

**Design Traffic Report
For
SR 426/ CR 419
From
Pine Avenue to Lockwood Boulevard**

Prepared For:
City of Oviedo
400 Alexandria Boulevard
Oviedo, Florida 32765
Phone: (407) 977-6000

Prepared By:
 **DRMP**
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
1505 East Colonial Drive
Orlando, Florida 32803
Phone: 407-896-0594
E-mail: drmp@drmp.com

Design Traffic Report For SR 426/CR 419 From Pine Avenue to Lockwood Boulevard

TABLE OF CONTENTS

		Page No.
1.	PROJECT DESCRIPTION	1
2.	EXISTING CONDITIONS	1
	2.1 Traffic Counts	3
	2.2 Traffic Characteristics	4
	2.3 Roadway Characteristics	6
	2.4 Crash Analysis	9
	2.5 Base Year Traffic Volumes	11
	2.6 Existing Level of Service	11
3.0	FUTURE TRAFFIC PROJECTIONS	17
	3.1 Methodology	17
	3.2 No Build Projected Traffic Volumes and Intersection Analysis	17
	3.3 Build Projected Traffic Volumes and Intersection Analysis	26
4.0	RECOMMENDED IMPROVEMENTS	39
	4.1 Scenario 2A and Scenario 2B	39
	4.2 Recommended Improvements	39

LIST OF TABLES

Table 1	Count Locations	3
Table 2	Traffic Characteristics	4
Table 3	Recommended Design Factors	5
Table 4	High Crash Locations - Intersections	9
Table 5	Crash Types For Crash Locations	10
Table 6	2001 Existing Traffic Volumes	16
Table 7	Recommended Growth Rates	15
Table 8	Segment Level of Service	38
Table 9	Intersection Level of Service	38
Table 10	Recommended Storage Length of Approach Lanes	47

APPENDICES

Appendix A	Collision Summary Sheet
Appendix B	Traffic Count Data Sheets
Appendix C	Capacity Analysis Worksheets
Appendix D	FSUTMS Model Plots
Appendix E	Design Traffic Technical Memorandum
Appendix F	TURNS5 Spreadsheets

TABLE OF CONTENTS (continued)

Page No.

LIST OF FIGURES

Figure 1	Study Area	2
Figure 2A	Existing Geometry	6
Figure 2B	Existing Geometry	7
Figure 3A	Existing PM Peak Hour Traffic Volumes	12
Figure 3B	Existing PM Peak Hour Traffic Volumes	13
Figure 4A	Existing Level of Service	14
Figure 4B	Existing Level of Service	15
Figure 5A	No Build AADTs	18
Figure 5B	No Build AADTs	19
Figure 6A	No Build DDHVs	20
Figure 6B	No Build DDHVs	21
Figure 7	2010 No Build Design Hour Volumes & Intersection LOS	23
Figure 8	2020 No Build Design Hour Volumes & Intersection LOS	24
Figure 9	2030 No Build Design Hour Volumes & Intersection LOS	25
Figure 10	Build Scenarios for Downtown	27
Figure 11A	Build AADT	28
Figure 11B	Build AADT	29
Figure 12A	Build DDHV	30
Figure 12B	Build DDHV	31
Figure 13	2010 Build Design Hour Volumes & Intersection LOS	32
Figure 14	2020 Build Design Hour Volumes & Intersection LOS	33
Figure 15	2030 Build Design Hour Volumes & Intersection LOS	34
Figure 16	2010 Build Design Hour Volumes & Intersection LOS	35
Figure 17	2020 Build Design Hour Volumes & Intersection LOS	36
Figure 18	2030 Build Design Hour Volumes & Intersection LOS	37
Figure 19	2010 Build Design Hour Volumes & Intersection LOS	40
Figure 20	2020 Build Design Hour Volumes & Intersection LOS	41
Figure 21	2030 Build Design Hour Volumes & Intersection LOS	42
Figure 22	2010 Build Design Hour Volumes & Intersection LOS	43
Figure 23	2020 Build Design Hour Volumes & Intersection LOS	44
Figure 24	2030 Build Design Hour Volumes & Intersection LOS	45
Figure 25	2030 Build Recommended Geometry	46

1. PROJECT DESCRIPTION

City of Oviedo has contracted with Dyer, Riddle, Mills and Precourt, Inc. (DRMP) to provide services for a Project Development and Environmental (PD&E) Study. The following Design Traffic Report will provide information to guide the development of the SR 426/ CR 419 project. This analysis will utilize new traffic count information and the latest regional travel demand model to derive Design Traffic volumes for two scenarios, No-Build and Build scenario.

