

PRELIMINARY ENGINEERING REPORT FINAL

SR 15/600 (US 17/92) PD&E Study

**From Norfolk Avenue to Monroe Street
Orange County, Florida**

Financial Project Number: 408429-1-22-01
Federal Aid Project Number: 3993-045-P

This document presents the evaluation of the proposed congestion management improvements for SR 15/600 (US 17/92) from Norfolk Avenue to Monroe Street in Orange County, Florida. The proposed action addressed herein involves the implementation of congestion management strategies including the proposed extension of SR 423 (Lee Road) from SR 15/600 (US 17/92) to a connection with Denning Drive and Solana Avenue.

Prepared for:

FLORIDA DEPARTMENT OF TRANSPORTATION

District Five

719 South Woodland Boulevard
DeLand, Florida 32720

JULY 2004

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**Prepared for:
FLORIDA DEPARTMENT OF TRANSPORTATION
District Five
719 South Woodland Boulevard
DeLand, Florida 32720**

**Prepared by:
DRMP, INC.**

July 2004

PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a Registered Professional Engineer in the State of Florida practicing with DRMP, Inc. and that I have supervised the preparation and approve the evaluation, findings, opinions, conclusions, and technical advice hereby reported for:

FINANCIAL PROJECT ID No.: 408429-1-22-01

FEDERAL AID PROJECT No.: 3993 045 P

PROJECT: SR 15/600 (US 17/92)
From Norfolk Avenue to Monroe Street
Orange County, Florida

This report includes a summary of data collection efforts, corridor analyses, and conceptual design analyses for the SR 15/600 (US 17/92) PD&E Study. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgment and experience.

Signature:



Name:

Mark Prochak, P.E.

P.E. No.:

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Date:

7/6/04

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1.0 SUMMARY

1.1 Commitments

The following represents the commitments made by FDOT during the SR 15/600 (US 17/92) study addressed in this document:

The FDOT is committed to continuing its working relationship with the City of Winter Park and METROPLAN ORLANDO during subsequent project phases to ensure that certain components of the preferred build alternative continue to be addressed following the Location and Design Concept Acceptance (LDCA) by the Federal Highway Administration (FHWA). In particular, FDOT and the City of Winter Park have entered into a Memorandum of Understanding (MOU) (see Appendix A) to “cooperate with each other in order to maximize the use and allocation of the monetary resources each are entrusted with” during subsequent project development activities. The overall project commitments, including those detailed in the MOU, are summarized below.

Commitments by the City of Winter Park:

- Construct the SR 423 (Lee Road) Extension prior to or at the same time as the enhancements along SR 15/600 (US 17/92);
- Relocate existing bicycle facilities from the SR 15/600 (US 17/92) corridor to Denning Drive prior to the construction of the SR 15/600 (US 17/92) enhancements;
- Provide funding for any sidewalk widths over six (6) feet;
- Provide funding for landscape and/or aesthetic enhancements associated with the project;
- Provide funding for the incremental cost associated with the texturing of the center bi-directional turn-lane along SR 15/600 (US 17/92); and,
- With FDOT, agree to the funding responsibilities for street lighting during the final design phase.

Commitments by the FDOT:

- Provide funding for the remaining portions of the project. The MOU states that the extension of SR 423 (Lee Road) shall be funded and completed prior to or at

the same time as the construction of the enhancements along SR 15/600 (US 17/92). If both projects are funded together, FDOT may elect to proceed with the construction of both projects at or about the same time;

- Coordinate with LYNX and/or regional transit authorities to evaluate potential sidewalk connections to adjacent land uses and/or transit features such as bus shelters;
- Coordinate with the City of Winter Park during subsequent project phases to ensure the placement of pedestrian refuge islands accomplish the goals and objectives of such facilities while minimizing impacts to adjacent properties;
- Re-evaluate, during final design, the proposed intersection geometry and turning radii at the intersections of SR 15/600 (US 17/92) and Fairbanks Avenue and SR 15/600 (US 17/92) and Webster Avenue (comment received from METROPLAN ORLANDO citizens Advisory Committee following the November 13, 2003 Public Hearing);
- Coordinate with local government and regulatory agencies relative to the final design of stormwater management facilities in conjunction with the final design of the proposed improvement.

1.2 Recommendations

The Florida Department of Transportation (FDOT) recommends that the preferred build alternative as shown in Figure 1-1, be implemented as the proposed action for providing safety, congestion management and aesthetic improvements along SR 15/600 (US 17/92) from Norfolk Avenue to Monroe Street. Appendix B contains the Conceptual Design Plans for the preferred alternative. The proposed action also includes the easterly extension of SR 423 (Lee Road) from SR 15/600 (US 17/92) to Denning Drive near Solana Avenue (see Figure 1-2) as well as median modifications along SR 15/600 (US 17/92) north of SR 423 (Lee Road) to improve turn lane storage and queue lengths.

Minor deviations from the full extent of the proposed action occur at select locations within these limits, as follows:

From Norfolk Avenue to Orange Avenue (SR 527): The continuous two-way center left-turn lane would not be implemented in this section because the existing and proposed configuration includes flush (painted) left-turn storage lanes. However, to be consistent with the proposed City of Orlando improvements along SR 15/600 (US 17/92) from SR 50 (Colonial Drive) to Norfolk Avenue, the proposed action addressed in this document will include sidewalk widening and the placement of a pedestrian refuge island in the vicinity of Leith Avenue

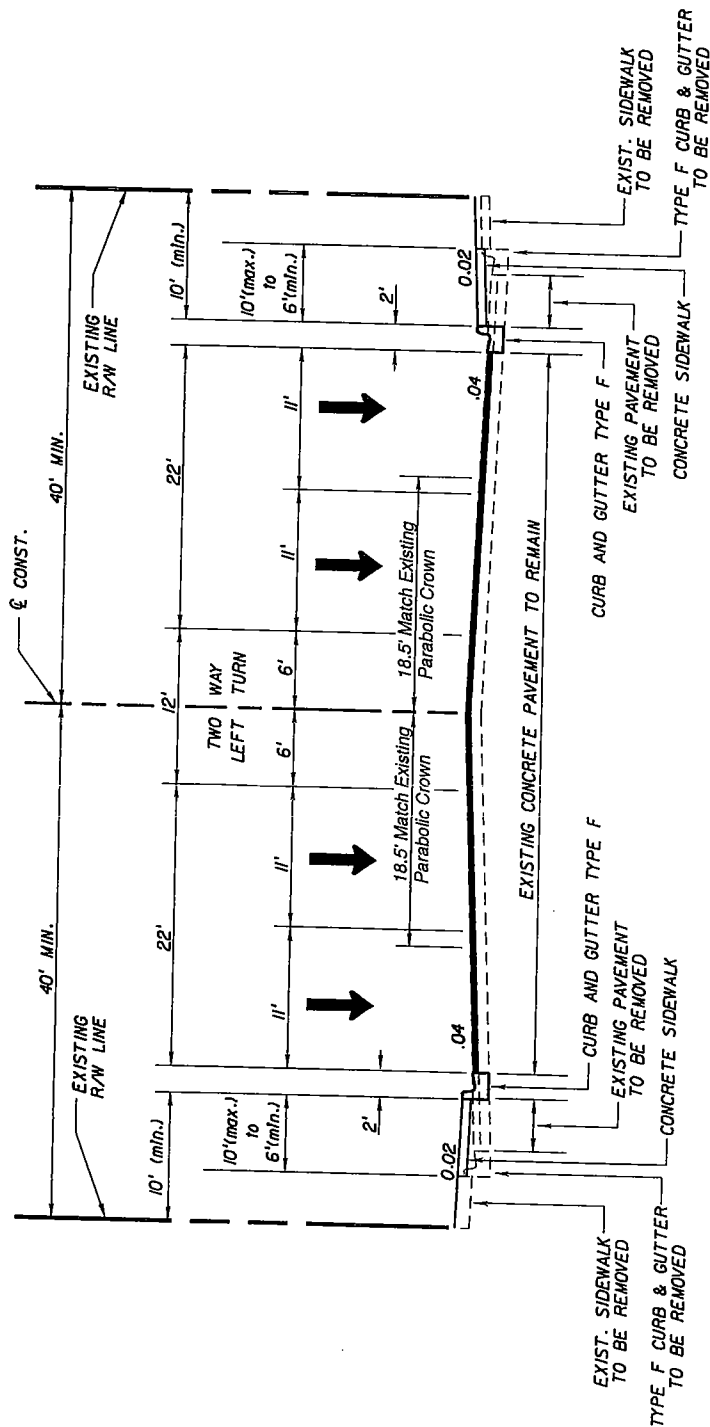
From Gay Road to Lee Road: The continuous two-way center left-turn lane would not be implemented in this section because the existing and proposed configuration includes a raised concrete traffic separator in this section.

From Lee Road (SR 423) to Monroe Street: The recommended improvements in this section include median modifications only in order to enhance left-turn storage conditions (see Appendix B). A minor re-alignment of Solana Avenue east of SR 15/600 (US 17/92) has been suggested within these limits, as shown on the Conceptual Design Plans located in Appendix B. However, if implemented, the cost of this re-alignment will be the responsibility of the City of Winter Park.

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 408429-1-22-01 COUNTY NAME ORANGE
 STATE PROJECT NO. 75030 ROAD DESIGNATION SR 15/600 (US 17/92) LIMITS/MILEPOST MP 4.661 TO MP 6.663
 FEDERAL AID PROJECT NO. 3993045P PROJECT DESCRIPTION TRAFFIC OPS IMPROVEMENT ON SR15/600 (US 17/92)
FROM NORFOLK AVENUE TO MONROE STREET

PROPOSED ROADWAY TYPICAL SECTION



FLUSH MEDIAN TYPICAL SECTION ALTERNATIVE

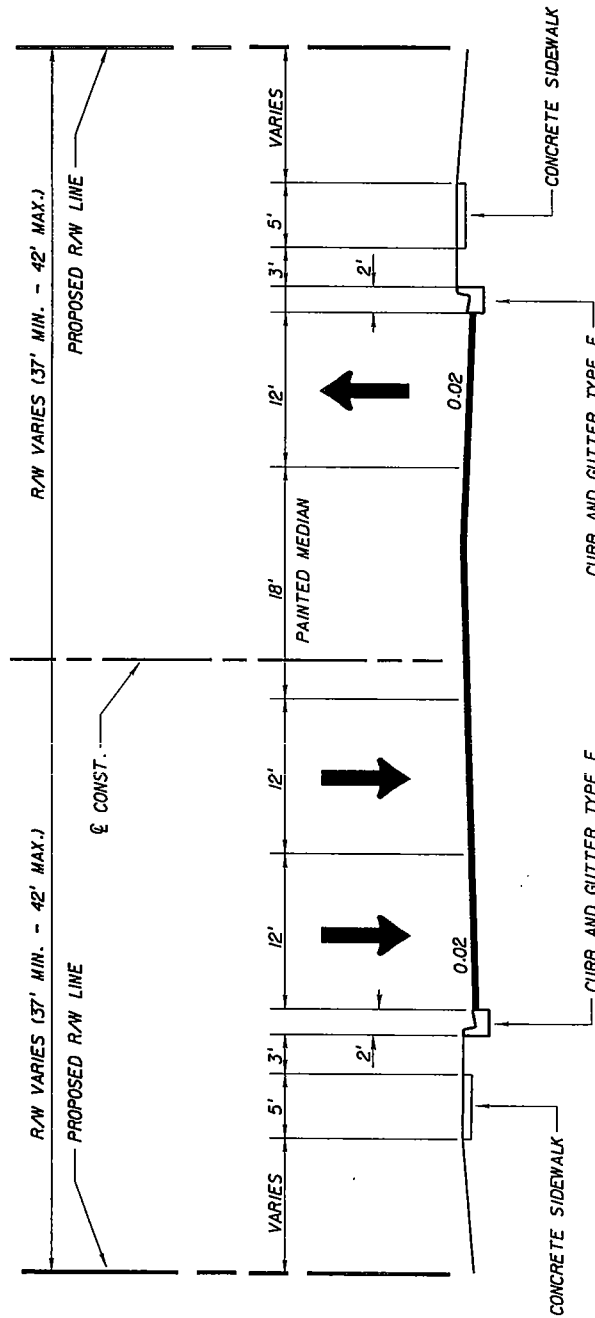
APPROVED BY		FDOT CONCURRENCE		FHWA CONCURRENCE	
Mark Prochak, P.E. Engineer Of Record	Date	Annette K. Brennan, P.E. FDOT District Design Engineer	Date	N/A	Printed Name FHWA Transportation Engineer
	Date		Date		

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PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 408429-1-22-01 COUNTY NAME ORANGE
 STATE PROJECT NO. 75030 ROAD DESIGNATION LEE ROAD EXTENSION LIMITS/MILEPOST N/A
 FEDERAL AID PROJECT NO. 3993045P PROJECT DESCRIPTION TRAFFIC OPS IMPROVEMENT
 LEE ROAD EXTENSION FROM SR15/600 IUS 17/92 TO DENNING DRIVE

PROPOSED ROADWAY TYPICAL SECTION



3 LANE URBAN TYPICAL SECTION WITH A FLUSH MEDIAN
 FROM SR 15/600 US 17/92 TO DENNING DRIVE

APPROVED BY	FDOT CONCURRENCE	FHWA CONCURRENCE
Colette F. Moss, P.E. Engineer Of Record Date _____	Annette K. Brennan, P.E. FDOT District Design Engineer Date _____	N/A Printed Name FHWA Transportation Engineer Date _____

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Figure 1-2

2.0 INTRODUCTION

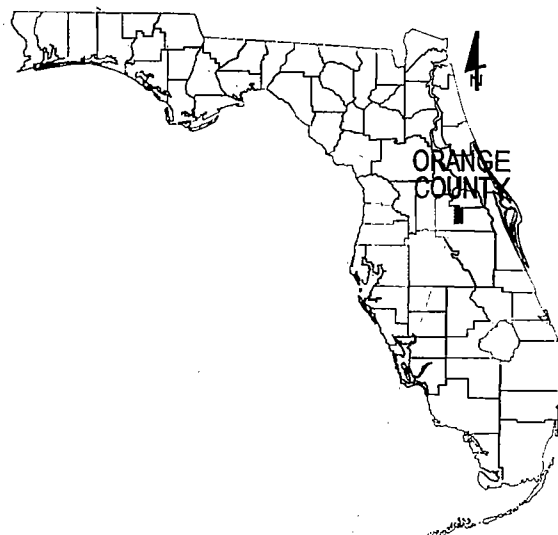
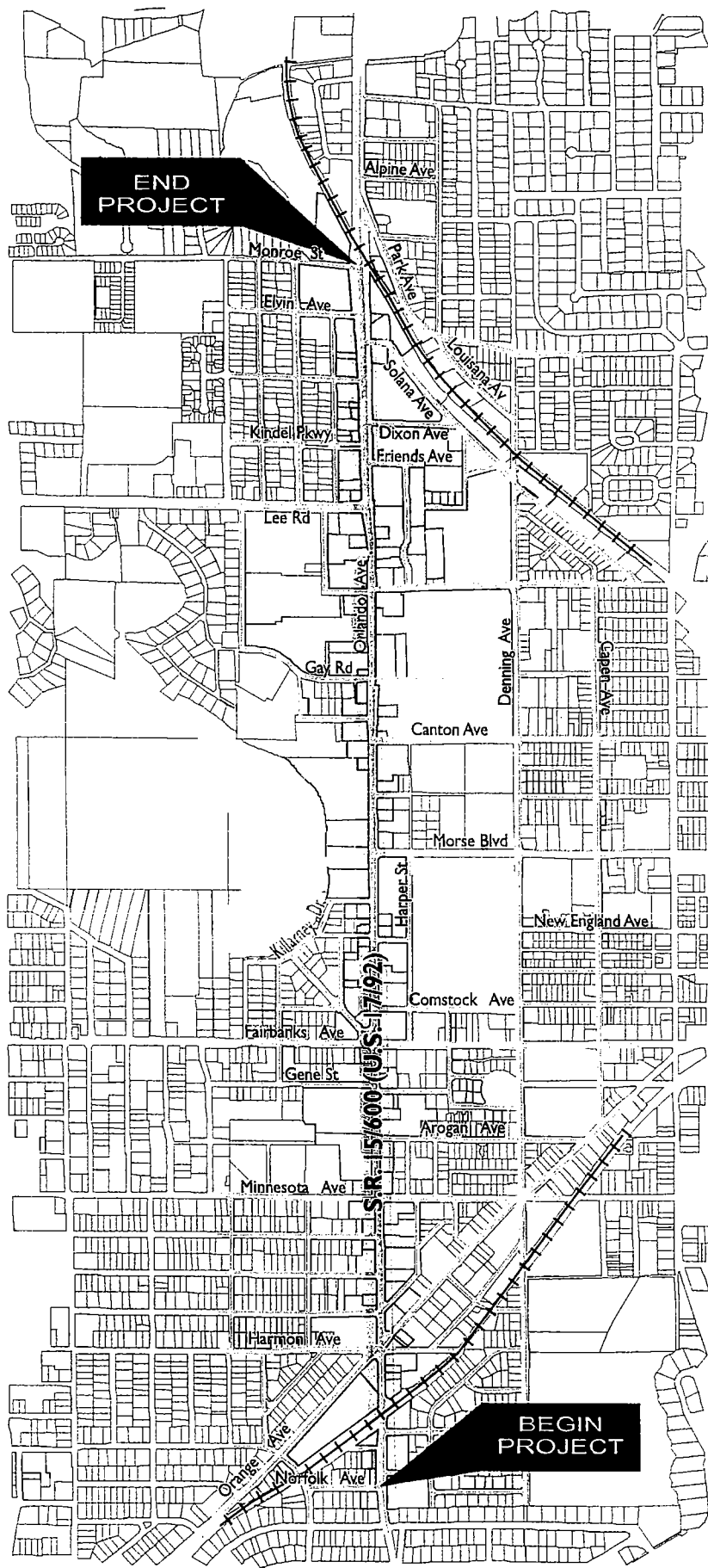
2.1 *Purpose*

This Preliminary Engineering Report (PER) has been prepared as part of the Florida Department of Transportation (FDOT) Project Development and Environment (PD&E) Study for SR 15/600 (US 17/92) from Norfolk Avenue to Monroe Street located within the city limits of Winter Park in Orange County, Florida. Figure 2-1, Project Location Map, shows the general project limits.

Proposed traffic engineering and congestion management improvements to this segment of SR 15/600 (US 17/92) were identified and documented by METROPLAN ORLANDO in 1996 in the METROPLAN ORLANDO's regional Congestion Management System (CMS) Technical Memorandum. The CMS was incorporated into the METROPLAN ORLANDO's current Year 2020 Long Range Transportation Plan which was adopted in December 2000. Therefore, the SR 15/600 (US 17/92) PD&E Study is consistent with the current adopted urban area long range transportation plan.

In addition, the City of Winter Park identified and documented a desire to improve this section of SR 15/600 (US 17/92) which lies within its jurisdictional boundaries. This desire was documented in conjunction with the City of Winter Park Community Re-development Enhancement Area (CREA) Plan developed in 1998. The City prepared a Corridor Master Plan for proposed improvements to SR 15/600 (US 17/92), also known as Orlando Avenue during the CREA Plan process. The US 17/92 Corridor Master Plan documented potential congestion management improvements to be evaluated during the SR 15/600 (US 17/92) PD&E Study including median modifications, access management, bicycle and pedestrian facility improvements, traffic signal spacing and/or relocation (ie: Park Avenue signal relocation to Solana Avenue), minor intersection improvements, and the potential extension of SR 423 (Lee Road) from the existing SR 423/SR 15/600 (US 17/92) intersection to a connection with Denning Drive, a parallel facility maintained by the City of Winter Park located approximately ¼ mile east of SR 15/600 (US 17/92). The congestion management improvements identified by the City of Winter Park in 1998 served as the point of departure for developing and evaluating preliminary engineering design concepts for the SR 15/600 (US 17/92) PD&E Study.

The purpose of the SR 15/600 (US 17/92) Project Development and Environment (PD&E) Study was to evaluate congestion management alternatives which would improve current traffic operational conditions along this heavily traveled corridor. Existing right-of-way, land use constraints and potential economic impacts prohibit capacity improvements or widening along the mainline. The SR 15/600 (US 17/92) PD&E Study was conducted to identify the most appropriate transportation



Project Location Map

Not To Scale

SR 15/600 (US 17/92) Project Development and Environment Study
 From Norfolk Avenue to Monroe Street
 Orange County, Florida
 Financial Project ID Number: 408429-1-22-01

Figure 2-1

improvements which would be needed to accommodate existing and project travel demand along SR 15/600 (US 17/92) consistent with area transportation plans and with minimal socio-economic and environmental impact.

FDOT, in association with the City of Winter Park, initiated the SR 15/600 (US 17/92) PD&E Study in November 2001. The study involved the preparation of environmental documents and engineering reports that support the evaluation of potential social, economic and environmental impacts associated with providing congestion management and related transportation improvements along SR 15/600 (US 17/92) within the limits described above. These activities were performed in compliance with the National Environmental Policy act (NEPA) of 1969, and associated federal and state laws, regulations, and guidelines.

2.2 *Project Description*

The existing SR 15/600 (US 17/92) corridor, from Norfolk Avenue to Monroe Street, is an existing four- and six-lane urban principal arterial. SR 15/600 (US 17/92) through the Orlando urban area, serves a number of municipalities including the cities of Orlando, Winter Park, Maitland, Casselberry, Lake Mary, Longwood and Sanford. During the study, the northern study limits were extended to Park Avenue in the City of Maitland strictly for the purpose of including this signalized intersection in the overall traffic operational analysis. This also allowed for a re-evaluation of one of the City's original Corridor Master Plan recommendations involving the potential relocation of the existing traffic signal at Park Avenue to Solana Avenue. The total length of the study section of SR 15/600 (US 17/92), from Norfolk Avenue to Monroe Street, is approximately 2.0 miles.

Within the study limits, there are two distinct lane configurations, median treatments and access classifications. From Norfolk Avenue to Gay Road, the existing roadway is a five-lane section. Two (2) travel lanes are provided in each direction and are separated by a two-way continuous left-turn center lane. Between Gay Road and SR 423 (Lee Road), a distance of approximately 1,600 feet, a concrete traffic separator is used to separate opposing travel lanes and restrict left turn movements from the mainline. Signalized intersections with limited turn lane provisions are located at SR 527 (Orange Avenue), Minnesota Avenue, SR 426 (Fairbanks Avenue), Morse Boulevard, Gay Road, Webster Avenue and SR 423 (Lee Road). The existing right-of-way in this area is generally 80 feet.

From SR 423 (Lee Road) to Monroe Street, SR 15/600 (US 17/92) is a five- and six-lane divided facility. A six-lane divided roadway is provided from SR 423 (Lee Road) to just south of the CSX railroad overpass north of Monroe Street. In this area, the outside northbound through-lane is eliminated in order to accommodate the CSX overpass. North of the CSX overpass, a six-lane divided roadway continues north of the existing

Park Avenue signal into the City of Maitland. Access to adjacent properties is restricted in this area. Existing right-of-way in this segment is generally 106 feet.

