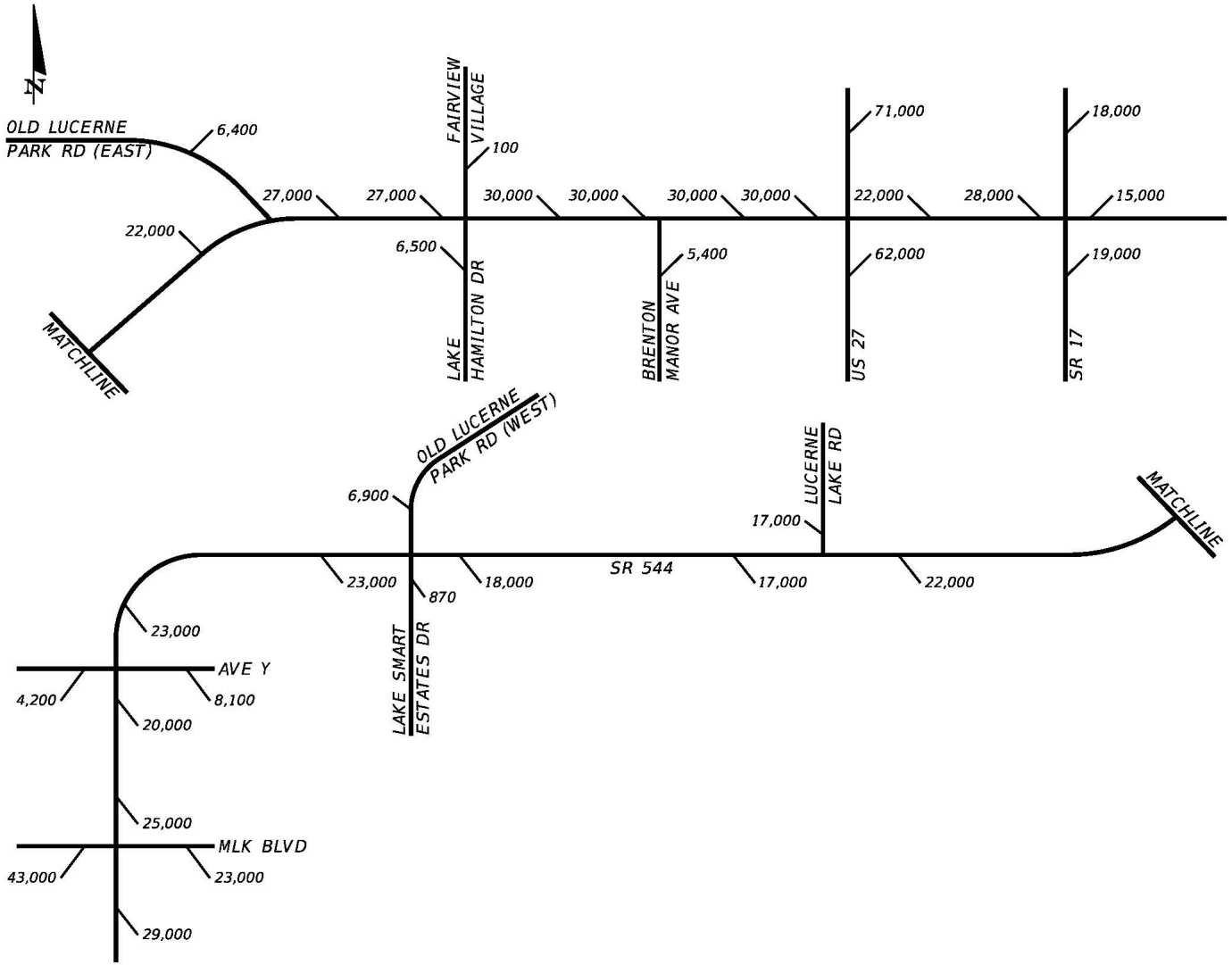

Figure 3-5: Design Year (2045) AADT Volumes – No-Build Alternative

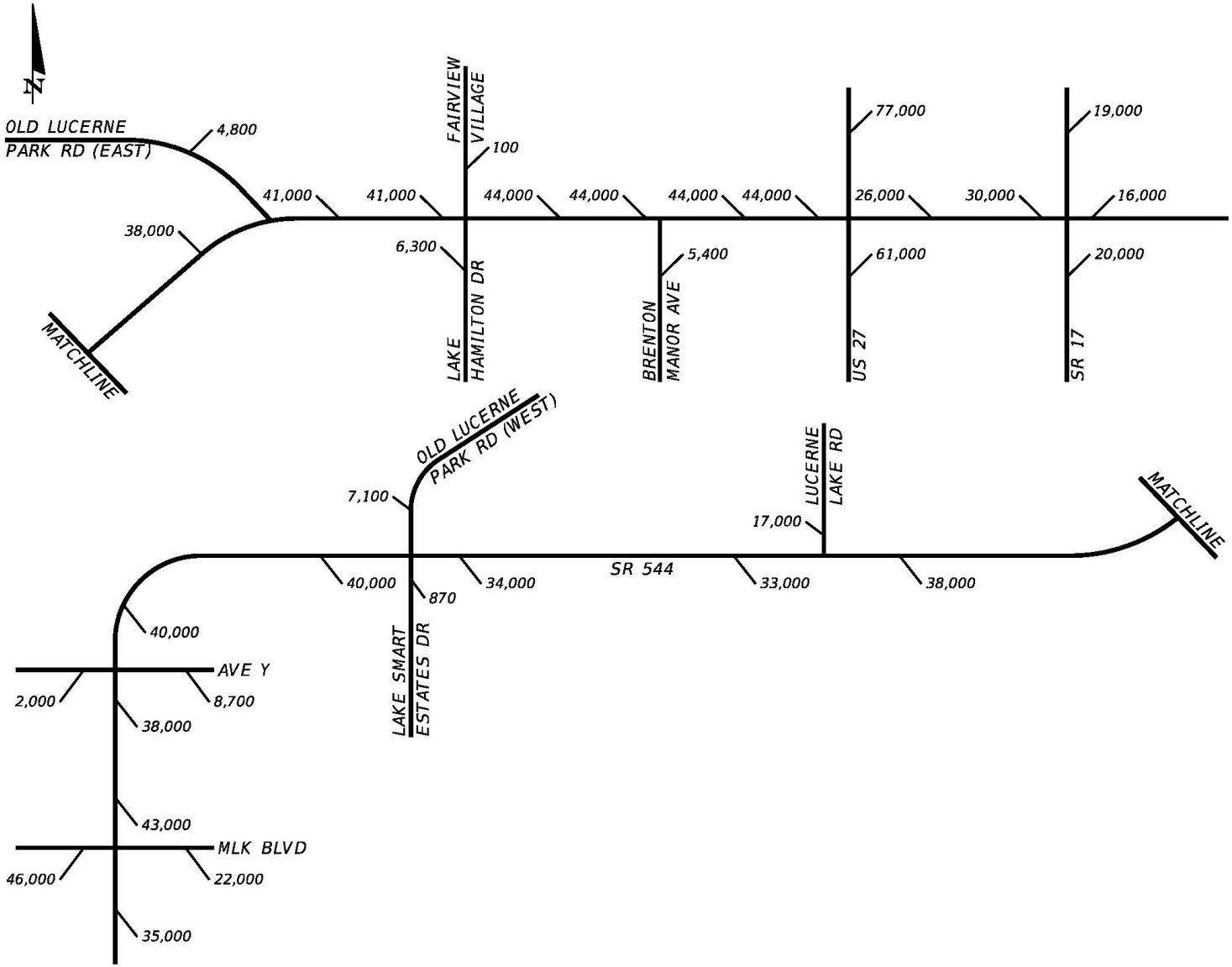

Figure 3-6: Design Year (2045) AADT Volumes – Build Alternative No. 1

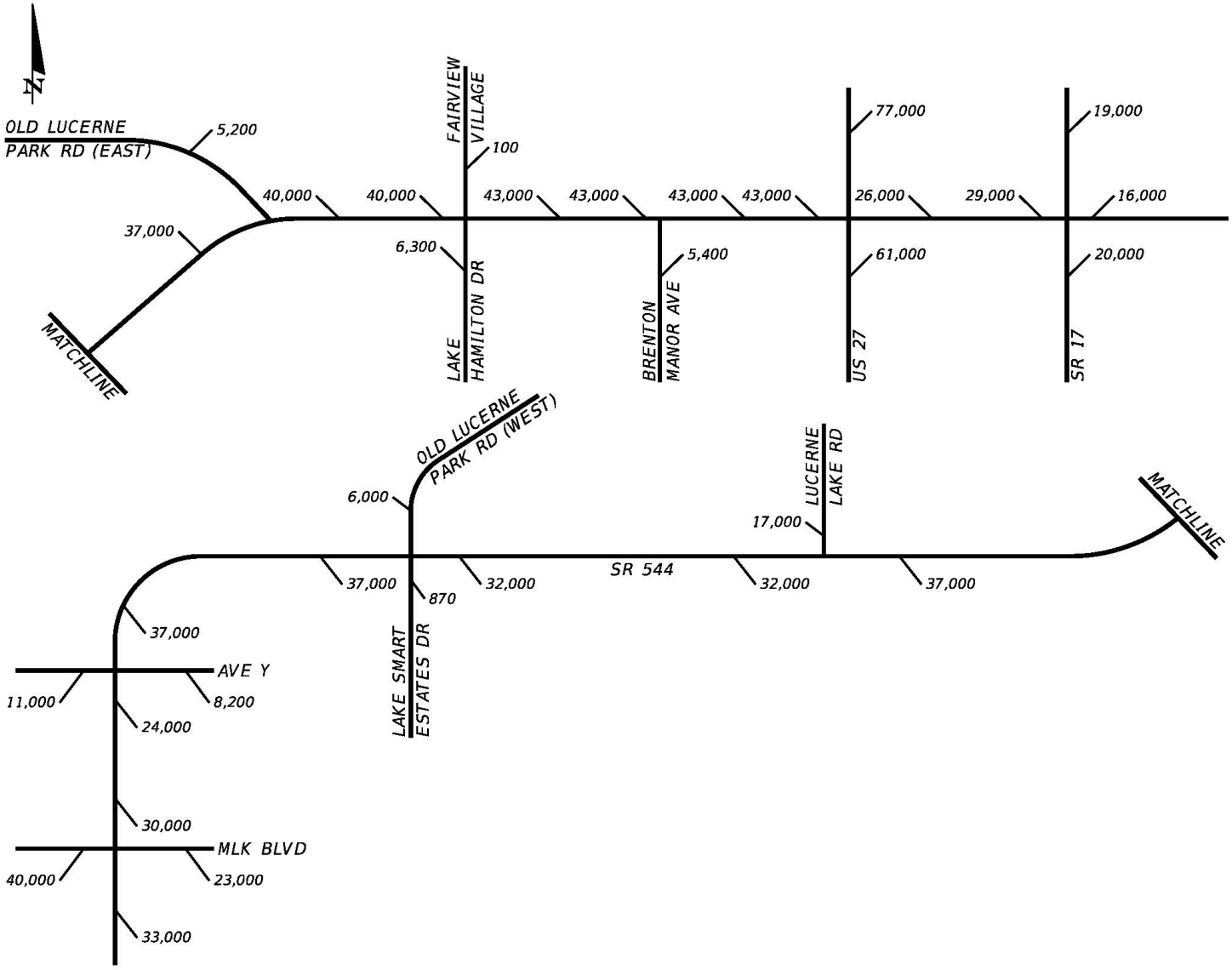

Figure 3-7: Design Year (2045) AADT Volumes – Build Alternative No. 2

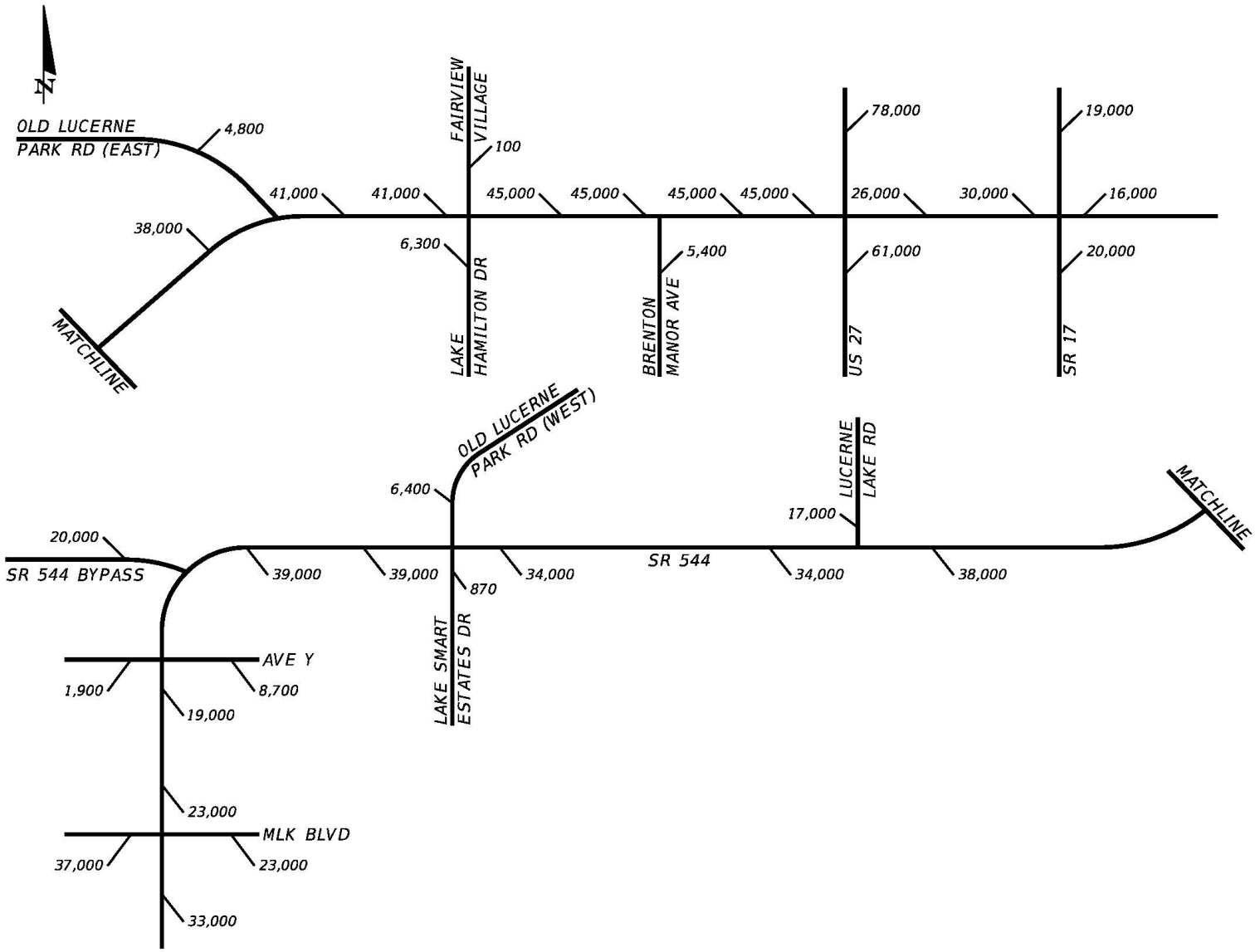

Figure 3-8: Design Year (2045) AADT Volumes – Build Alternative No. 3

Two cross streets that are not included in the D1RPM are the entrance/exit to Fairview Village and Brenton Manor Avenue. The Fairview Village entrance/exit is located on the north side of SR 544 directly across from Lake Hamilton Drive. This is the only access to and from this small, manufactured home community that is built-out. Brenton Manor Avenue is located on the south side of SR 544 approximately 1,100 feet west of US 27. This roadway provides access to and from Ridge Technical College, as well as a residential community located on the west side of Middle Lake Hamilton. Since the Fairview Village residential community is built-out and there is no room for future expansion, the future year AADT volumes were assumed to be equal to the existing (2019) AADT volume. There is developable land on the east side of Brenton Manor Avenue and there is also the possibility of future growth in enrollment associated with Ridge Technical College. Consequently, the 2045 AADT volume for this roadway was derived by applying a 3.28 percent per year growth rate to the existing (2019) AADT volume. This growth rate is the average yearly growth rate for Lake Hamilton Drive that was derived for all three build alternatives.

A second independent estimate of the opening year (2025) and design year (2045) AADT volumes using historic growth trend analysis was not conducted for this PD&E study because the historic growth trend methodology is unable to take into account the impact of future land use growth on future travel demand. Since significant increases in future population and employment are expected to occur within the SR 544 study corridor, the 2040 AADT volumes estimated using the D1RPM would be expected to be significantly higher than the 2040 AADT volumes estimated from a historic growth trend analysis. In addition, the results of the travel demand modeling indicate that significant levels of traffic diversion are projected to occur within the study corridor depending on how much (if any) additional capacity is provided within the corridor and the locations where the additional capacity is provided. A historic growth trend analysis is also unable to account for traffic diversion resulting from overcapacity conditions when alternative routes are available.

The opening year (2025) AADT volumes were derived by interpolating between the existing (2019) and design year (2045) AADT volumes. The 2025 AADT volumes are graphically illustrated in **Figure 3-9** through **Figure 3-12**.

3.2 K-factor and D-factor

The K-factor that is used for this study is 9.0%. This value is the Standard K-factor for urbanized areas, as well as areas that are transitioning to urbanized areas, and represents the percentage of the AADT volume that occurs during the typical weekday peak hour. The study corridor is located within the urbanized portion of Polk County. It should be noted that a Standard K-factor of 9.0% is significantly higher than the existing peak hour K-factors associated with SR 544.