Based on information provided by the County, the following periods are to be used to develop Design Traffic forecasts for the SR 426/ CR 419 widening:

Existing Conditions	2002
Opening Year	2010
Mid-Design Year	2020
Design Year	2030

The project limits for this project are from Pine Avenue east to Lockwood Boulevard, a distance of approximately 3.0 miles. Figure 1 provides a map of the study area.

2. EXISTING CONDITIONS

The Existing Conditions analysis provides a base for the development of future traffic volumes, required roadway and intersection geometry, and capacity evaluations. The following primary roadways and intersections were identified during project scope development for the existing conditions analysis:

Roadways

- SR 426, CR 419

Analyzed Intersections with SR 426

- Pine Avenue
- Aulin Avenue
- Lake Jessup Avenue
- Central Avenue
- Station Avenue
- Railroad Avenue

Analyzed Intersections with CR 419

- Division Street
- Avenue B
- Stephan Street
- Reed Road
- Carolyn Drive
- Evans Street
- Bishop Avenue
- Waverlee Woods Boulevard
- Lockwood Boulevard

2.1 Traffic Counts

Traffic counts were conducted in June, 2002 for this Design Traffic analysis. The following table specifies the count location and type of count conducted. All turning movement counts (TMCs) are 8-hour counts from 7:00 am to 9:00 am, 11:00 am to 1:00 pm, and 2:00 pm to 6:00 pm.

**TABLE 1
COUNT LOCATIONS**

Roadway Segment	Type
426 West of Pine Avenue	24 Hour Volume
Pine Avenue North of 426	24 Hour Volume
426 West of Aulin Avenue	24 Hour Volume
Aulin Avenue South of 426	24 Hour Volume
Aulin Avenue North of 426	24 Hour Volume
426 West of Lake Jessup Avenue	24 Hour Volume
Lake Jessup Avenue South of 426	24 Hour Volume
Lake Jessup Avenue North of 426	24 Hour Volume
426 East of Lake Jessup Avenue	24 Hour Volume
426 West of Central Avenue	24 Hour Volume
Central Avenue South of 426	24 Hour Volume
Central Avenue North of 426	24 Hour Volume
426 East of Central Avenue	24 Hour Volume
Station Street South of 426	24 Hour Volume
419 East of Station Street	24 Hour Volume
426 North of Station Street	24 Hour Volume
Railroad Street North of 426	24 Hour Volume
419 East of Division Street	24 Hour Volume
419 West of Division Street	24 Hour Volume
Division Street North of 419	24 Hour Volume
419 East of Avenue B	24 Hour Volume
419 West of Avenue B	24 Hour Volume
Avenue B North of 419	24 Hour Volume
419 East of Stephan Street	24 Hour Volume
Academy Avenue South of 419	24 Hour Volume
419 East of Stephan Street	24 Hour Volume
Stephan Street North of 419	24 Hour Volume
Reed Road North of 419	24 Hour Volume
Carolyn Drive East of 419	24 Hour Volume
419 South of Carolyn	24 Hour Volume
Evans Street East of 419	24 Hour Volume
Bishop Avenue West of 419	24 Hour Volume
419 South of Bishop Avenue	24 Hour Volume
Waverlee Woods Blvd. East of 419	24 Hour Volume
Lockwood Blvd. South of 419	24 Hour Volume
419 East of Lockwood Blvd.	24 Hour Volume

**TABLE 1 (Continued)
COUNT LOCATIONS**

Roadway Segment	Type
419 East of Lockwood Blvd.	24 Hour Volume
Lockwood Blvd. North of 419	24 Hour Volume
426 East of Aulin Avenue	72 Hour Classification
419 East of Reed Road	72 Hour Classification
426 and Aulin Avenue	8 Hour TMC
426 and Lake Jessup Avenue	8 Hour TMC
426 and Central Avenue	8 Hour TMC
426 and Station Avenue	8 Hour TMC
419 and Division Street	8 Hour TMC
419 and Avenue B	8 Hour TMC
419 and Stephan Street	8 Hour TMC
419 and Reed Road	8 Hour TMC
419 and Carolyn Drive	8 Hour TMC
419 and Bishop Avenue	8 Hour TMC
419 and Lockwood	8 Hour TMC

2.2 Traffic Characteristics

Traffic count information as collected was used to develop existing traffic characteristics for roadways within the study area. Based on the 24-hour vehicle volume counts information, peak traffic flow (K measured) and peak traffic flow directions (D) were derived. Table 2 provides the traffic characteristics for the analyzed roadways.