Congestion management alternatives evaluated during the SR 15/600 (US 17/92) PD&E Study initially included median modifications, intersection improvements, and bicycle and pedestrian facility improvements. In addition, the easterly extension of Lee Road (SR 423) from its existing terminus at SR 15/600 (US 17/92) across Galloway Drive to a connection with Denning Drive, located approximately ¼ mile east of SR 15/600 (US 17/92) was also considered. This proposed improvement was identified in the City of Winter Park's US 17/92 Corridor Master Plan and was anticipated to alleviate congestion at the existing SR 15/600 (US 17/92) intersections with SR 423 (Lee Road) and Webster Avenue. These signals are closely spaced (within 800 feet) and experience unacceptable levels of service in peak travel periods resulting in long periods of delay. The extension of SR 423 (Lee Road) was initially intended to provide an alternative distribution of traffic on SR 15/600 (US 17/92) by utilizing Denning Drive, a parallel north-south facility. Between SR 527 (Orange Avenue) and Webster Avenue, Denning Drive is currently a four-lane undivided collector.

3.0 NEED FOR IMPROVEMENT

The factors that constitute the need for the proposed improvements include current and projected deficiencies including traffic capacity and congestion at major intersections, safety, consistency with adopted local, state and regional long range transportation plans and growth management plans, and socio-economic demand. These factors are discussed below in more detail.

3.1 Deficiencies

Existing and future year travel demand characteristics were developed for the SR 15/600 (US 17/92) PD&E Study including an analysis of traffic flow conditions at major intersections and roadway segments along the corridor. In analyzing the existing conditions along SR 15/600 (US 17/92), traffic counts were collected and recommended traffic characteristics were established. The analyses of existing conditions along the mainline and major intersections within the corridor were performed based on existing roadway and intersection geometry. The analyses of future conditions along the mainline and major intersections were performed based on a variety of alternative improvement strategies including potential capacity improvements (ie: widening SR 15/600 (US 17/92) to six lanes between Orange Avenue and Lee Road), the potential extension of SR 423 (Lee Road) from SR 15/600 (US 17/92) to Denning Drive, minor intersection improvements and potential traffic signal modifications (ie: relocation of the existing Park Avenue signal to Solana Avenue and the removal of the existing signal at Webster Avenue). The results of the existing and future year travel demand analyses are fully documented in the Design Traffic Technical Memorandum prepared in October 2002, a copy of which is located at the FDOT District Five office. A majority of the information provided in this section of the Preliminary Engineering Report, as well as Section 6.0, Traffic, has been generated from the Design Traffic Technical Memorandum.

Existing year (2001) average annual daily traffic (AADT) volumes range from 30,960 vehicles per day (vpd) to 50,280 vpd. By the year 2025, the traffic volumes along SR 15/600 (US 17/92) are expected to range from 29,700 vpd to 55,400 vpd. Due to potentially significant social and economic impacts, this project was not anticipated to involve a major capacity improvement (ie: widening from four to six lanes) although one of the initial travel demand alternatives involved a widening option for comparative purposes. The traffic analysis of future conditions was based primarily on existing mainline geometry (ie: four lanes from Norfolk Avenue to Lee Road and six lanes from Lee Road to Monroe Street).

Existing and future year traffic operational conditions were evaluated at fourteen (14) locations within the SR 15/600 (US 17/92) study area. These are:

- SR 15/600 (US 17/92) at Orange Avenue (Signalized);
- SR 15/600 (US 17/92) at Minnesota Avenue (Signalized);
- SR 15/600 (US 17/92) at Fairbanks Avenue (Signalized);
- SR 15/600 (US 17/92) at Morse Boulevard (Signalized);
- SR 15/600 (US 17/92) at Gay Road (Signalized);
- SR 15/600 (US 17/92) at Webster Avenue (Signalized);
- SR 15/600 (US 17/92) at Lee Road (Signalized);
- SR 15/600 (US 17/92) at Solana Avenue (**Un-Signalized**);
- SR 15/600 (US 17/92) at Park Avenue (Signalized);
- Denning Drive at Webster Avenue (Signalized);
- Denning Drive at Canton Avenue (Signalized);
- Denning Drive at Morse Boulevard (Signalized);
- Denning Drive at Minnesota Avenue (Signalized); and
- Denning Drive at Fairbanks Avenue (Signalized).

Existing P.M. peak hour turning movement volumes were used for the intersection analysis using standard HCM procedures. Based on this analysis, the following intersections currently operate at LOS F:

- Denning Drive at Fairbanks Avenue
- SR 15/600 (US 17/92) at Orange Avenue
- SR 15/600 (US 17/92) at Fairbanks Avenue
- SR 15/600 (US 17/92) at Webster Avenue

The roadway operational level of service analysis was performed by comparing the P.M. peak hour/peak direction volumes for individual roadway segments against the peak-hour peak-direction capacities.

Based on this comparison the following roadway segments operate below their adopted LOS standard:

- SR 15/600 (US 17/92), between Morse Boulevard and Gay Road – LOS F
- SR 15/600 (US 17/92), between Gay Road and Webster Avenue – LOS F
- Webster Avenue east of SR 15/600 (US 17/92) – LOS F

By the year 2025, the following intersections are expected to operate at LOS F:

- SR 15/600 (US 17/92) at Lee Road

- SR 15/600 (US 17/92) at Webster Avenue
- SR 15/600 (US 17/92) at Morse Boulevard
- SR 15/600 (US 17/92) at Fairbanks Avenue
- SR 15/600 (US 17/92) at Orange Avenue/Harmon Avenue
- Denning Drive at Webster Avenue
- Denning Drive at Fairbanks Avenue
- Denning Drive at Orange Avenue/Minnesota Avenue
- Denning Drive at Morse Boulevard

3.2 *Safety*

Historical crash data was obtained for the five-year period of 1995 to 1999. During this time, a total of 369 collisions occurred on SR 15/600 (US 17/92) from Orange Avenue to Park Avenue (the nearest signalized intersection north of Monroe Street). It was determined from the analysis of the collision summaries that installation of a median on SR 15/600 (US 17/92) would potentially increase the safety of the roadway. A majority of the head-on, angle and left turn collisions can be minimized if not prevented. These collisions accounted for approximately 36 percent of the total for the five-year period. The trend of these collisions shows the driver at fault failed to yield the right of way. If a median were to be installed, drivers would have limited access to turning lanes therefore minimizing conflict points were head-on, angle and left turn collisions occur.

Approximately 43 percent of the reported crashes were rear end collisions. A majority of the rear-end collisions were caused by careless driving. The trends in the collision summary shows a large number of the rear-end collisions occurred in the through traffic lanes. This demonstrated the driver at fault did not stop when vehicles queued at the traffic signal. From a roadway standpoint there are no changes that can be made to prevent this type of crash. It should also be noted that more than half of the pedestrian collisions occurred between Morse Boulevard and Webster Avenue. This is due to the larger number of pedestrians that travel that section of roadway because of commercial development.

Additional details regarding crash data along SR 15/600 (US 17/92) from Norfolk Avenue to Monroe Street are provided in Section 4.1.9.

3.3 *Consistency with Local, State and Regional Transportation Plans*

Proposed traffic engineering and congestion management improvements to this segment of SR 15/600 (US 17/92) were identified and documented by METROPLAN ORLANDO in 1996 in the METROPLAN ORLANDO's Regional Congestion Management System (CMS) Technical Memorandum. The CMS was incorporated into the METROPLAN ORLANDO's current Year 2020 Long Range Transportation Plan which was adopted in December 2000. Therefore, the SR 15/600 (US 17/92) PD&E Study is consistent with the current adopted urban area long range transportation plan.

In addition, the City of Winter Park identified and documented a desire to improve this section of SR 15/600 (US 17/92), which lies within its jurisdictional boundaries. This desire was documented in conjunction with the City of Winter Park Community Re-development Enhancement Area (CREA) Plan developed in 1998. The City prepared a Corridor Master Plan for proposed improvements to SR 15/600 (US 17/92), also known as Orlando Avenue during the CREA Plan process. The US 17/92 Corridor Master Plan documented potential congestion management improvements to be evaluated during the SR 15/600 (US 17/92) PD&E Study including median modifications, access management, bicycle and pedestrian facility improvements, traffic signal spacing, minor intersection improvements and the potential extension of SR 423 (Lee Road) from the existing SR 423/SR 15/600 (US 17/92) intersection to a connection with Denning Drive, a parallel facility maintained by the City of Winter Park located approximately ¼ mile east of SR 15/600 (US 17/92).

3.4 *Social and Economic Development*

The land within the study area is essentially fully developed. The primary land use designations include retail commercial and service-oriented, professional office, light manufacturing and warehousing, single- and multi-family residential and hotel/motel services.

Surface transportation facilities are, and always have been, the backbone of economic development. SR 15/600 (US 17/92) serves as a main artery throughout the Orlando urban area and connects the cultural, historic, recreational and commercial features located within the cities of Orlando, Winter Park, Maitland, Casselberry, Longwood, Lake Mary and Sanford. Proposed improvements to this corridor include congestion management (intersection improvements and operational improvements), minor capacity improvements (potential extension of Lee Road), and multi-modal improvements (improved sidewalks and connectivity to regional off-system bicycle facilities). These improvements and enhancements are expected to benefit the social and economic viability of this corridor and the Winter Park urban area.

Enhancing travel mobility and maintaining access to adjacent land uses, where feasible, will help strengthen economic development within the corridor. Access management has been identified as one of the major issues associated with this project and will be addressed during the development of alternative design concepts for the proposed improvement. In addition, the City of Winter Park has expressed an interest in providing corridor enhancements such as landscaping and streetscaping which will improve the aesthetic qualities of the existing corridor which may influence and encourage economic re-development.

4.0 EXISTING CONDITIONS

4.1 Roadway Characteristics

The study area for the SR 15/600 (US 17/92) PD&E Study is generally bounded by Norfolk Avenue to the south, Monroe Street to the north, Denning Drive to the east and Lake Killarney to the west. Figure 4-1 illustrates the study limits and associated roadway network. The following is a description of existing roadway characteristics for SR 15/600 (US 17/92). Figure 4-2 is a reproduction of the FDOT Straight Line Diagram for this segment of SR 15/600 (US 17/92) and was used to document portions of the following information.

4.1.1 FUNCTIONAL CLASSIFICATION

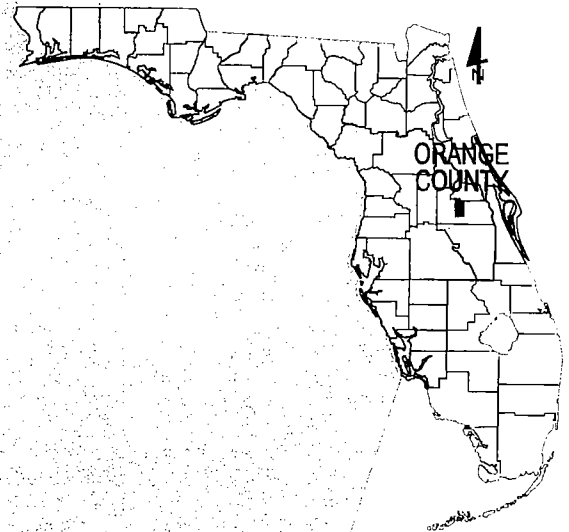
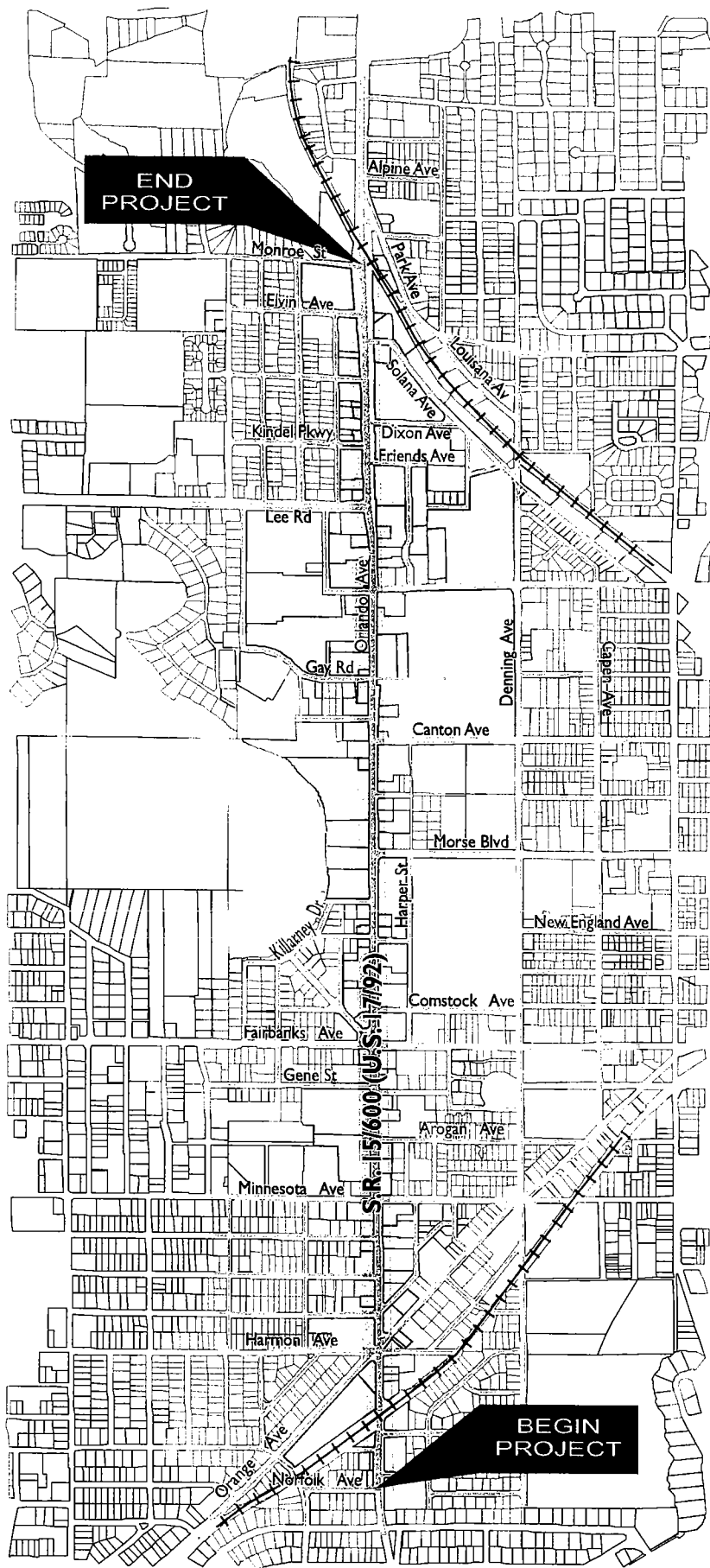
The functional classifications for the major roadway facilities located in the study area are listed below in Table 4-1. These were obtained from the report "Federal Functional Classification – District Five," prepared by FDOT District Five Planning Office which was based on the 1990 census data.

Table 4-1 Functional Classifications

Facility	Classification and Description
SR 15/600 (US 17/92)	Urban principal arterial
SR 426 (Fairbanks Avenue)	Urban minor arterial
SR 423 (Lee Road)	Urban principal arterial
Denning Drive	Urban collector
Minnesota Avenue	Urban collector

4.1.2 TYPICAL SECTIONS

The existing typical section varies along SR 15/600 (US 17/92) within the study limits. From Norfolk Avenue to Gay Road, the existing roadway is a five-lane section with two travel lanes in each direction separated by a continuous two-way center left-turn lane (see Figure 4-3). The inside travel lanes and center lane in this section are 12 feet wide while the outside travel lanes are approximately 15.5 feet wide and are designed to accommodate experienced bicyclists. An existing 4.5-foot wide concrete sidewalk is located along both sides of the existing roadway in this section. Roadway signage, utility structures and other obstructions are located between the existing right-of-way line and back of curb. The total existing right-of-way width in this section is 80 feet. Access to adjacent



Study Area Map

Not To Scale

SR 15/600 (US 17/92) Project Development and Environment Study

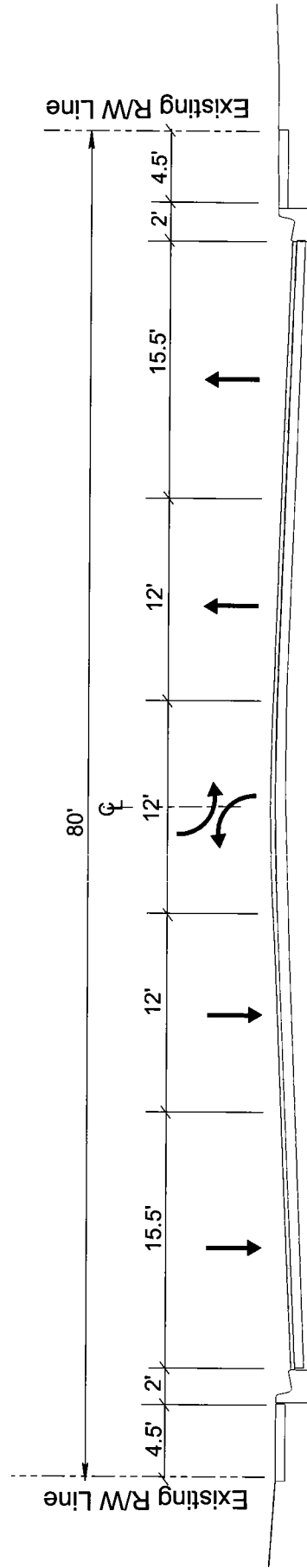
From Norfolk Avenue to Monroe Street

Orange County, Florida

Financial Project ID Number: 408429-1-22-01

Figure 4-1

ROADWAY FEATURES	6		7		8		9	
	8/FC-0	28/FC-4	28/FC-3	28/FC-4	28/FC-3	28/FC-4	28/FC-3	28/FC-4
ROADWAY COMPOSITION	6		7		8		9	
	6		7		8		9	
HORIZONTAL ALIGNMENT	6		7		8		9	
	6		7		8		9	
STRUCTURE DESCRIPTION	6		7		8		9	
	6		7		8		9	
DISTRICT USE	6		7		8		9	
	6		7		8		9	
FUTURE USE	6		7		8		9	
	6		7		8		9	
FUNCTIONAL CLASSIFICATION	6		7		8		9	
	6		7		8		9	
ROADWAY FEATURES	6		7		8		9	
	6		7		8		9	
ROADWAY COMPOSITION	6		7		8		9	
	6		7		8		9	
HORIZONTAL ALIGNMENT	6		7		8		9	
	6		7		8		9	
STRUCTURE DESCRIPTION	6		7		8		9	
	6		7		8		9	
DISTRICT USE	6		7		8		9	
	6		7		8		9	
FUTURE USE	6		7		8		9	
	6		7		8		9	
FUNCTIONAL CLASSIFICATION	6		7		8		9	
	6		7		8		9	



Existing Typical Section
Five-Lane Urban Typical Section (Two-Way Left Turn Lane)
 From Norfolk Avenue to Gay Road
 Existing Posted Speed: 35 mph

properties is unrestricted in this area and there are numerous driveways and side streets that connect directly to the mainline.

From Gay Road to SR 423 (Lee Road), the existing roadway is essentially the same as the section previously described with the exception of the median treatment. In this segment, the center turn lane is replaced with a concrete median and traffic separator to allow for left turn storage lanes to be developed at the intersections of Gay Road, Webster Avenue and SR 423 (Lee Road). The total existing right-of-way width in this section remains 80 feet. Access to adjacent properties is restricted in this area due to the concrete median and traffic separator. Figure 4-4 shows the existing typical section from Gay Road to SR 423 (Lee Road).

From SR 423 (Lee Road) to Monroe Street, SR 15/600 (US 17/92) is generally a six-lane divided facility (see Figure 4-5). Three (3) 11.5-foot wide travel lanes are provided in each direction separated by a raised, landscaped median that varies in dimension from 10 feet to 17.5 feet in width. A five-foot wide concrete sidewalk is provided along both sides of the existing roadway. The existing right-of-way width in this section is 106 feet. Between Solana Avenue and Monroe Street, the outside northbound travel lane is eliminated in order to accommodate the horizontal clearance at the CSX overpass. In the southbound direction, the outside travel lane is converted to an exclusive right-turn lane for westbound SR 423 (Lee Road). Access north of SR 423 (Lee Road) is restricted by the existing raised median which includes turn lanes for access and u-turn maneuvers.

4.1.3 PEDESTRIAN, BICYCLE AND PUBLIC TRANSPORTATION FACILITIES

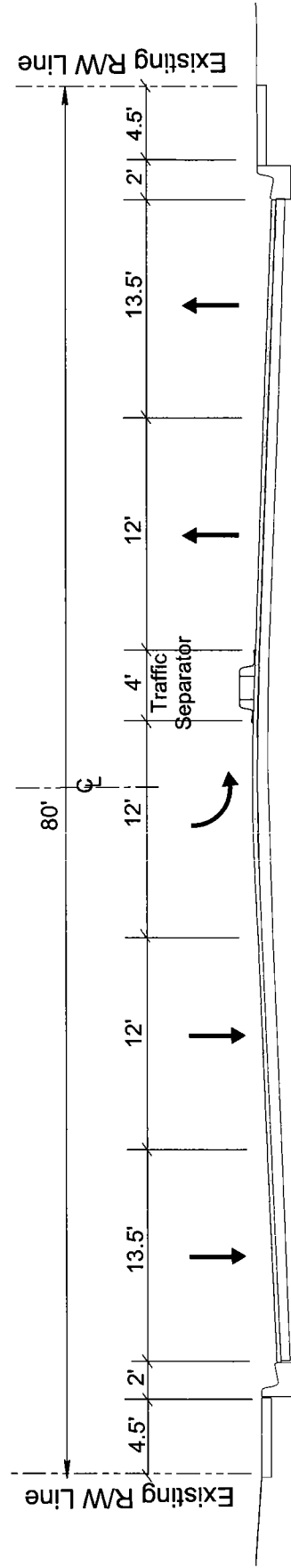
Below is a summary of existing pedestrian, bicycle and surface transit facilities located within the SR 15/600 (US 17/92) study area.