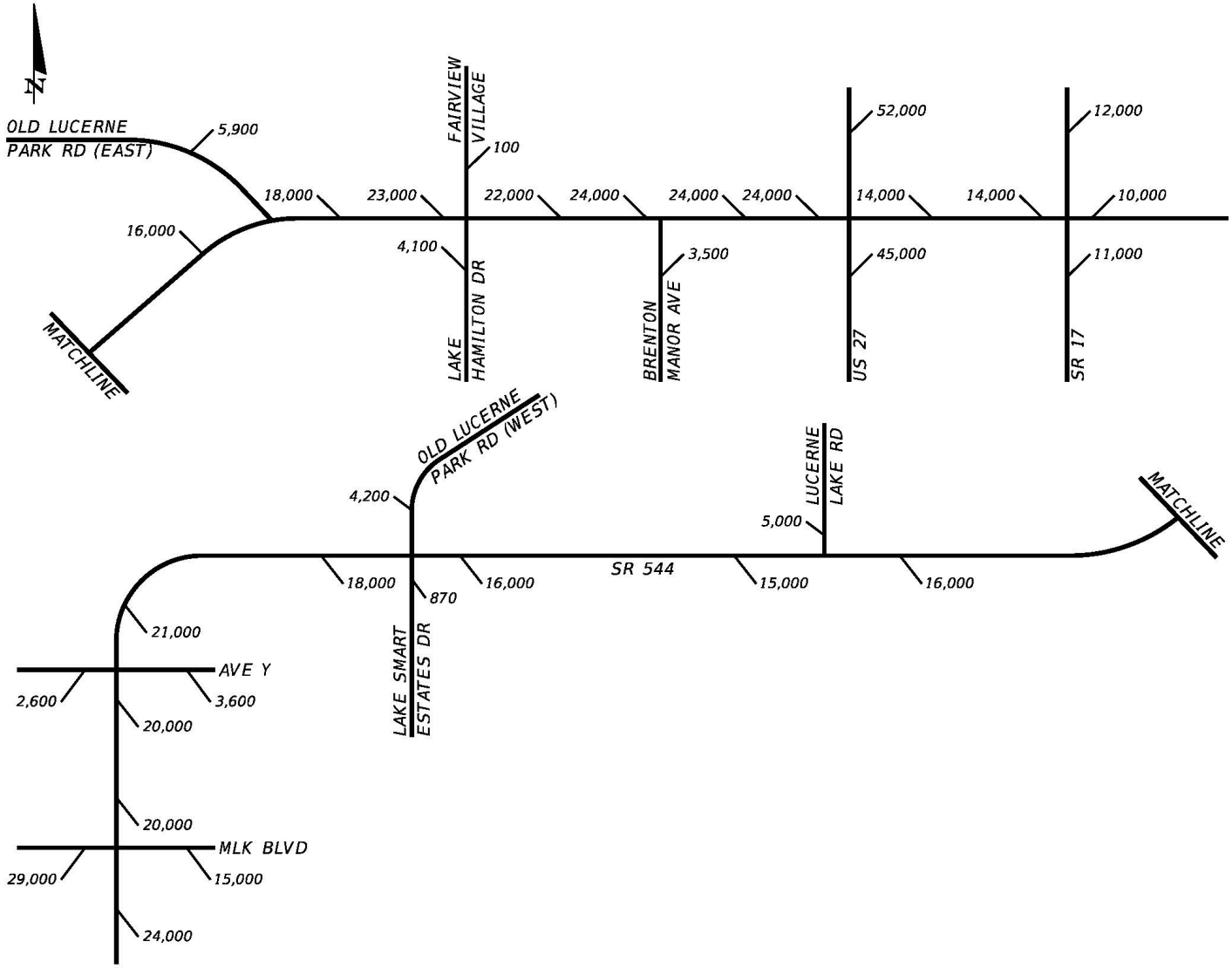

Figure 3-9: Opening Year (2025) AADT Volumes – No-Build Alternative

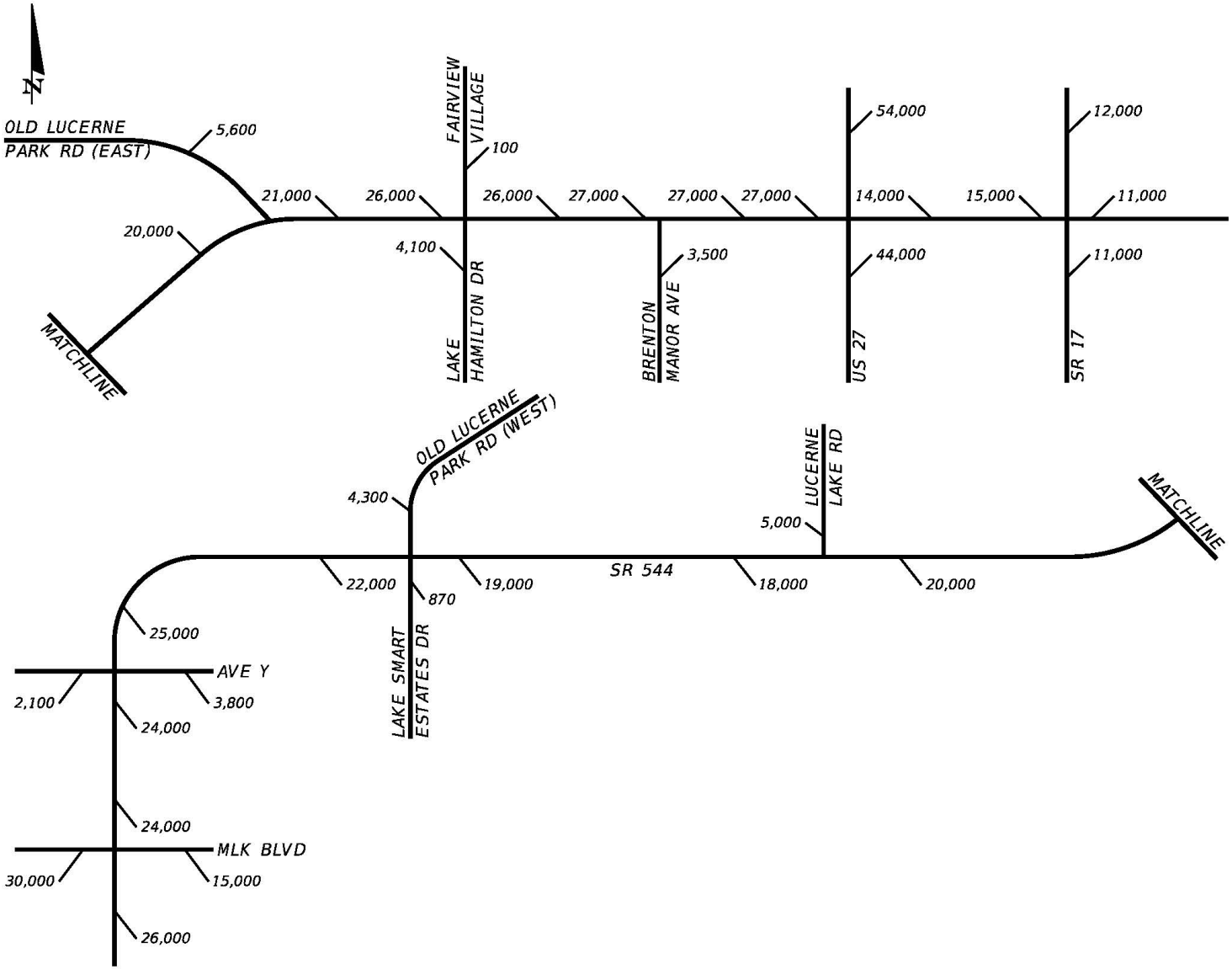

Figure 3-10: Opening Year (2025) AADT Volumes – Build Alternative No. 1

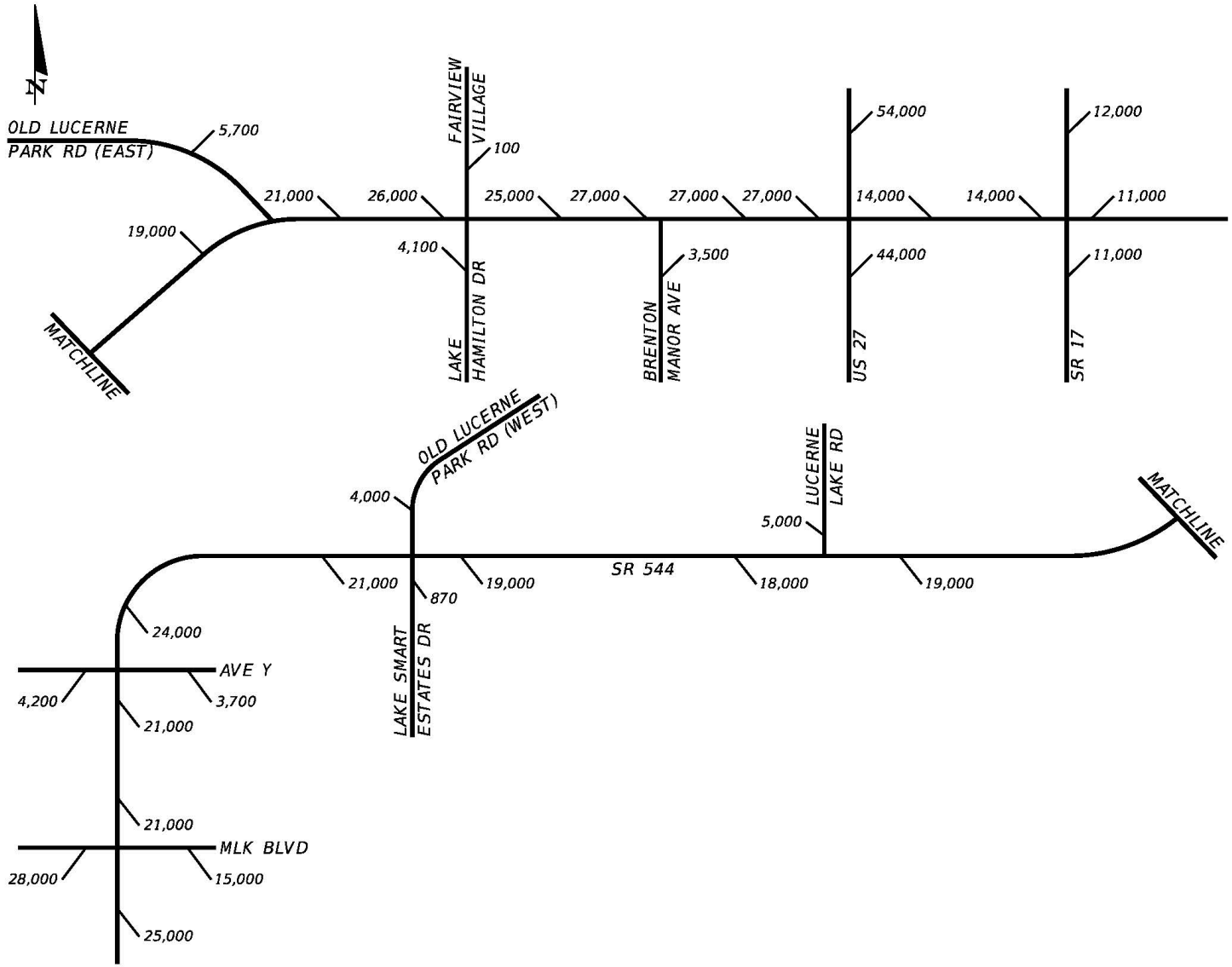

Figure 3-11: Opening Year (2025) AADT Volumes –Build Alternative No. 2

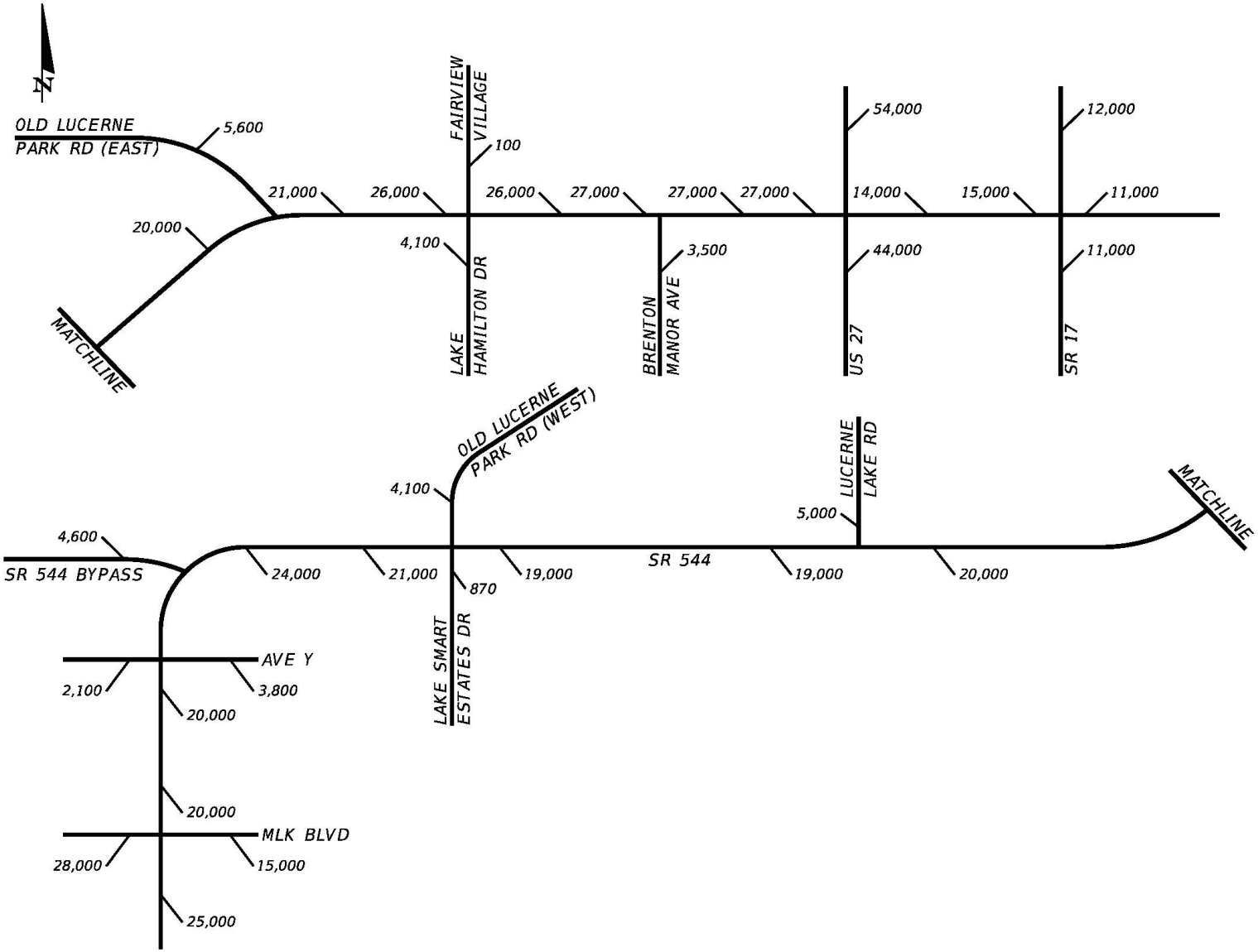

Figure 3-12: Opening Year (2025) AADT Volumes – Build Alternative No. 3

As previously discussed in **Section 2.0** of this report, the overall average D-factor for the study corridor was calculated to be approximately 53.5% in the a.m. peak hour and approximately 53.7% in the p.m. peak hour. A review of the FDOT's Historical AADT Report for the telemetered (permanent) count station on SR 544 west of Old Lucerne Park Road – east end (i.e., FDOT Count Station No. 160275) indicates the 2019 D-factor is 52.9% for this location. This D-factor value represents the median D-factor of the 200 highest volume hours for the entire year and compares favorably to the overall average peak hour D-factors for the entire study corridor. In addition, the average D-factor for this permanent count station location over the ten-year period from 2010 to 2019 is approximately 53.1%. Consequently, a D-factor value equal to 53.0% was used for this study.

3.3 Opening Year (2025) and Design Year (2045) Peak Hour Volumes

The design year (2045) a.m. and p.m. peak hour volumes were initially estimated with the use of the FDOT's TURNS5 software. The existing (2019) and future year AADT volumes were used as inputs along with a Standard K-factor of 9.0%, a D-factor of 53.0% and the existing peak hour turning movement percentages. The 2045 peak hour volumes obtained from the TURNS5 software were subsequently reviewed for reasonableness. Based on this review it was determined that manual adjustments to the output were appropriate for one or more of the following reasons:

- To increase individual movement volumes that were estimated to be less than existing volumes (if there was not a reasonable explanation for this);
- To obtain very similar (if not identical) approach and departure volumes for Build Alternatives that were projected to have the exact same AADT volume for a given intersection leg; and
- To obtain SR 544 mainline approach and departure volumes that more closely reflected a 53.0%/47.0% directional distribution.

The TURNS5 output is provided in **Appendix J1**. Spreadsheets comparing the existing peak hour turning movement volumes and the initial TURNS5 design year peak hour turning movement volumes, as well as the existing peak hour turning movement volumes and the final (adjusted) design year peak hour turning movement volumes are also provided in **Appendix J1**. The design year (2045) a.m. peak hour volumes for the No-Build Alternative and Build Alternative No 1 are graphically depicted in **Figure 3-13** and **Figure 3-14**, while the design year (2045) p.m. peak hour volumes are graphically depicted in **Figure 3-15** and **Figure 3-16**. The opening year (2025) peak hour volumes for these two alternatives were derived by interpolating between the existing (2019) peak hour volumes and the design year (2045) peak hour volumes. The opening year (2025) a.m. peak hour volumes for these two alternatives are graphically depicted in **Figure 3-17** and **Figure 3-18,** while the opening year (2025) p.m. peak hour volumes are graphically depicted in **Figure 3-19** and **Figure 3-20**.

At the time of preparation of this document, the costs and impacts of providing a four-lane roadway between Martin Luther King Boulevard and Avenue Y have not yet been evaluated. Consequently, a.m. and p.m. peak hour volumes were also developed for Build Alternative 2.

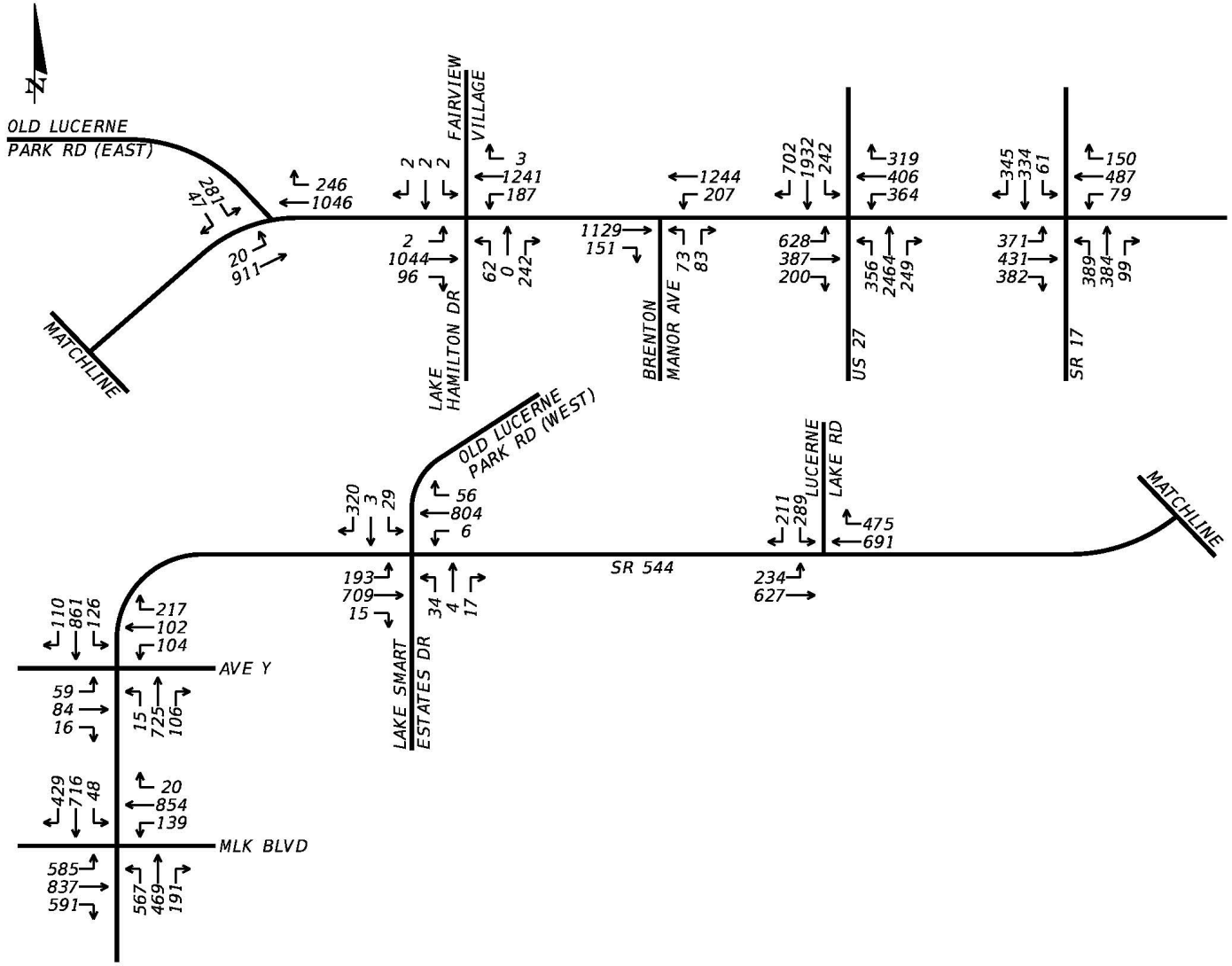

Figure 3-13: Design Year (2045) A.M. Peak Hour Intersection Volumes – No-Build Alternative

