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Memorandum

DRMP #99-0170.028 Date: October 2, 2003

To: Charles Smith, PE City of Oviedo

From: Darrell Cunningham, AICP

Subject: **SR 426/CR 419 (Broadway Street) Design Traffic Technical Memorandum**

MEMO OBJECTIVE

The objective of this memo is to develop design characteristics and future traffic volume projections for the SR 426/CR 419 (Broadway Street) Design Traffic Report. This effort is being undertaken to provide design traffic for the improvement of SR 426/CR 419 between Pine Avenue and Lockwood Boulevard within the City of Oviedo. This analysis will utilize new traffic count information and the latest travel demand model for the Florida Department of Transportation (FDOT) District 5 to derive Design Traffic volumes for the Build and No Build scenario. The opening, interim and design years will be 2010, 2020, and 2030, respectively.

TRAFFIC COUNTS

Daily volume traffic counts were conducted in September 2002 for this design traffic analysis. Table 1, provided as an attachment to this memo, summarizes the existing daily traffic volumes and the Annual Average Daily Traffic (AADTs) based on an axle adjustment factor of 0.98 and a seasonal factor of 1.07. Existing AADTs along SR 426/CR 419 range from approximately 7,800 vehicles east of Central Avenue to 21,200 east of Lockwood Boulevard.

Two (2) 72-hour vehicle classification counts were taken east of Aulin Avenue and east of Reed Road along SR 426/CR 419. In addition, eight-hour turning movement counts were conducted at eleven (11) intersections along SR 426/CR 419 (listed in Table 1).

TRAFFIC CHARACTERISTICS

The traffic count information was used to develop existing traffic characteristics for roadways within the study area. Based on the 24-hour vehicle volume counts and 72-hour vehicle classification counts, peak traffic flow (K measured), peak traffic direction (D), and Medium and Heavy truck percentages (T) were derived. Table 2 (attachment) provides the measured traffic characteristics for the mainline and side streets, while Table 3 provides the summary traffic characteristics for the project.

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**TABLE 3
 SUMMARY OF TRAFFIC CHARACTERISTICS
 FOR SR 426/CR 419 FROM PINE AVENUE TO LOCKWOOD BOULEVARD**

Mainline	
K(measured)	0.0891
K30(estimated)	0.0956
K30(FDOT)	0.0895
D(measured)	0.5597
D(FDOT)	0.5401
T(measured)	7.2%
T(FDOT)	3.02

Side Streets	
K(measured)	0.1023
K30(estimated)	0.1097
K30(FDOT)	NA
D(measured)	0.5654
D(FDOT)	NA
T(measured)	NA
T(FDOT)	NA

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. FDOT provided seasonal factors for Seminole County.

The average K30 of 0.0956 as shown above is in the range of 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 larger K30 (estimated) for the design factor of 0.0956.

The measured daily truck percentages (T) for Medium and Heavy trucks was 7.3% east of Aulin Avenue and 7.1% east of Reed Road, for an average T 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 and pavement design:

TABLE 4
RECOMMENDED DESIGN FACTORS
FOR SR 426/ CR 419 FROM PINE AVENUE TO LOCKWOOD BOULEVARD

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

PROJECTED TRAFFIC VOLUMES

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 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 and 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% $R^2 = 0.9\%$

TABLE 5
GROWTH RATE COMPARISON
FOR SR 426/ CR 419 FROM PINE AVENUE TO LOCKWOOD BOULEVARD

	Growth Rate	
	Mainline	Side Street
Historical	9.6%	NA
2002 Existing to 2010 No-Build	-3.80%	1.40%
2002 Existing to 2010 Build	4.18%	1.73%
2010 to 2025 No-Build	0.68%	0.39%
2010 to 2025 Build	0.62%	0.36%
2002 to 2025 No-Build	-2.86%	3.08%
2002 to 2025 Build	6.60%	2.58%

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. 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 5. A composite growth rate was developed by averaging the Build growth rates. The composite Build growth rate is 3.8 percent. Table 6 summarizes the 2030 AADTs based on the No Build and Build growth rates.

**TABLE 6
PROJECTED YEAR 2030 AADTs
FOR SR 426/ CR 419 FROM PINE AVENUE TO LOCKWOOD BOULEVARD**

Build Roadway Segment	2002 AADT	Growth Rate	2010	2020	2030
SR 426 West of Aulin Avenue	17,200	3.80%	22,400	29,000	35,500
SR 426 East of Lake Jessup Avenue	15,700	3.80%	20,500	26,400	32,400
CR 419 East of Station Street	13,000	3.80%	17,000	21,900	26,800
CR 419 West of Reed Road	14,200	3.80%	18,500	23,900	29,300
CR 419 East of Lockwood Blvd.	21,200	3.80%	27,600	35,700	43,800
No Build Roadway Segment	2002 AADT	Growth Rate	2010	2020	2030
SR 426 West of Aulin Avenue	17,200	2.00%	20,000	23,400	26,800
SR 426 East of Lake Jessup Avenue	15,700	2.00%	18,200	21,400	24,500
CR 419 East of Station Street	13,000	2.00%	15,100	17,700	20,300
CR 419 West of Reed Road	14,200	2.00%	16,500	19,300	22,200
CR 419 East of Lockwood Blvd.	21,200	2.00%	24,600	28,800	33,100

Based on the FSUTMS analysis, historical growth rates and future land use the recommended growth rates are summarized in Table 7.

**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%



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A comprehensive analysis of projected year 2030 volumes for both No-Build and the Build conditions will be developed as part of the Design Traffic procedure. Please provide any comments or questions on the information provided herein. Upon approval of the Design Traffic Technical Memorandum, DRMP will move forward with the Design Traffic Report.

End of Memorandum.

Attachments: Table 1 – Existing Daily Traffic Volumes
Table 2 – Traffic Characteristics
FSUTMS plots
Historical trends

cc: Coco Woo, Seminole County
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