Pedestrian Facilities

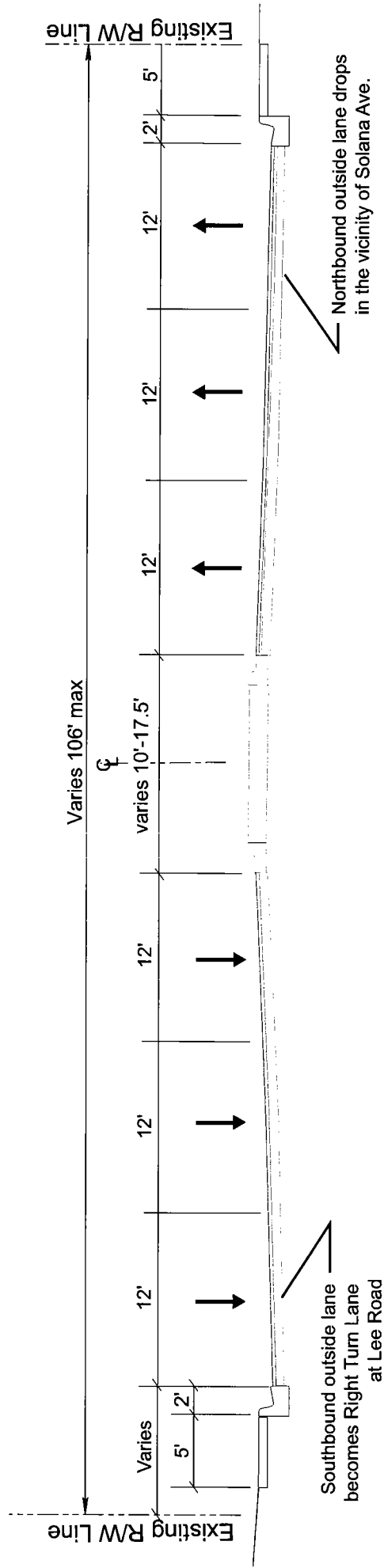
Concrete sidewalks are located along both sides of the existing SR 15/600 (US 17/92) roadway. From Norfolk Avenue to Lee Road, a 4 ½ foot wide sidewalk is located flush with the existing curb line. North of Lee Road, a five foot wide sidewalk is provided.

Bicycle Facilities

There are no designated bicycle facilities along SR 15/600 (US 17/92) within the study limits. From Norfolk Avenue to Lee Road, the existing outside travel lane in both directions is 15 ½ feet wide and can accommodate experienced bicyclists.



Existing Typical Section
Four-Lane Urban Typical Section
 From Gay Road to Lee Road
 Existing Posted Speed: 35 mph



Existing Typical Section
Six-Lane Urban Typical Section (Raised Median)
 From Lee Road to Monroe Street
 Existing Posted Speed: 35 mph

Transit

The Central Florida Regional Transportation Authority, also known as Lynx, has several bus routes that operate within the study area. The following is a list of routes and corresponding descriptions as provided by Lynx. Figure 4-6 shows the Lynx route locations graphically.

Link 1	N. Orange Avenue/Altamonte Mall
Link 9	N. Orange Avenue/Rosemont
Link 14	Princeton Street
Link 16	College Park
Link 23	Winter Park/Forest City
Link 39	Fern Park/Sanford

There are twenty-one (21) bus stops within the study area. The following is a list of bus stop locations and their corresponding routes:

Links 14 and 39 – In front of Bank of America (before Chick-Fil-A); sign posted; no bench or covering; small sidewalk straight to curb.

Links 14 and 39 – In front of Burger King; sign against a light pole; small sidewalk straight to the curb.

Links 14 and 39 – At Morse Boulevard (in front of the Best Western); sign posted; no bench or cover; some shade provided by the trees.

Links 1, 9, 14, 16, 23 and 39 – On Webster Avenue across from The Volvo Store and next to the Winter Park Village Shopping Center; sign posted; no bench or cover; small sidewalk straight to curb.

Links 1, 9, 14, 16, 23 and 39 – On Denning Drive, behind the Winter Park Village Shopping Center; sign posted; one covered bench; sidewalk straight to curb.

Links 1, 9, 14, 16, 23 and 39 – Denning Drive at Swoope Avenue; sign posted; one covered bench; shade is provided by trees.

Links 1, 9, 14, 16, 23 and 39 – Denning Drive across from Denning Square Apartments, behind Regal Cinema 20 (Winter Park Village); sign posted; bench (uncovered) and trash can; sidewalk straight to curb.

Lynx Transit Service

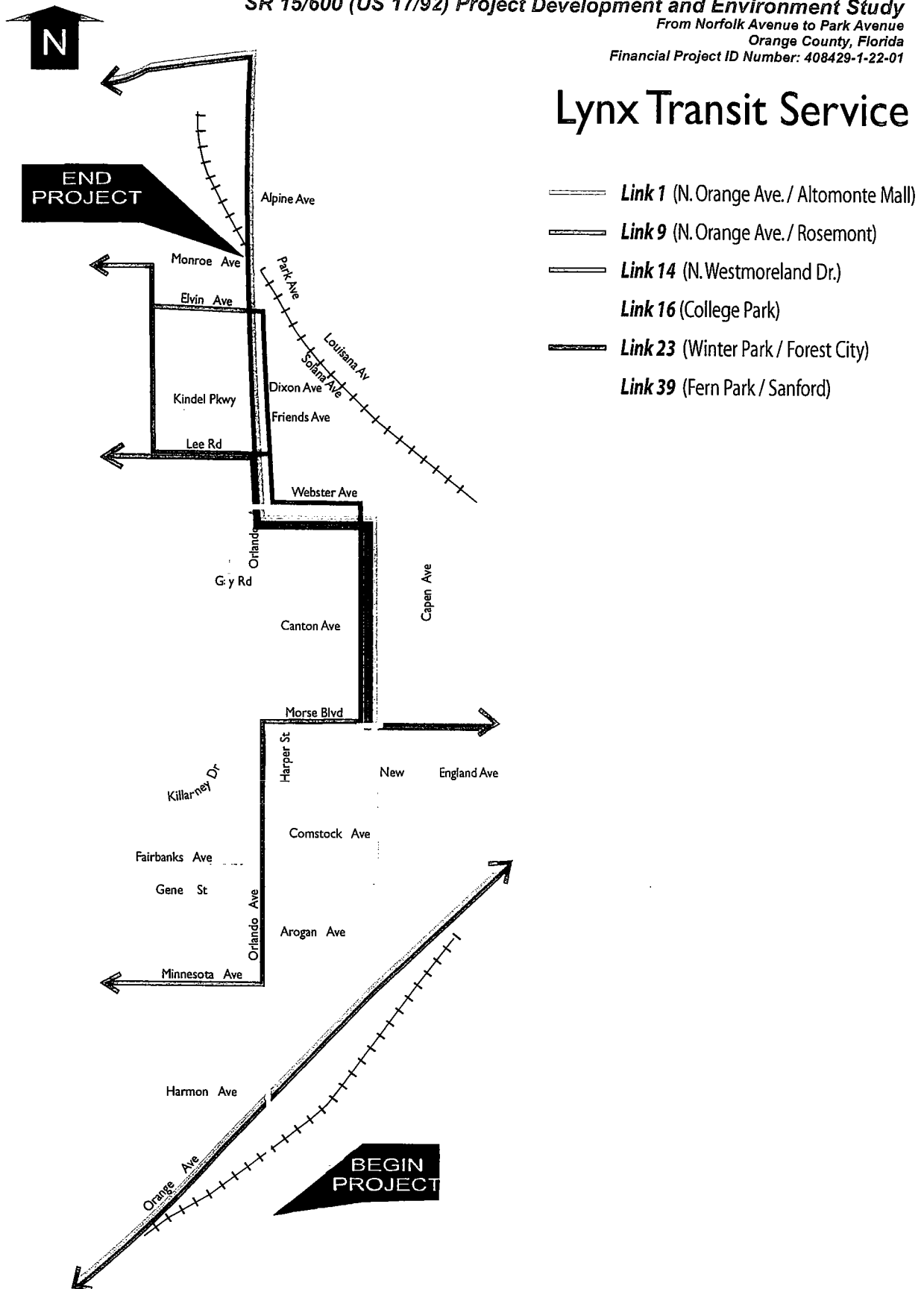


Figure 4-6

Links 1, 9, 14, 16, 23 and 39 – On Denning Drive southbound, across from Canton Avenue; sign posted; no bench or cover; sidewalk straight to curb.

Links 1, 9, 14, 16, 23 and 39 – On Denning Drive northbound; sign posted; covered bench; no sidewalk (footpath in grass strip).

Links 1, 9, 14, 16, 23 and 39 – On Denning Drive southbound; sign posted; sidewalk straight to curb; trashcan and bench; no cover.

Link 1, 9 and 39 – On SR 15/600 (US 17/92) northbound, in front of the Honda dealership; sign posted; sidewalk; no bench or cover.

Link 1, 9 and 39 – On SR 15/600 (US 17/92) northbound before railroad, in front of Sparkles Car Wash; sign posted; no benches or cover (some shade from trees); no sidewalk, just curb and gutter.

Link 1, 9 and 39 – On SR 15/600 (US 17/92) southbound at Elvin Avenue; sign posted; bench; no cover; sidewalk.

Links 1, 9, 14 and 39 – On SR 15/600 (US 17/92) southbound at Glendon Parkway; sign posted; bench; no cover; sidewalk.

Links 14 and 39 – On SR 15/600 (US 17/92) southbound at Fairview Avenue; sign posted; no bench or cover; sidewalk straight to curb.

Links 14 and 39 – On SR 15/600 (US 17/92) southbound at the Wendy's exit, before Fairbanks Avenue; sign posted; no bench or cover; sidewalk straight to curb.

Links 14 and 39 – On SR 15/600 (US 17/92) southbound across from Aragon Street at Hollianna Shopping Center; sign posted; no bench or cover; some shade from trees; trash can (litter on ground).

Link 39 – On SR 15/600 (US 17/92) southbound, in front of Wachovia at Orange Avenue; sign posted; no bench or cover; sidewalk straight to curb.

Link 39 – On SR 15/600 (US 17/92) northbound at Garden Drive; sign posted; no bench or cover; sidewalk straight to curb.

Link 39 – On SR 15/600 (US 17/92) northbound at Balch Avenue; sign posted; bench approximately 15 feet from sign (shade from trees); sidewalk straight to curb.

Link 39 – On SR 15/600 (US 17/92) northbound, just before Minnesota Avenue; sign posted; no bench or cover; sidewalk to curb.

A majority of the bus stops along Route 39 are in front of shopping centers and commercial areas. The remaining stops are in residential areas, consisting mostly of apartment or rented living buildings. Of the 21 bus stops that are in the project study area, 13 are equipped with a sign that lists the routes. The signs are located on the embankment just outside of the sidewalks. The 4½ foot wide sidewalks are flush to the curb. They have no benches or shelters. The other 8 stops are equipped with benches. Three of those stops have a covered shelter. Along this route, there is one turning lane for buses to pull out away from traffic.

Route 39 continues onto smaller side streets that connect to SR 15/600 (US 17/92). These streets have four lanes and on-curb sidewalks. There are no areas for buses to pull away from traffic. These streets are in a residential area and directly behind a shopping center. Four of the signs are located at the point where the sidewalk meets the driveway.

There are no bicycle racks or facilities provided for cyclists on Route 39. The small width of the sidewalks makes it difficult for pedestrians and bicyclists to share. Light poles take up some areas of the sidewalk, as do newspaper stands and overgrown plant life. Litter is also a problem. Some of the stops are equipped with wastebaskets, but there is still litter on the ground.

4.1.4 RIGHT OF WAY

Generally, the existing SR 15/600 (US 17/92) corridor is centered within 80 feet of right-of-way between Norfolk Avenue and Lee Road and 106 feet of right-of-way between Lee Road and Monroe Street. The existing right-of-way was obtained from existing FDOT construction plans and right-of-way maps which are located in the District Office in DeLand, Florida.

4.1.5 HORIZONTAL ALIGNMENT

The existing SR 15/600 (US 17/92) horizontal alignment from Norfolk Avenue to Monroe Street traverses approximately 2 miles and is basically a straight tangent with no horizontal curvature. At its beginning point, Norfolk Avenue, the SR 15/600 (US 17/92) horizontal centerline is due N 0°15'30" W varying slightly to N 0°57'30" E just past Morse Boulevard. The alignment continues on that same tangent until Gay Road where it changes to N 0°23'30" E, changing again when the alignment reaches Lee Road to N 1°25'00" E. The SR 15/600 (US 17/92) horizontal alignment stays at this bearing until it reaches the Monroe Street intersection.

4.1.6 VERTICAL ALIGNMENT

The existing vertical alignment (Profile Grade) is moderately flat with longitudinal grades varying from 0.20% to the maximum of 1.37%. Since most of the profile is relatively flat, vertical curves are often not required. In areas where they are used, they vary in length from 50' to 350'.

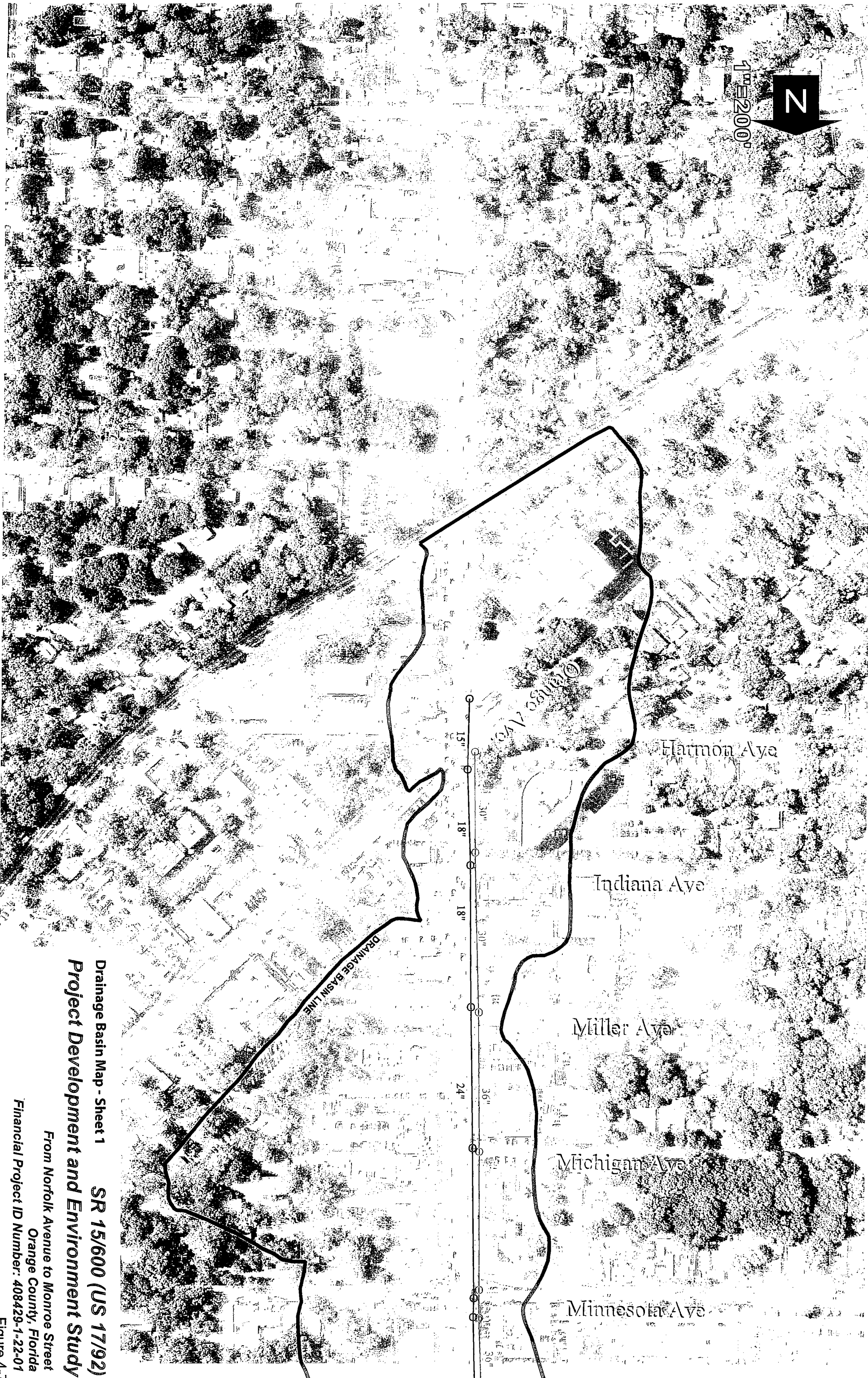
4.1.7 DRAINAGE

The SR 15/600 (US 17/92) corridor through the study area is an urban roadway section drained by curb and gutter and curb inlets. The corridor is served by two major storm sewer outfalls. Figure 4-7 shows existing Drainage Basin Features within the SR 15/600 (US 17/92) study area.

One of the outfalls runs along Peachview Avenue to Lake Killarney. This outfall consists of a 60-inch concrete culvert and serves approximately 7,350 linear feet (LF) of roadway from Ashburne Road (railroad crossing) which is one street south of Orange Avenue on southern end of project area northward to Webster Avenue. From the outfall, the system branches into dual trunk lines consisting of a 42-inch and 24-inch pipe system running southward and a 30-inch and 42-inch pipe system running northward from Peachview Avenue. The present drainage system consists of both Type 5 and Type 6 FDOT standard curb inlets and dual trunk lines that are interconnected as a result of roadway widening efforts circa 1965. The adjacent properties along this corridor are primarily commercial with high runoff potential and no existing stormwater treatment or detention areas.

The area of exception is the recently redeveloped Winter Park Village area which is approximately 40 acres in size. The drainage divide for the SR 15/600 (US 17/92) system meanders through this development with approximately 17.5 acres of the area draining into the SR 15/600 (US 17/92) system and the rest draining to the Denning Drive system. The drainage system for the Village area includes an interconnected system of exfiltration systems which are designed to treat 1.5 inches of runoff.

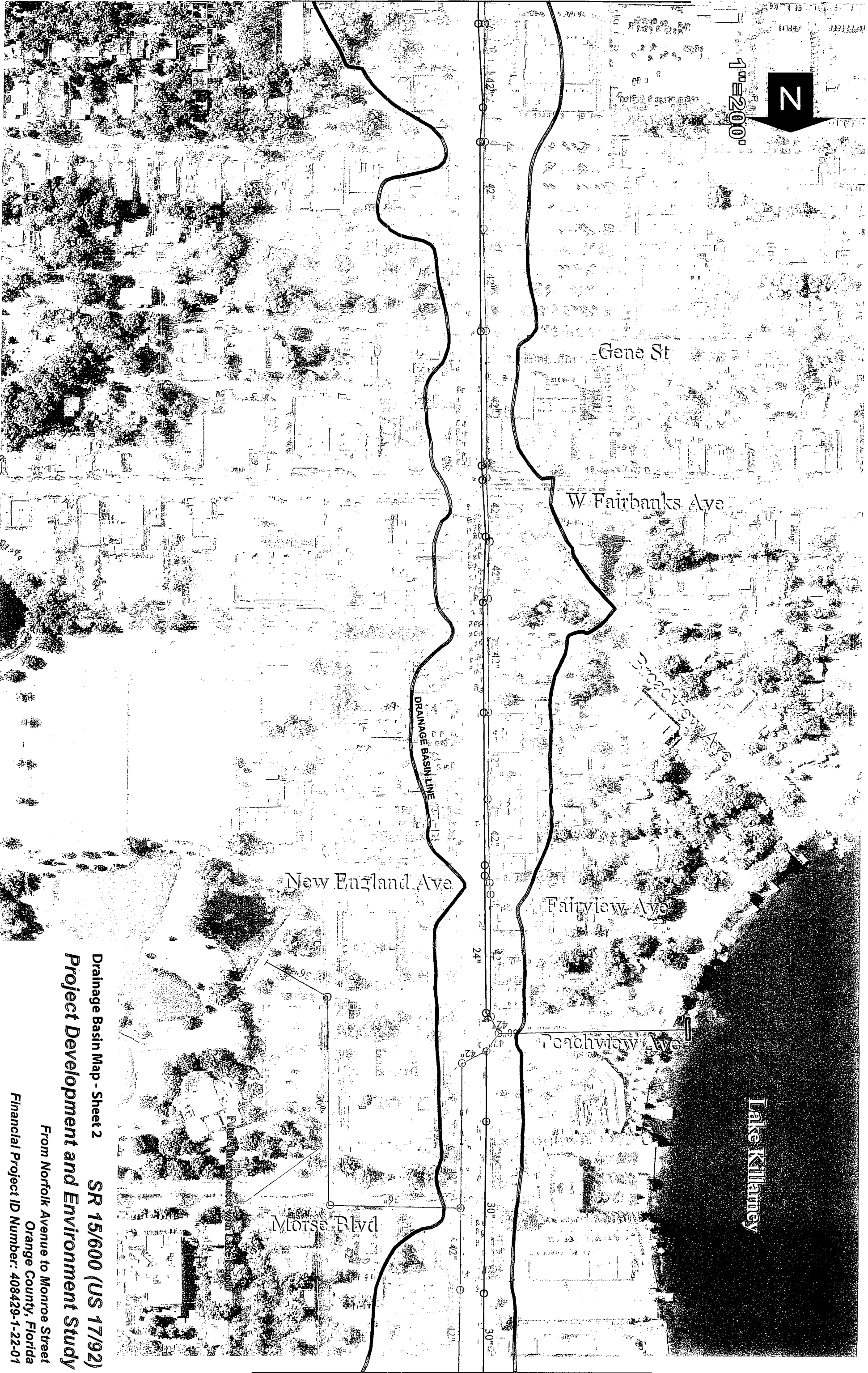
An analysis of the existing SR 15/600 (US 17/92) storm sewer system has been conducted and the findings are that the system is undersized for the standard FDOT rational 3-year criteria. The gutter spread has also been analyzed and indicates that the curb inlet spacing is deficient. Although the analyses indicate the drainage system is less than desirable, City and FDOT officials have stated that there are no chronic flooding problems along this corridor.