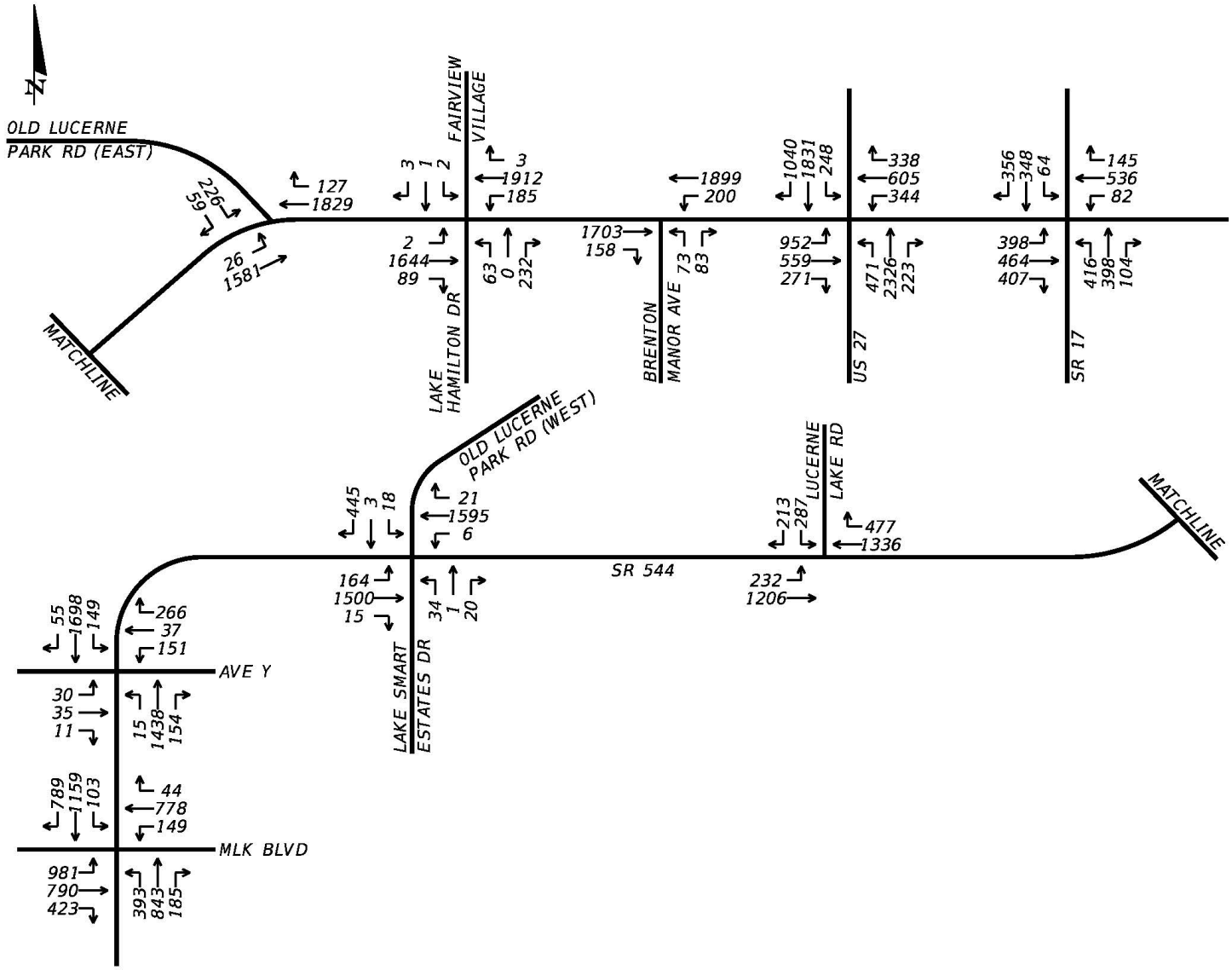

Figure 3-14: Design Year (2045) A.M. Peak Hour Intersection Volumes – Build Alternative No. 1

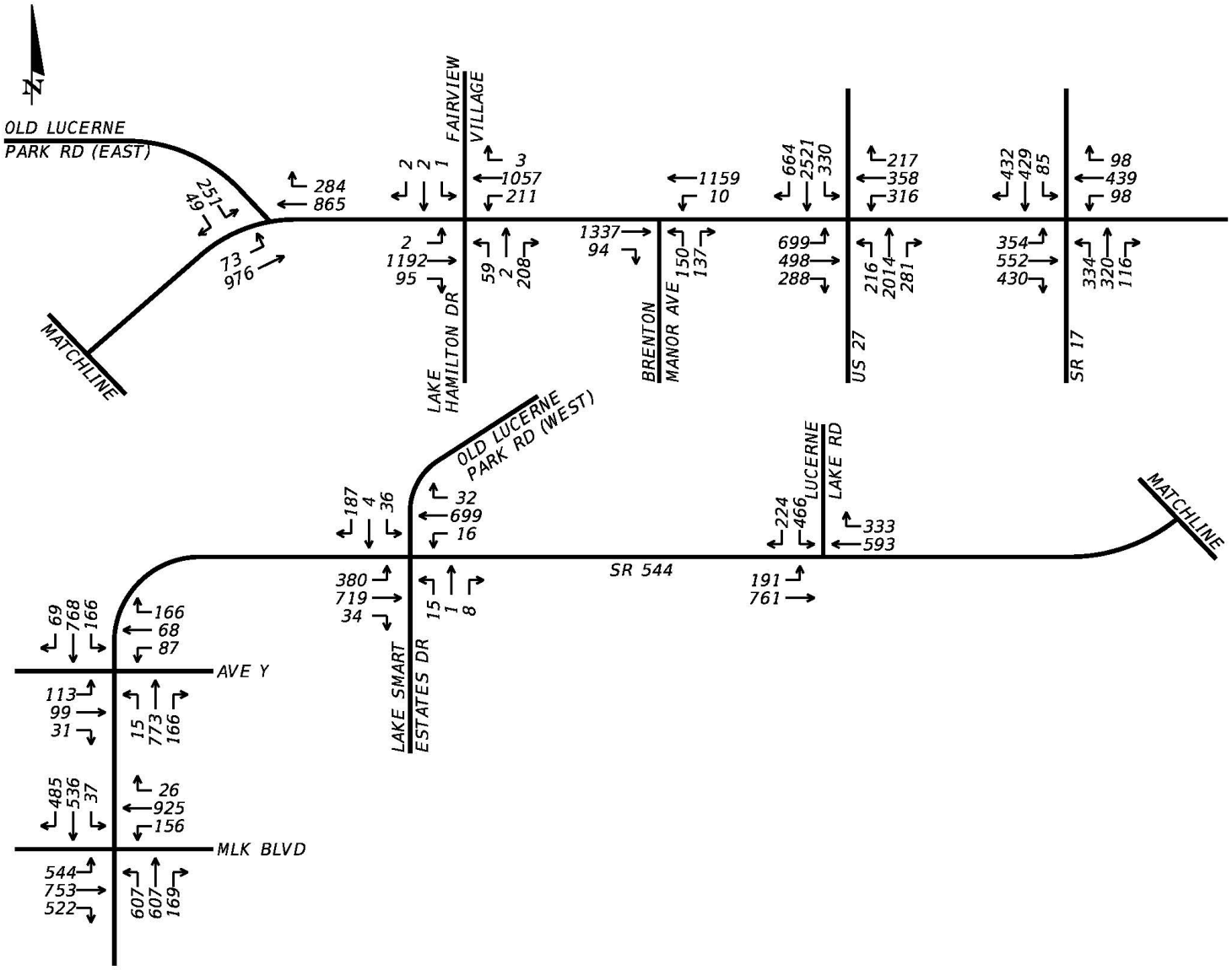

Figure 3-15: Design Year (2045) P.M. Peak Hour Intersection Volumes – No-Build Alternative

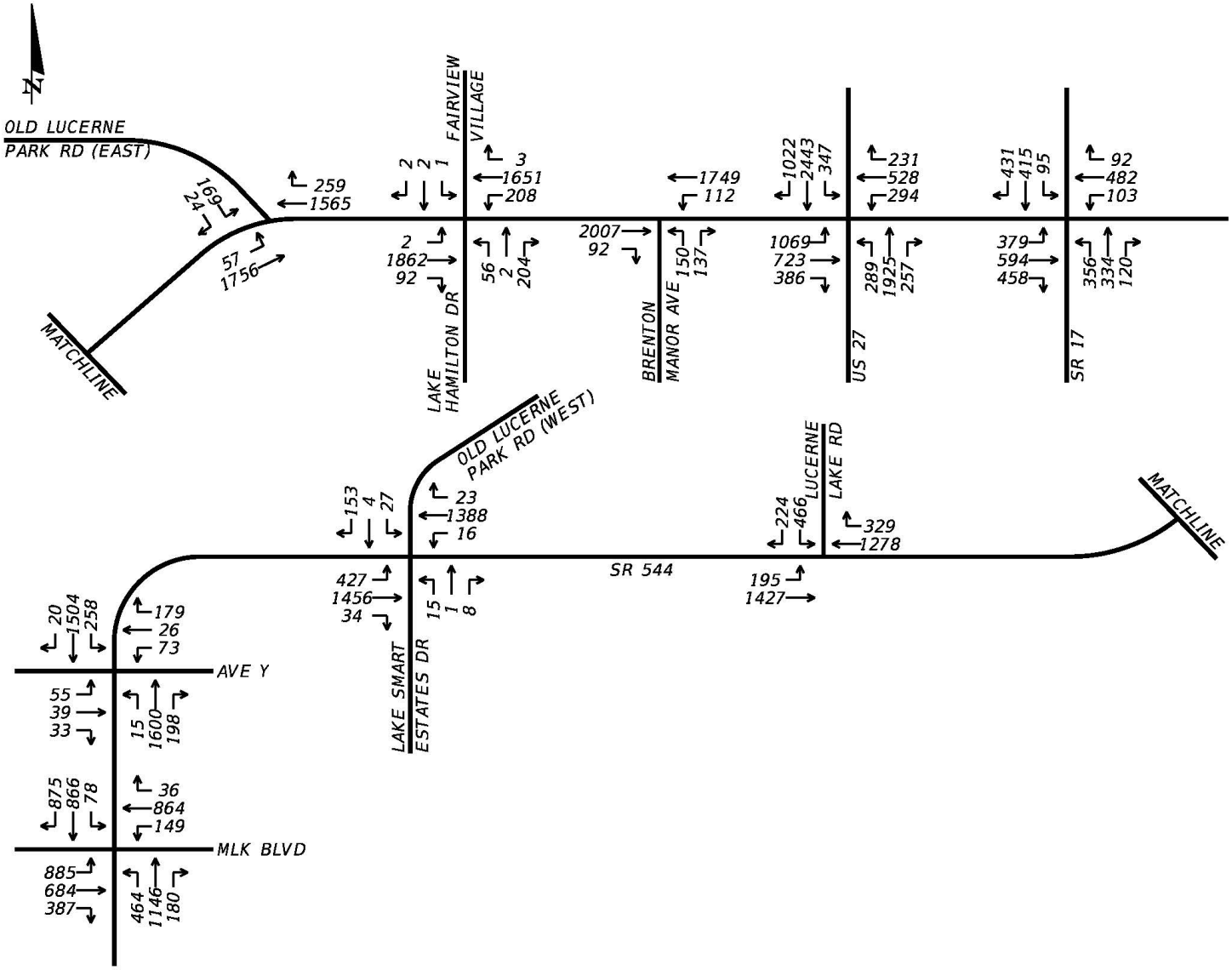

Figure 3-16: Design Year (2045) P.M. Peak Hour Intersection Volumes – Build Alternative No. 1

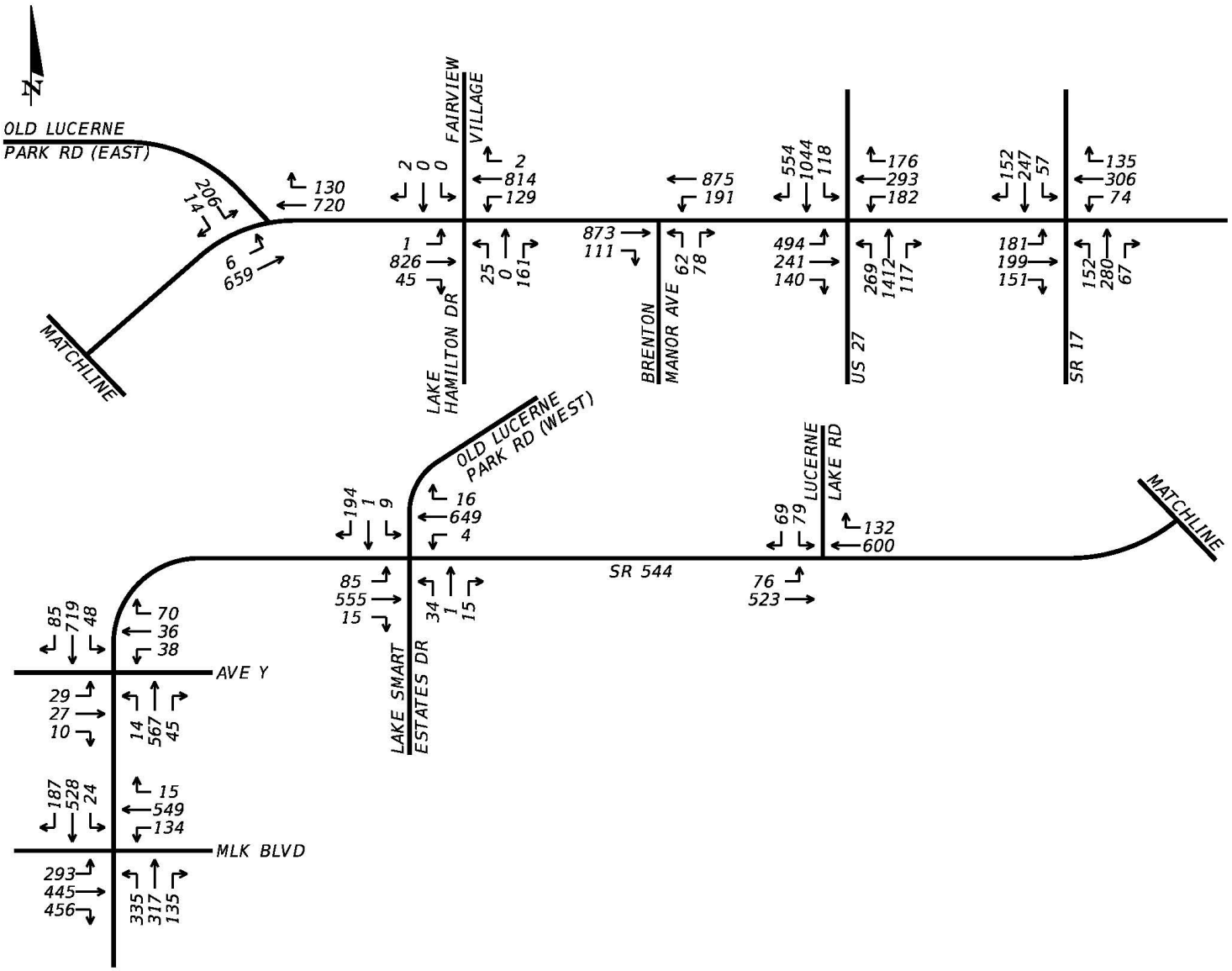

Figure 3-17: Opening Year (2025) A.M. Peak Hour Intersection Volumes – No-Build Alternative

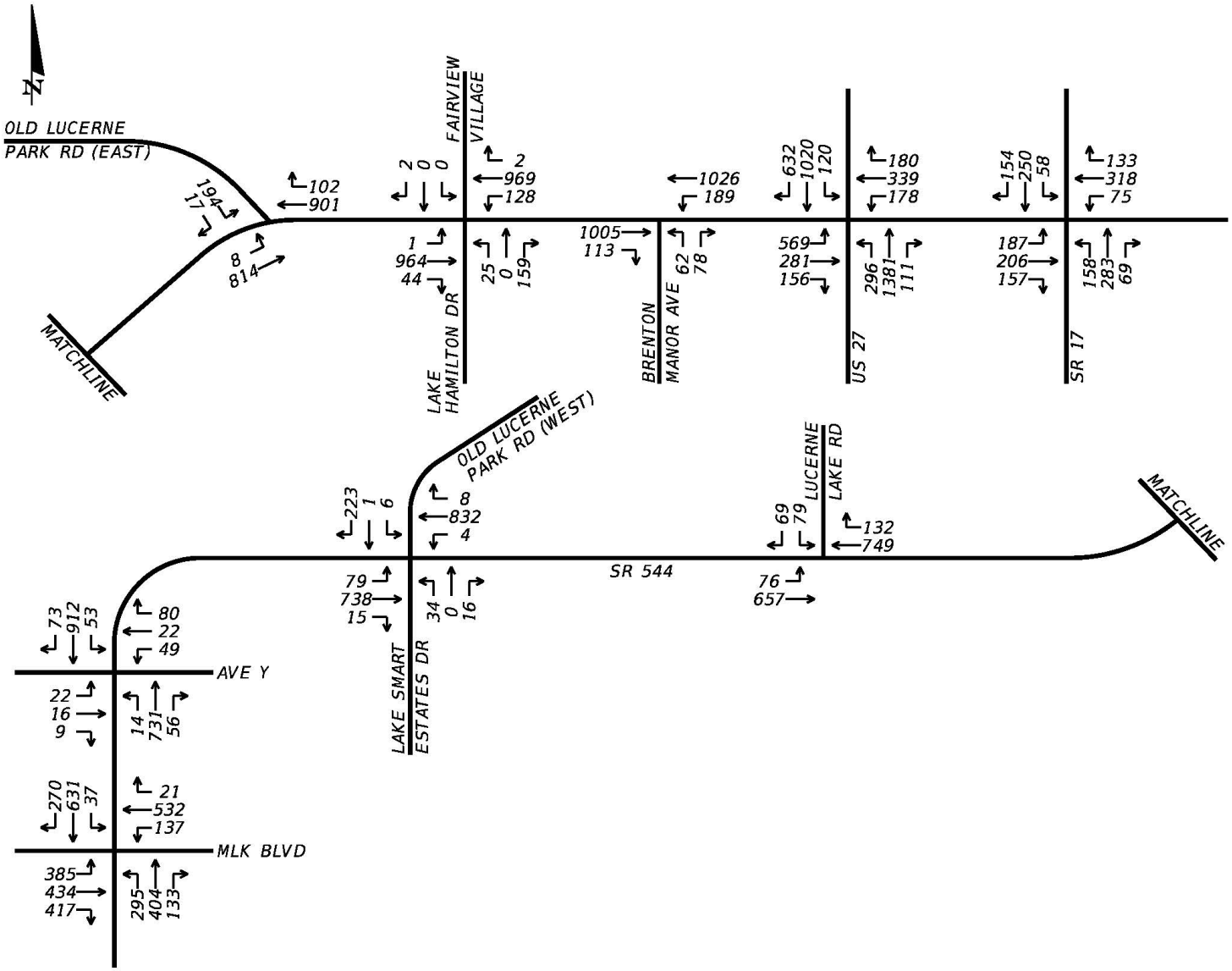

Figure 3-18: Opening Year (2025) A.M. Peak Hour Intersection Volumes – Build Alternative No. 1