**TABLE 2
TRAFFIC CHARACTERISTICS
SR 426/CR 419**

Roadway Segment	K Measured	D	D (Direction)	T (Percent)
426 East of Pine Avenue	0.0822	0.575	East	
426 West of Pine Avenue	0.0823	0.577	East	
426 West of Lake Jessup Avenue	0.0815	0.577	East	
426 East of Lake Jessup Avenue	0.0733	0.592	East	
426 West of Central Avenue	0.2096	0.509	East	
426 East of Central Avenue	0.0778	0.540	North	
419 East of Station Street	0.0840	0.544	East	
419 East of Division Street	0.0916	0.547	East	
419 West of Division Street	0.0855	0.525	East	
419 East of Avenue B	0.1021	0.573	East	
419 West of Avenue B	0.1016	0.565	East	
419 West of Stephan Street	0.0865	0.617	East	
419 East of Stephan Street	0.1009	0.564	North	
419 South of Carolyn Drive	0.0999	0.525	South	
419 North of Carolyn Drive	0.1002	0.553	South	
419 South of Bishop Avenue	0.0884	0.542	East	
419 East of Lockwood Blvd.	0.0914	0.605	East	
426 East of Aulin Avenue				7.3
419 East of Reed Road				7.1
	0.0891	0.5597		

SIDE STREETS

Roadway Segment	K Measured	D	D (direction)
Pine Avenue North of 426	0.1255	0.506	South
Aulin Avenue South of 426	0.1355	0.607	South
Aulin Avenue North of 426	0.0930	0.555	North
Lake Jessup Avenue South of 426	0.1081	0.516	North
Lake Jessup Avenue North of 426	0.0963	0.528	North
Central Avenue South of 426	0.0754	0.535	South
Central Avenue North of 426	0.0738	0.564	South
Station Street South of 426	0.0983	0.626	North
Division Street North of 419	0.1316	0.639	South
Avenue B North of 419	0.1154	0.51	North
Academy Avenue South of 419	0.1050	0.511	North
Stephan Street North of 419	0.0996	0.574	North
Reed Road North of 419	0.0926	0.588	North
Carolyn Drive West of 419	0.1528	0.63	East
Evans Street East of 419	0.0762	0.606	West
Bishop Avenue West of 419	0.1209	0.585	West
Waverlee Woods Blvd. East of 419	0.0958	0.578	East
Lockwood Blvd. South of 419	0.0849	0.542	North
Lockwood Blvd. North of 419	0.0938	0.543	North
Railroad Street North of 426 (one-way)	0.0713	1	North
	0.1023	0.5654	

Based on the measured peak traffic flow to daily ratios, an estimated value for K30 was developed. The process adjusts the K Measured factor by a ratio of the median seasonal factor for the highest 13 weeks (peak season) and the median seasonal factor for the lowest 13 weeks (non-peak season) to produce an adjusted K factor. The Florida Department Of Transportation (FDOT) develops seasonal factors for all Florida counties, including Seminole County.

The average K30 estimate of 0.0956 as shown above falls within the FDOT recommended K30 factors for an urban arterial. The recommended range for an urban arterial from the Design Traffic Handbook is 0.092 to 0.115. While an observed characteristic of increasing traffic volumes in an urban area is the reduction of the peak to daily ratio, we recommend utilizing the K30 value of 0.0956.

The measured daily truck percentages (T) for Medium and Heavy trucks was 7.3% on SR 426/CR East of Aulin Avenue and 7.1% East of Reed Road, for an average T Factor of 7.2%. The current truck percentages are not expected to vary between the opening and the design year.