Match to Sheet No. 2

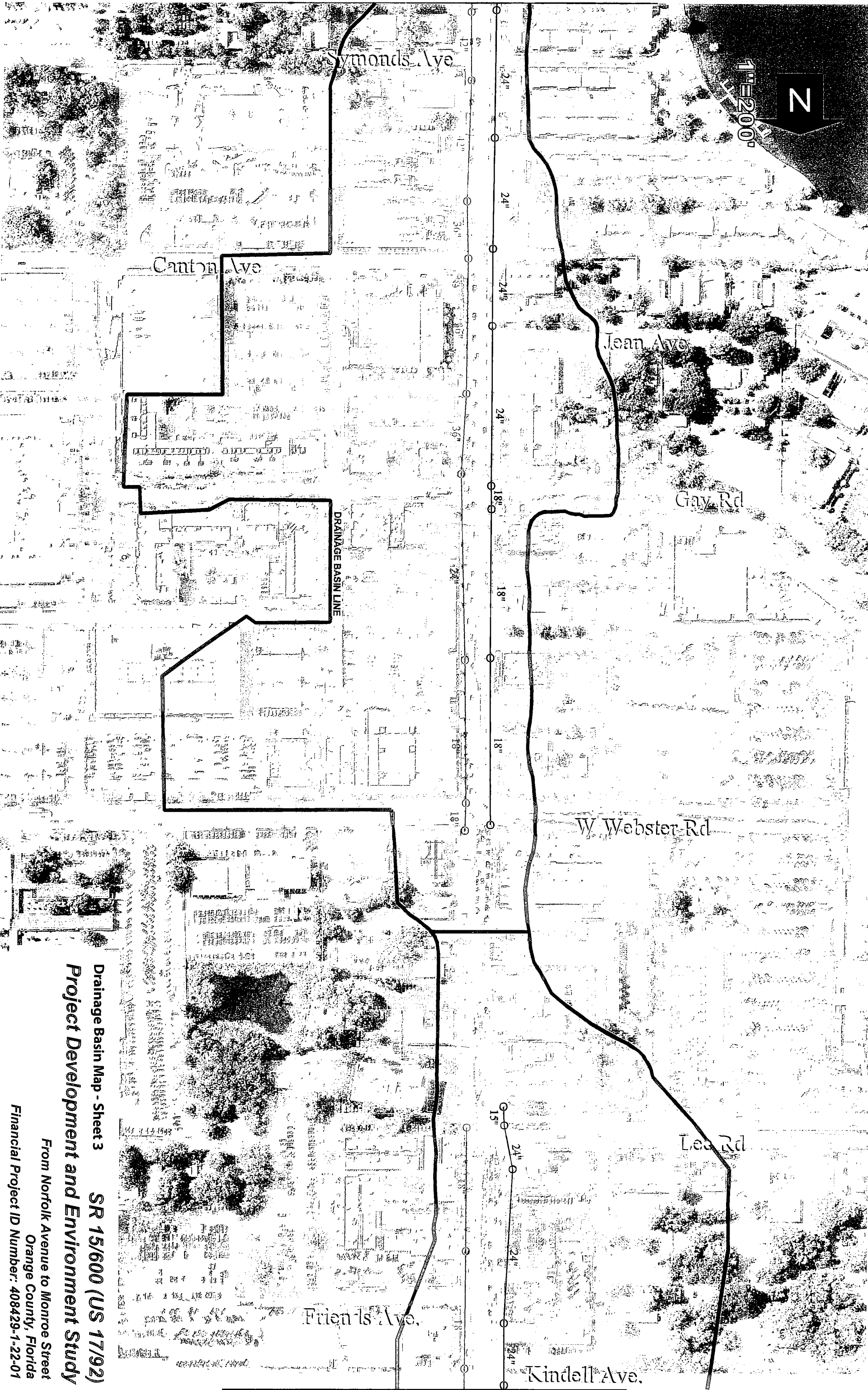
Drainage Basin Map - Sheet 1 **SR 15/600 (US 17/92)**
Project Development and Environment Study

From Norfolk Avenue to Monroe Street
Orange County, Florida
Financial Project ID Number: 408429-1-22-01
Figure 4-7



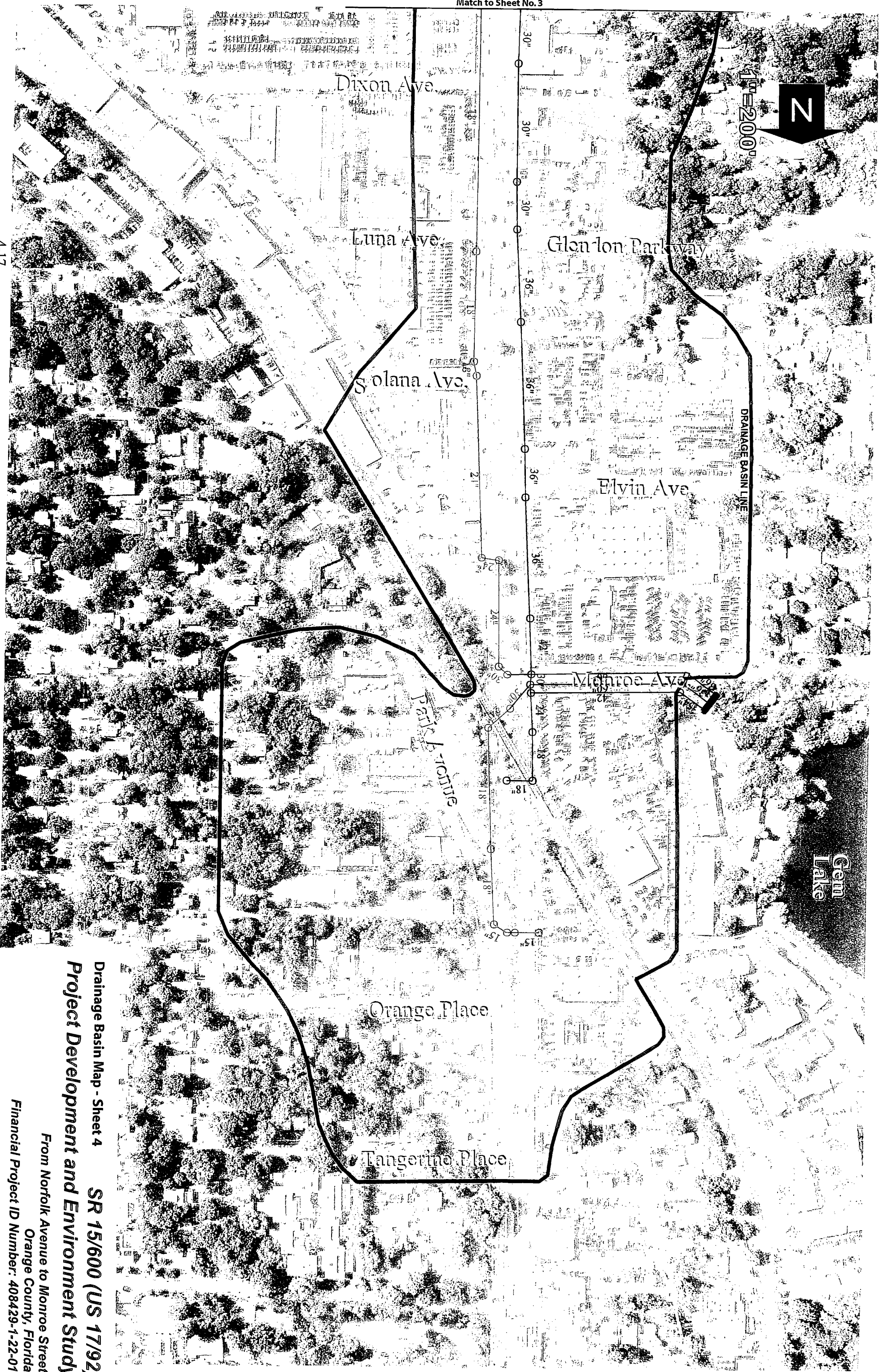
Drainage Basin Map - Sheet 2 **SR 15/600 (US 17/92)**
Project Development and Environment Study

From Norfolk Avenue to Monroe Street
Orange County, Florida
Financial Project ID Number: 408429-1-22-01



Drainage Basin Map - Sheet 3 SR 15/600 (US 17/92)
Project Development and Environment Study

From Norfolk Avenue to Monroe Street
Orange County, Florida
Financial Project ID Number: 408429-1-22-01



Drainage Basin Map - Sheet 4 **SR 15/600 (US 17/92)**
Project Development and Environment Study

From Norfolk Avenue to Monroe Street
Orange County, Florida
Financial Project ID Number: 408429-1-22-01

In 2003, the City of Winter Park completed construction of a piped interconnect between Lake Island (just to the east of SR 15/600 (US 17/92) and Lake Killarney. This interconnect ties into a section of the existing storm sewer along SR 15/600 (US 17/92) and is designed to have minimal effect on the performance of the SR 15/600 (US 17/92) drainage. This interconnect provides benefits of stormwater treatment for SR 15/600 (US 17/92) and positive outfall for Lake Island.

The second storm sewer outfall within the project area runs along Monroe Street to Lake Gem and Park Lake. This outfall consists of three outfall pipes, two 60-inch and a 42-inch, and serves approximately 3,650 LF of roadway from Webster Avenue to Tangerine Place at the north end of the project area. From the outfall, the system branches into two 42-inch pipes running southward and a 24-inch and 30-inch running northward. As with the southern drainage system, this system is the product of retrofits from previous roadway improvements (widening projects). Additionally, inlets were added and the outfall piping was upgraded during a retrofit project in the year 2000 conducted by FDOT. It is understood that a future phase of work in this area will be to construct a stormwater treatment system at the outfall in the lake which could include a trash rack, skimmer, and/or a CDS unit and to upgrade the last section of piping at the outfall. This retrofit project is being conducted in order to relieve chronic flooding of SR 15/600 (US 17/92) under the CSX railroad bridge over the existing roadway. FDOT and City officials have indicated that flooding has become less frequent since construction of the first phase of this project.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) Number 120179-0225C dated August 5, 1986 and Number 120122-0005C dated February 4, 1983, there is one area along the proposed study corridor that is within the 100 year floodplain. This floodplain area is associated with Lake Killarney and lies within Zone AE, an area where the estimated 100 year flood elevation has been determined 85 feet, NGVD.

Due to the location of this floodplain within the study area and considering the proposed improvements recommended in this study, it has been determined that this project will have no floodplain encroachments.

4.1.8 GEOTECHNICAL DATA

A preliminary geotechnical investigation has been performed for the SR 15/600 (US 17/92) Study. The results of this investigation are documented in the *Report of Preliminary Geotechnical Investigation, State Road 15/600 (US Highway 17/92), September 2002*. The following information was compiled from the report.

According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey of Orange County, Florida, soils at the subject site are primarily classified as Urban Land-Tavares-Pomello. The USDA Orange County Area Soil Survey of the project location is shown on Figure 4-8. The SCS defines this soil map unit as follows:

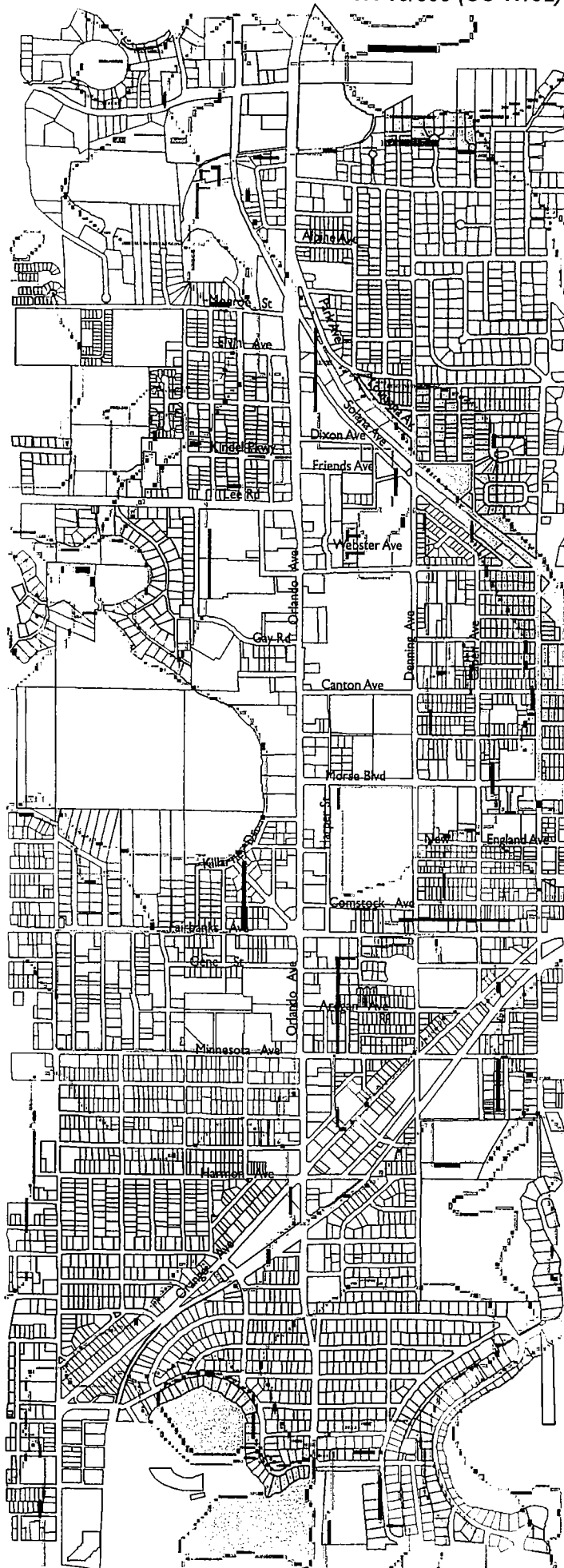
Urban Land-Tavares-Pomello: Nearly level to gently sloping, moderately well drained soils that are sandy throughout, some with organic stained subsoil at a depth of 30 to 50 inches. The project area has been modified for urban use.

Within the study area, unconsolidated sand and shell ranging in age from Pleistocene to Recent extend to a depth of 50 feet below surface grade and serve as the reservoir for non-artesian water. According to Barraclough (1962), these sediments lie un-conformably over Pliocene or Late Miocene deposits of sticky blue clay beds which may extend down to approximately 60 feet below surface grade. These Pleistocene and Late Miocene deposits lie un-conformably over the Avon Park Limestone and serve as the confining unit for the artesian aquifer (Floridan Aquifer) contained in the Avon Park Limestone. Both the Hawthorn Group, which un-conformably overlies the Ocala Group, and the Ocala Group, which un-conformably overlies the Avon Park Limestone, have been thinned by erosion along the flanks of, and removed from the crest of, a structural high in the Sanford area known as the Sanford high. The Avon Park Limestone is a granular to chalky limestone, ranging from 450 feet to 550 feet in thickness, and has been irregularly dolomitized upon deposition. The Avon Park Limestone conformably overlies the Lake City Limestone, which averages 400 feet in thickness in Orange County.

Two (2) general hydrostratigraphic divisions can be found in Orange County. The two (2) divisions include a non-artesian aquifer and the Floridan Aquifer. The non-artesian aquifer is composed of sand beds of the Pleistocene and Recent age. The non-artesian aquifer is recharged locally by precipitation on the land surface, which percolates downward. The Floridan Aquifer is composed of limestone and dolomite of Eocene age. Water is confined in the rocks of Eocene age by clay beds in the



Soil Types



- ☐ No classification
- ☐ Arenas, very level
- ☐ Arcadia fine sand, 0 to 5 percent slopes
- ☐ Basinger fine sand, depressional
- ☐ Carder fine sand, 0 to 5 percent slopes
- ☐ Carder fine sand, 5 to 12 percent slopes
- ☐ Carder-Apoka fine sands, 5 to 12 percent slopes
- ☐ Carder-Urban land complex, 0 to 5 percent slopes
- ☐ Carder-Urban land complex, 5 to 12 percent slopes
- ☐ Carova muck
- ☐ Choctaw fine sandy loam, frequently flooded
- ☐ Florida and Choctaw soils, frequently flooded
- ☐ Escambia and Holopaw fine sands, frequently flooded
- ☐ Felda fine sand
- ☐ Felda fine sand, occasionally flooded
- ☐ Felda fine sand, frequently flooded
- ☐ Florida fine sand, frequently flooded
- ☐ Florida mucky fine sand, depressional
- ☐ Gator muck
- ☐ Horton muck
- ☐ Immokalee fine sand
- ☐ Lake fine sand, 0 to 5 percent slopes
- ☐ Landless fine sand
- ☐ Malabar fine sand
- ☐ Milhopper-Urban land complex, 0 to 5 percent slopes
- ☐ Ocala muck
- ☐ Opa fine sand
- ☐ Opa Urban land complex
- ☐ Palatka fine sand, 0 to 5 percent slopes
- ☐ Palatka-Urban land complex, 1 to 5 percent slopes
- ☐ Pineda fine sand
- ☐ Pineda fine sand
- ☐ Pits
- ☐ Pomello fine sand, 0 to 5 percent slopes
- ☐ Pomello-Urban land complex, 0 to 5 percent slopes
- ☐ Porters fine sand
- ☐ St. Johns fine sand
- ☐ St. Lucia fine sand, 0 to 5 percent slopes
- ☐ St. Lucia Urban land complex, 0 to 5 percent slopes
- ☐ Samsula muck
- ☐ Samsula-Horton-Basinger association, depressional
- ☐ Samsula muck
- ☐ Seffner fine sand
- ☐ Smyrna fine sand
- ☐ Smyrna Urban land complex
- ☐ Tavares fine sand, 0 to 5 percent slopes
- ☐ Tavares-Milhopper fine sand, 0 to 5 percent slopes
- ☐ Tavares Urban land complex, 0 to 5 percent slopes
- ☐ Terra Ceia muck
- ☐ Urban land
- ☐ Wabasso fine sand
- ☐ Wabasso-Urban land complex
- ☐ Wauberg fine sand
- ☐ Zolfo fine sand
- ☐ Zolfo Urban land complex
- ☐ Water

deposits of Miocene or Pliocene age. The Floridan Aquifer furnishes sufficient quantities of water for municipal, agricultural, industrial, and commercial needs in Orange County. The unconfined water table in the non-artesian aquifer system represents a subdued expression of the surface topography, whereas the Floridan Aquifer system is confined under pressure. Each is classified as a G-II aquifer according to Florida Administrative Code (FAC) 62-3.

4.1.9 CRASH DATA

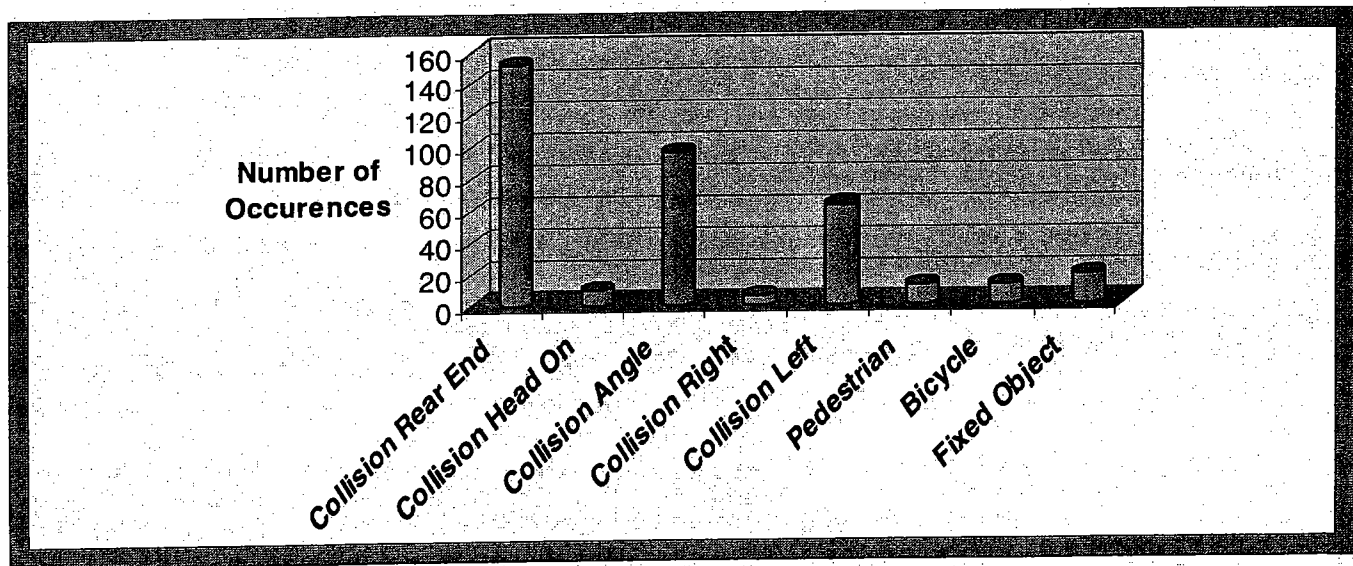
The accident data collected for SR 15/600 (US 17/92) covers the area from Camellia Avenue (MP 4.687) north to Tangerine Place (MP 6.878). This data was collected using the FDOT accident database for the previous five years that were available, the years 1995 through 1999.

The accident data was organized into the following categories:

- Type of Accident
- Accident Time of Day
- Accident Locations
- Accident Fatalities and Injuries
- Estimate of Economic Loss

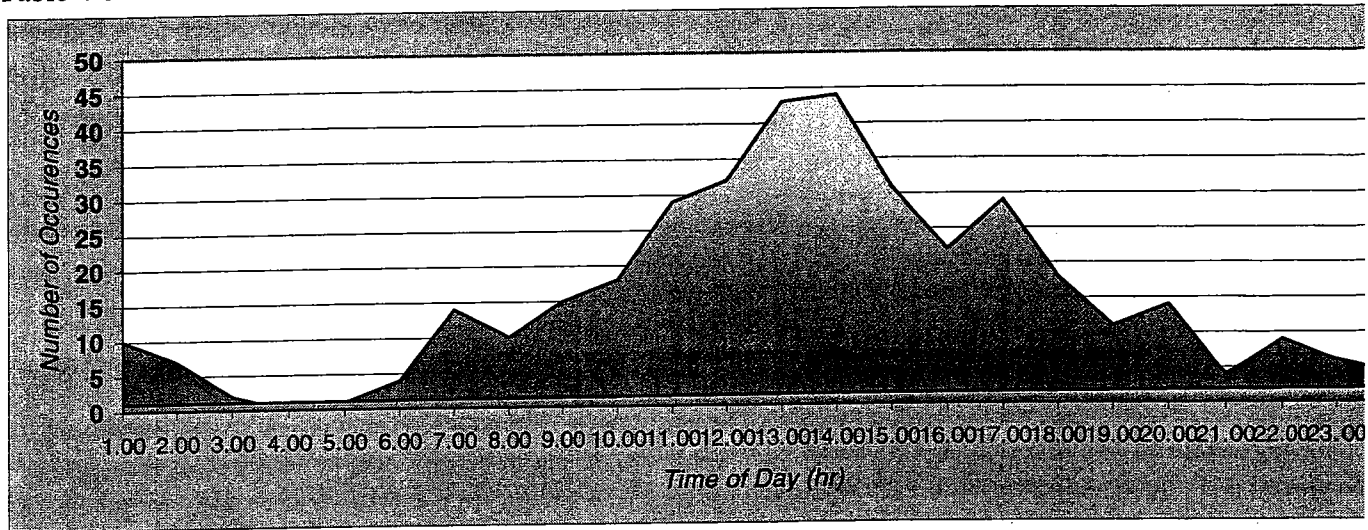
A total of 369 accidents were reported during the five-year reporting period. The accident data was analyzed to identify the type of accidents occurring along the study corridor. The following Table 4-2 summarizes the type of accidents along SR 15/600 (US 17/92).

Table 4-2 Type of Accidents



The accident data also revealed a trend that indicates most of the accidents were occurring during the afternoon period following lunch. This can be seen on Table 4-3, Accident Occurrences along SR 15/600 (US 17/92).

Table 4-3 Accident Occurrences



Utilizing a straight line diagram of the project area all of the accidents in the corridor were marked to specify their location. The accidents that occurred at the seven signalized intersections were analyzed in the following Table 4-4.

Table 4-4 Accidents Per Intersection

Signalized Intersections	1995	1996	1997	1998	1999	Total (5 Year)
Orange Avenue/Harmon Avenue (MP 4.881)	4	10	4	9	7	34
Minnesota Avenue (MP 5.125)	7	9	15	5	7	43
Fairbanks Avenue (MP 5.373)	13	14	9	5	15	56
Morse Boulevard (MP 5.691)	6	3	1	2	5	17
Webster Avenue (MP 6.120)	7	11	9	13	10	50
Lee Road (MP 6.261)	2	4	5	3	8	22
Park Avenue (MP 6.742)	3	5	7	1	2	18

(*500' south and north of intersection)

The SR 15 corridor during the five year accident analysis showed a high percentage of injuries with few fatalities, as shown in the following Table 4-5.