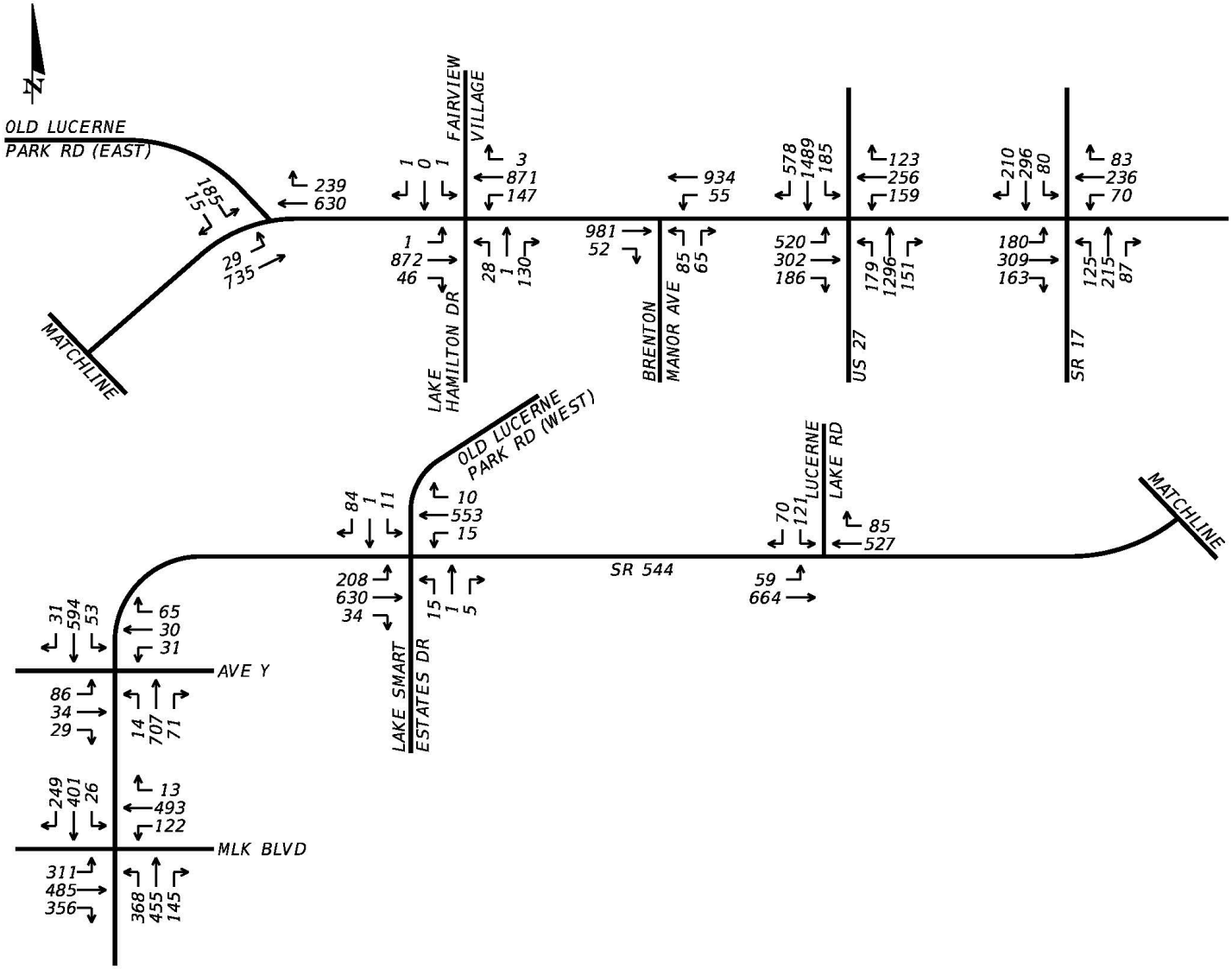

Figure 3-19: Opening Year (2025) P.M. Peak Hour Intersection Volumes – No-Build Alternative

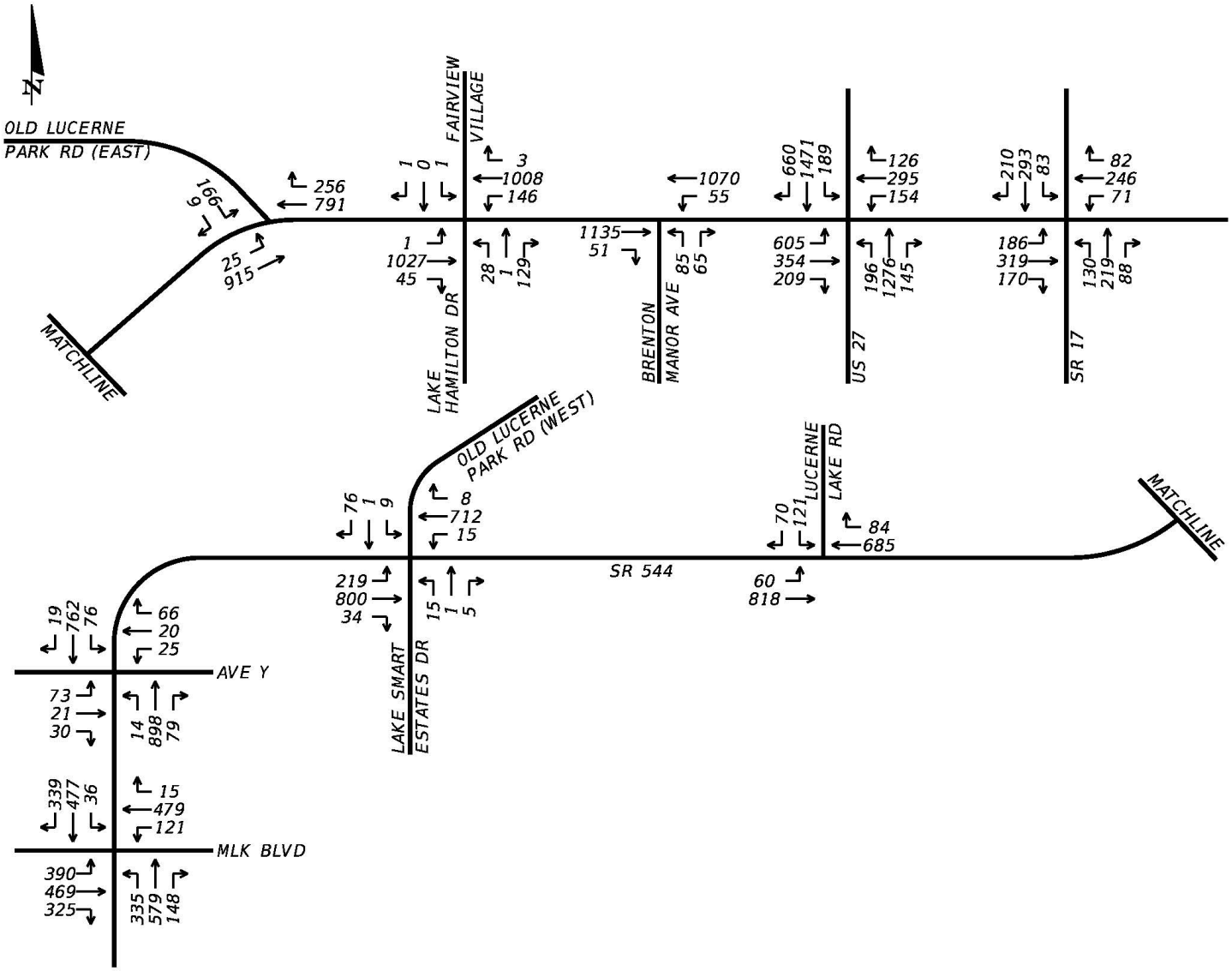

Figure 3-20: Opening Year (2025) P.M. Peak Hour Intersection Volumes – Build Alternative No. 1

The Design Year (2045) a.m. and p.m. peak hour volumes for Build Alternative No. 2 are graphically depicted in **Figure 3-21** and **Figure 3-22**, respectively. The Opening Year (2025) a.m. and p.m. peak hour volumes for Build Alternative No.2 are graphically depicted in **Figure 3-23** and **Figure 3-24**, respectively.

A preliminary assessment of the feasibility of providing a new four-lane bypass roadway to the west of SR 544 was conducted as part of the PD&E study. This preliminary assessment indicated the disadvantages associated with this alternative outweighed the advantages. Consequently, the District One DEMO staff decided that Build Alternative No. 3 would not be carried forward in the PD&E study at this time. A copy of the preliminary assessment memorandum is provided in **Appendix J2**.

3.4 Opening Year (2025) and Design Year (2045) Truck Volumes

The SR 544 daily truck volume forecasting methodology consisted of the following steps:

Step 1: The historic daily truck volumes on SR 544 between Martin Luther King Boulevard and SR 17 were estimated by multiplying the historic Average Annual Daily Traffic (AADT) volumes by the historic daily truck percentages (i.e., the historic T-factors). The historic AADT volumes and T-factors associated with the six FDOT count stations located within the PD&E study limits were obtained from the FDOT's Historical AADT Volume Reports for the years 2009 through 2019. These reports are provided in **Appendix K** and the historic daily truck volume estimates are summarized in **Table 3-7**. It should be noted that only actual AADT volumes were used to obtain daily truck volume estimates (i.e., no first year or second year AADT volume estimates were used).

Table 3-7: SR 544 Historic Daily Truck Volumes and Percentages

FDOT Count Station No.	Location	Year	AADT	T-Factor	Truck AADT	FDOT Count Station No.	Location	Year	AADT	T-Factor	Truck AADT
165153	NE of Avenue U	2009	16,900	3.80%	642	160275	W of Old Lucerne Park Road (east end)	2009	10,500	10.20%	1,071
		2010	16,400	5.40%	886			2010	10,500	9.80%	1,029
		2011						2011	10,100	9.60%	970
		2012	15,900	6.50%	1,034			2012	10,000	9.50%	950
		2013	15,000	6.60%	990			2013	10,100	9.90%	1,000
		2014						2014	10,400	10.00%	1,040
		2015	16,500	8.50%	1,403			2015	10,900	9.90%	1,079
		2016	17,300	6.80%	1,176			2016	11,800	10.30%	1,215
		2017	17,300	5.50%	952			2017	12,700	9.80%	1,245
		2018	17,800	7.10%	1,264			2018	13,600	9.70%	1,319
		2019	18,800	6.90%	1,297			2019	14,000	9.70%	1,358
160096	S of Conine Drive	2009	15,300	6.40%	979	163106	W of Hide-A-Way Lane (East of Lake Hamilton Dr)	2009	16,300	9.20%	1,500
		2010						2010			
		2011						2011			
		2012	14,200	7.50%	1,065			2012	14,800	9.50%	1,406
		2013						2013			
		2014						2014			
		2015	15,600	7.00%	1,092			2015	16,100	9.30%	1,497
		2016	16,000	7.40%	1,184			2016	16,900	10.70%	1,808
		2017	17,000	7.00%	1,190			2017	19,500	8.80%	1,716
		2018	18,100	7.00%	1,267			2018	21,000	9.40%	1,974
		2019	19,200	7.60%	1,459			2019	21,000	7.60%	1,596
160009	E of Winter Haven Boulevard	2009	11,300	8.20%	927	160021	SW of Circle 4 Drive	2009	8,400	9.10%	764
		2010						2010			
		2011						2011			
		2012	10,400	9.70%	1,009			2012	8,300	13.00%	1,079
		2013						2013			
		2014						2014			
		2015	11,500	8.40%	966			2015	8,500	12.90%	1,097
		2016	12,600	9.10%	1,147			2016			
		2017	12,500	9.90%	1,238			2017	9,100	12.90%	1,174
		2018	13,800	8.60%	1,187			2018	10,900	12.80%	1,395
		2019	14,000	8.60%	1,204			2019	11,000	13.30%	1,463

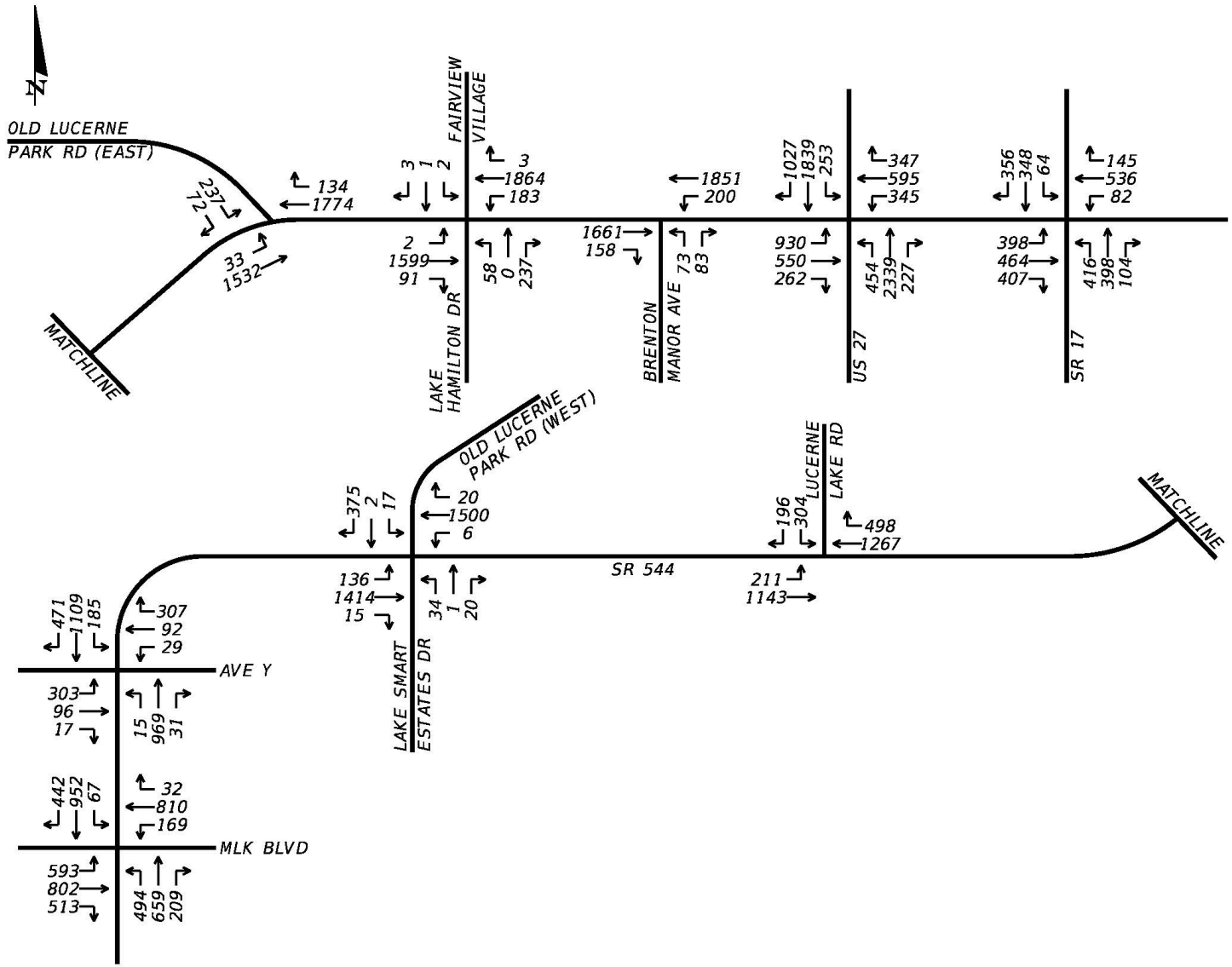

Figure 3-21: Design Year (2045) A.M. Peak Hour Intersection Volumes – Build Alternative No. 2

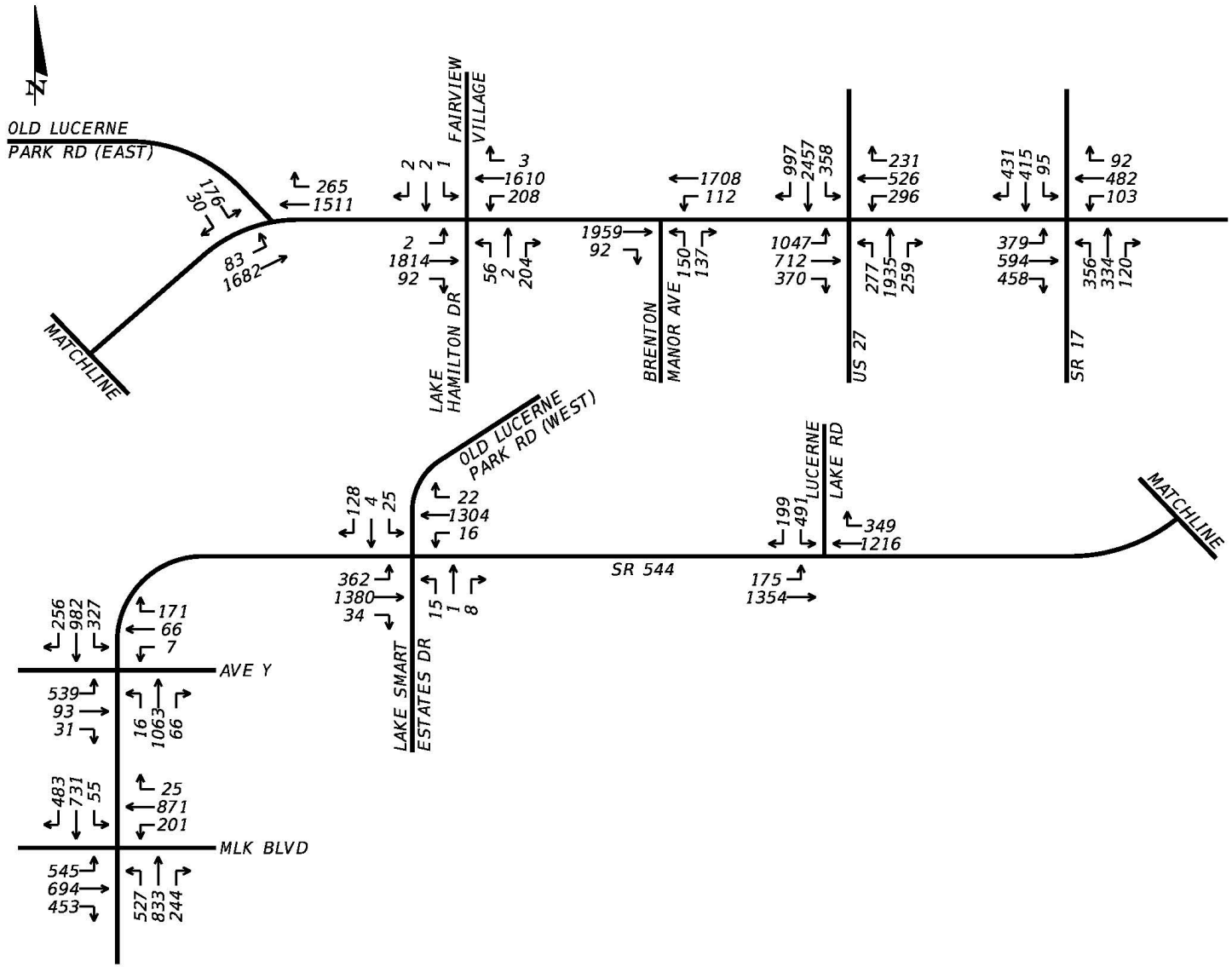

Figure 3-22: Design Year (2045) P.M. Peak Hour Intersection Volumes – Build Alternative No. 2

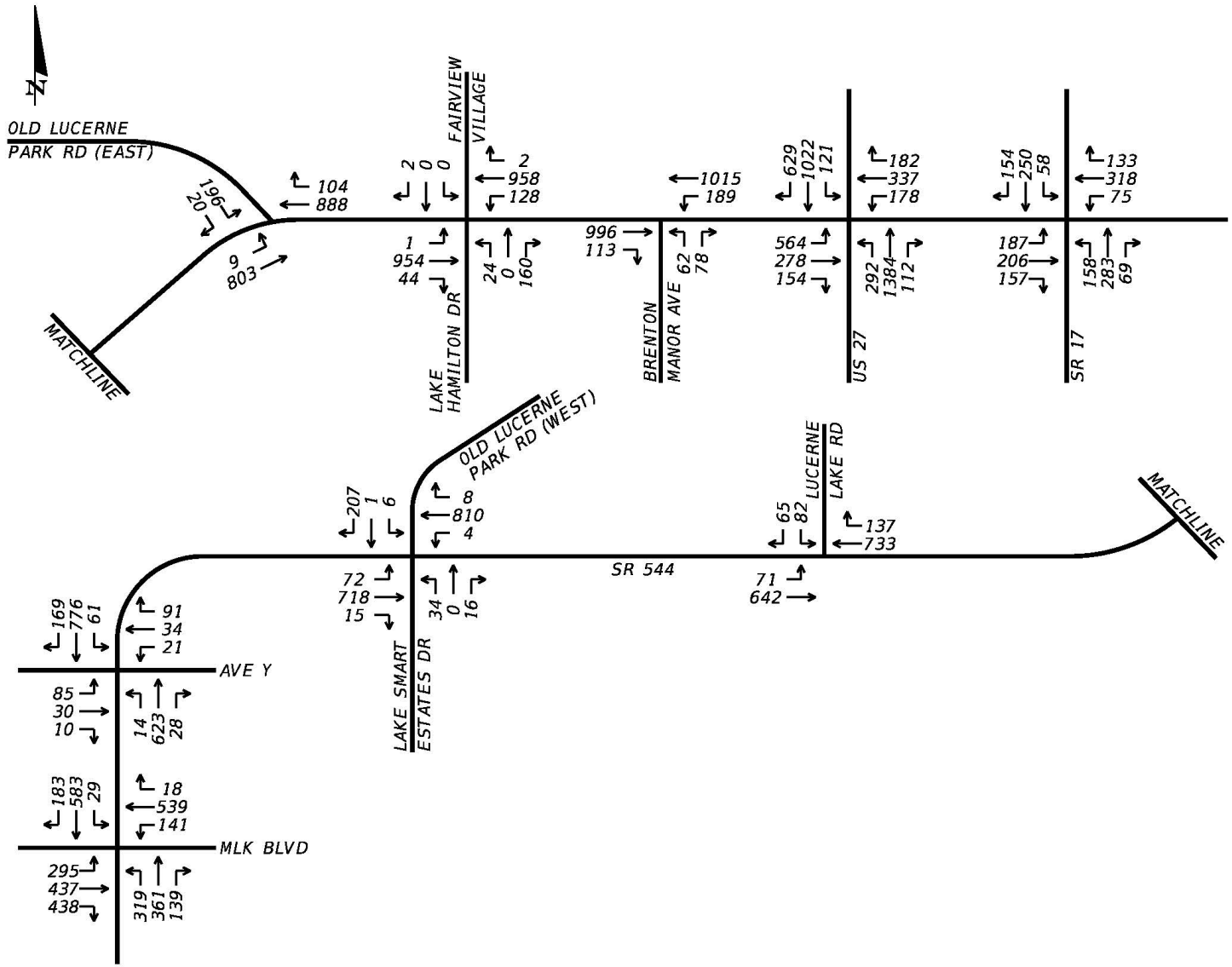

Figure 3-23: Opening Year (2025) A.M. Peak Hour Intersection Volumes – Build Alternative No. 2