The following table provides recommended design factors for the development of Design Traffic:

**TABLE 3
RECOMMENDED DESIGN FACTORS**

K30 Mainline	0.0956
D Factor Mainline	0.560
T Factor Mainline (Medium & Heavy)	7.2%
K30 Side streets	0.1097
D Factor Side streets	0.565

2.3 Roadway Characteristics

SR 426 is classified as an urban principal arterial that links the cities of Winter Park and Oviedo in Orange and Seminole Counties. The portion of SR 426/CR 419 (Broadway Street) included in this Design Traffic Report has limits from Pine Avenue to Lockwood Boulevard within the Oviedo city limits in Seminole County. SR 426/ CR 419 from Pine Avenue to just east of Station Street, is a three-lane section with one travel lane in each direction separated by a paved center lane. From just east of Station Street to Boston Avenue, Broadway Street exists strictly as a two-lane facility, from Boston Avenue to just east of Louise Avenue as a three-lane facility and from just east of Louise Avenue to Lockwood Boulevard as a two-lane facility.

Existing geometry and traffic controls for the primary intersections to be analyzed in this report are provided in Figure 2A and Figure 2B. Access to adjacent properties along the SR 426 /CR 419 is unrestricted with numerous driveways and side streets that connect directly to the mainline. A number of businesses, residential communities and community facilities depend on SR 426/CR 419 for access. The existing speed limit varies between 35 mph and 45 mph along the SR 426/CR 419 corridor.

Crash Analysis

Crash data for the corridor was collected via original accident report forms (long and short) as filed with City of Oviedo. Crashes for 2000, 2001 and 2002 through August were analyzed. Data collected included the nearest intersection (location), date, time, type of crash, number of injuries and/or fatalities, property damage, daylight and weather conditions, and primary contributing cause. The collision summary sheets are provided in Appendix A.

The crash analysis included the computation of crash rates and safety ratios for each intersection. The safety ratio, as specified in the FDOT Highway Safety Improvement Program Manual, ascribes a collision safety value to any specific roadway segment or “spot” location (intersection) on a state road. This value is based on the roadway classification (divided or undivided, rural or urban), the number of lanes, traffic volumes experienced and, in the case of roadway segments, the length of the segment.

**TABLE 4
CRASH LOCATIONS – SR 426/CR 419 INTERSECTIONS**

Location	2000	2001	2002
	Crashes	Crashes	Crashes
Pine Avenue	3	2	2
Aulin Drive	4	5	1
Tomoka Drive	0	3	0
Lake Jessup Avenue	1	9	1
Lawton Avenue	0	2	0
Graham Avenue	1	1	1
Central Avenue	1	2	4
Geneva Drive	15	7	9
Division Street	4	8	1
Avenue B	0	1	0
Boston Alley	1	0	0
Stephan Street	0	0	1
Reed Road	1	2	0
Carolyn Dr/Evans St	0	2	1
Bishop Ave/Waverlee	0	0	0
Lockwood Boulevard	7	9	0

* 2000 crash data is from Aug. to Dec./2002 crash data is from Jan. to Aug.

A review of the collision summary sheets indicates the following crash types for the study intersections over the three-year period:

**TABLE 5
CRASH TYPES FOR CRASH LOCATIONS
SR 426/CR 419 INTERSECTIONS**

2000								
Location	TOTAL	Angle	Left Turn	Rear End	Bike/Ped	Night	Injury	Fatal
Pine Avenue	3	0	0	3	0	0	0	0
Aulin Drive	4	1	0	2	0	1	0	0
Tomoka Drive	0	0	0	0	0	0	0	0
Lake Jessup Avenue	1	1	0	0	0	0	2	0
Lawton Avenue	0	0	0	0	0	0	0	0
Graham Avenue	1	0	0	1	0	1	0	0
Central Avenue	1	0	0	1	0	1	0	0
Geneva Drive	15	6	5	4	0	1	5	0
Division Street	4	0	0	3	0	0	2	0
Avenue B	0	0	0	0	0	0	0	0
Boston Alley	1	0	0	1	0	0	1	0
Stephan St/Academy Ave	1	0	0	1	0	1	0	0
Reed Road	1	0	0	0	0	1	0	0
Carolyn Dr/Evans St	0	0	0	0	0	0	0	0
Bishop Ave/Waverlee	0	0	0	0	0	0	0	0
Lockwood Bouevard	7	0	1	1	0	2	1	0
2001								
Location	TOTAL	Angle	Left Turn	Rear End	Bike/Ped	Night	Injury	Fatal
Pine Avenue	2	0	1	1	0	0	0	0
Aulin Drive	5	0	0	4	0	1	1	0
Tomoka Drive	2	0	1	1	0	0	1	0
Lake Jessup Avenue	9	1	0	6	0	2	3	0
Lawton Avenue	2	0	0	2	0	0	0	0
Graham Avenue	1	0	0	1	0	0	0	0
Central Avenue	1	0	0	1	0	0	0	0
Geneva Drive	6	3	0	3	0	0	3	0
Division Street	8	3	0	5	0	0	3	0
Avenue B	1	0	0	1	0	0	1	0
Boston Alley	0	0	0	0	0	0	0	0
Stephan St/Academy Ave	3	1	0	2	0	0	0	0
Reed Road	1	0	1	0	0	0	0	0
Carolyn Dr/Evans St	2	1	1	0	0	0	1	0
Bishop Ave/Waverlee	0	0	0	0	0	0	0	0
Lockwood Bouevard	9	2	4	2	0	1	3	0