Table 4-5 SR 15/600 (US 17/92) Injuries and Fatalities, Years 1995 through 1999

Fatalities		Injuries	
1995	0	1995	72
1996	1	1996	88
1997	2	1997	94
1998	0	1998	64
1999	0	1999	73
Total Fatalities		Total Injuries	
3		391	

The economic loss that is contributed to the accidents during the five year study period is shown in the following Table 4-6.

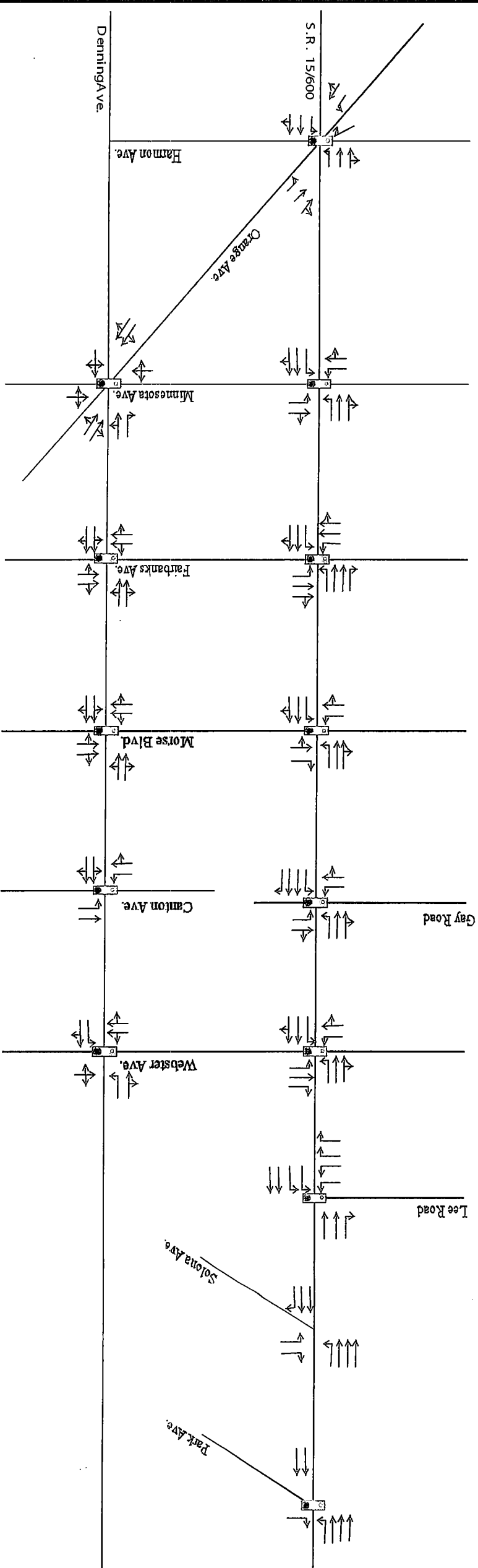
Table 4-6 SR 15/600 (US 17/92) Economic Loss, Years 1995 through 1999

Estimate of Economic Loss	
Year	Economic Loss
1995	\$3,659,500
1996	\$4,091,300
1997	\$3,874,000
1998	\$3,576,000
1999	\$4,619,000

4.1.10 INTERSECTIONS AND SIGNALIZATION

Figure 4-9 shows the existing functional geometry for the major signalized intersections located along SR 15/600 (US 17/92) and Denning Drive. The signalized intersections along SR 15/600 (US 17/92) within the study area include:

- SR 15/600 (US 17/92) at Orange Avenue (SR 527) (Signalized)
- SR 15/600 (US 17/92) at Minnesota Avenue (Signalized)
- SR 15/600 (US 17/92) at Fairbanks Avenue (SR 426) (Signalized)
- SR 15/600 (US 17/92) at Morse Boulevard (Signalized)
- SR 15/600 (US 17/92) at Gay Road (Signalized)
- SR 15/600 (US 17/92) at Webster Avenue (Signalized)
- SR 15/600 (US 17/92) at Lee Road (SR 423) (Signalized)
- SR 15/600 (US 17/92) at Park Avenue (Signalized)



Year 2001 Existing Geometry
S R 600/15 (US 17/92)
Norfolk Ave. To Monroe Ave.

SR 15/600 (US 17/92) Project Development and Environment Study

From Norfolk Avenue to Park Avenue
Orange County, Florida
Financial Project ID Number: 408429-1-22-01

The existing intersection geometry plays a vital role in assessing the existing intersection level of service (LOS). The existing geometry will be considered as one of the factors in determining potential intersection improvements to accommodate the travel demand.

4.1.11 LIGHTING

Street lighting is provided continuously along the east and west side of SR 15/600 (US 17/92). These facilities consist of single Cobra Head style fixtures, high-pressure sodium, mounted on a concrete square pole. The poles spacing varies in distance of 150' to 500'. North of Lee Road this same type of lighting fixture is mounted on round wooden poles.

4.1.12 UTILITIES AND RAILROADS

The following information describes, in general terms, the existing utilities and railroad facilities within the study area. Aerial maps showing existing utility locations are located in the project file.

City of Winter Park Utilities

The City of Winter Park has a system of potable water mains, wastewater force mains and gravity sewer lines that lie within the SR 15/600 (US 17/92) right-of-way. The City of Winter Park system ends south of Monroe Street, at which point the City of Maitland utility system provides service.

Potable Water: The City's potable water lines vary from 2 to 12 inches in diameter and are identified on the utilities exhibit package. Generally, a 12 inch diameter main is located on the east side of the right-of-way from the south project limit to Trovillion Avenue. From Trovillion to Lee Road, the main is located on the west side of SR 15/600 (US 17/92) corridor. From Lee Road north, the Winter Park system continues north as an 8 inch main to Monroe Street. Depending upon location, the water main materials include galvanized steel, cast iron, asbestos cement and PVC. The City of Winter Park also has an inter-connection with the City of Maitland water system at their 6-inch ductile iron water main on Park Avenue.

Sanitary Sewer: Within the SR 15/600 (US 17/92) corridor, the City of Winter Park gravity sanitary sewer system consists of a combination of PVC and vitrified clay pipes that vary in size from 6 to 15 inches in diameter. Generally, an 8 inch gravity main exists on the east side of the corridor from the south project limit to Fairbanks Avenue. A 12 inch main crosses the corridor at Fairbanks Avenue, and an 8 inch main runs along the east right-of-way from New England to Symonds Avenue. The

balance of the City's gravity sewer collection system consists of periodic crossings or lines that extend near the edge of right-of-way. Along the SR 15/600 (US 17/92) project corridor, the City of Winter Park does not have any City-operated lift stations. Instead, private lift stations pump into 4-inch cast iron force mains, and discharge into the City of Winter Park gravity sewer collection system.

Planned Improvements: At this time, the City of Winter Park does not have plans to upgrade any of their utility lines or other system facilities in the immediate corridor area.

City of Maitland Utilities

The City of Maitland has a system of potable water mains, wastewater force mains and gravity sewer lines within the SR 15/600 (US 17/92) right-of-way. As noted, the City of Maitland utility system provides service from Monroe Street to and beyond the north project study limit.

Potable Water: The City of Maitland potable water system consists of mains that vary in size from a 2-inch diameter PVC line starting at Elvin Avenue to an 8-inch diameter ductile iron main continuing north along the west side of SR 15/600 (US 17/92). The City of Maitland system is interconnected with the City of Winter Park's system via a set of 4 and 6-inch cast and ductile iron water mains that cross SR 15/600 (US 17/92) north and south of the CSX Railroad overpass.

Sanitary Sewer: The City of Maitland sanitary sewer system begins at the intersection of Monroe Street and SR 15/600 (US 17/92). The system consists of a gravity main that discharges into a recently upgraded lift station at the southwest corner of the northern CSX Railroad crossing of SR 15/600 (US 17/92). From the lift station, a force main extends northwest along the south side of the railroad right-of-way, and then crosses the track and runs along the east edge of the rail corridor. Near the north project limit, a separate gravity sewer system commences on the west side of SR 15/600 (US 17/92) at Tangerine Place, and flows north towards a lift station system.

Planned Improvements: The City of Maitland does not have any plans, at this time, to upgrade their water or sanitary sewer system in the area.

TECO (Peoples Gas)

TECO has a 4-inch diameter steel gas main on the east side of SR 15/600 (US 17/92) from Camellia Avenue to Orange Avenue. At Orange Avenue the 4-inch steel gas main crosses to the west side of SR 15/600 (US 17/92) to West New England Avenue, at which point it connects to a 2-inch steel gas main to Lee Road. The 2-inch gas main runs parallel to SR 15/600

(US 17/92) on the east side of Benjamin Avenue, from Lee Road to Elvin Avenue. The gas main crosses to the east side of SR 15/600 (US 17/92) at Elvin Avenue and continues north as a 2-inch steel line and, subsequently, a 2-inch diameter plastic line. At this time, there are no plans to upgrade the system.

Progress Energy (formerly Florida Power)

Progress Energy, formerly Florida Power, has a system of aerial and underground, primary and secondary, power lines along both sides of the SR 15/600 (US 17/92) right-of-way. Progress Energy also owns and operates a transformer sub-station located on the southeast corner of SR 15/600 (US 17/92) and Canton Avenue. At this time, Progress Energy does not have any plans to upgrade or modify the existing pole and power line system.

Brighthouse Networks (formerly Time Warner Communications)

Brighthouse Networks has aerial cable lines along the west side of the SR 15/600 (US 17/92) right-of-way between Harmon Avenue and Gay Road. At Lee Road, the aerial cables are located along both sides of SR 15/600 (US 17/92) and continue north to Glendon Parkway. At Glendon Parkway, the aerial cable continues along the west side of SR 15/600 (US 17/92) only, north to Monroe Street. At Monroe Street, the Brighthouse cable converts to an underground line running below the northern CSX railroad crossing. North of the CSX railroad crossing, the lines are aerial and continue north along the west side of SR 15/600 (US 17/92). Brighthouse does not have any immediate plans for additional installations or improvements within the project area at this time.

Bellsouth

Bellsouth has an aerial fiber optic cable on the west side of SR 15/600 (US 17/92) from Minnesota Avenue to Canton Avenue. The aerial fiber optic cable crosses SR 15/600 (US 17/92) underground from west to east in a 4-inch diameter duct at West Morse Boulevard and at West Canton Avenue, where the system continues underground to the east. Bellsouth service along the SR 15/600 (US 17/92) corridor is based on direct service orders. At this time, there are no plans to upgrade the system.

Sprint

Sprint currently has a conduit and manhole system containing multiple cables; buried and aerial copper cables; and, buried fiber optic cables within the project area. The facilities are generally located on the east side of SR 15/600 (US 17/92) from the south project limit north to Fairbanks Avenue, on the west side from New England Avenue to Gay Road, and again on the east side from N. of Lee Road to the CSX Railroad bridge crossing. At this time, Sprint has no plans for improvements in the study area.

Sprint Metropolitan Networks

Sprint Metropolitan Networks is located within the Sprint Local duct and manhole system on the south side of Orange Avenue across the SR 15/600 (US 17/92) right-of-way. At this time there are no plans for upgrades to the system.

Level (3) Communications

The Level 3 Communications system consists of a twenty line, 13-inch HDPE pipe conduit. The Level 3 duct bank runs on the north side of Orange Avenue crossing SR 15/600 (US 17/92). The duct bank also nears SR 15/600 (US 17/92) at Park Avenue, where the duct bank runs along the south side of Park Avenue, turning and heading north along the east side of SR 15/600 (US 17/92) at the intersection of Park Avenue and SR 15/600 (US 17/92). Adelphia Business Solutions also is within the Level 3 duct bank on Park Avenue and north along SR 15/600 (US 17/92). There are currently no plans for improvements to this duct bank.

Adelphia Business Solutions

Adelphia Business Solutions is located within the Level 3 Communications duct bank system on Park Avenue, following the Level 3 system north along the east side of SR 15/600 (US 17/92). Adelphia Business Solutions has no plans at this time to upgrade their system.

Williams Communications

Williams Communications has a manhole and 3-sleeve conduit system running along the CSX railroad right-of-way. Along the northern CSX railroad crossing the conduit system runs underground across SR 15/600 (US 17/92) from east to west and then along the railroad right-of-way. At this time, Williams Communications does not have any plans for upgrades to this system.

Epik Communications

Communications is located in the same duct bank with Williams Communications in a 3-sleeve conduit system. The conduit system is located within the CSX Railroad right-of-way. Epik Communications is dependent on Williams Communications for upgrades to their system. At this time, there are no proposed upgrades to the Williams Communication or Epik Communication systems.

MCI Worldcom

MCI Worldcom has telecommunication lines along the north and south sides of the southern CSX Railroad crossing right-of-way within the project area. MCI Worldcom lines follow the CSX Railroad track within its right-of-way through Winter Park. The lines also cross the project corridor at the northern CSX crossing, where the lines continue

underground, crossing from the east side of SR 15/600 (US 17/92) to the west side and then following the CSX railroad right-of-way. MCI Worldcom does not have any plans at this time for changes along this route.

AT&T Communications

AT&T has a high capacity (Jacksonville-Orlando) fiber optic cable housed in two, 2-inch diameter PVC conduit systems, with associated concrete manholes, along the south side of Orange Avenue. At this time, AT&T has no plans for any capital improvements to this route.

AT&T Local Network Services

AT&T Local Network Services facilities consist of an aerial run on the west side of the SR 15/600 (US 17/92) right-of-way between Gay Road and Indiana Avenue. Their facilities also include two buried extensions across the SR 15/600 (US 17/92) right-of-way located at the Canton Avenue and Morse Boulevard intersections. At this time, there are no plans for capital improvements or relocation of their facilities.

Florida Power Corporation –Transmission

Florida Power - Transmission has two main aerial crossings over SR 15/600 (US 17/92). One crossing is at Fairbanks Avenue and the other crossing extends west from the substation, west of Canton Avenue, to Trovillion Avenue. The line coming out of the substation is a WO 69kV line. At this time, Florida Power - Transmission Division does not have any plans for improvements.

FPL FiberNet

FPL FiberNet crosses SR 15/600 (US 17/92) at two locations along the study route. One crossing, containing four 13 HDPE lines, is along the south right-of-way of Camellia Road and then turns and heads south along the west SR 15/600 (US 17/92) right-of-way. The second crossing, also containing four 13 HDPE lines, is along the north right-of-way of Webster Avenue and then turns and heads north along the west right-of-way of SR 15/600 (US 17/92). The FPL FiberNet system was installed in the Fall of 2000, and does not have any plans for improvements at this time.

Progress Telecom

Progress Telecom, a Progress Energy Company, has facilities that consist of aerial and underground cables. The aerial cables run along the east right-of-way of SR 15/600 (US 17/92) from Harmon Avenue north to the Florida Power sub-station at Symonds Avenue. The aerial cable crosses SR 15/600 (US 17/92) at three locations. One location is approximately 100 feet south of the Fairbanks Avenue and SR 15/600 (US 17/92) intersection. The second crossing is along the south side of Fairbanks

Avenue, running from east to west. The third crossing is from the southeast corner of W. Canton Avenue running west along the Florida Power Transmission main. The underground cable crosses SR 15/600 (US 17/92) along the south side of Minnesota Avenue from east to west. At this time, Progress Telecom does not have any plans for improvement.

CSX Railroad

CSX Transportation, Inc. operates two railroad crossings within the SR 15/600 (US 17/92) study area. The following descriptive information was generated from the FDOT District Five Planning Office Railroad Crossing Index.

An at-grade railroad crossing is located near the Orange Avenue intersection along SR 15/600 (US 17/92) in the City of Winter Park. The crossing number is 622169T and is located at Railroad Milepost 786.9. At the time of the FDOT's last inventory update in 1998, a total of 13 trains use this crossing each day (7 through trains in the morning and 6 through trains in the evening). The type of rail traffic is documented as passenger and the maximum train speed is 25 miles per hour. There are two (2) main tracks located at this crossing. The crossing surface type is concrete slab and is rated in excellent condition with a smooth transition.

The second railroad crossing is located between Monroe Street and Park Avenue in the City of Maitland and consists of an overpass over SR 15/600 (US 17/92). The crossing number is 622149G and is located at Railroad Milepost 784.3. At the time of FDOT's last inventory update in 1998, a total of 15 trains used this crossing every day (6 through trains and 5 switch trains in the morning and 2 through trains and 2 switch trains in the evening). The type of rail traffic is documented as passenger and the maximum train speed is 25 miles per hour. There is one (1) main track located at this crossing.

4.1.13 PAVEMENT CONDITIONS

The existing SR 15/600 (US 17/92) pavement is 7-inch thick cement concrete pavement. The cross section of the pavement is parabolic with 1/2":1' minimum cross slopes. A request for a pavement conditions forecast report from FDOT District Five was made during the study. A portion of this report can be found on the following page. This report (dated July 2002) rates the condition of the pavement based on cracks along the pavement, ride, and any rutting of the limerock base. For the year 2002, the section of SR 15/600 (US 17/92) between SR 50 (Colonial Drive) and SR 438 (Lee Road) (milepost 2.622 to milepost 6.259), the report shows cracking rates below 6.0 and ride rates of 6.1. From Lee Road to Monroe Street, the report shows rates below 6.0 for cracking and above 6.0 for ride conditions.

DISTRICT = 5 COUNTY = ORANGE

RDWYID	SR	US	BMP	G_BMP	EMP LN	SYSTEM	TYPE	DISTRESS	RATINGS	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	FUTURE
INTERSECT AT (MPSIDE)	ITMSEG-P	CONTRACTOR (YEAR--PAVEMENT ONE YR OLD)	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP	W_BMP
75020000	15	17	0.814	7.298	L	1	2	CRACKING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
500 441								RIDE	8.1	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
COUNTRY CLUB VILLAGE (1.0C)								RUTTING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
2389581			0.000	7.200	C	1977	0220	CRACKING	9.4	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
								RIDE	8.7	7.9	8.6	8.6	8.4	8.5	8.5	8.5	8.5	8.3	8.0	8.0	8.0	8.0	8.0
2395232			0.000	2.459	C	2001	0012	RUTTING	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
								RIDE	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
75030000	15	17	0.000	0.851	C	1	1	CRACKING	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
SR 500-600/SR 526-600-WASH(0.0C)								RIDE	4.5	4.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2391641			0.000	2.141	C	1989	0220	CRACKING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
SLOAN CONSTRUCTION CO INC (1990)								RIDE	8.1	7.3	7.6	7.6	7.7	7.8	7.7	7.6	7.8	7.3	6.5	6.2	6.6	6.5	5.9
4117271			0.000	2.118	C	2005	0012	RUTTING	9.0	9.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
								RIDE	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
75030000	15	17	0.851	1.069	C	1	1	CRACKING	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
SR 526-HUGHEY/SR 526-WASH(0.9C)								RIDE	4.5	4.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2391641			0.000	2.141	C	1989	0220	CRACKING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
SLOAN CONSTRUCTION CO INC (1990)								RIDE	6.4	5.9	5.0	5.0	5.6	4.8	5.6	3.7	5.9	3.1	6.1	6.6	6.4	6.3	5.9
4117271			0.000	2.118	C	2005	0012	RUTTING	9.0	9.0	8.0	8.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
								RIDE	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
75030000	15	17	1.069	2.118	C	1	1	CRACKING	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
SR 526-GARLAND/SR 526-ROBI(1.1C)								RIDE	4.5	4.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2391641			0.000	2.141	C	1989	0220	CRACKING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
SLOAN CONSTRUCTION CO INC (1990)								RIDE	6.3	6.5	5.8	5.8	6.4	5.6	6.5	5.2	5.9	5.6	4.3	4.0	4.3	4.3	3.2
4117271			0.000	2.118	C	2005	0012	RUTTING	9.0	9.0	8.0	8.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
								RIDE	6.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
75030000	15	17	2.622	6.259	C	1	4	CRACKING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
SR 50-COLONIAL/SR 15-MILL(2.6C)								RIDE	6.8	6.5	6.5	6.5	6.5	6.5	6.7	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
								RIDE	7.4	7.7	5.2	5.2	5.2	5.2	5.3	5.1	5.9	5.7	6.2	5.3	6.1	6.1	5.1
								RUTTING															
75030000	15	17	6.259	7.146	R	1	4	CRACKING	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
SR 423-LEE RD/SR 15-SR 600(6.3C)								RIDE	6.5	6.5	6.1	6.0	6.0	6.0	5.8	5.7	5.5	5.6	5.9	5.7	5.7	5.7	5.7
								RIDE	8.0	8.2	7.3	7.3	7.3	7.3	7.4	6.7	5.9	7.6	6.2	5.5	6.5	6.5	6.0
								RUTTING															

"*" INDICATES PAVEMENT RATED 6 OR LESS;
 2007 FORECASTED BY SIMPLE LINEAR REGRESSION.

"@" INDICATES PROJECT LENGTH SHORTER THAN ROADWAY SEGMENT 1 MILE OR MORE

4.2 Existing Bridges

There are no existing bridge structures located within the SR 15/600 (US 17/92) study area limits from Norfolk Avenue to Monroe Street; however, there is a bridge structure located just outside the study limit north of Monroe Street for the CSX Transportation railroad facility. CSXT Bridge No. A-784.4 was originally constructed in 1937. This structure was modified and extended in the 1950's. The existing bridge length is approximately 275 feet. The superstructure consists of an eight (8) span steel "through plate girder" founded on octagonal pre-cast concrete piling. Three (3) of these spans are located over the northbound and southbound travel lanes of SR 15/600 (US 17/92) north of Monroe Street. The existing structure is centered within an approximate 60 foot swathe of existing CSXT right of way. The bridge crosses SR 15/600 (US 17/92) approximately 350 feet south of the Park Avenue intersection with SR 15/600 (US 17/92) and is within a 35 mph roadway speed limit zone.

The existing bridge configuration consists of a single railroad track with each rail approximately five (5) feet apart. The longitudinal steel "through plate girders" supporting the track are located approximately 17 feet center to center.

The existing vertical clearance for SR 15/600 (US 17/92) beneath the CSXT Railroad bridge is 13 feet, 8 inches. Since the vertical clearance is less than current AASHTO & FDOT design standards, signs have been posted at the bridge location.

The existing horizontal clearances from the piers to the face of gutters are less than the required 16 feet; therefore, guardrail has been provided to shield the piers. The horizontal clearances are listed below:

Northbound: Outside 5 feet	Inside 5 feet
Southbound: Outside 5.5 Feet	Inside 5 feet

The vertical alignment of the CSX Railroad bridge over SR 15/600 (US 17/92) is a zero-percent grade. The horizontal alignment is an 1800' tangent section of the railroad between two opposite direction horizontal curves.

4.3 Environmental Characteristics

4.3.1 LAND USE DATA

4.3.1.1 Existing Land Use

Existing land use within the study area was reviewed in order to

determine the potential impacts of the project. The existing land within the study area use along the SR 15/600 (US 17/92) corridor is dominated by commercial and office but also includes both single family and multi family residential, office or professional, recreation, institutional, and light industrial.

The following is a brief description of the existing land uses and the general locations of these uses:

Commercial/Office: These major land uses include Winter Park Village, Big K K-mart Plaza, Hollieana Plaza and car dealerships including Bill Bryan Subaru, Don Reid Ford, Holler Dodge and Holler Honda.