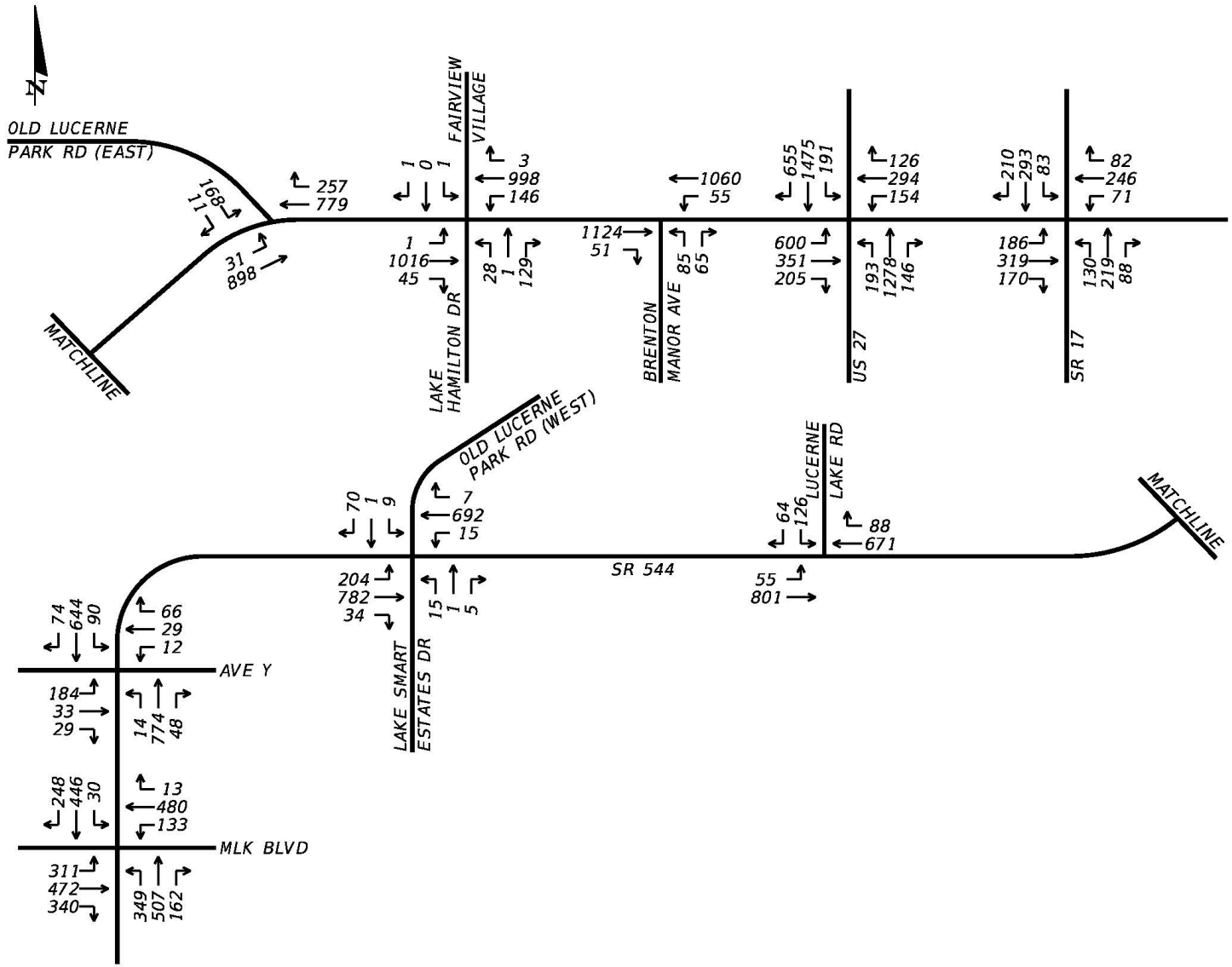

Figure 3-24: Opening Year (2025) P.M. Peak Hour Intersection Volumes – Build Alternative No. 2

Step 2: The design year (2045) daily truck volumes for the six FDOT count station locations were estimated by conducting growth trend analyses using the historic daily truck volumes and the FDOT's Traffic Trends software. The growth trend analyses are provided in **Appendix L**. A review of these analyses indicate the R^2 values associated with the trend lines range from approximately 47% to approximately 85% and with one exception, all of the R^2 values are greater than 61%. A review of the daily truck volumes at FDOT Count Station No. 163106 indicates that these volumes remained relatively constant between 2009 and 2015 and then experienced fluctuations upwards and downwards during the four-year period from 2016 to 2019, resulting in a lower R^2 value for this growth trend analysis. The design year (2045) daily truck volumes range between 1,900 trucks per day and 2,800 trucks per day,

Step 3: The design year (2045) daily truck volumes were divided by the design year (2045) AADT volumes that were previously estimated for Build Alternative No. 1, to obtain an initial estimate of the 2045 daily truck percentages. As stated previously, Build Alternative No. 1 assumes that SR 544 is widened to a four-lane divided roadway from Martin Luther King Boulevard to SR 17. The 2045 daily truck percentages for Build Alternative No. 1 are provided in **Table 3-8** and range from 5.8% to 10.8%. **Table 3-8** also indicates that the 2045 daily truck percentages exhibit only minor fluctuations for the portion of SR 544 from Martin Luther King Boulevard to US 27, ranging from 5.8% to 6.4% with an average value equal to 6.0%.

Step 4: The opening year (2025) daily truck volumes were derived by interpolating between the existing (2019) and design year (2045) daily truck volumes. The opening year (2025) daily truck volumes were estimated to range between 1,400 trucks per day and 1,900 trucks per day. The total opening year (2025) AADT volumes were also derived by interpolating between the existing (2019) and design year (2045) AADT volumes. The 2025 daily truck percentages were then estimated by dividing the 2025 daily truck volumes by the 2025 AADT volumes. The 2025 daily truck percentages for Build Alternative No. 1 are provided in Table 3-8 and range from 6.7% to 12.9%. **Table 3-8** indicates that the 2025 daily truck percentages exhibit only minor fluctuations for the portion of SR 544 from Martin Luther King Boulevard to US 27, ranging from 6.7% to 8.0% with an average value equal to 7.4%.

The results of this methodology were originally documented in a SR 544 Design Year and Opening Year Truck Volume Forecasts Technical Memorandum (dated June 7, 2020) and were approved by District One on July 9, 2020.

Table 3-8 also provides a comparison of the existing (2019), design year (2045) and opening year (2025) daily truck percentages. A review of **Table 3-8** indicates that the 2025 and 2045 daily percentages are lower than the 2019 daily percentages at all six locations. Although truck volumes are expected to increase over the 26-year period from 2019 to 2045, the increase in passenger vehicles is expected to be greater than the increase in trucks as a result of the significant amount of passenger vehicle trips that will be generated by the future residential, commercial and office land uses projected to occur within the study corridor. This will result in lower future year daily and peak hour truck percentages (compared to the existing percentages). The average yearly percentage increase in daily truck volumes over the 26-year period from 2019 to 2045 was subsequently calculated and these average yearly growth rates are also provided in

Table 3-8. The average yearly growth rates range between 2.2% per year and 4.1% per year, with an average value equal to approximately 2.8% per year. Based on the results of this daily truck volume forecasting methodology, the following daily truck percentages (i.e., T-factors) were recommended (and approved by District One) for use in the SR 544 PD&E study:

Opening Year (2025)

- 7.4% from Martin Luther King Boulevard to US 27
- 12.9% from US 27 to SR 17

Design Year (2045)

- 6.0% from Martin Luther King Boulevard to US 27
- 10.8 % from US 27 to SR 17

Initially, it was assumed that the design year (2045) and opening year (2025) peak hour truck percentages would be approximately equal to one-half the 2045 and 2025 daily truck percentages. Consequently, the 2045 two-way peak hour volumes for the portion of SR 544 west of US 27 were multiplied by 3.0%, while the 2045 two-way peak hour volumes for the portion of SR 544 east of US 27 were multiplied by 5.4%. These preliminary 2045 peak hour truck volume estimates are provided in **Table 3-9**. Similarly, the 2025 two-way peak hour volumes for the portion of SR 544 west of US 27 were multiplied by 3.7%, while the 2025 two-way peak hour volumes for the portion of SR 544 east of US 27 were multiplied by 6.4%. These preliminary 2025 peak hour truck volume estimates are provided in **Table 3-10Error! Reference source not found.**. It should be noted that the two-way peak hour volumes were derived by multiplying the AADT volumes by a standard K-factor value equal to 9.0%.

The existing a.m. and p.m. peak hour truck volumes were obtained from the intersection turning movement counts provided by the District One Traffic Operations staff. The peak hour truck turning movement counts are provided in **Appendix M**. The a.m. and p.m. peak hours for the SR 544 study corridor were previously determined to be from 7:15 a.m. to 8:15 a.m. and 4:45 p.m. to 5:45 p.m., respectively. The differences between the design year peak hour truck volumes and the existing peak hour truck volumes were calculated along with the differences between the opening year peak hour truck volumes and the existing peak hour truck volumes. These differences are included in **Table 3-9** and **Table 3-10**. A comparison of the future year peak hour truck volumes with the 2019 peak hour truck volumes indicated that a reasonable amount of growth was estimated for the p.m. peak hour. However, many of the 2025 a.m. peak hour truck volumes were lower than the 2019 a.m. peak hour truck volumes. In addition, there were several 2045 a.m. peak hour truck volumes that were only slightly greater than the 2019 a.m. peak hour truck volumes.

Table 3-8: SR 544 Design Year (2045) and Opening Year (2025) Daily Truck Volumes and Percentages

Location	Build Alternative No. 1 (2045)			Existing (2019)			2019 - 2045	Build Alternative No. 1 (2025)		
	AADT	Truck AADT	Daily Truck %	AADT	Truck AADT	Daily Truck %	% Incr/Year	AADT	Truck AADT	Daily Truck %
North of MLK Blvd	43,000	2,700	6.3%	18,800	1,300	6.9%	4.1%	24,000	1,600	6.7%
South of Conine Dr	40,000	2,400	6.0%	19,200	1,500	7.6%	2.3%	24,000	1,700	7.1%
East of Winter Haven Blvd	33,000	1,900	5.8%	14,000	1,200	8.6%	2.2%	18,000	1,400	7.8%
West of Old Lucerne Park Rd (east end)	38,000	2,200	5.8%	14,000	1,400	9.7%	2.2%	20,000	1,600	8.0%
West of Hide-A-Way Ln	44,000	2,800	6.4%	21,000	1,600	7.6%	2.9%	26,000	1,900	7.3%
Average			6.0%			8.1%	2.8%			7.4%
West of Circle 4 Dr	26,000	2,800	10.8%	11,000	1,500	13.3%	3.3%	14,000	1,800	12.9%

Table 3-9: Existing and Design Year Two-Way Peak Hour Truck Volumes

Location	Build Alternative No. 1 (2045)			Existing AM PK Hr	Existing PM PK Hr	AM Pk Hr	PM Pk Hr	Existing AM/PM	Build Alternative No. 1 (2045)	
	AADT	Two-Way Pk Hr Volume	Two-Way AM/PM Pk Hr Truck Volume [1]	Two-Way Pk Hr Truck Volume	Two-Way Pk Hr Truck Volume	Truck Voume Difference	Truck Voume Difference	Pk Hr Truck Voume Ratio	Two-Way AM Pk Hr Truck Volume [2]	Two-Way PM Pk Hr Truck Volume [2]
North of M. L. King Boulevard	43,000	3,870	116	54	34	62	82	1.59	174	116
South of Avenue Y	38,000	3,420	103	N/A	41	N/A	62	N/A	154	103
North of Avenue Y	40,000	3,600	108	N/A	44	N/A	64	N/A	162	108
West of Old Lucerne Park Road (west end)	40,000	3,600	108	64	N/A	44	N/A	N/A	162	108
East of Old Lucerne Park Road (west end)	34,000	3,060	92	56	N/A	36	N/A	N/A	138	92
West of Lucerne Lake Road	33,000	2,970	89	50	54	39	35	0.93	134	89
East of Lucerne Lake Road	38,000	3,420	103	56	54	47	49	1.04	154	103
West of Old Lucerne Park Road (east end)	38,000	3,420	103	85	N/A	18	N/A	N/A	154	103
East of Old Lucerne Park Road (east end)	41,000	3,690	111	104	N/A	7	N/A	N/A	166	111
West of Lake Hamilton Drive/Fairview Village	41,000	3,690	111	98	62	13	49	1.58	166	111
East of Lake Hamilton Drive/Fairview Village	44,000	3,960	119	103	67	16	52	1.54	178	119
West of Brenton Manor Avenue	44,000	3,960	119	112	79	7	40	1.42	178	119
East of Brenton Manor Avenue	44,000	3,960	119	111	77	8	42	1.44	178	119
West of US 27	44,000	3,960	119	97	87	22	32	1.11	178	119
East of US 27	26,000	2,340	126	68	40	58	86	1.70	190	126
West of SR 17	30,000	2,700	146	72	27	74	119	2.67	219	146
Average								1.50		

[1] *Initial estimate*

[2] *Final estimate*

Table 3-10: Existing and Opening Year Two-Way Peak Hour Truck Volumes

Location	Build Alternative No. 1 (2025)			Existing AM PK Hr	Existing PM PK Hr	AM Pk Hr	PM Pk Hr	Existing AM/PM	Build Alternative No. 1 (2025)	
	AADT	Two-Way Pk Hr Volume	Two-Way AM/PM Pk Hr Truck Volume [1]	Two-Way Pk Hr Truck Volume	Two-Way Pk Hr Truck Volume	Truck Voume Difference	Truck Voume Difference	Pk Hr Truck Voume Ratio	Two-Way AM Pk Hr Truck Volume [2]	Two-Way PM Pk Hr Truck Volume [2]
North of M. L. King Boulevard	24,000	2,160	80	54	34	26	46	1.59	120	80
South of Avenue Y	24,000	2,160	80	N/A	41	N/A	39	N/A	120	80
North of Avenue Y	25,000	2,250	83	N/A	44	N/A	39	N/A	125	83
West of Old Lucerne Park Road (west end)	22,000	1,980	73	64	N/A	9	N/A	N/A	110	73
East of Old Lucerne Park Road (west end)	19,000	1,710	63	56	N/A	7	N/A	N/A	95	63
West of Lucerne Lake Road	18,000	1,620	60	50	54	10	6	0.93	90	60
East of Lucerne Lake Road	20,000	1,800	67	56	54	11	13	1.04	100	67
West of Old Lucerne Park Road (east end)	20,000	1,800	67	85	N/A	-18	N/A	N/A	100	67
East of Old Lucerne Park Road (east end)	21,000	1,890	70	104	N/A	-34	N/A	N/A	105	70
West of Lake Hamilton Drive/Fairview Village	26,000	2,340	87	98	62	-11	25	1.58	130	87
East of Lake Hamilton Drive/Fairview Village	26,000	2,340	87	103	67	-16	20	1.54	130	87
West of Brenton Manor Avenue	27,000	2,430	90	112	79	-22	11	1.42	135	90
East of Brenton Manor Avenue	27,000	2,430	90	111	77	-21	13	1.44	135	90
West of US 27	27,000	2,430	90	97	87	-7	3	1.11	135	90
East of US 27	14,000	1,260	81	68	40	13	41	1.70	121	81
West of SR 17	15,000	1,350	86	72	27	14	59	2.67	130	86
Average								1.50		

[1] *Initial estimate*

[2] *Final estimate*

A review of the existing a.m. and p.m. peak hour truck volumes indicates that, with one exception, the a.m. peak hour volumes are higher than the p.m. peak hour volumes. The ratio of the a.m. and p.m. peak hour truck volume was calculated for each location and then the overall average ratio for the study corridor was calculated. The average overall ratio was equal to 1.50. A revised estimate of the 2025 and 2045 a.m. peak hour truck volumes was obtained by multiplying the initial estimate of the 2025 and 2045 a.m. peak hour truck volumes by 1.50. The revised 2025 and 2045 a.m. peak hour truck volumes are also provided in **Table 3-9** and Table 3-10. The final recommended 2045 and 2025 peak hour truck volumes and percentages are provided in **Table 3-11** and **Table 3-12**, respectively. Based on these assumptions, the following SR 544 mainline peak hour truck percentages (i.e., T_{PkHr}-factors) are recommended for use in the SR 544 PD&E study:

Opening Year (2025) – AM Peak Hour

- 5.6% from Martin Luther King Boulevard to US 27
- 9.6% from US 27 to SR 17

Opening Year (2025) – PM Peak Hour

- 3.7% from Martin Luther King Boulevard to US 27
- 6.4% from US 27 to SR 17

Design Year (2045) – AM Peak Hour

- 4.5% from Martin Luther King Boulevard to US 27
- 8.1 % from US 27 to SR 17

Design Year (2045) – PM Peak Hour

- 3.0% from Martin Luther King Boulevard to US 27
- 5.4 % from US 27 to SR 17

Table 3-11: Final SR 544 Mainline Design Year Peak Hour Truck Volumes and Percentages

Location	Build Alternative No. 1 (2045)					
	AADT	Two-Way Pk Hr Volume	Two-Way AM Pk Hr Truck Volume	Two-Way AM Pk Hr Truck Percentage	Two-Way PM Pk Hr Truck Volume	Two-Way PM Pk Hr Truck Percentage
North of M. L. King Boulevard	43,000	3,870	174	4.5%	116	3.0%
South of Avenue Y	38,000	3,420	154	4.5%	103	3.0%
North of Avenue Y	40,000	3,600	162	4.5%	108	3.0%
West of Old Lucerne Park Road (west end)	40,000	3,600	162	4.5%	108	3.0%
East of Old Lucerne Park Road (west end)	34,000	3,060	138	4.5%	92	3.0%
West of Lucerne Lake Road	33,000	2,970	134	4.5%	89	3.0%
East of Lucerne Lake Road	38,000	3,420	154	4.5%	103	3.0%
West of Old Lucerne Park Road (east end)	38,000	3,420	154	4.5%	103	3.0%
East of Old Lucerne Park Road (east end)	41,000	3,690	166	4.5%	111	3.0%
West of Lake Hamilton Drive/Fairview Village	41,000	3,690	166	4.5%	111	3.0%
East of Lake Hamilton Drive/Fairview Village	44,000	3,960	178	4.5%	119	3.0%
West of Brenton Manor Avenue	44,000	3,960	178	4.5%	119	3.0%
East of Brenton Manor Avenue	44,000	3,960	178	4.5%	119	3.0%
West of US 27	44,000	3,960	178	4.5%	119	3.0%
East of US 27	26,000	2,340	190	8.1%	126	5.4%
West of SR 17	30,000	2,700	219	8.1%	146	5.4%

Table 3-12: Final SR 544 Mainline Opening Year Peak Hour Truck Volumes and Percentages

Location	Build Alternative No. 1 (2025)					
	AADT	Two-Way Pk Hr Volume	Two-Way AM Pk Hr Truck Volume	Two-Way AM Pk Hr Truck Percentage	Two-Way PM Pk Hr Truck Volume [2]	Two-Way PM Pk Hr Truck Percentage
North of M. L. King Boulevard	24,000	2,160	120	5.6%	80	3.7%
South of Avenue Y	24,000	2,160	120	5.6%	80	3.7%
North of Avenue Y	25,000	2,250	125	5.6%	83	3.7%
West of Old Lucerne Park Road (west end)	22,000	1,980	110	5.6%	73	3.7%
East of Old Lucerne Park Road (west end)	19,000	1,710	95	5.6%	63	3.7%
West of Lucerne Lake Road	18,000	1,620	90	5.6%	60	3.7%
East of Lucerne Lake Road	20,000	1,800	100	5.6%	67	3.7%
West of Old Lucerne Park Road (east end)	20,000	1,800	100	5.6%	67	3.7%
East of Old Lucerne Park Road (east end)	21,000	1,890	105	5.6%	70	3.7%
West of Lake Hamilton Drive/Fairview Village	26,000	2,340	130	5.6%	87	3.7%
East of Lake Hamilton Drive/Fairview Village	26,000	2,340	130	5.6%	87	3.7%
West of Brenton Manor Avenue	27,000	2,430	135	5.6%	90	3.7%
East of Brenton Manor Avenue	27,000	2,430	135	5.6%	90	3.7%
West of US 27	27,000	2,430	135	5.6%	90	3.7%
East of US 27	14,000	1,260	121	9.6%	81	6.4%
West of SR 17	15,000	1,350	130	9.6%	86	6.4%

A similar approach was followed to obtain the design year (2045) and opening year (2025) truck volumes and percentages for US 27 and SR 17. The historic daily truck volumes on these two roadways were estimated by multiplying the historic Average Annual Daily Traffic (AADT) volumes by the historic daily truck percentages (i.e., the historic T-factors). The historic AADT volumes and T-factors associated with the four FDOT count stations listed below were obtained from the FDOT's Historical AADT Volume Reports for the years 2009 through 2019.