**TABLE 5
CRASH TYPES FOR CRASH LOCATIONS
SR 426/CR 419 INTERSECTIONS Cont.**

2002								
Location	TOTAL	Angle	Left Turn	Rear End	Bike/Ped	Night	Injury	Fatal
Pine Avenue	2	0	0	2	0	0	0	0
Aulin Drive	0	0	0	0	0	0	0	0
Tomoka Drive	0	0	0	0	0	0	0	0
Lake Jessup Avenue	1	0	0	1	0	0	1	0
Lawton Avenue	0	0	0	0	0	0	0	0
Graham Avenue	1	0	0	1	0	0	0	0
Central Avenue	2	0	0	2	0	0	3	0
Geneva Drive	9	4	2	2	0	1	3	0
Division Street	1	1	0	0	0	0	0	0
Avenue B	0	0	0	0	0	0	0	0
Boston Alley	0	0	0	0	0	0	0	0
Stephan St/Academy Ave	2	0	0	2	0	0	1	0
Reed Road	0	0	0	0	0	0	0	0
Carolyn Dr/Evans St	0	0	0	0	0	0	0	0
Bishop Ave/Waverlee	0	0	0	0	0	0	0	0
Lockwood Boulevard	5	0	1	4	0	0	4	0

* 2000 crash data is from Aug. to Dec./2002 crash data is from Jan. to Aug.

2.4 Base Year Traffic Volumes

The traffic counts were seasonally and axle adjusted to provide Average Annual Daily Traffic (AADT). Table 6 provides the existing traffic volumes. TMCs conducted in June 2002 for the analyzed intersections are provided in Figure 3A and Figure 3B. Traffic count data sheets are provided in Appendix B.

2.6 Existing Level of Service

A roadway link level of service (LOS) analysis was performed for the existing traffic volumes using the Generalized LOS Tables provided by the FDOT. Intersection LOS were analyzed using the Highway Capacity Software (HCS) Version 4.1 (2000 HCM) signalized and unsignalized analysis, as appropriate. The HCS worksheets are included in Appendix C. Figure 4A and Figure 4B provide the roadway segment and intersection LOS for the existing condition.

Currently SR 426/ CR 419 is operating at LOS F east of Pine Street to Lake Jessup Avenue. From Lake Jessup Avenue to west of Central Avenue (SR 434) SR 426/CR 419 operates at LOS E and from Central Avenue to Division Street at LOS C. West of Division Street to Academy Avenue SR 426/CR419 operate at LOS D. From Academy Avenue to Bishop Avenue SR 426/CR 419 operates at LOS C with the remaining section to Lockwood Boulevard at LOS D. Most of the project's primary signalized intersections operate at acceptable LOS except for Lockwood Boulevard which operates at LOS F (at the time of this study CR 419 at Lockwood Boulevard was under construction). A majority of the project's unsignalized intersections have acceptable LOS along SR 426/CR419 however, the side streets of Aulin Avenue and Waverlee Woods Boulevard are operating at LOS F.