Residential: The Orwin Manor neighborhood is located on the southern end of the study area near Norfolk Avenue. The Lake Killarney Condominiums are located near the intersection of Morse Boulevard.

Industrial: There are light industrial land uses along Solana Avenue including warehouses, storage facilities and boat and auto repair facilities. Florida Power has an electrical substation located near Canton Avenue.

Institutional: This land use designation includes government buildings, parks, schools, and churches. These facilities are scattered throughout the study area and include the branch campuses of Troy State University and Warner Southern College as well as the St. John's Lutheran Evangelical Church.

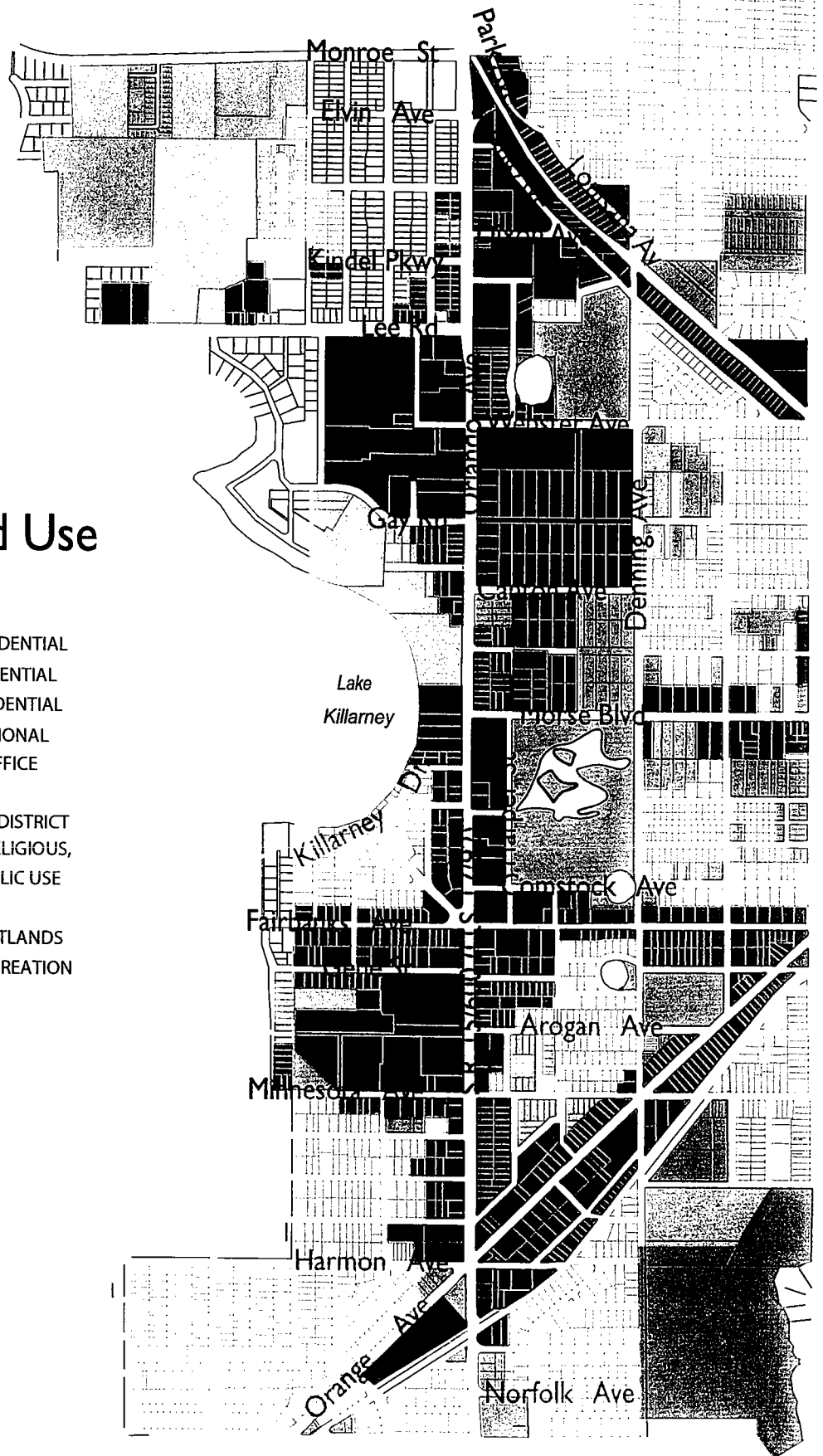
Figure 4-10 shows existing land use designations described above. Future land use designations generally consist of similar uses, as shown in Figure 4-11.



Existing Land Use

LEGEND

	SINGLE FAMILY RESIDENTIAL
	LOW DENSITY RESIDENTIAL
	MULTI-FAMILY RESIDENTIAL
	OFFICE OR PROFESSIONAL
	COMMERCIAL OR OFFICE
	INDUSTRIAL
	CENTRAL BUSINESS DISTRICT
	GOVERNMENTAL, RELIGIOUS, EDUCATIONAL, PUBLIC USE
	AGRICULTURAL
	CONSERVATION/WETLANDS
	OPEN SPACE OR RECREATION
	VACANT LAND



SR 15/600 (US 17/92) Project Development and Environment Study

From Norfolk Avenue to Monroe Street

Orange County, Florida










Financial Project ID Number: 408429-1-22-01

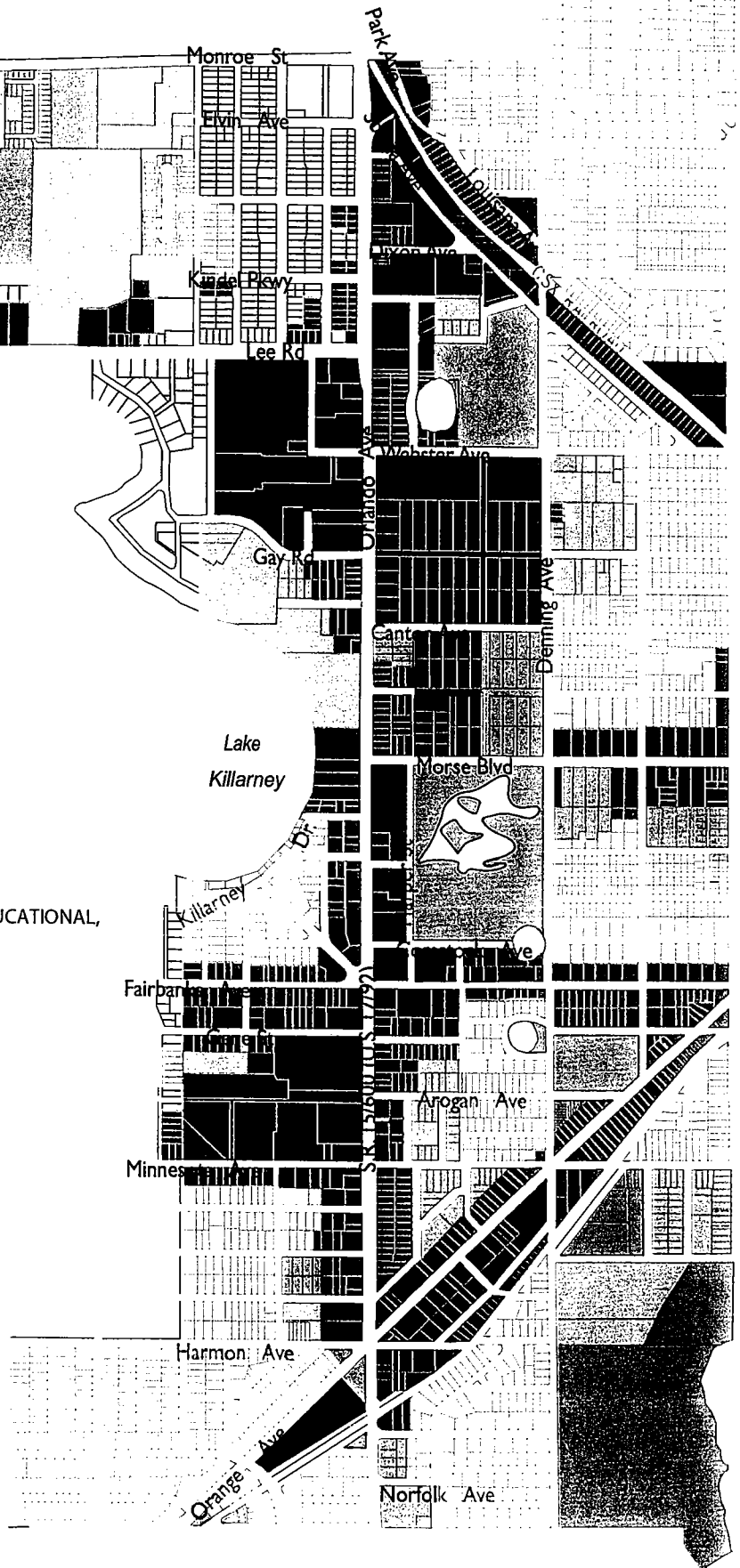
Figure 4-10



Future Land Use

LEGEND

-  SINGLE FAMILY RESIDENTIAL
-  LOW DENSITY RESIDENTIAL
-  MULTI-FAMILY RESIDENTIAL
-  COMMERCE
-  OFFICE & PROFESSIONAL
-  CENTRAL BUSINESS DISTRICT
-  INDUSTRIAL
-  OPEN SPACE AND RECREATION
-  GOVERNMENTAL, RELIGIOUS, EDUCATIONAL,
AND COMMUNITY SERVICES



SR 15/600 (US 17/92) Project Development and Environment Study

From Norfolk Avenue to Monroe Street

Orange County, Florida

Financial Project ID Number: 408429-1-22-01

4.3.2 CULTURAL FEATURES AND COMMUNITY SERVICES

4.3.2.1 *Cultural Features and Community Services*

Existing cultural features and community services located within the SR 15/600 (US 17/92) study area are listed below and are shown on Figure 4-12.

- Lake Island Park
- Rachel D. Murrah Civic Center
- Orange County Vo-Tech
- Center for Independent Living

4.3.2.2 *Archaeological Resources*

Background research and a review of the Florida Master Site File (FMSF) indicated that no archaeological sites, including any sites listed in the *National Register of Historic Places (NRHP)* were recorded within or adjacent to the archaeological area of potential effect (APE) for the SR 15/600 (US 17/92) study. A review of relevant site information for environmentally similar areas within Orange County, Florida and the surrounding region indicated a variable (low to moderate) potential for the occurrence of prehistoric sites within the archaeological APE. The background research also indicated that sites, if present, would likely be small lithic or artifact scatters. As a result of field surveys conducted for this study, no archaeological sites were discovered.

4.3.2.3 *Historic Resources*

Historical background research, including a review of the FMSF and the *NRHP*, indicated that no historic properties (50 years of age or older) were recorded within or adjacent to the historical APE. Six (6) potential historic resources were identified and recorded involving residential or commercial buildings. These six buildings are neither distinguished by their architectural features, nor known to be associated with significant events or with the lives of persons significant in the past. In addition, many of the buildings have been extremely altered, resulting in a loss of architectural integrity. By these criteria, none of the historic resources appear to be eligible for listing in the *NRHP*, either independently or as part of a district.

Cultural Features Community Services & Potential Historical Sites

LEGEND



Civic / Public Amenities



Newly Recorded Historic Resources

8OR9613 - CSX Railroad Overpass

8OR9614 - 1121 North Orlando Avenue

8OR9614 - 1501 Lee Road

8OR9616 - 1531 Lee Road

8OR9617 - 1549 Lee Road

8OR9618 - 276 South Orlando Avenue

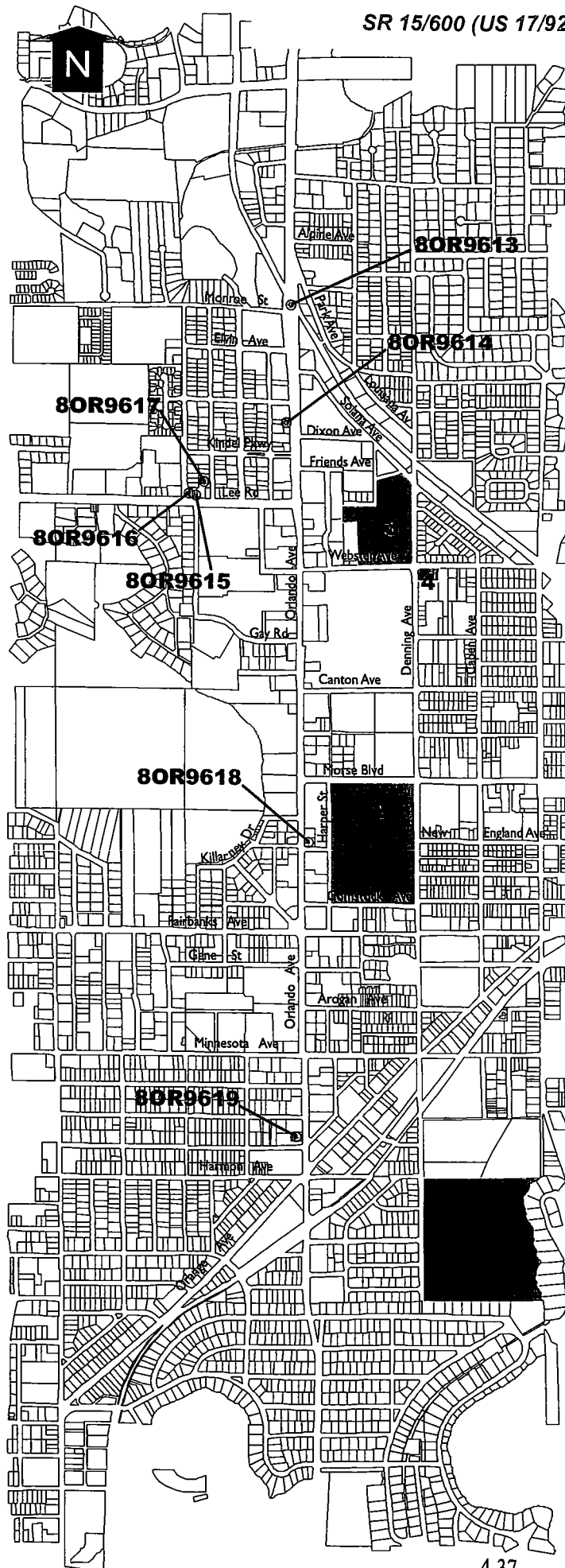
8OR9619 - 1155 South Orlando Avenue

1 - Lake Island Park

2 - Rachel D. Murrah Civic Center

3 - Orange County Vo-Tech

4 - Center For Independent Living



4.3.3 NATURAL AND BIOLOGICAL FEATURES

The SR 15/600 (US 17/92) corridor was investigated through review of published information, review of State database occurrence records, and field reviews to ground truth on-site vegetative communities and approximate wetland boundaries. Field investigations were conducted by representatives of DRMP during October 2002. Maps defining the vegetation associations/land uses, wetland location and Threatened and Endangered species habitat were developed. The project study area was traversed to determine the following:

- On-site vegetation
- Landward extent of jurisdictional wetlands
- Land use within the project corridor
- Threatened and Endangered animal and plant species habitat

A geographic information system (GIS) database, obtained from the University of Florida Geographic Data Library, was used to determine existing land uses in the project corridor. The corridor was inspected in the field to verify the accuracy of the GIS database. The specific methodology employed for each study criteria is documented below.

For the purpose of determining constraints, all forested and herbaceous wetlands, surface waters and open water bodies identified on the GIS land use database were considered jurisdictional wetlands. In addition the GIS land use database, wetlands were identified through the use of the United States Fish and Wildlife Service (USFWS) *National Wetland Inventory* (NWI) maps, United States Department of Agriculture (USDA) *Natural Resource Conservation Service* soil surveys, and aerial photography.

Using the information obtained from the above data sources as a guide, field surveys were conducted on October 2002 to verify approximated wetland boundaries and to characterize wetland habitat within the project corridor. Vegetation structural diversity was noted for each wetland, including type, plant composition and stratification, and hydric characteristics. Each wetland site was identified in the field using the delineation methods described in the US Army Corps of Engineers (ACOE) "Federal Manual for Identification and Delineation of Wetlands", dated 1987, and Statewide Unified Methodology and Criteria as adopted by the Florida Department of Environmental Protection (FDEP), and the Water Management Districts.

Wetland classification occurring within the project corridor was

determined based on the FDOT's Florida Land Use, Cover and Forms Classification System (FLUCCS) (January 1999). FLUCCS codes were determined to Level III and IV classification for specific identification of wetland and upland habitats occurring with the project corridor. Definitions of Level IV classification that are not specifically described in the FLUCCS classification system were developed based on field observation of dominate vegetation and hydrology.

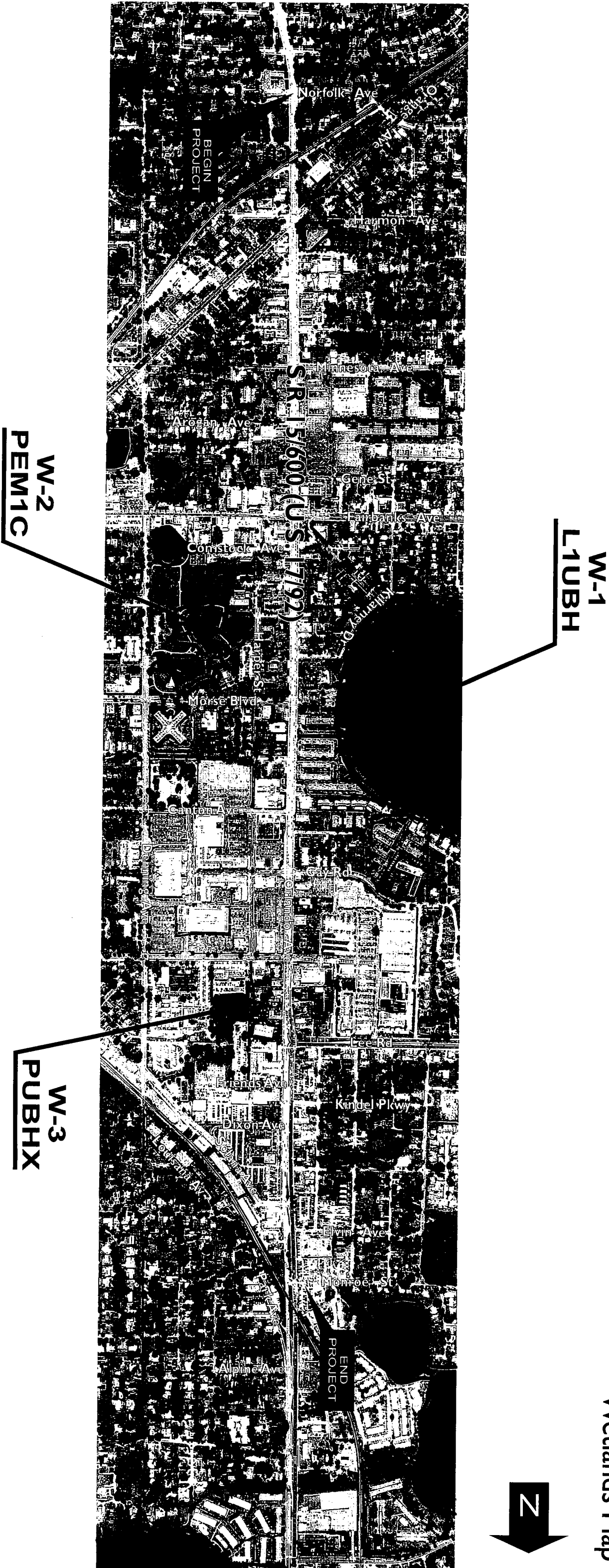
Wetlands Within the Project Limits

In accordance with Executive Order 11990, "Protection of Wetlands," Federal Highway Administration Technical Advisory 6640.8A, and 23 CFR part 777 as amended, an assessment was conducted of wetlands having the potential to be impacted by the proposed improvements. The NWI Maps document three wetlands within 500 feet of the existing SR 15/600 (US 17/92) project study area. These systems were also field verified for accuracy. Avoidance alternatives were considered during the study to completely avoid impacts to wetlands. The three wetlands are summarized in Table 4-7 and are shown on Figure 4-13. The character of wetlands within and adjacent to the study corridor varies in response to the historical drainage patterns and intensity of more recent human activities. The wetlands within the project corridor include herbaceous systems.

Wetland 1 (Lake Killarney) is located west of the intersection of the SR 15/600 (US 17/92) and Morse Boulevard. It is approximately 236.7 acres in size. It is classified by the USFWS as LIUBH (lacustrine, limnetic, unconsolidated bottom, permanently flooded). This wetland is characterized by open water fringed by Cypress, (*Taxodium distichum*), Bog rushes (*Junca sp.*), Cattail (*Typha sp.*) *Pontederia cordata*, wild taro (*Colocasia esculenta*), torpedo grass (*Panicum repens*, and water primrose (*Ludwigia sp.*). Privately owned boat docks are located all the way around the perimeter. This wetland is used as a recreation facility but also provides habitat for a variety of small mammals and birds.

Wetland 2 (Lake Mendsen, which is also known as Lake Island) is located near the intersection of Morse Boulevard and Harper Avenue. This wetland is approximately 6.7 acres in size and is classified by USFWS as a PEM1C (palustrine, emergent, persistent, seasonally flooded) which is characterized by sparse patches of cypress, willow (*Salix carolinia*), pickerelweed (*Pontederia cordata*) and alligator weed (*Alternanthera philoxeroides*) in the littoral zone.

Wetlands Map



Wetland 3 (Lake Francis) is located directly east and adjacent to Galloway Avenue. This system is classified as PUBHx (palustrine, unconsolidated bottom, permanently flooded, excavated). This system is approximately 1.2 acres in size and is densely vegetated with cattail, torpedo grass, pickerelweed, willow and primrose willow. Lake Francis is a small lake which has been excavated and reshaped into a rectangular-shaped pit. Lake Francis is drained by a 6-inch drainage well located to the southwest of the lake and is considered a land-locked lake.

All wetland areas within the project corridor have a history of physical and hydrologic alteration resulting from the development of this area and the drainage features installed to reduce flooding concerns within the area. Many of the developed portions of the project corridor drain directly into wetland systems with no pre-treatment of the stormwater for pollution control.

Table 4-7 Wetland Summary

Wetland	Name	USFWS Classification	Total Area (Acres)
W-1	Lake Killarney	L1UBH	236.7
W-2	Lake Mendsen (Lake Island)	PEM1C	6.7
W-3	Lake Francis	PUBHx	1.2

Threatened and Endangered Species

The urbanized nature of the SR 15/600 (US 17/92) corridor limits utilization by threatened and endangered species. Vegetation is sparse with moderately vegetated sites located around Lake Killarney and Lake Francis. Construction-related impacts are anticipated to be minimal. No Federal or State listed plants were observed during the field survey. Wading birds were observed utilizing the wetland areas, however there were no rookeries or major concentrations of these species observed and the overall impacts to wading birds would not be anticipated. No portion of the study area has been designated as Critical Habitat by the US Fish and Wildlife Service.