- Count Station No. 160097 – US 27 south of US 17/92 (i.e., north of SR 544)
- Count Station No. 160098 – US 27 north of Hughes Road (i.e., south of SR 544)
- Count Station No. 165049 – SR 17 north of SR 544/Lake Marion Road
- Count Station No. 160046 – SR 17 south of SR 544/Lake Marion Road

These reports are provided in **Appendix K** and the historic daily truck volume estimates are summarized in **Table 3-13**. It should be noted that only actual AADT volumes were used to obtain daily truck volume estimates (i.e., no first year or second year AADT volume estimates were used).

The design year (2045) daily truck volumes for the four FDOT count station locations were estimated by conducting growth trend analyses using the historic daily truck volumes and the FDOT's Traffic Trends software. The growth trend analyses are provided in **Appendix L**. A review of these analyses indicate the R^2 values associated with Count Station No. 160098 and Count Station No. 165049 are extremely low. A review of the daily truck volumes at these two locations indicates that these volumes did not experience any appreciable growth over the ten-year period. Consequently, the design year and opening year daily truck percentages for these two locations were assumed to be equal to the 2019 daily truck percentages obtained from the FDOT's 2019 AADT Volume Reports. For the other two locations, the design year (2045) daily truck volumes were divided by the design year (2045) AADT volumes that were previously estimated for Build Alternative No. 1, to obtain estimates of the 2045 daily truck percentages.

Table 3-13: US 27 and SR 17 Historic Daily Truck Volumes and Percentages

FDOT Count Station No.	Location	Year	AADT	T-Factor	Truck AADT	FDOT Count Station No.	Location	Year	AADT	T-Factor	Truck AADT
160097	US 27 South of US 17/92 (north of SR 544)	2009	38,500	10.80%	4,158	165049	SR 17 North of SR 544/Lake Marion Road	2009	10,600	5.20%	551
		2010	37,000	11.30%	4,181			2010			0
		2011						2011			0
		2012	41,000	8.90%	3,649			2012	8,400	7.00%	588
		2013						2013			0
		2014						2014			0
		2015	41,500	11.60%	4,814			2015			0
		2016	47,500	10.30%	4,893			2016	7,500	5.90%	443
		2017	45,000	10.50%	4,725			2017	9,100	6.70%	610
		2018	48,000	10.60%	5,088			2018	9,400	7.60%	714
		2019	46,500	9.90%	4,604			2019	9,700	6.50%	631
160098	US 27 North of Hughes Road (south of SR 544)	2009	29,000	13.90%	4,031	160046	SR 17 South of SR 544/Lake Marion Road	2009	5,900	10.40%	614
		2010						2010			0
		2011						2011			0
		2012	29,500	10.60%	3,127			2012	5,900	10.90%	643
		2013						2013			0
		2014	32,000	11.60%	3,712			2014			0
		2015	35,000	11.60%	4,060			2015	5,000	12.00%	600
		2016	38,500	11.60%	4,466			2016			0
		2017	34,000	11.60%	3,944			2017	6,600	12.00%	792
		2018	38,000	10.30%	3,914			2018	8,200	9.30%	763
		2019	39,500	10.30%	4,069			2019	8,300	9.40%	780

This resulted in the following 2045 daily truck percentages:

- US 27 south of US 17/92 (i.e., north of SR 544) – 9.9%
- US 27 north of Hughes Road (i.e., south of SR 544) – 10.3%
- SR 17 north of SR 544/Lake Marion Road – 6.5%
- SR 17 south of SR 544/Lake Marion Road – 7.0%

It should be noted that the estimated 2045 daily truck percentage for US 27 north of SR 544 is equal to the 2019 daily truck percentage. The opening year (2025) daily truck volume for SR 17 south of SR 544 was derived by interpolating between the existing (2019) and design year (2045) daily truck volumes. This resulted in a 2025 truck volume equal to approximately 900 trucks. The 2025 daily truck volume was subsequently divided by the 2025 AADT volume (i.e., 11,000 vehicles per day) to obtain a 2025 daily truck percentage equal to approximately 8.2%. The 2045 and 2025 daily truck volumes and percentages for Build Alternative No. 1 are provided in **Table 3-14**. The average yearly percentage increase in daily truck volumes over the 26-year period from 2019 to 2045 was subsequently calculated and these average yearly growth rates are also provided in **Table 3-14**. The average yearly growth rates range between 2.0% per year and 3.8% per year.

Table 3-14: Design Year (2045) and Opening Year (2025) Daily Truck Volumes and Percentages for US 27 and SR 17

	Build Alternative No. 1 (2045)			Existing (2019)			2019 - 2045	Build Alternative No. 1 (2025)		
Location	AADT	Truck AADT [1]	Daily Truck %	AADT	Truck AADT [1]	Daily Truck %	% Incr/Year	AADT	Truck AADT [1]	Daily Truck %
US 27 North of SR 544	77,000	7,600	9.9%	46,500	4,600	9.9%	2.5%	54,000	5,300	9.9%
US 27 South of SR 544	61,000	6,200	10.3%	39,500	4,100	10.3%	2.0%	44,000	4,500	10.3%
SR 17 North of SR 544	19,000	1,200	6.5%	10,000	600	6.5%	3.8%	12,000	800	6.5%
SR 17 South of SR 544	20,000	1,400	7.0%	8,400	800	9.4%	2.9%	11,000	900	8.2%

[1] *Rounded to the nearest 100 vehicles*

Initially, it was assumed that the design year (2045) and opening year (2025) peak hour truck percentages would be approximately equal to one-half the 2045 and 2025 daily truck percentages. The preliminary 2045 and 2025 peak hour truck volume estimates were compared to the existing a.m. and p.m. peak hour truck volumes obtained from the intersection turning movement counts provided by the District One Traffic Operations staff. The differences between the design year peak hour truck volumes and the existing peak hour truck volumes were calculated along with the differences between the opening year peak hour truck volumes and the existing peak hour truck volumes. These differences are included in **Table 3-15**.

A comparison of the 2025 and 2019 peak hour truck volumes indicated the 2025 truck volumes were lower than the 2019 a.m. peak hour truck volumes at two locations and were only marginally higher the 2019 a.m. peak hour truck volumes at the other two locations. In addition, a comparison of the 2045 and 2019 peak hour truck volumes indicated the 2045 truck volumes did not reflect reasonable growth over a 26-year period for both the SR 17 locations. As was the case with the SR 544 mainline, a review of the existing a.m. and p.m. peak hour truck volumes indicates the a.m. peak hour volumes are higher than the p.m. peak hour volumes for all four US 27 and SR 17 locations. Consequently, revised estimates of the 2025 and 2045 a.m. peak hour truck volumes

were obtained by multiplying the initial estimates of the 2025 and 2045 a.m. peak hour truck volumes by the individual ratios of the a.m. to p.m. peak hour truck volumes. Revised estimates of the 2025 a.m. peak hour truck volumes were calculated for all four locations, while revised estimates of the 2045 a.m. peak hour truck volumes were only calculated for the two SR 17 locations. The final estimates of the 2025 and 2045 peak hour truck volumes are also provided in **Table 3-15**.

Table 3-15: Existing, Opening Year and Design Year Two-Way Peak Hour Truck Volumes for US 27 and SR 17

Location	Build Alternative No. 1 (2045) AADT	Two-Way Pk Hr Volume	Two-Way AM/PM Pk Hr Truck Volume [1]	Existing AM PK Hr Two-Way Pk Hr Truck Volume	Existing PM PK Hr Two-Way Pk Hr Truck Volume	AM Pk Hr Truck Voume Difference	PM Pk Hr Truck Voume Difference	Existing AM/PM Pk Hr Truck Voume Ratio	Build Alternative No. 1 (2045) Two-Way AM Pk Hr Truck Volume [2]	Two-Way PM Pk Hr Truck Volume [2]
US 27 North of SR 544	77,000	6,930	347	256	207	91	140	1.24	347	347
US 27 South of SR 544	61,000	5,490	285	199	173	86	112	1.15	285	285
SR 17 North of SR 544	19,000	1,710	56	56	22	0	34	2.55	144	56
SR 17 South of SR 544	20,000	1,800	63	37	25	26	38	1.48	93	63
Location	**Build Alternative No. 1 (2025) AADT**	**Two-Way Pk Hr Volume**	**Two-Way AM/PM Pk Hr Truck Volume [1]**	**Existing AM PK Hr Two-Way Pk Hr Truck Volume**	**Existing PM PK Hr Two-Way Pk Hr Truck Volume**	**AM Pk Hr Truck Voume Difference**	**PM Pk Hr Truck Voume Difference**	**Existing AM/PM Pk Hr Truck Voume Ratio**	**Build Alternative No. 1 (2025) Two-Way AM Pk Hr Truck Volume [2]**	**Two-Way PM Pk Hr Truck Volume [2]**
US 27 North of SR 544	54,000	4,860	243	256	207	-13	36	1.24	301	243
US 27 South of SR 544	44,000	3,960	206	199	173	7	33	1.15	237	206
SR 17 North of SR 544	12,000	1,080	36	56	22	-20	14	2.55	91	36
SR 17 South of SR 544	11,000	990	41	37	25	4	16	1.48	60	41

[1] *Initial estimate*

[2] *Final estimate*

Based on these assumptions, the following peak hour truck percentages (i.e., T_{PkHr}-factors) are recommended for use in the SR 544 PD&E study for US 27 and SR 17:

Opening Year (2025) – AM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 6.2%
- US 27 north of Hughes Road (i.e., south of SR 544) – 6.0%
- SR 17 north of SR 544/Lake Marion Road – 8.4%
- SR 17 south of SR 544/Lake Marion Road – 6.1%

Opening Year (2025) – PM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 5.0%
- US 27 north of Hughes Road (i.e., south of SR 544) – 5.2%
- SR 17 north of SR 544/Lake Marion Road – 3.3%
- SR 17 south of SR 544/Lake Marion Road – 4.1%

Design Year (2045) – AM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 5.0%
- US 27 north of Hughes Road (i.e., south of SR 544) – 5.2%
- SR 17 north of SR 544/Lake Marion Road – 8.4%
- SR 17 south of SR 544/Lake Marion Road – 5.2%

Design Year (2045) – PM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 5.0%
- US 27 north of Hughes Road (i.e., south of SR 544) – 5.2%
- SR 17 north of SR 544/Lake Marion Road – 3.3%
- SR 17 south of SR 544/Lake Marion Road – 3.5%

The final recommended 2045 and 2025 peak hour truck volumes and percentages for US 27 and SR 17 are also summarized in **Table 3-16**.

Table 3-16: Final Design Year and Opening Year Peak Hour Truck Volumes and Percentages for US 27 and SR 17

	Build Alternative No. 1 (2045)					
Location	AADT	Two-Way Pk Hr Volume	Two-Way AM Pk Hr Truck Volume	Two-Way AM Pk Hr Truck Percentage	Two-Way PM Pk Hr Truck Volume	Two-Way PM Pk Hr Truck Percentage
US 27 North of SR 544	77,000	6,930	347	5.0%	347	5.0%
US 27 South of SR 544	61,000	5,490	285	5.2%	285	5.2%
SR 17 North of SR 544	19,000	1,710	144	8.4%	56	3.3%
SR 17 South of SR 544	20,000	1,800	93	5.2%	63	3.5%
	Build Alternative No. 1 (2025)					
Location	AADT	Two-Way Pk Hr Volume	Two-Way AM Pk Hr Truck Volume	Two-Way AM Pk Hr Truck Percentage	Two-Way PM Pk Hr Truck Volume	Two-Way PM Pk Hr Truck Percentage
US 27 North of SR 544	54,000	4,860	301	6.2%	243	5.0%
US 27 South of SR 544	44,000	3,960	237	6.0%	206	5.2%
SR 17 North of SR 544	12,000	1,080	91	8.4%	36	3.3%
SR 17 South of SR 544	11,000	990	60	6.1%	41	4.1%

The existing a.m. and p.m. peak hour truck percentages calculated from the intersection turning movement count data provided by the District One Traffic Operations staff were used to derive the future year peak hour truck percentages for the seven other cross streets (i.e., Martin Luther King Boulevard, Avenue Y, Old Lucerne Park Road (west and east ends), Lucerne Lake Road, Lake Hamilton Drive and Brenton Manor Avenue). **Table 3-17** summarizes the existing a.m. and p.m. peak hour truck percentages for these cross streets, as well as the recommended future peak hour truck percentages. These percentages were used for both the design year and opening year peak hour intersection analyses.

Table 3-17: SR 544 Cross Streets Existing and Future Year Peak Hour Truck Percentages

Intersection	Movement	AM Peak Hour (7:15 - 8:15)			PM Peak Hour (4:45 -5:45)			Avg. Truck %	2025/2045 Truck %
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %		
Martin Luther King Blvd	NB LT	269	7	2.6%	299	0	0.0%		
	NB TH	275	11	4.0%	413	3	0.7%		
	NB RT	119	1	0.8%	139	0	0.0%		
	NB APPROACH	663	19	2.9%	851	3	0.4%	1.6%	2.0%
	WB LT	134	5	3.7%	113	2	1.8%		
	WB TH	462	10	2.2%	366	6	1.6%		
	WB RT	14	2	14.3%	9	0	0.0%		
	WB APPROACH	610	17	2.8%	488	8	1.6%	2.2%	2.0%
	EB LT	208	12	5.8%	243	13	5.3%		
	EB TH	330	7	2.1%	409	9	2.2%		
	EB RT	419	6	1.4%	309	3	1.0%		
	EB APPROACH	957	25	2.6%	961	25	2.6%	2.6%	3.0%
Avenue Y [1]	WB LT	17	0	0.0%	13	0	0.0%		
	WB TH	15	0	0.0%	17	0	0.0%		
	WB RT	25	1	4.0%	34	1	2.9%		
	WB APPROACH	57	1	1.8%	64	1	1.6%	1.7%	2.0%
	EB LT	19	2	10.5%	36	2	5.6%		
	EB TH	10	1	10.0%	14	0	0.0%		
	EB RT	8	0	0.0%	28	0	0.0%		
	EB APPROACH	37	3	8.1%	78	2	2.6%	2.6% [2]	3.0%
Old Lucerne Park Rd (West End)	NB TH	0	0	0.0%	N/A	N/A	N/A		
	NB RT	14	0	0.0%	N/A	N/A	N/A		
	NB APPROACH	14	0	0.0%	N/A	N/A	N/A	0.0% [3]	0.0%
	SB LT	3	0	0.0%	N/A	N/A	N/A		
	SB TH	1	0	0.0%	N/A	N/A	N/A		
	SB RT	149	4	2.7%	N/A	N/A	N/A		
	SB APPROACH	153	4	2.6%	N/A	N/A	N/A	2.6% [3]	3.0%
Lucerne Lake Rd	SB LT	16	11	68.8%	17	8	47.1%		
	SB RT	25	9	36.0%	24	8	33.3%		
	SB APPROACH	41	20	48.8%	41	16	39.0%	43.9%	44.0%
Old Lucerne Park Rd (Eest End) [4]	SB LT	174	13	7.5%	126	8	6.3%		
	SB RT	4	0	0.0%	4	0	0.0%		
	SB APPROACH	178	13	7.3%	130	8	6.2%	6.7%	7.0%
Lake Hamilton Dr	NB LT	14	1	7.1%	19	1	5.3%		
	NB TH	0	0	0.0%	1	0	0.0%		
	NB RT	134	6	4.5%	105	2	1.9%		
	NB APPROACH	148	7	4.7%	125	3	2.4%	3.6%	4.0%
	SB LT	0	0	0.0%	1	0	0.0%		
	SB TH	0	0	0.0%	0	0	0.0%		
	SB RT	2	0	0.0%	1	0	0.0%		
	SB APPROACH	2	0	0.0%	2	0	0.0%	0.0%	0.0%
Brenton Manor Ave	NB LT	58	5	8.6%	65	2	3.1%		
	NB RT	75	5	6.7%	42	0	0.0%		
	NB APPROACH	133	10	7.5%	107	2	1.9%	4.7%	5.0%
US 27	NB LT	238	5	2.1%	165	8	4.8%		
	NB TH	1,075	80	7.4%	1,060	78	7.4%		
	NB RT	76	6	7.9%	110	1	0.9%		
	NB APPROACH	1,389	91	6.6%	1,335	87	6.5%	6.5%	[5]
	SB LT	79	13	16.5%	138	10	7.2%		
	SB TH	762	88	11.5%	1,157	62	5.4%		
	SB RT	500	31	6.2%	541	25	4.6%		
	SB APPROACH	1,341	132	9.8%	1,836	97	5.3%	7.6%	[5]
SR 17	NB LT	79	9	11.4%	61	6	9.8%		
	NB TH	244	6	2.5%	180	5	2.8%		
	NB RT	57	2	3.5%	76	3	3.9%		
	NB APPROACH	380	17	4.5%	317	14	4.4%	4.4%	[5]
	SB LT	55	5	9.1%	77	0	0.0%		
	SB TH	217	10	4.6%	251	6	2.4%		
	SB RT	92	14	15.2%	141	6	4.3%		
	SB APPROACH	364	29	8.0%	469	12	2.6%	5.3%	[5]

[1] *Turning movement count data was not available for the 7:15 to 8:15 a.m. time period. The 8:00 to 9:00 a.m. time period was used for this location.*

[2] *Average peak hour truck percentage not calculated due to disparity in peak hour approach volumes. P.M. peak hour percentage recommended for use.*

[3] *A.M. peak hour percentages only.*

[4] *Turning movement count data was not available for the 4:45 to 5:45 p.m. time period. The 4:00 to 5:00 p.m. time period was used for this location.*

[5] *Alternate methodologies were used to derve the recommended a.m. and p.m. peak hour truck percentages for US 27 and SR 17.*

SECTION 4.0 FUTURE CONDITIONS TRAFFIC OPERATIONS ANALYSIS

4.1 No-Build Alternative Roadway Segments

The future conditions No-Build Alternative peak hour roadway segment level of service analyses was conducted using the two-lane highway module of the HCS. The opening year (2025) and design year (2045) level of service analyses were conducted using the following parameter values:

- PHF (Opening Year) = 0.93 (a.m. peak hour)/0.96 (p.m. peak hour)
- PHF (Design Year) = 0.95 (a.m. peak hour)/0.97 (p.m. peak hour)

The opening year (2025) and design year (2045) peak hour truck percentages that were discussed previously in **Section 3.0** of this report were also used to conduct the roadway segment level of service analyses.