Figure 4A

Figure 4B

**TABLE 6
2001 EXISTING TRAFFIC VOLUMES
MAINLINE**

Roadway Segment	2002 Count	Axle Factor	Seasonal Factor	2002 AADT
426 West of Pine Avenue	17,355	0.98	1.07	18,200
426 West of Aulin Avenue	16,399	0.98	1.07	17,200
426 West of Lake Jessup Avenue	16,082	0.98	1.07	16,900
426 East of Lake Jessup Avenue	15,002	0.98	1.07	15,700
426 West of Central Avenue	15,962	0.98	1.07	16,700
426 East of Central Avenue	7,407	0.98	1.07	7,800
419 East of Station Street	12,367	0.98	1.07	13,000
419 West of Division Street	11,783	0.98	1.07	12,400
419 East of Division Street	13,732	0.98	1.07	14,400
419 East of Avenue B	13,808	0.98	1.07	14,500
419 West of Avenue B	13,993	0.98	1.07	14,700
419 East of Stephan Street	14,046	0.98	1.07	14,700
419 West of Reed Road	13,529	0.98	1.07	14,200
419 South of Carolyn Drive	10,587	0.98	1.07	11,100
419 North of Carolyn Drive	10,142	0.98	1.07	10,600
419 South of Bishop Avenue	13,731	0.98	1.07	14,400
419 East of Lockwood Blvd.	20,188	0.98	1.07	21,200

SIDE STREETS

Roadway Segment	2002 Count	Axle Factor	Seasonal Factor	2002 AADT
Pine Avenue North of 426	4,988	0.99	1.07	5,300
Aulin Avenue South of 426	959	0.99	1.07	1,000
Aulin Avenue North of 426	2,881	0.99	1.07	3,100
Lake Jessup Avenue South of 426	3,293	0.99	1.07	3,500
Lake Jessup Avenue North of 426	5,524	0.99	1.07	5,900
Central Avenue South of 426	12,045	0.99	1.07	12,800
Central Avenue North of 426	14,644	0.99	1.07	15,500
Station Street South of 426	3,730	0.99	1.07	4,000
Railroad Street North of 426	2,243	0.99	1.07	2,400
Division Street North of 419	2,423	0.99	1.07	2,600
Avenue B North of 419	407	0.99	1.07	400
Academy Avenue South of 419	2,027	0.99	1.07	2,100
Stephan Street North of 419	542	0.99	1.07	600
Reed Road North of 419	2,438	0.99	1.07	2,600
Carolyn Drive West of 419	975	0.99	1.07	1,000
Evans Street East of 419	1,233	0.99	1.07	1,300
Bishop Avenue West of 419	918	0.99	1.07	1,000
Waverlee Woods Blvd. East of 419	1,189	0.99	1.07	1,300
Lockwood Blvd. South of 419	26,129	0.99	1.07	27,700
Lockwood Blvd. North of 419	8,414	0.99	1.07	8,900

3. FUTURE TRAFFIC PROJECTIONS

3.1 Methodology

The Central Florida Regional Planning Model (CFRPM) was used to obtain Peak Season Weekday Daily Traffic (PSWDT) volumes for the area. The Model Output Conversion Factor (MOCF) of 0.96 was applied to the model volumes to produce AADTs from the Peak Season Daily Traffic Volumes. A “Build” scenario was evaluated for SR 426/CR 419 as a four-lane facility and a “No-Build” scenario with SR 426/CR 419 as a two-lane facility from Pine Avenue east to Lockwood Boulevard.

The 2010 CFRPM corresponds directly to the opening year of the project. For comparison purposes, growth rates were developed from existing AADTs to 2010 Build and No Build Scenarios. For the design year, a growth rate was developed between 2010 and 2025 models for both the Build & No Build Scenarios. Growth rates for the following conditions were derived:

- Existing AADTs to 2010 (2-Lane) and 2025 (2-Lane)
- Existing AADTs to 2010 (4-Lane) and 2025 (4-Lane)
- Historical Trends: -0.9% $R^2=0.9\%$

A review of the No Build growth rates shows that the FSUTMS model does not accurately project the future traffic volumes for the study area, as the growth rates are negative. FSUTMS model plots are provided in Appendix D. The historical growth rate of 9.6 percent is not reasonable for a two-lane undivided roadway. Based on the study area and the future land use within the study area, a 2.0 percent growth rate appears reasonable and is consistent with other areas of this type. The Build growth rate varies as shown in Table 7. A composite growth rate of 3.8% was developed.