A comprehensive literature review was conducted to determine the potential for occurrence of any listed species with known geographic ranges that coincide with the project corridor. Project biologists consulted the Florida Fish and Wildlife Conservation Commission (FFWCC), United States Fish and Wildlife Service species lists, and the *Florida Natural Areas Inventory* (FNAI). Additionally, a detailed review of project aerial photographs, and a preliminary field survey were conducted in order to determine the various habitat types within the vicinity of the proposed project.

Pursuant to Section 7(c) of the Endangered Species Act of 1973, the project corridor was evaluated for the potential occurrence of threatened and endangered species. State and federally listed species (endangered, threatened and species of special concern) potentially occur within the project corridor. Based upon the literature review, coordination with environmental agencies, and subsequent field reconnaissance, a list of species that could potentially occur in the project corridor was developed (See Table 4-8 below). The following is not a conclusive list of species occurrence as extensive site surveys were not conducted as a part of this study.

Table 4-8 SR 15/600 (US 17/92) Federally Threatened and Endangered Flora and Fauna

MAMMALS			
Common Name	Scientific Name	State Status	Federal Status
Bear Florida Black	<i>Ursus americanus floridanus</i>	SSC	C
BIRDS			
Sandhill crane	<i>Grus canadensis</i>	T	-
Eagle, Bald	<i>Haliaeetus leucocephalus</i>	T	T
Limpkin	<i>Aramus guarauna</i>	SSC	-
Scrub-Jay, Florida	<i>Aphelocoma coerulescens</i>	E	E
Wood Stork	<i>Mycteria americana</i>	E	E
Woodpecker, Red-cockaded	<i>Picoides borealis</i>	E	E
REPTILES			
Gopher Tortoise	<i>Gopherus polyphemus</i>	SSC	
Snake, Eastern Indigo	<i>Drymarchon corais couperi</i>	T	T
PLANTS			
Bear-grass, Britton's	<i>Nolina brittoniana</i>	-	E
Bonamia, Florida	<i>Bonamia grandiflora</i>	-	T
Lupine, Scrub	<i>Lupinus aridorum</i>	-	E
Pawpaw, Beautiful	<i>Deeringothamnus pulchellus</i>	-	E
Sandlace	<i>Polygonella myriophylla</i>	-	E
Whitlow-wort, Papery	<i>Paronychia chartacea</i> = <i>Nyachia pulvinata</i>	-	T
Wild Buckwheat, Scrub	<i>Eriogonum longifolium</i> var.g = <i>Eriogonum floridanum</i>	-	T

E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat, P = Proposed, SSC = Species of Special Concern

4.3.4 CONTAMINATION SITES

An evaluation of properties within the SR 15/600 (US 17/92) corridor was conducted to evaluate if hazardous waste or hazardous materials exist that may impact future roadway construction. The study area commences at Norfolk Avenue and extends to Monroe Street. The lateral extent of the study area includes the SR 15/600 (US 17/92) corridor, and corresponding right-of-way areas, and the entire area extending from SR 15/600 (US 17/92) eastward to Denning Drive. These sites are shown on Figure 4-14 and Table 4-9. A full description of the potential contamination sites located within the study area can be found in the SR 15/600 (US 17/92) Contamination Screening Evaluation Report which is located in the project file.

Potential Contamination Sites

■ Site Location

1. St. Johns Lutheran Church
2. First Printing and Copy Center
3. State Auto Body Works
4. Einstein Bros. Bagels
5. Jewett Medical Clinic
6. All Florida Paint & Decorating
7. GS Farm Produce
8. Krispy Kreme
9. Signs Now
10. Firestone
11. Car Emergency Room
12. Mab Paints
13. Orange Tree Antiques & Mall
14. Spring Cleaners of Winter Park
15. ADT Security Systems
16. Systems Devices and Supplies
17. Elite Motors of Winter Park
18. Quick Signs
19. Winter Park Texaco
20. Goodyear/Action Tire Suto Service Center
21. Winter Park Auto Electric
22. Mobil Lube Express
23. Alarm Products Distributors World Wide, Inc.
24. Marc's Hair Studio
25. Imperial Laundry & Dry Cleaners
26. Roger Holler Chevrolet Co.
27. Adventist Health System
28. Midas Muffler
29. Bank First
30. Mid-Florida Imaging
31. Priceless Dry Cleaners
32. Dent Wizard
33. Liquidation Station
- 34a. Chamberlins Market
- 34b. Winter Park Terrace
35. Winter Park Village
36. Royal Coach Car Wash
37. Former Oklahoma Installation Company
38. Amoco
39. The Volvo Store
40. Vacant (Former Bills Cleaner)
41. Ice Cold Auto-Air
42. Ritz Cleaners
43. Bill Bryan Imports
44. Holler Dodge
45. Richies Economy Cars, Inc.
46. Roger Holler Honda
47. U-Haul Center of Winter Park
48. C&H Auto Service, Inc.
49. Joe's Autos Services
50. Ron Parks Motor Sports
51. Dingman Petroleum Company
52. Takash Race Craft
53. Race Car Engineering
54. At Your Service Auto Repair
55. Savage Automotive, Inc.
56. Don Reid Ford
57. Speedway
58. U-Save Auto Rental
59. CSX Railroad Overpass at Roadway
60. Classic Laundry and Dry Cleaning
61. Park Avenue Snapper
62. Rads Antiques & Refinishing
63. Parkland Printing
64. Enterprise Rent-A-Car

Figure 4-14

Table 4-9 Summary of Potential Contamination Sites

Site No.	Rank	Name	Activity	Comment
1	Medium	St. Johns Lutheran Church	Church	'92 Discharge, RAP, '00 MOP approved.
2	Low	First Printing & Copy Center	Printing Service	No file info available.
3	Low	State Auto Body Works	Auto Repair and Body / Paint Shop	No file info available.
4	Medium	Former Shakepearins, Inc. a.k.a. Car Tunes Audio (Currently Einstein Brothers Bagels)	Former Auto/Audio Installation	'95 NFA.
5	No/Low	Former Orange Radiology (Currently Jewett Medical Clinic)	Medical / Radiology services	No file available.
6	High	Former Union 76 / Fina Station (Current All Florida Paint & Decorating)	Former Gasoline Service Station	'02: Tanks closed in-place, no closure report.
7	High	Former My Brothers Fina (Currently GS Farms Produce)	Former Gasoline Service Station	'91 Discharge (reported at time of tank removal), '96 letter indicates soil and groundwater contamination exists at site.
8	Low	Former Winter Park Marine (Currently Crispy Creme)	Potential Former Marine Engine Repair	No file info available.
9	No/Low	Signs Now	Printing and Signage Services	No file info available.
10	High	Firestone # 19E9	Tire Sales and Service	'89 Oil underground storage tank (UST) removed, potential contamination, no closure.
11	Medium	Former Holler Chevrolet Company (Currently Car Emergency Room)	Former Auto Sales and Maintenance	'97 Tanks removed, no other info available.
12	Low	MAB Paints	Paint Supply Store	No file info available.
13	Low	Former Eagle G. Ward Auto Parts Inc. (Currently Orange Tree Antiques Mall)	Former Auto Parts Supply and Sales (RCRA Generator)	No file info available.
14	High	Spring Cleaners of Winter Park	Dry cleaner (RCRA Generator and LUST Site)	No file info available.
15	No/Low	ADT Security Systems	Electronic Supply and Repairs	No file info available.
16	No/Low	Systems Devices & Suppliers, Inc.	Electronic Supply and Repairs	No file info available.
17	Low	Elite Motors of Winter Park	Auto Sales and Maintenance	No file info available.
18	Low	Quick Signs	Printing and Signage services	No file info available.
19	High	Winter Park Texaco # 24-025-0193	Gas Station/Convenience Store	'86 Discharge, Remediation continues.
20	Medium	Good Year Auto Service Center	Tire Sales and Service	'90 Waste Oil tank removed, soil contamination. '91 NFA.
21	High	Winter Park Auto Electric	Auto Maintenance and Repair	'91 Compliance Inspection: No tanks, utilizes 55-gallon drums.
22	Low	Mobil Lube Express	Auto Maintenance	'02 Compliance Inspection: No violations noted.
23	No/Low	Former Hill Printing, Inc. (Currently Alarm Products Distributors World Wide, Inc.)	Former Printing Services (RCRA Generator)	No file info available.

Site No.	Rank	Name	Activity	Comment
24	High	Former Rodriguez Property (Currently Marc's Hair Studio)	LUST Site	No File info available.
25	Low	Imperial Laundry & Dry Cleaners	Dry Cleaner	'99 Compliance Inspection: No violations noted.
26	High	Roger Holler Chevrolet	Auto Sales and Maintenance	'90 Discharge reported during tank (mineral spirits) removal. '95 CAR, '96 Petroleum tanks removal, no other info available.
27	High	Former Gale Building (Currently Adventist Health Systems)	LUST Site	No file info available.
28	Low	Midas Muffler	Auto Maintenance and Repair	'02 Compliance Inspection: No violations noted.
29	High	Former Morse Blvd. Development Associates (Currently BankFIRST)	LUST Site	'89 Tank discovered during building demolition. Soil contamination documented. No other info available.
30	Low	Mid-Florida Imaging	Printing Services	No file info available.
31	Low	Priceless Dry Cleaners	Dry Cleaner	'02 Compliance Inspection: No violations noted.
32	High	Former Match Point Tennis (Currently Dent Wizard)	RCRA Generator and LUST Site	No file info available.
33	High	Former Action Tire/ Tire Kingdom (Currently Liquidation Station)	Former Tire Sales and Service	'86 tanks removed. No other info available.
34	High	Former Firestone #19FT (Currently Chamberlins Market)	Former Tire Sales and Service	'89 Tank Closure Report, No NFA.
35	Low	Former Winter Park Mall (Currently Winter Park Village)	Former RCRA Generator	No file info available.
36	High	Royal Coach Car Wash (Currently Rain Dancer Car Wash)	Car Wash	'97 Tanks removed, Soil contamination, No other info available.
37	No	Oklahoma Installation Company (Potential Former outparcel of Former Winter Park Mall)	Former RCRA Generator	No file info available.
38	High	Former Shell Station (Current Amoco # 15293)	Gas Station/Convenience Store	'92 Discharge, Soil cleanup. '92 Free product recovery, No other info available.
39	Low	Volvo Store	Auto Sales	'99 Waste oil tanks removed, no visual evidence of contamination. '02 Compliance Inspection: No violations noted.
40	Low	Bills Cleaners	Dry Cleaner	RCRA Generator, No File info available.
41	Low	Ice Cold Auto Air	Auto Maintenance and Repair	No File info available.
42	High	Ritz Cleaners	Dry Cleaner	RCRA Generator and LUST Site.
43	Low	Bill Bryan Imports	Auto Sales and Maintenance	'02 Compliance Inspection: No violations noted.
44	Medium	Holler Dodge	Auto Sales and Maintenance	'95 Waste Oil Tank Removal and Tank Closure Assessment Report approved. '99 Compliance Inspection: No violations noted.
45	Medium	Former Richie's Economy Cars, Inc. (Currently Central Florida Truck Accessories)	Former Auto Sales and Maintenance	'92 Petroleum tanks removed and Tank Closure Assessment approved.
46	High	Roger Holler Honda	Auto Sales and Maintenance	'90 Discharge reported, '91 Petroleum tanks

Site No.	Rank	Name	Activity	Comment
				removed, '91 Cleanup activities, No NFA.
47	High	U-Haul Custom Hitches / U-Haul Center of Winter Park	Vehicle Rental	'88 Discharge reported, '97 tank closure, no contamination found.
48	Low	C&H Auto Service Inc.	Auto Maintenance and Repair	'93 Compliance Inspection: No violations noted.
49	Low	Joe's Auto Service	Auto Maintenance and Repair	No File info available.
50	Low	Ron Parks Motor Sports	Auto Maintenance and Repair	No File info available.
51	Medium	Former Dingman Petroleum Company, Inc. (Currently vacant)	LUST Site and Former RCRA Generator	'92 Oil discharge reported. '95 Inspection found 22 aboveground storage tanks, and all tanks subsequently removed.
52	Low	Takash Race Craft	Race Car Construction and Repair	No File info available.
53	Low	Race Car Engineering	Race Car Construction and Repair	'99 Compliance Inspection: No violations noted.
54	Low	At Your Service Import Auto Repair	Auto Maintenance and Repair	No File info available.
55	Low	Savage Automotive Inc.	Auto Maintenance and Repair	No File info available.
56	Medium	Don Reid Ford	Auto Sales and Maintenance	'94 NFA. '02 Compliance Inspection: No violations noted.
57	High	Speedway # 9862	Gas Station/Convenience Store	'86 Discharge, Remediation system currently inactive.
58	Low	U-Save Auto Rental	Auto Rental and Maintenance	No File info available.
59	High	CSX Railroad Bridge Overpass	CSX Railroad Bridge Overpass	Lead-based paint, ERNS Site.
60	Low	Classic Laundry & Dry Clean	Dry Cleaner	No File info available.
61	Low	Park Avenue Snapper	Sales and Small Engine Repair	No File info available.
62	Low	RADS Antiques Refinishing	Furniture Restoration	No File info available.
63	Low	Parkland Printing	Printing Services	No File info available.
64	High	Currently Enterprise Rent-A-Car	Vehicle Rental	LUST Site, No File info available.

Based upon the findings of the Contamination Screening Evaluation Report (CSER), 64 sites located along the project corridor have the potential for hazardous materials or petroleum contamination. Of the 64 sites, 35 have been assigned a contamination risk potential of Low, 8 were assigned a rating of Medium and 21 were assigned a rating of High.

The sites which were rated High or Medium should be further investigated during the remaining pre-construction phases. Should cleanup procedures be required, FDOT will implement a plan prior to, or during construction, if feasible. Special provisions for handling unexpected contamination discovered during construction will be included in the construction plans package. The potential contamination concerns are not anticipated to affect or delay project implementation significantly. No substantial contamination involvement is anticipated.

5.0 DESIGN CRITERIA AND STANDARDS

The following publications were used to establish the design criteria for this PD&E Study.

- Roadway and Traffic Design Standards (FDOT, 2000, English)
- Plans Preparation Manual (FDOT, 2003)
- A Policy on Geometric Design of Highways and Streets (AASHTO, 1994)
- Manual on Uniform Traffic Control Devices (MUTCD) (Millennium Edition)
- Drainage Manual (FDOT, 2003)
- Drainage Handbook Cross Drains (FDOT, 1996)
- Structures Design Guidelines (FDOT, July 1997)

Table 5-1 summarizes the design criteria to be used during the conceptual design development and analysis phase.

Table 5-1 Design Criteria and Standards for SR 15/600 (US 17/92)

A. General

Design Vehicle	WB 50	FDOT
Design Year	2025	FDOT Design Traffic
Design Speed <ul style="list-style-type: none"> SR 15/600 (US 17/92) Lee Road Extension 	35 mph 30 mph	Plans Preparation Manual Table 1.9.1

B. Typical Sections

Lane Widths <ul style="list-style-type: none"> SR 15/600 (US 17/92) Lee Road Extension 	11 to 12 feet 12 feet	Plans Preparation Manual Tables 2.1.1 and 2.1.2
Median <ul style="list-style-type: none"> SR 15/600 (US 17/92) 	12' Painted	Plans Preparation Manual Table 2.2.1
Minimum Pavement Cross-Slopes <ul style="list-style-type: none"> Roadways 	0.02	Plans Preparation Manual Figure 2.1.1
Maximum Algebraic Pav't. Crossover	4% to 5%	1994 AASHTO, Page 738
Maximum Shoulder Cross-Slope Break	7%	2000 FDOT Roadway and Traffic Design Standards, Index 510
Border Widths <ul style="list-style-type: none"> Lee Road Extension 	12' from edge of pavement	Plans Preparation Manual Table 2.5.2
Clear Zone From Edge of Travel Lane <ul style="list-style-type: none"> Lee Road Extension 	4' from face of curb	Plans Preparation Manual Table 2.11 series

C. Horizontal Geometry

Maximum Super-elevation <ul style="list-style-type: none"> Lee Road Extension 	$e_{\max} = 0.05$	Plans Preparation Manual Table 2.9.2
Minimum Stopping Sight Distance <ul style="list-style-type: none"> Lee Road Extension 	250 feet	Plans Preparation Manual Table 2.7.1
Max. Curvature of Horiz. Curve <ul style="list-style-type: none"> Lee Road Extension 	20'	Plans Preparation Manual Table 2.8.3
Max. Deflection (through lane through intersection) <ul style="list-style-type: none"> Lee Road Extension 	3'	Plans Preparation Manual Table 2.8.1b

D. Vertical Geometry

Minimum Crest Vertical Curve • Lee Road Extension	3 times design speed	Plans Preparation Manual Table 2.8.5
Minimum Sag Vertical Curve • Lee Road Extension	3 times design speed	Plans Preparation Manual Table 2.8.6
Maximum Grade • Lee Road Extension	9%	Plans Preparation Manual Table 2.6.1
Maximum Change in % Grade Without Vertical Curve • Lee Road Extension	1%	Plans Preparation Manual Table 2.6.2
Minimum Grade • Lee Road Extension	0.3%	Plans Preparation Manual Table 2.6.4
Minimum Distance Between VPI's • Lee Road Extension	250 ft	Plans Preparation Manual Table 2.6.4

E. Traffic Control (Maintenance of Traffic)

Design Speed	Existing posted speed (desirable) Existing posted speed minus 10 mph (minimum)	Plans Preparation Manual Chapter 10 MUTCD or 2000 FDOT Roadway and Traffic Design Standards, Index 600 Series
Lane Widths	12' desirable, 10' minimum	Plans Preparation Manual Chapter 10 MUTCD or 2000 FDOT Roadway and Traffic Design Standards, Index 600 Series

6.0 TRAFFIC

The information used in this Section has been extracted from the SR 15/600 (US 17/92) Design Traffic Technical Memorandum prepared by Gyhabi and Associates, Inc. in October 2002. Gyhabi & Associates, Inc. was retained by the Florida Department of Transportation, District Five, to provide transportation engineering services in association with the Project Traffic for PD&E and Design contract. Their technical memorandum was prepared as part of the services covered under this contract pursuant to the Letter of Authorization for Work Order Number 5, dated November 19, 2001. The scope of the Design Traffic Technical Memorandum entailed the development of future traffic forecasts for no-build and build conditions and the evaluation of the characteristics and basic operational conditions of the corridor during the service life of the roadway improvement project.

The methodology prepared for the development of the SR 15/600 (US 17/92) Design Traffic Technical Memorandum is consistent with the Design Traffic procedure (Topic No. 525-030-120-f) published by the Florida Department of Transportation. The methodology covers the following topics:

- Collect relevant traffic count information from the Department's historical traffic count records and from actual field count data, review previous studies, traffic characteristics and other relevant data.
- Based on the data collection process, estimate the travel characteristics of the corridor. These characteristics include Design Hour Volume Factor (K), Directional Design Hour Volume Factor (D), and Design Truck Factor (T).
- Develop future year traffic volume forecasts for the corridor based on trends analysis of historical traffic counts and/or officially adopted travel demand models (FSUTMS).
- Evaluate the future year traffic volume forecasts for the corridor based on capacity to determine whether or not the corridor will operate under constrained or unconstrained capacity conditions.
- Modify the travel characteristics based on constrained or unconstrained operating conditions.
- In addition to design year traffic conditions, develop opening and mid-design year traffic volume forecasts.
- Provide a generalized link level of service analysis for the corridor based on no-build and build traffic conditions.

- Based on the level of service analysis, provide recommendations for improvements to accommodate the anticipated travel demand within the corridor.
- Provide level of service ranges for the no-build and build conditions for the purpose of performing noise analysis.

A complete copy of the SR 15/600 (US 17/92) Design Traffic Technical Memorandum, dated October 2002, is located in the project file.

6.1 Traffic Count Information

In analyzing the existing conditions of the roadway system, traffic counts were collected and recommended traffic characteristics were established. The analysis was performed based on the geometric conditions of existing roadways and intersections.

Historic traffic count information was compiled for the FDOT and Orange County count stations along SR 15/60 (US 17/92). As a supplement to the historic count information, additional 24-hour approach, 72-hour classification, and 6-hour turning movement traffic counts were collected during the month of October 2001. Table 6-1 provides the location of the traffic counts, type of count data, and the date collected. All traffic count data collected during this period were adjusted to reflect average annual conditions using the most recent FDOT Seasonal and Axle Adjustment Factors.

Table 6-1 SR 15/600 (US 17/92) Traffic Counts Data Inventory

Roadway	Limits	Type of Counts	Date of Counts
US 17/92	N. & S. of Orange Ave.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Minnesota Ave.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Fairbanks Ave.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Morse Blvd.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Gay Rd.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Webster Ave.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Lee Rd.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Solana Ave.	24-hour Approach Count	Wk. of 10/15
	N. & S. of Park Ave.	24-hour Approach Count	Wk. of 10/15
Orange Avenue	E. & W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Minnesota Avenue	E. & W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Fairbanks Avenue	E. & W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Morse Boulevard	E. & W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Gay Road	E. & W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Webster Avenue	E. & W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Lee Road	W. of US 17/92	24-hour Approach Count	Wk. of 10/15
Solana Avenue	E. of US 17/92	24-hour Approach Count	Wk. of 10/15
Park Avenue	E. of US 17/92	24-hour Approach Count	Wk. of 10/15
Denning Drive	S. of Webster Ave.	72-Hour Classification Count	Wk. of 10/15
	S. of Fairbanks Ave.	72-Hour Classification Count	Wk. of 10/15

As part of the traffic count program for this project, two (2) locations on Denning Drive, one south of Webster Avenue, and one south of Fairbanks Avenue were utilized in this study as vehicle classification count locations. Based on the 13 vehicle types, vehicle classification was aggregated into three primary vehicle types:

- Passenger Vehicles- Motorcycles, Cars, Vans, and Pickups;
- Medium Trucks- Buses and 2-Axle Single Unit Trucks;
- Heavy Trucks- 3- or 4-Axle Single Unit Trucks, 2-Axle Tractors (with 1- or 2-axle trailers), 3-Axle Tractors (with 2- or 3-axle trailers), and 5-, 6-, and 7-Axle Multi-Trailers.

Using these categories, percentages for overall trucks (medium and heavy) were determined for the peak and daily traffic conditions.

Traffic design characteristics for the project were developed from the traffic count data collected in the field and from the Department's Roadway Characteristics Inventory (RCI). These design characteristics include design hour traffic flow factor (K_{30}), directional distribution factor (D), and daily truck factor (T_{daily}).

Existing travel characteristics and information from the FDOT RCI database for

the project corridor were used to develop the Design Characteristics. Based on 24-hour approach and 72-hour classification counts, average peak traffic flow (K measured) and peak traffic direction (D measured) were obtained. Table 6-2 shows the 24-hour and 72-hour traffic count analysis respectively, which include the measured K, D and adjusted AADT. The adjusted AADT was obtained by applying the Seasonal and Axle Adjustment Factors.