4.1.1 Opening Year (2025) and Design Year (2045) No-Build Alternative Roadway Segment Levels of Service

Table 4-1 summarizes the opening year (2025) No-Build Alternative roadway segment level of service analysis results. With one exception, all of the two-lane undivided segments of SR 544 are projected to operate at Level of Service E for the peak travel direction during the a.m. peak hour. Only the portion of SR 544 from the west end of Old Lucerne Park Road to Lucerne Lake Road is projected to operate at Level of Service D during the a.m. peak hour. In addition, seven of the 11 two-lane undivided segments are also projected to operate at Level of Service E for the off-peak travel direction. Similarly, only one of the two-lane undivided segments is not projected to operate at Level of Service E for the peak travel direction during the p.m. peak hour. The 55-mph segment located east of US 27 is projected to operate at Level of Service D for both the peak and off-peak travel directions. Seven of the 11 two-lane undivided segments are also projected to operate at Level of Service E for the off-peak travel direction. The four-lane undivided segment between Peninsular Drive and SR 17 is projected to operate at Level of Service A for both travel directions during both peak hours. The No-Build Alternative opening year HCS segment analysis summary sheets are provided in **Appendix N1**.

It should be noted the existing posted speed for the portion of SR 544 from Martin Luther King Boulevard to Avenue Y is 35 mph. The lowest speed the HCS two-lane highway software allows the user to enter is 45 mph. Consequently, the base free flow speed needed to be manually modified and the average travel speed and percent free flow speed calculations needed to be conducted manually.

Table 4-1: Opening Year (2025) No-Build Alternative Peak Hour Roadway Segment Analysis Summary

AM Peak Hour														
From	To	No. of Lanes	Posted Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB % FFS [2]	NB/EB PTSF [3]	NB/EB LOS [4]	SB/WB Volume	SB/WB ATS [1]	SB/WB % FFS [2]	SB/WB PTSF [3]	SB/WB LOS [4]
Martin Luther King Blvd	Avenue Y	2	35	626	18.1	60.3%	73.0%	E	753	18.1	60.3%	78.9%	E
Avenue Y	Speed Limit Change	2	45	666	34.9	71.6%	77.5%	E	852	34.5	70.9%	86.5%	E
Speed Limit Change	Old Lucerne Park Rd (west end)	2	55	655	43.5	75.6%	77.1%	D	877	43.0	74.8%	86.9%	E
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	2	55	589	47.1	79.4%	75.1%	D	670	46.8	79.0%	80.0%	D
Lucerne Lake Rd	Speed Limit Change	2	55	602	46.4	78.6%	74.8%	D	732	46.0	77.9%	82.4%	E
Speed Limit Change	Old Lucerne Park Rd (east end)	2	50	665	39.6	75.1%	78.1%	E	734	39.4	74.8%	82.4%	E
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	2	50	869	36.7	70.3%	85.7%	E	846	36.8	70.4%	85.1%	E
Lake Hamilton Dr	Brenton Manor Ave	2	50	986	32.8	65.7%	88.4%	E	941	32.9	65.7%	87.8%	E
Brenton Manor Ave	US 27	2	50	913	32.5	64.7%	86.5%	E	1,091	32.4	64.5%	90.8%	E
US 27	Speed Limit Change	2	55	476	48.2	82.0%	66.0%	D	651	46.9	79.8%	80.4%	E
Speed Limit Change	Peninsular Dr	2	45	504	38.9	78.9%	68.7%	E	631	37.6	78.3%	76.9%	E
Peninsular Dr	SR 17	4	45	531	46.9	N/A	N/A	A	610	45.6	N/A	N/A	A
PM Peak Hour													
From	To	No. of Lanes	Posted Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB % FFS [2]	NB/EB PTSF [3]	NB/EB LOS [4]	SB/WB Volume	SB/WB ATS [1]	SB/WB % FFS [2]	SB/WB PTSF [3]	SB/WB LOS [4]
Martin Luther King Blvd	Avenue Y	2	35	786	17.9	59.7%	80.2%	E	665	17.9	59.7%	74.8%	E
Avenue Y	Speed Limit Change	2	45	858	34.8	71.3%	85.3%	E	678	35.1	72.0%	77.3%	E
Speed Limit Change	Old Lucerne Park Rd (west end)	2	55	872	43.4	75.5%	86.4%	E	652	43.9	76.3%	75.9%	D
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	2	55	685	47.0	79.3%	80.1%	E	588	47.3	79.8%	74.5%	D
Lucerne Lake Rd	Speed Limit Change	2	55	785	45.8	77.6%	83.2%	E	612	46.3	78.5%	74.1%	D
Speed Limit Change	Old Lucerne Park Rd (east end)	2	50	764	39.6	75.1%	82.4%	E	645	40.0	75.7%	76.5%	E
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	2	50	920	36.5	69.8%	86.1%	E	885	36.5	69.9%	85.1%	E
Lake Hamilton Dr	Brenton Manor Ave	2	50	1,018	32.5	64.9%	88.9%	E	1,020	32.5	64.9%	89.1%	E
Brenton Manor Ave	US 27	2	50	1,027	32.8	65.2%	88.7%	E	1,001	32.8	65.2%	88.4%	E
US 27	Speed Limit Change	2	55	638	47.8	81.3%	76.3%	D	538	47.5	80.8%	71.6%	D
Speed Limit Change	Peninsular Dr	2	45	645	38.5	78.2%	76.4%	E	555	37.6	78.4%	70.2%	E
Peninsular Dr	SR 17	4	45	652	45.6	N/A	N/A	A	571	46.9	N/A	N/A	A

[1] *ATS = Average travel speed (miles/hour)*

[2] *% FFS = Percent free-flow speed*

[3] *PTSF = Percent time-spent-following*

[4] *LOS = Level of service*

N/A = Not applicable

Table 4-2 summarizes the results of the design year (2045) No-Build Alternative roadway segment level of service analysis. The entire two-lane undivided portion of SR 544 is projected to operate at Level of Service E for both travel directions during both peak hours. The four-lane undivided segment between Peninsular Drive and SR 17 is projected to operate at Level of Service B for both travel directions during both peak hours. These results document the need to widen SR 544 from Martin Luther King Boulevard to Peninsular Drive prior to the design year. The No-Build Alternative design year HCS segment analysis summary sheets are provided in **Appendix N2**.

4.2 No-Build Alternative Intersections

The future conditions No-Build Alternative peak hour signalized, and unsignalized intersection level of service analyses were conducted using the SYNCHRO software and the unsignalized intersection module of the HCS, respectively. The opening year (2025) and design year (2045) level of service analyses were conducted using the following parameter values:

- PHF (Opening Year) = 0.93 (a.m. peak hour)/0.96 (p.m. peak hour)
- PHF (Design Year) = 0.95 (a.m. peak hour)/0.97 (p.m. peak hour)

The opening year (2025) and design year (2045) peak hour truck percentages that were discussed previously in **Section 3.0** of this report were also used to conduct the roadway segment level of service analyses.

4.2.1 Opening Year (2025) and Design Year (2045) No-Build Alternative Intersection Levels of Service

Table 4-3 summarizes the opening year (2025) No-Build Alternative intersection level of service analysis results. Two of the three existing signalized intersections (i.e., Martin Luther King Boulevard and US 27) are projected to operate at Level of Service E overall during the a.m. and p.m. peak hours. Although there are several individual movements that are projected to operate at Level of Service F during one of the two peak hours, all of the movements are projected to operate with v/c ratios less than 1.00. The SR 17 signalized intersection is projected to operate at Level of Service C overall during both peak hours. All of the unsignalized left-turn movements from SR 544 are projected to operate at Level of Service B or better; however, five of the six unsignalized intersections have cross street movements that are projected to operate at Level of Service F during one or both peak hours. In addition, some of the cross-street movements at the Avenue Y, Lake Hamilton Drive and Brenton Manor Avenue intersections are projected to have v/c ratios greater than 1.00. The No-Build Alternative opening year intersection analysis summary sheets are provided in **Appendix N3**.

Table 4-2: Design Year (2045) No-Build Alternative Peak Hour Roadway Segment Analysis Summary

AM Peak Hour													
From	To	No. of Lanes	Posted Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB % FFS [2]	NB/EB PTSF [3]	NB/EB LOS [4]	SB/WB Volume	SB/WB ATS [1]	SB/WB % FFS [2]	SB/WB PTSF [3]	SB/WB LOS [4]
Martin Luther King Blvd	Avenue Y	2	35	960	13.0	43.3%	86.0%	E	1,087	13.0	43.3%	88.1%	E
Avenue Y	Speed Limit Change	2	45	1,001	30.6	62.7%	88.5%	E	1,097	30.5	62.6%	90.2%	E
Speed Limit Change	Old Lucerne Park Rd (west end)	2	55	917	39.5	68.7%	86.0%	E	1,158	39.4	68.4%	91.3%	E
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	2	55	808	44.2	74.5%	83.2%	E	884	44.1	74.4%	85.8%	E
Lucerne Lake Rd	Speed Limit Change	2	55	916	40.9	69.4%	86.2%	E	1,166	40.8	69.1%	91.5%	E
Speed Limit Change	Old Lucerne Park Rd (east end)	2	50	931	35.2	66.7%	86.7%	E	1,093	35.1	66.5%	90.4%	E
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	2	50	1,167	31.2	59.8%	91.0%	E	1,299	31.1	59.6%	93.3%	E
Lake Hamilton Dr	Brenton Manor Ave	2	50	1,284	27.6	55.1%	93.1%	E	1,374	27.4	54.9%	94.2%	E
Brenton Manor Ave	US 27	2	50	1,214	27.8	55.4%	92.3%	E	1,458	27.5	54.7%	95.5%	E
US 27	Speed Limit Change	2	55	878	42.0	71.5%	84.2%	E	1,089	41.5	70.7%	89.8%	E
Speed Limit Change	Peninsular Dr	2	45	1,031	31.0	62.9%	88.0%	E	1,155	29.8	62.0%	90.1%	E
Peninsular Dr	SR 17	4	45	1,184	46.9	N/A	N/A	B	1,221	45.6	N/A	N/A	B
PM Peak Hour													
From	To	No. of Lanes	Posted Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB % FFS [2]	NB/EB PTSF [3]	NB/EB LOS [4]	SB/WB Volume	SB/WB ATS [1]	SB/WB % FFS [2]	SB/WB PTSF [3]	SB/WB LOS [4]
Martin Luther King Blvd	Avenue Y	2	35	1,066	13.4	44.7%	87.3%	E	972	13.4	44.7%	85.6%	E
Avenue Y	Speed Limit Change	2	45	1,052	31.2	64.0%	89.1%	E	1,003	31.2	64.1%	87.8%	E
Speed Limit Change	Old Lucerne Park Rd (west end)	2	55	1,133	40.0	69.5%	90.8%	E	901	40.2	69.8%	85.1%	E
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	2	55	858	44.7	75.5%	84.6%	E	782	44.8	75.6%	81.8%	E
Lucerne Lake Rd	Speed Limit Change	2	55	1,227	40.5	68.7%	92.0%	E	926	40.8	69.1%	85.7%	E
Speed Limit Change	Old Lucerne Park Rd (east end)	2	50	1,049	35.9	68.0%	89.1%	E	914	36.0	68.2%	85.4%	E
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	2	50	1,258	32.1	61.4%	92.5%	E	1,134	32.2	61.6%	90.4%	E
Lake Hamilton Dr	Brenton Manor Ave	2	50	1,416	27.5	55.0%	94.6%	E	1,289	27.6	55.3%	92.7%	E
Brenton Manor Ave	US 27	2	50	1,480	27.5	54.7%	95.4%	E	1,254	27.8	55.2%	92.5%	E
US 27	Speed Limit Change	2	55	1,109	42.0	71.5%	88.8%	E	891	41.8	71.1%	84.9%	E
Speed Limit Change	Peninsular Dr	2	45	1,223	30.7	62.2%	91.0%	E	1,048	29.5	61.4%	87.8%	E
Peninsular Dr	SR 17	4	45	1,336	45.6	N/A	N/A	B	1,205	46.9	N/A	N/A	B

[1] *ATS = Average travel speed (miles/hour)*

[2] *% FFS = Percent free-flow speed*

[3] *PTSF = Percent time-spent-following*

[4] *LOS = Level of service*

N/A = Not applicable

Table 4-3: Opening Year (2025) No-Build Alternative Peak Hour Intersection Analysis Summary

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		V/C Ratio	Average Delay	Level of Service	V/C Ratio	Average Delay	Level of Service
Martin Luther King Blvd (Signalized)	**NB LT**	0.79	62.2	E	0.69	50.6	D
	NB TH	0.87	70.2	E	0.98	82	F
	NB RT	0.28	4.8	A	0.26	4.6	A
	SB LT	0.07	41.4	D	0.08	45.6	D
	SB TH	0.98	77.9	E	0.97	73.4	E
	SB RT	0.98	77.9	E	0.97	73.4	E
	EB LT	0.93	72.3	E	0.97	80.0	E
	EB TH	0.89	64.7	E	0.97	81.4	F
	EB RT	0.64	10.5	B	0.57	12.3	B
	WB LT	0.86	75.8	E	0.86	79.5	E
	WB TH	0.94	76.6	E	0.84	66.5	E
	WB RT	0.94	76.6	E	0.84	66.5	E
	ALL	0.90	61.1	E	0.95	63.9	E
Avenue Y	**NB LT**	0.02	9.8	A	0.02	9.0	A
	SB LT	0.06	9.2	A	0.07	9.8	A
	EB LT	1.37	283.6	F	1.08	173.3	F
	EB TH	1.37	283.6	F	1.08	173.3	F
	EB RT	1.37	283.6	F	1.08	173.3	F
	WB LT	1.15	300.6	F	2.19	699.4	F
	WB TH	1.15	300.6	F	2.19	699.4	F
	WB RT	0.02	12.7	B	0.08	14.8	B
Old Lucerne Park Rd (West End)	NB LT	0.90	254.5	F	0.36	119.2	F
	NB TH	0.90	254.5	F	0.36	119.2	F
	NB RT	0.03	12.3	B	0.01	12.8	B
	SB LT	0.60	28.2	D	0.39	27.6	D
	SB TH	0.60	28.2	D	0.39	27.6	D
	SB RT	0.60	28.2	D	0.39	27.6	D
	EB LT	0.11	9.6	A	0.22	9.7	A
	WB LT	0.00	8.7	A	0.02	9.0	A
Lucerne Lake Rd	SB LT	0.36	28.8	D	0.53	35.9	E
	SB RT	0.18	15.9	C	0.16	14.2	B
	EB LT	0.12	11.1	B	0.08	10.1	B
Old Lucerne Park Rd (East End)	SB LT	0.86	65.5	F	0.77	51.4	F
	SB RT	0.86	65.5	F	0.77	51.4	F
	EB LT	0.01	10.0	A	0.04	10.0	B
Lake Hamilton Dr	NB LT	1.50	321.7	F	1.75	454.9	F
	NB TH	1.50	321.7	F	1.75	454.9	F
	NB RT	1.50	321.7	F	1.75	454.9	F
	SB LT	0.01	15.3	C	0.09	179.9	F
	SB TH	0.01	15.3	C	0.09	179.9	F
	SB RT	0.01	15.3	C	0.09	179.9	F
	EB LT	0.00	9.6	A	0.00	9.8	A
	WB LT	0.19	11.2	B	0.22	11.4	B
Brenton Manor Ave	NB LT	2.21	838.4	F	1.76	539.5	F
	NB RT	0.27	20.5	C	0.24	21.7	C
	WB LT	0.29	12.1	B	0.09	10.9	B
US 27 (Signalized)	NB LT	0.98	108.3	F	0.77	79.5	E
	NB TH	0.79	44.0	D	0.85	52.0	D
	NB RT	0.16	18.5	B	0.22	25.6	C
	SB LT	0.8	98.8	F	0.78	79.1	E
	SB TH	0.73	49.3	D	0.97	63.1	E
	SB RT	0.75	35.8	D	0.71	30.5	C
	EB LT	0.97	92.1	F	0.87	71.6	E
	EB TH	0.57	55.1	E	0.64	52.9	D
	EB RT	0.21	25.0	C	0.28	24.9	C
	WB LT	0.58	40.6	D	0.52	35.5	D
	WB TH	0.98	104.8	F	0.84	79.7	E
	WB RT	0.79	42.6	D	0.23	31.3	C
	ALL	0.85	56.4	E	0.87	55.2	E
SR 17 (Signalized)	NB LT	0.39	16.7	B	0.34	16.4	B
	NB TH	0.77	39.1	D	0.58	30.4	C
	NB RT	0.77	39.1	D	0.58	30.4	C
	SB LT	0.19	14.4	B	0.20	14.8	B
	SB TH	0.54	29.5	C	0.62	31.8	C
	SB RT	0.24	14.7	B	0.31	15.8	B
	EB LT	0.69	32.4	C	0.53	22.5	C
	EB TH	0.49	31.4	C	0.71	38.2	D
	EB RT	0.26	17.2	B	0.26	16.6	B
	WB LT	0.2	16.8	B	0.22	16.6	B
	WB TH	0.85	51.2	D	0.64	35.9	D
	WB RT	0.24	17.3	B	0.14	15.5	B
	ALL	0.85	30.2	C	0.66	26.6	C

Note: Bold font denotes SR 544 movements

Table 4-4 summarizes the design year (2045) No-Build Alternative intersection level of service analysis results. Two of the three existing signalized intersections (i.e., Martin Luther King Boulevard and US 27) are projected to operate at Level of Service F overall during the a.m. and p.m. peak hours. In addition, many of the individual movements are projected to have v/c ratios greater than 1.00. The SR 17 signalized intersection is projected to operate at Level of Service E overall during both peak hours and three individual movements are projected to have v/c ratios greater than 1.00. All of the unsignalized left-turn movements from SR 544 are projected to operate at Level of Service C or better; however, all six unsignalized intersections have cross street movements that are projected to operate at Level of Service F during one or both peak hours. In addition, almost all of the unsignalized cross street movements are projected to have v/c ratios greater than 1.00. These results document the need for intersection improvements prior to the design year at all nine locations that were analyzed. The No-Build Alternative design year intersection analysis summary sheets are provided in **Appendix N4**.

4.3 Build Alternative Roadway Segments

The future conditions peak hour roadway segment level of service analyses was conducted for Build Alternative No. 1 and Build Alternative No. 2 using the multi-lane highway module of the HCS. The opening year (2025) and design year (2045) level of service analyses were conducted using the following parameter values:

- PHF (Opening Year) = 0.93 (a.m. peak hour)/0.96 (p.m. peak hour)
- PHF (Design Year) = 0.95 (a.m. peak hour)/0.97 (p.m. peak hour)

The opening year (2025) and design year (2045) peak hour truck percentages that were discussed previously in **Section 3.0** of this report were also used to conduct the roadway segment level of service analyses. Two preliminary four-lane typical sections were developed for the portion of SR 544 between Martin Luther King Boulevard and Avenue Y. The first typical section is a four-lane undivided roadway with sidewalks on both sides, while the second typical section is a five-lane section with shared use pathways on both sides. Both of these typical sections have a design speed equal to 35 mph and provide 11-foot inside travel lanes and 12-foot outside travel lanes. The second typical section also provides an 11-foot two-way center left-turn lane. A third typical section was also developed for this portion of SR 544. This typical section is a three-lane section with shared use pathways on both sides. This typical section also has a design speed equal to 35 mph and provides one 12-foot travel lane in each direction and a 12-foot two-way center left turn lane. Two preliminary four-lane divided typical sections were developed for the portion of SR 544 from Avenue Y to SR 17. Both of these typical sections have a design speed equal to 45 mph and provide 11-foot inside travel lanes, 12-foot outside travel lanes, and a 22-foot raised median. One of these typical sections provides a shared use pathway on both sides of the road, while the other provides a shared use pathway on the east/south side and a sidewalk on the west/north side. From a traffic operations/roadway segment level of service perspective, the two typical sections developed for SR 544 between Avenue Y and SR 17 will operate exactly the same and therefore, only one analysis was conducted. The preliminary typical sections are provided in **Appendix O**.