Based on the FSUTMS analysis, historical growth rates and future land use, the recommended growth rates are summarized in Table 7. The Design Traffic Technical Memorandum is provided in Appendix E.

**TABLE 7
RECOMMENDED GROWTH RATES
FOR SR 426/ CR 419 FROM PINE AVENUE TO LOCKWOOD BOULEVARD**

No Build Scenario	Growth Rate
Mainline	2.00%
Side streets	1.60%
Build Scenario	
Mainline	3.80%
Side streets	1.60%

3.2 No-Build Projected Traffic Volumes and Intersection Analysis

Figure 5A and Figure 5B provide the existing and projected AADTs for the No-Build scenario. These volumes were derived utilizing the approved growth rates for the roadway segments and conditions noted in the previous Section. Figure 6A and Figure 6B provide the

Fig 5A

Fig 5B

Fig 6A

Fig 6B

existing and projected Directional Design Hour Volumes (DDHVs). The approved K and D design factors were applied to the AADTs to derive the DDHVs

Projected AADTs were input into TURNS5 analysis worksheets to develop future year turning movements for the opening (2010), interim (2020), and design (2030) years. These projected movements are based upon the K and D design factors. Where appropriate, TURNS5 turning movements were manually adjusted based on existing traffic volumes. TURNS5 spreadsheets are provided in Appendix F.

As stated previously, the No-Build scenario shows SR 426/CR 419 as a two-lane facility from Pine Avenue eastward to Lockwood Boulevard. The DDHVs and future year turning movement volume projections were analyzed to determine projected future LOS. Level of service analyses were conducted based on the roadway's existing characteristics using the FDOT Generalized Capacity Tables. Figures 7 through 9 provide the projected design hour turning movement volumes and the LOS for the No-Build scenario for the years 2010, 2020, and 2030 respectively.

A review of Figures 7 through 9 show that by the year 2010 in the No-Build scenario, the following roadway segments and intersections fall below LOS E:

Roadway segments

- SR 426 (Broadway Avenue) from Pine Avenue to Central Avenue (SR 434)
- CR 419 (Broadway Avenue) from Division Street to Academy Avenue

Intersections

- SR 426/CR 419 (Broadway Avenue) and Central Avenue (SR 434)
- SR 426/CR 419 (Broadway Avenue) and Station Street & CR 426
- CR 419 (Broadway Avenue) and Lockwood Boulevard

By the year 2020 in the No-Build scenario, the following additional roadway segments and intersections fall below LOS E:

Roadway segments

- CR 419 (Broadway Avenue) from Station Street & CR 426 to Division Street
- CR 419 (Broadway Avenue) from Academy Avenue to Reed Road
- CR 419 (Broadway Avenue) from Waverlee Woods Blvd to Lockwood Blvd

Intersections

- SR 426 and Lake Jessup Avenue
- CR 419 (Broadway Avenue) and Lockwood Blvd

By the year 2030 in the No-Build scenario the following additional roadway segments and intersections fall below LOS E:

- *Roadway segment*
- CR 419 (Broadway Avenue) from Carolyn Drive to Waverlee Woods Blvd

As shown above, the roadways segments and intersection LOS will continue to decline if no improvements are done to SR 426 / CR 419.

Fig 7

Fig 8

Fig 9

3.3 Build Projected Traffic Volumes and Intersection Analysis.

During the study phase of this project, The City of Oviedo and The Florida Department of Transportation agreed that a one-way pair will be design and implemented as part of the City of Oviedo Downtown roadway system. This one-way pair will be developed using SR 434 (Central Avenue), Station Street and Railroad Street. SR 434 will be one-way southbound from Railroad Street to Garden Street. The complementary part of this one-way pair will be a combination of Garden Street, Station Street and Railroad Street as a one-way northbound. It is this one-way pair and the four lane section of SR 426/CR 419 from Pine Street to west of Lockwood Boulevard that was used for one of the build scenarios, namely Scenario 2A.

The other build scenario, Scenario 2B, leaves SR 434 as a two-lane, two-way road and four lanes on SR 426/CR 419 from Pine Avenue to west of Lockwood Boulevard. Additionally, Station Street will remain as a two-way two lane road with a minor change at its intersection with SR 426/CR 419 where it will be right-in and right-out only. Scenario 2B does not consider Railroad Street. Figure 10 shows Scenario 2A and Scenario 2B roadway arrangement. In the early phase of this study Seminole County, widen CR 419 to four lanes from Pine Street in Chuluota to west of Lockwood Boulevard, just east of Waverlee Woods Blvd. DRMP will match our project to the county's termini on CR 419.