Table 4-4: Design Year (2045) No-Build Alternative Peak Hour Intersection Analysis Summary

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		V/C Ratio	Average Delay	Level of Service	V/C Ratio	Average Delay	Level of Service
Martin Luther King Blvd (Signalized)	**NB LT**	1.30	190.8	F	1.13	124.5	F
	NB TH	1.31	194.1	F	1.32	196.3	F
	NB RT	0.39	11.5	B	0.30	6.8	A
	SB LT	0.13	42.5	D	0.11	46.2	D
	SB TH	1.49	260.8	F	1.41	225.8	F
	SB RT	1.49	260.8	F	1.41	225.8	F
	EB LT	1.81	403.5	F	1.72	364.7	F
	EB TH	1.61	316.9	F	1.50	267.8	F
	EB RT	0.93	45.2	D	0.84	33.7	C
	WB LT	1.00	109.8	F	1.10	136.5	F
	WB TH	1.41	232.2	F	1.56	297.2	F
	WB RT	1.41	232.2	F	1.56	297.2	F
	ALL	1.38	229.2	F	1.40	215.0	F
Avenue Y	**NB LT**	0.02	10.5	B	0.02	9.7	A
	SB LT	0.17	10.7	B	0.24	11.7	B
	EB LT	*	**	F	*	**	F
	EB TH	*	**	F	*	**	F
	EB RT	*	**	F	*	**	F
	WB LT	*	**	F	*	**	F
	WB TH	*	**	F	*	**	F
	WB RT	0.61	28.4	D	0.34	20.7	C
Old Lucerne Park Rd (West End)	NB LT	23.10	13,864.9	F	2.27	1,551.1	F
	NB TH	23.10	13,864.9	F	2.27	1,551.1	F
	NB RT	0.04	14.0	B	0.02	13.8	B
	SB LT	2.06	537.3	F	2.96	998.6	F
	SB TH	2.06	537.3	F	2.96	998.6	F
	SB RT	2.06	537.3	F	2.96	998.6	F
	EB LT	0.27	11.7	B	0.46	12.8	B
	WB LT	0.01	9.3	A	0.02	9.4	A
Lucerne Lake Rd	SB LT	3.47	1,212.8	F	3.89	1,374.7	F
	SB RT	0.61	29.6	D	0.54	23.1	C
	EB LT	0.55	22.7	C	0.34	14.5	B
Old Lucerne Park Rd (East End)	SB LT	1.93	480.7	F	1.73	397.9	F
	SB RT	1.93	480.7	F	1.73	397.9	F
	EB LT	0.04	12.6	B	0.13	12.0	B
Lake Hamilton Dr	NB LT	*	**	F	*	**	F
	NB TH	*	**	F	*	**	F
	NB RT	*	**	F	*	**	F
	SB LT	*	**	F	*	**	F
	SB TH	*	**	F	*	**	F
	SB RT	*	**	F	*	**	F
	EB LT	0.00	11.8	B	0.00	10.6	B
	WB LT	0.34	14.6	B	0.42	16.9	C
Brenton Manor Ave	NB LT	7.62	3,707.6	F	10.13	4,596.0	F
	NB RT	0.39	30.7	D	0.81	79.6	F
	WB LT	0.38	15.0	B	0.23	14.4	B
US 27 (Signalized)	NB LT	1.26	190.9	F	0.91	101.5	F
	NB TH	1.36	201.2	F	1.37	210.8	F
	NB RT	0.32	21.1	C	0.42	30.7	C
	SB LT	1.49	292.8	F	1.24	183.8	F
	SB TH	1.31	187.1	F	1.62	316.5	F
	SB RT	0.92	52.0	D	0.82	38.1	D
	EB LT	1.19	154.8	F	1.18	148.2	F
	EB TH	0.91	80.4	F	1.02	97.6	F
	EB RT	0.30	26.8	C	0.42	29.5	C
	WB LT	1.60	318.7	F	1.48	272.4	F
	WB TH	1.30	202.9	F	1.06	120.5	F
	WB RT	0.69	52.5	D	0.37	34.6	C
	ALL	1.22	168.1	F	1.24	194.7	F
SR 17 (Signalized)	NB LT	1.18	136.9	F	1.07	104.7	F
	NB TH	0.91	64.1	E	0.75	47.5	D
	NB RT	0.91	64.1	E	0.75	47.5	D
	SB LT	0.36	30.3	C	0.34	26.4	C
	SB TH	0.93	82.1	F	0.97	84.8	F
	SB RT	0.55	31.1	C	0.62	30.9	C
	EB LT	1.12	120.9	F	1.05	100.5	F
	EB TH	0.68	40.1	D	0.88	56.4	E
	EB RT	0.46	17.3	B	0.52	20.8	C
	WB LT	0.28	22.7	C	0.54	33.6	C
	WB TH	1.08	111.2	F	1.02	95.6	F
	WB RT	0.28	30.7	C	0.19	30.3	C
	ALL	1.05	72.2	E	1.04	62.8	E

Note: Bold font denotes SR 544 movements

** The v/c ratio is infinite because the capacity for this movement is zero.*

*** The average vehicle delay cannot be calculated because the v/c ratio is infinite.*

4.3.1 Opening Year (2025) and Design Year (2045) Build Alternative No. 1 Roadway Segment Levels of Service

Table 4-5 summarizes the opening year (2025) Build Alternative No. 1 roadway segment level of service analysis results. Both four-lane typical sections for SR 544 between Martin Luther King Boulevard and Avenue Y are projected to operate at Level of Service C or better during both peak hours. Slightly higher average travel speeds and slightly lower densities are projected to occur with the four-lane divided typical section. The four-lane divided typical sections between Avenue Y and SR 17 are projected to operate at Level of Service B or better in both travel directions during both peak hours. The Build Alternative No. 1 opening year roadway segment analysis summary sheets are provided in **Appendix P1**. The lowest speed the HCS multilane highway software allows the user to enter is 45 mph. Since the proposed design speed for the portion of SR 544 from Martin Luther King Boulevard to Avenue Y is 35 mph, the base free flow speed needed to be manually modified and the average travel speed and density calculations needed to be conducted manually.

Table 4-6 summarizes the results of the design year (2045) Build Alternative No. 1 roadway segment level of service analysis. The four-lane undivided typical section for SR 544 between Martin Luther King Boulevard and Avenue Y is projected to operate at Level of Service E for both travel directions during both peak hours. The four-lane divided typical section for this same portion of SR 544 is also projected to operate at Level of Service E in both travel directions during the a.m. peak hour, as well as in the peak travel direction during the p.m. peak hour. Level of Service D operations are projected for the off-peak travel direction during the p.m. peak hour. The four-lane divided typical sections between Avenue Y and SR 17 are projected to operate at Level of Service D or better in both travel directions during both peak hours and a majority of this portion of SR 544 is projected to operate at Level of Service C or better. The Build Alternative No. 1 design year roadway segment analysis summary sheets are provided in **Appendix P2**.

Table 4-5: Opening Year (2025) Build Alternative No. 1 Peak Hour Roadway Segment Analysis Summary

AM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	4U	35	805	25.2	18.2	C	954	25.2	21.6	C
Martin Luther King Blvd	Avenue Y	4D*	35	805	26.8	17.1	B	954	26.8	20.3	C
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	833	41.6	11.4	B	1,063	42.6	14.2	B
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	747	42.8	10.0	A	831	42.8	11.1	B
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	779	42.6	10.4	A	900	42.1	12.2	B
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,009	41.8	13.8	B	1,000	41.8	13.6	B
Lake Hamilton Dr	Brenton Manor Ave	4D	45	1,094	40.6	15.4	B	1,121	40.6	15.7	B
Brenton Manor Ave	US 27	4D	45	1,045	40.6	14.7	B	1,241	40.6	17.4	B
US 27	SR17	4D	45	531	42.1	7.5	A	664	41.8	9.4	A
PM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	4U	35	988	25.2	21.2	C	835	25.2	17.9	B
Martin Luther King Blvd	Avenue Y	4D*	35	988	26.8	20.0	C	835	26.8	16.9	B
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	1,045	41.6	13.6	B	830	42.6	10.6	A
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	846	42.8	10.7	A	745	42.8	9.4	A
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	940	42.6	11.9	B	785	42.1	10.1	A
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,077	41.8	13.9	B	1,042	41.8	13.5	B
Lake Hamilton Dr	Brenton Manor Ave	4D	45	1,172	40.6	15.6	B	1,156	40.6	15.4	B
Brenton Manor Ave	US 27	4D	45	1,184	40.6	15.8	B	1,138	40.6	15.2	B
US 27	SR17	4D	45	682	42.1	8.9	A	581	41.8	7.7	A

* *Two-Way Center Left-Turn Lane*

[1] *ATS = Average Travel Speed (miles/hour)*

[2] *Density (passenger cars/mile/lane)*

[3] *LOS = Level of Service*

Table 4-6: Design Year (2045) Build Alternative No. 1 Peak Hour Roadway Segment Analysis Summary

AM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	4U	35	1,738	25.2	38.1	E	1,956	25.2	42.9	E
Martin Luther King Blvd	Avenue Y	4D*	35	1,738	26.8	35.9	E	1,956	26.8	40.4	E
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	1,707	41.6	22.7	C	1,988	42.6	25.8	C
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	1,488	42.8	19.2	C	1,586	42.8	20.5	C
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	1,550	42.6	20.1	C	1,851	42.1	24.3	C
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,771	41.8	23.4	C	1,967	41.8	26.0	C
Lake Hamilton Dr	Brenton Manor Ave	4D	45	1,870	40.6	25.5	C	2,036	40.6	27.7	D
Brenton Manor Ave	US 27	4D	45	1,784	40.6	24.3	C	2,108	40.6	28.7	D
US 27	SR17	4D	45	1,150	42.1	15.5	B	1,298	41.8	17.7	B
PM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	4U	35	1,940	25.2	40.9	E	1,715	25.2	36.1	E
Martin Luther King Blvd	Avenue Y	4D*	35	1,940	26.8	38.4	E	1,715	26.8	34.0	D
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	1,876	41.6	23.9	C	1,669	42.6	20.8	C
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	1,557	42.8	19.3	C	1,465	42.8	18.2	C
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	1,853	42.6	23.1	C	1,598	42.1	20.1	C
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,941	41.8	24.6	C	1,767	41.8	22.4	C
Lake Hamilton Dr	Brenton Manor Ave	4D	45	2,083	40.6	27.2	D	1,881	40.6	24.6	C
Brenton Manor Ave	US 27	4D	45	2,161	40.6	28.3	D	1,850	40.6	24.2	C
US 27	SR17	4D	45	1,374	42.1	17.7	B	1,161	41.8	15.0	B

* *Two-Way Center Left-Turn Lane*

[1] *ATS = Average Travel Speed (miles/hour)*

[2] *Density (passenger cars/mile/lane)*

[3] *LOS = Level of Service*

4.3.2 Opening Year (2025) and Design Year (2045) Build Alternative No. 2 Roadway Segment Levels of Service

Table 4-7 summarizes the opening year (2025) Build Alternative No. 2 roadway segment level of service analysis results. The two-lane divided typical section for SR 544 between Martin Luther King Boulevard and Avenue Y is projected to operate at Level of Service E in both travel directions during both peak hours. The average travel speeds for Build Alternative No.2 are estimated to be approximately eight to nine mph lower than the average travel speeds for Build Alternative No.1 for this portion of SR 544. The four-lane divided typical sections between Avenue Y and SR 17 are projected to operate at Level of Service B or better in both travel directions during both peak hours. The Build Alternative No. 2 opening year roadway segment analysis summary sheets are provided in **Appendix Q1**. **Table 4-8** summarizes the design year (2045) Build Alternative No. 2 roadway segment level of service analysis results. The two-lane divided typical section for SR 544 between Martin Luther King Boulevard and Avenue Y is projected to operate at Level of Service E in both travel directions during both peak hours. The average travel speeds for Build Alternative No.2 are estimated to be approximately 15 to 16 mph lower than the average travel speeds for Build Alternative No.1 for this portion of SR 544. The four-lane divided typical sections between Avenue Y and SR 17 are projected to operate at Level of Service D or better in both travel directions during both peak hours and a majority of this portion of SR 544 is projected to operate at Level of Service C or better. The Build Alternative No. 2 design year roadway segment analysis summary sheets are provided in **Appendix Q2**.

4.4 Build Alternative Intersections

Based on the direction provided by the District One District Environmental Management Office (DEMO), all of the future year Build Alternative intersection analyses will be conducted as part of the FDOT's Intersection Control Evaluation (ICE) process. The results of the ICE analyses will be documented in the SR 544 Preliminary Engineering Report and not in the Project Traffic Analysis Report.

Table 4-7: Opening Year (2025) Build Alternative No. 2 Peak Hour Roadway Segment Analysis Summary

AM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	2D*	35	670	17.3	N/A	E	801	17.1	N/A	E
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	802	41.6	11.0	A	1,029	42.6	13.8	B
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	727	42.8	9.7	A	810	42.8	10.8	A
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	768	42.6	10.3	A	889	42.1	12.0	B
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	999	41.8	13.6	B	988	41.8	13.5	B
Lake Hamilton Dr	Brenton Manor Ave	4D	45	1,112	40.6	15.6	B	1,083	40.6	15.2	B
Brenton Manor Ave	US 27	4D	45	1,035	40.6	14.5	B	1,231	40.6	17.3	B
US 27	SR17	4D	45	531	42.1	7.5	A	664	41.8	9.4	A
PM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	2D*	35	834	16.9	N/A	E	705	17.2	N/A	E
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	1,022	41.6	13.3	B	793	42.6	10.1	A
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	826	42.8	10.4	A	725	42.8	9.2	A
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	928	42.6	11.8	B	775	42.1	10.0	A
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,064	41.8	13.8	B	1,032	41.8	13.3	B
Lake Hamilton Dr	Brenton Manor Ave	4D	45	1,161	40.6	15.5	B	1,146	40.6	15.3	B
Brenton Manor Ave	US 27	4D	45	1,173	40.6	15.6	B	1,129	40.6	15.0	B
US 27	SR17	4D	45	682	42.1	8.9	A	580	41.8	7.7	A

* Two-Way Center Left-Turn Lane
[1] ATS = Average Travel Speed (miles/hour)
[2] Density (passenger cars/mile/lane)
[3] LOS = Level of Service

Table 4-8: Design Year (2045) Build Alternative No. 2 Peak Hour Roadway Segment Analysis Summary

AM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	2D*	35	1,150	10.1	N/A	E	1,293	9.9	N/A	E
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	1,572	41.6	20.9	C	1,837	42.6	23.8	C
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	1,403	42.8	18.1	C	1,495	42.8	19.3	C
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	1,506	42.6	19.5	C	1,806	42.1	23.7	C
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,731	41.8	22.9	C	1,917	41.8	25.4	C
Lake Hamilton Dr	Brenton Manor Ave	4D	45	1,829	40.6	24.9	C	1,987	40.6	27.0	D
Brenton Manor Ave	US 27	4D	45	1,743	40.6	23.7	C	2,064	40.6	28.1	D
US 27	SR17	4D	45	1,150	42.1	15.5	B	1,298	41.8	17.7	B
PM Peak Hour											
From	To	No. of Lanes	Design Speed	NB/EB Volume	NB/EB ATS [1]	NB/EB Density [2]	NB/EB LOS [3]	SB/WB Volume	SB/WB ATS [1]	SB/WB Density [2]	SB/WB LOS [3]
Martin Luther King Blvd	Avenue Y	2D*	35	1,274	10.4	N/A	E	1,145	10.6	N/A	E
Avenue Y	Old Lucerne Park Rd (west end)	4D	45	1,775	41.6	22.6	C	1,506	42.6	18.8	C
Old Lucerne Park Rd (west end)	Lucerne Lake Rd	4D	45	1,471	42.8	18.2	C	1,379	42.8	17.1	B
Lucerne Lake Rd	Old Lucerne Park Rd (east end)	4D	45	1,805	42.6	22.5	C	1,553	42.1	19.6	C
Old Lucerne Park Rd (east end)	Lake Hamilton Dr	4D	45	1,883	41.8	23.9	C	1,722	41.8	21.9	C
Lake Hamilton Dr	Brenton Manor Ave	4D	45	2,035	40.6	26.6	D	1,840	40.6	24.1	C
Brenton Manor Ave	US 27	4D	45	2,113	40.6	27.6	D	1,810	40.6	23.7	C
US 27	SR17	4D	45	1,380	42.1	17.7	B	1,161	41.8	15.0	B

* *Two-Way Center Left-Turn Lane*
[1] *ATS = Average Travel Speed (miles/hour)*
[2] *Density (passenger cars/mile/lane)*
[3] *LOS = Level of Service*

Appendix A

Twenty-Four Hour Volume Counts and Traffic Volume Adjustment Factors

Appendix B

Historic Traffic Volume Growth Trend Analyses

Appendix C

FDOT Annual Vehicle Classification Reports

Appendix D

Peak Hour Intersection Turning Movement Counts and Adjusted Peak Hour Volumes

Appendix D1

Martin Luther King Boulevard and Avenue Y Peak Hour Intersection Volumes

Appendix D2

Old Lucerne Park Road (West End) Peak Hour Intersection Volumes

Appendix D3

Old Lucerne Park Road (East End) Peak Hour Intersection Volumes

Appendix D4

Brenton Manor Avenue, US 27 and SR 17 Peak Hour Intersection Volumes

Appendix E

Eight-Hour Bicycle and Pedestrian Crossing Volumes

Appendix F

Existing Conditions (2019) Traffic Analysis Summary Sheets

Appendix F1

Existing Conditions (2019) Roadway Segment Analysis Summary Sheets

Appendix F2

Existing Conditions (2019) Intersection Analysis Summary Sheets

Appendix G

Historic Crash Data

Appendix H

Subarea Travel Demand Model Validation Technical Memorandum and 2040 Peak Season Weekday Average Daily Traffic Volume Plots

Appendix I

Bureau of Economics and Business Research (BEBR) Polk County Population Projections

Appendix J1

TURNS5 Input/Output Volumes

Appendix J2

Florence Villa Bypass Memorandum

Appendix K

FDOT Historical AADT Volume Reports

Appendix L

Historic Truck Volume Growth Trend Analyses

Appendix M

Peak Hour Intersection Truck Turning Movement Counts

Appendix N

Future Conditions No-Build Alternative Traffic Analysis Summary Sheets

Appendix N1

Opening Year (2025) No-Build Alternative Roadway Segment Analysis
Summary Sheets

Appendix N2

Design Year (2045) No-Build Alternative Roadway Segment Analysis Summary Sheets

Appendix N3

Opening Year (2025) No-Build Alternative Intersection Analysis Summary Sheets

Appendix N4

Design Year (2045) No-Build Alternative Intersection Analysis Summary Sheets

Appendix O

Preliminary Typical Sections

Appendix P

Future Conditions Build Alternative No.1 Traffic Analysis Summary Sheets

Appendix P1

Opening Year (2025) Build Alternative No.1 Roadway Segment Analysis Summary Sheets

Appendix P2

Design Year (2045) Build Alternative No.1 Roadway Segment Analysis Summary Sheets

Appendix Q

Future Conditions Build Alternative No. 2 Traffic Analysis
Summary Sheets

Appendix Q1

Opening Year (2025) Build Alternative No.2 Roadway Segment Analysis Summary Sheets

Appendix Q2

Design Year (2045) Build Alternative No.2 Roadway Segment Analysis Summary Sheets