Existing and projected AADTs for the Build scenarios (Scenario 2A and 2B) are presented in Figures 11A and 11B. These volumes were derived utilizing the approved growth rates for the roadway segments and conditions noted in the previous Section. Figures 12A and 12B provide the existing and projected DDHVs. The approved K and D design factors were applied to the AADTs to derive the DDHVs.

Projected AADTs were input into TURNS5 analysis worksheets to develop future year turning movements. These projected movements are based upon the K and D design factors shown in Table 3 and the recommended growth rates shown in Table 7. Where appropriate, TURNS5 turning movements were manually adjusted based on existing traffic volumes. The projected design hour volumes, intersection LOS and segments LOS for Build Scenarios 2A and 2B, for the years 2010, 2020, and 2030 respectively are shown in Figures 13 thru 18.

A summary of the LOS from Figures 13 thru 18 is shown in Tables 8 and Table 9. Table 8 shows that no segment of SR 426/CR 419 falls below LOS E either in Scenario 2A or Scenario 2B through the Design year 2030. Table 9 shows the intersection LOS for both scenarios and depicts the Oviedo downtown intersections as those falling below LOS E. Under Scenario A, the intersection of Central Avenue at SR 426 and Station Street at CR 419 are at LOS F for the design year 2030. Under Scenario B, the intersection of Station Street at CR 419 is at LOS C.

Fig 10

Fig 11A

Fig 11B

Fig 12A

Fig 12B

Fig 13

Fig 14

Fig 15

Fig 16

Fig 17

Fig 18

Table 8 and Table 9

4.0 Recommended Improvements

4.1 Scenario 2A and Scenario 2B

Based on the evaluation of the roadway segment operating conditions for both Build scenarios, SR 426 /CR 419 from Pine Avenue to Lockwood Boulevard will operate at acceptable levels of service. The downtown Oviedo intersections of SR 434 at SR 426, and Station Street at CR 419 failed in the opening year. Further analysis of these intersections shows that widening SR 434 may expect some relief to the above mention intersections. The following is a list of possible recommended improvements to the 2A and 2B scenarios.

Under Scenario 2A, the recommended improvement is to widen SR 434 to three lanes at SR 426, two through lanes and one left turn lane; from Railroad Avenue to Garden Street. This geometric improvement will improve this intersection during the opening and mid-design year although it is projected to fail by the design year. There are no possible improvements to Station Street at CR 419 because of limited right-of-way along Railroad Avenue and CR 426. This intersection fails during the mid-design year and design year.

Under Scenario 2B, the recommended improvement is to widen SR 434 to five lanes at SR 426, 2 lanes northbound and 2 lanes southbound with a separate left turn lane. Station Street will be considered only as a right in and right out at CR 419. This recommendation will improve SR 434 and SR 426 greatly with acceptable level of service beyond the design year. Figures 19 thru 24 show the results of the analysis for scenarios 2A and 2B with the recommended improvements.

4.2 Recommended Improvements

The proposed recommended improvements to SR 426/CR 419 and those mentioned above for SR 434 provide acceptable level of service to the study corridor. The recommended geometry shown in Figure 25 represents the maximum efficient geometry to sustain through traffic flow within the SR424/CR419 corridor. Table 10 provides a summary of ideal storage length requirements for the signalized intersections evaluated for the project. It should be noted that the specific lengths do not include the taper or deceleration distance. (Refer to FDOT Index 301 to determine the appropriate specific taper and deceleration length). These storage lengths are recommended at locations where these lengths can be achieved. Implementation of the storage length requirements will be a function of the design and the physical practicality of their construction.

Fig 19

Fig 20

Fig 21

Fig 22

Fig 23

Fig 24

Fig 25

Table 10

Table 10 continue

APPENDICES

APPENDIX A

Collision Summary Sheets

APPENDIX B

Traffic Count Data Sheets

APPENDIX C

Capacity Analysis Worksheets

APPENDIX D

FSUTMS Model Plots

APPENDIX E

**Design Traffic Technical
Memorandum**

APPENDIX F

TURNS5 Spreadsheet

Figure1