An average estimated value for K_{30} (design hour demand for the 30th highest hour) of 8.82% for SR 15/600 (US 17/92) was developed by multiplying the K (measured) value of 8.41% by an adjustment factor of 1.05 (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)). An average estimated value for K_{30} of 11.25% for Denning Drive was developed, while an average estimated value for K_{30} of 9.29% for the side streets was developed. The estimated values of K_{30} , D, and T for the mainline and the side streets are summarized in Table 6-3.

The estimated K_{30} , measured D, and T factors for SR 15/600 (US 17/92) were compared with the RCI data provided in the SR 15/600 (US 17/92) DDTM. As shown in Table 6-3, the average estimated K_{30} for US 17/92 (8.82%) is slightly lower than the RCI K_{30} value of 8.88%, but both K_{30} values (estimated and RCI) are lower than the acceptable range of K_{30} (9.20% to 11.50%) for an urban arterial recommended in the *Design Traffic Procedure Handbook*. It is recommended, therefore, to use a K_{30} value of 8.88% for all three State Roadways such as SR 15/600 (US 17/92), SR 426 (Fairbanks Avenue), and SR 423 (Lee Road). The same observation was made for all the side streets and Denning Drive, which resulted in recommending the same K_{30} value of 9.20% within the study area.

In recommending the design characteristics for roadways within the study area, the average observed D values of 53.23% and 55.61% respectively for SR 15/600 (US 17/92) and the side streets were lower than the D value of 58.08% obtained from the RCI database, therefore, a D value of 58.08% is recommended for all three State Roadways. For the side streets, it was recommended to use the observed D Value that was 55.61%

Table 6-2 SR 15/600 (US 17/92) 24-Hour and 72-Hour Traffic Count Analysis

Roadway Segment	Existing ADT	Pk. Hr. Vol.	K Measured	D Measured	Pk. Dir.	Axle Factor	Seasonal Factor	Adjusted AADT*
SR 15/600 (US 17/92)								
Norfolk Ave to SR 527 (Orange Avenue)	31,730	2,775	0.087	0.500	NB	0.99	1.00	31,400
SR 527 (Orange Ave.) to Minnesota Avenue	30,955	2,787	0.090	0.494	NB	0.99	1.00	30,600
Minnesota Avenue to SR 426 (Fairbanks)	34,110	2,740	0.080	0.525	NB	0.99	1.00	33,800
SR 426 (Fairbanks) to Morse Boulevard	35,012	3,080	0.088	0.515	NB	0.99	1.00	34,700
Morse Boulevard to Gay Road	42,204	3,338	0.079	0.543	NB	0.99	1.00	41,800
Gay Road to Webster Avenue	37,603	3,669	0.098	0.528	NB	0.99	1.00	37,200
Webster Avenue to SR 423 (Lee Road)	48,856	4,293	0.088	0.526	NB	0.99	1.00	48,400
SR 423 (Lee Road) to Solana Avenue	47,256	3,485	0.074	0.569	NB	0.99	1.00	46,800
Solana Avenue to Park Avenue	50,283	3,669	0.073	0.590	NB	0.99	1.00	49,800
Average			0.084		0.532			
Denning Drive								
Orange Ave. to SR 426 (Fairbanks Ave.)	6,013	695	0.116	0.587	NB	0.99	1.00	6,000
SR 426 (Fairbanks Ave.) to Webster Ave.	8,607	855	0.099	0.565	NB	0.99	1.00	8,500
Average			0.107		0.576			
Side streets								
SR 527 (Orange Ave.) W of SR 15/600	14,974	1,599	0.107	0.53	EB	0.99	1.00	14,800
SR 527 (Orange Ave.) E of SR 15/600	19,886	1,600	0.080	0.531	WB	0.99	1.00	19,700
Minnesota Avenue W of SR 15/600	8,472	720	0.085	0.554	EB	0.99	1.00	8,400
Minnesota Avenue E of SR 15/600	6,684	656	0.098	0.544	EB	0.99	1.00	6,600
SR 426 (Fairbanks Ave.) W of SR 15/600	29,642	2,558	0.086	0.519	EB	0.99	1.00	29,300
SR 426 (Fairbanks Ave.) E of SR 15/600	29,150	2,157	0.074	0.505	WB	0.99	1.00	28,900
Morse Boulevard E of SR 15/600	8,240	655	0.079	0.583	WB	0.99	1.00	8,200
Gay Road W of SR 15/600	4,134	368	0.089	0.505	EB	0.99	1.00	4,100
Gay Road E of SR 15/600	3,944	596	0.151	0.636	EB	0.99	1.00	3,900
Webster Avenue W of SR 15/600	8,186	605	0.074	0.580	EB	0.99	1.00	8,100
Webster Avenue E of SR 15/600	14,854	1,416	0.095	0.577	WB	0.99	1.00	14,700
SR 423 (Lee Road) W of SR 15/600	46,600	2,598	0.056	0.547	EB	0.99	1.00	46,100
Solana Avenue E of SR 15/600	3,638	215	0.059	0.530	EB	0.99	1.00	3,600
Park Avenue E of SR 15/600	10,930	1,130	0.103	0.643	WB	0.99	1.00	10,800
Average			0.088		0.556			

* Measured Adjusted AADT= Measured ADT * Axle Factor * Seasonal Factor

Table 6-3 SR 15/600 (US 17/92) Roadway Characteristics Summary

Roadway Segment	K Measured	Estimated K ₃₀ [*]	D Measured	T daily Measured	T peak Measured	FDOT RCI Database		
						K ₃₀	D	T _{daily}
SR 15/600 (US 17/92)								
Norfolk Ave to SR 527 (Orange Ave.)	8.75%	9.20%	50.00%	N/A	N/A	8.88%	58.08%	3.13%
SR 527 (Orange) to Minnesota Ave.	9.00%	9.50%	49.38%	N/A	N/A	8.88%	58.08%	3.13%
Minnesota Ave. to SR 426 (Fairbanks)	8.03%	8.40%	52.54%	N/A	N/A	8.88%	58.08%	3.13%
SR 426 (Fairbanks) to Morse Blvd.	8.80%	9.20%	51.50%	N/A	N/A	8.88%	58.08%	3.13%
Morse Boulevard to Gay Road	7.91%	8.30%	54.26%	N/A	N/A	8.88%	58.08%	3.13%
Gay Road to Webster Avenue	9.76%	10.20%	52.79%	N/A	N/A	8.88%	58.08%	3.13%
Webster Avenue to SR 423 (Lee Rd.)	8.79%	9.20%	52.64%	N/A	N/A	8.88%	58.08%	3.13%
SR 423 (Lee Road) to Solana Ave.	7.37%	7.70%	56.88%	N/A	N/A	8.88%	58.08%	3.13%
Solana Avenue to Park Avenue	7.30%	7.70%	59.03%	N/A	N/A	8.88%	58.08%	3.13%
Average	8.41%	8.82%	53.23%			8.88%	58.08%	3.13%
Denning Drive								
Orange Ave. to SR 426 (Fairbanks)	11.56%	12.10%	58.70%	3.90%	3.90%	N/A	N/A	N/A
SR 426 (Fairbanks) to Webster Ave.	9.93%	10.40%	56.50%	5.20%	5.80%	N/A	N/A	N/A
Average	10.75%	11.25%	57.60%	4.55%	4.85%			
Side streets								
SR 527 (Orange) W of SR 15/600	10.68%	11.20%	53.00%	N/A	N/A	N/A	N/A	N/A
SR 527 (Orange) E of SR 15/600	8.05%	8.40%	53.10%	N/A	N/A	N/A	N/A	N/A
Minnesota Avenue W of SR 15/600	8.50%	8.90%	55.42%	N/A	N/A	N/A	N/A	N/A
Minnesota Avenue E of SR 15/600	9.81%	10.30%	54.42%	N/A	N/A	N/A	N/A	N/A
SR 426 (Fairbanks) W of SR 15/600	8.63%	9.10%	51.88%	N/A	N/A	8.88%	58.08%	10.66%
SR 426 (Fairbanks) E of SR 15/600	7.40%	7.80%	50.49%	N/A	N/A	8.88%	58.08%	10.66%
Morse Boulevard E of SR 15/600	7.95%	8.30%	58.32%	N/A	N/A	N/A	N/A	N/A
Gay Road W of SR 15/600	8.90%	9.30%	50.54%	N/A	N/A	N/A	N/A	N/A
Gay Road E of SR 15/600	15.11%	15.90%	63.59%	N/A	N/A	N/A	N/A	N/A
Webster Avenue W of SR 15/600	7.39%	7.80%	58.02%	N/A	N/A	N/A	N/A	N/A
Webster Avenue E of SR 15/600	9.53%	10.00%	57.70%	N/A	N/A	N/A	N/A	N/A
SR 423 (Lee Road) W of SR 15/600	5.58%	5.90%	54.66%	N/A	N/A	8.88%	58.08%	1.26%
Solana Avenue E of SR 15/600	5.91%	6.20%	53.02%	N/A	N/A	N/A	N/A	N/A
Park Avenue E of SR 15/600	10.34%	10.90%	64.34%	N/A	N/A	N/A	N/A	N/A
Average	8.84%	9.29%	55.61%					

* Using an adjustment factor of 1.05

The Truck percentage (T) for daily and peak condition on Denning Drive obtained from the 72-hour classification counts data are shown in Table 6-3. The average T_{daily} was calculated to be 4.55%, while the average T_{peak} is calculated to be 4.85%. No classification counts were taken along SR 15/600 (US 17/92), nor along any of the side streets. Therefore, the T_{daily} factor of 3.13% (obtained from FDOT RCI database) is recommended for use in this analysis for SR 15/600 (US 17/92) and all side streets. Table 6-4 provides a summary of the recommended design characteristics (K₃₀, D, and T factors) to be used in the analysis.

Based on the review of current and historical statistics, the recommended technical parameters represent current travel patterns within the area. As development and growth continue within the study area, it can be expected that travel characteristics for the study area will vary slightly. Based on the current data, the design characteristics provided in Table 6-4 indicate the best indication of travel patterns within the study area.

Table 6-4 SR 15/600 (US 17/92) Recommended Design Characteristics

Roadway Segment	Recommended		
	K ₃₀	D	T _{daily}
SR 15/600 (US 17/92)	8.80%	58.08%	3.13%
SR 426 (Fairbanks Avenue)	8.80%	58.08%	10.66%
SR 423 (Lee Road)	8.80%	58.08%	1.26%
Denning Drive	9.20%	55.61%	4.55%
Side Streets	9.20%	55.61%	3.13%

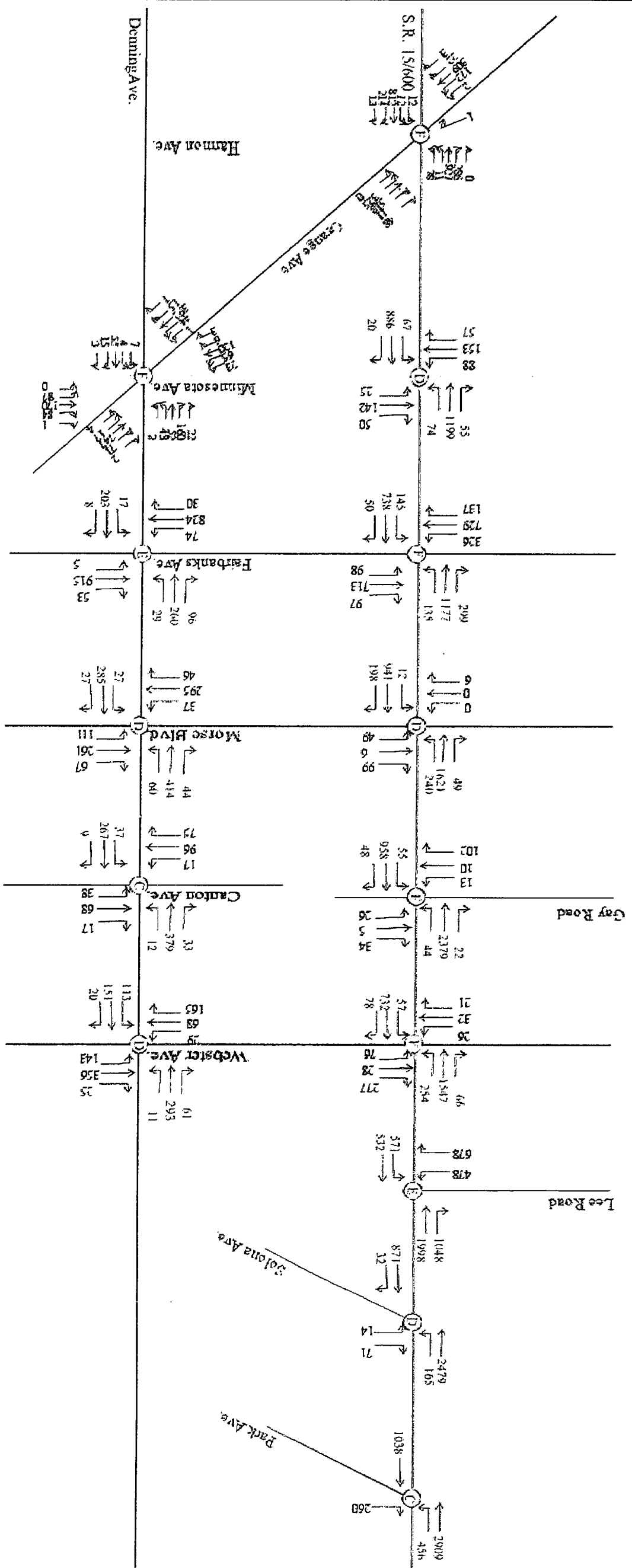
6.2 Existing Traffic Analysis

The existing A.M. and P.M. peak hour turning movements are shown in Figures 6-1 and 6-2, respectively. The turning movements shown in Figure 6-2 (the existing P.M. Peak Hour Turning Movements for the year of 2001) were used to assist in the future year analysis.

6.2.1 LEVEL OF SERVICE ANALYSIS

The Level of Service (LOS) analysis of current intersections was performed using the signal timing data provided by the City of Winter Park. For the LOS analysis of roadway segments, the analysis was conducted to P.M. peak hour peak directions. The capacities were based on the 2002 *FDOT Quality/Level of Service Handbook* and *ARTPLAN* (2002 Conceptual Planning Analysis) Spreadsheets.

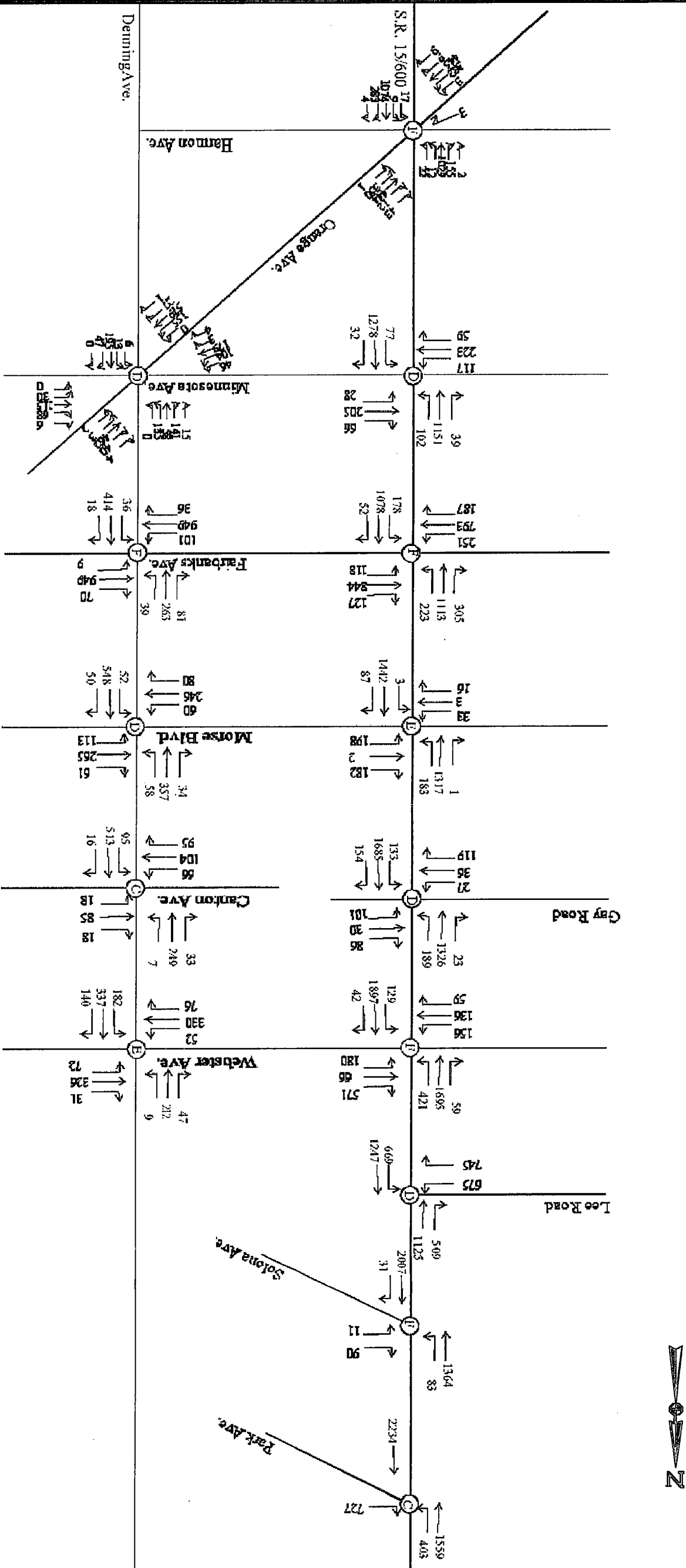
Levels of service for the study area were determined using the procedures as outlined in the Transportation Research Board's *Highway Capacity Manual* (HCM 2000). The most recent version of Highway Capacity Software (HCS 2000) was used for evaluating signalized and unsignalized intersections within the project limits. In addition, SYNCRO signal timing software was used to analyze both 6-leg intersections within the study limits (US 17/92 at Orange Avenue/Harmon Avenue and Denning Drive at Orange Avenue/Minnesota Avenue). The procedure used in SYNCRO is also based on the HCM 2000.



Year 2001 Existing A.M. Peak Hour Turning Movements
S R 600/15 (US 17/92)
Norfolk Ave. To Monroe Street

Figure 6-1

Year 2001 Existing P.M. Peak Hour Turning Movements
S R 600/15 (US 17/92)
Norfolk Ave. To Monroe Street



SR 151600 (US 17192) Project Development and Environment Study

Figure 6-2

The roadway segments LOS Analysis was performed for P.M. peak hour peak direction conditions. The capacities for the peak hour conditions were based on 2002 *FDOT Level of Service Handbook* and 2002 ARTPLAN Spreadsheet.

Existing Intersection Level of Service Analysis

The existing P.M. peak hour turning movement volumes shown in Figure 6-2 were used for intersection analysis using standard HCM procedures. The DDHV's obtained by applying recommended K_{30} and D factors to the AADT's were not computed for existing conditions. Intersection signal timings and phasing information was obtained from the City of Winter Park. Figure 6-2 also shows the existing P.M. peak hour intersection LOS.

For actuated signals, the signal timings are dynamic depending on demand and vehicle arrival pattern. The cycle lengths and timings vary based on the demand. Therefore, caution was applied in using the maximum time associated with the individual phases especially at intersections where the side street carries less traffic.

Based on the existing intersection analysis, the following intersections operate at LOS F:

Existing A.M. Peak Hour

- SR 15/600 (US 17/92) at Orange Avenue
- SR 15/600 (US 17/92) at Fairbanks Avenue
- SR 15/600 (US 17/92) at Gay Road
- Denning Drive at Orange Avenue/Minnesota Avenue

Existing P.M. Peak Hour

- SR 15/600 (US 17/92) at Orange Avenue
- SR 15/600 (US 17/92) at Fairbanks Avenue
- SR 15/600 (US 17/92) at Webster Avenue
- SR 15/600 (US 17/92) at Solana Avenue (un-signalized)
- Denning Drive at Fairbanks Avenue

Roadway Operational Level of Service Analysis

The roadway operational level of service analysis was performed by comparing the P.M. peak hour/peak direction volumes for individual roadway segments shown in Table 6-5, against the peak-hour peak-direction capacities.

Table 6-5

S.R. 15/600 (US 17/92) PD&E and Design
2001 Existing Roadway P.M. Peak Hour Peak Direction Level of Service

Roadway	Adopted LOS Standard	Peak Directional NL	Total Pk. Hr. Vol.	Pk. Hr. Vol. NB/WB	Pk. Hr. Vol. SB/EB	Estimated LOS	LOS A Capacity	LOS B Capacity	LOS C Capacity	LOS D Capacity	LOS E Capacity
S.R. 15/600 (US 17/92)											
Norfolk Ave to SR 527 (Orange Avenue)	E	2	2,775	1,387	1,388	D	**	220	1,360	1,710	1,800
SR 527 (Orange Avenue) to Minnesota Avenue	E	2	2,787	1,454	1,333	D	**	220	1,360	1,710	1,800
Minnesota Avenue to SR 426 (Fairbanks Avenue)	E	2	2,740	1,385	1,355	D	**	220	1,360	1,710	1,800
SR 426 (Fairbanks Avenue) to Morse Boulevard	E	2	3,080	1,494	1,586	D	**	220	1,360	1,710	1,800
Morse Boulevard to Gay Road	E	2	3,338	1,815	1,524	F	**	220	1,360	1,710	1,800
Gay Road to Webster Avenue	E	2	3,669	1,933	1,736	F	**	220	1,360	1,710	1,800
Webster Avenue to SR 423 (Lee Road)	E	3	4,293	2,270	2,023	D	**	340	2,110	2,570	2,710
SR 423 (Lee Road) to Solona Avenue	E	3	3,485	1,980	1,505	C	**	340	2,110	2,570	2,710
Solona Avenue to Park Avenue	E	3	3,669	2,166	1,503	D	**	340	2,110	2,570	2,710
Denning Drive											
Orange Ave. to SR 426 (Fairbanks Ave.)	E	2	695	408	287	B	**	**	1,120	1,620	1,720
SR 426 (Fairbanks Ave.) to Webster Ave.	E	2	855	483	372	B	**	**	1,120	1,620	1,720
Side Streets											
SR 527 (Orange Avenue) - W of SR 15/600	E	2	1,599	751	848	C	**	220	1,360	1,710	1,800
SR 527 (Orange Avenue) - E of SR 15/600	E	2	1,600	850	750	C	**	220	1,360	1,710	1,800
Minnesota Avenue - W of SR 15/600	E	1	720	321	399	B	**	**	480	760	810
Minnesota Avenue - E of SR 15/600	E	1	656	299	357	B	**	**	480	760	810
SR 426 (Fairbanks Avenue) - W of SR 15/600	E	2	2,558	1,327	1,231	C	**	220	1,360	1,710	1,800
SR 426 (Fairbanks Avenue) - E of SR 15/600	E	2	2,157	1,089	1,068	C	**	220	1,360	1,710	1,800
Morse Boulevard E of SR 15/600	E	1	655	382	273	B	**	**	480	760	810
Gay Road - W of SR 15/600	E	1	368	186	182	B	**	**	480	760	810
Gay Road E of SR 15/600	E	1	596	217	379	B	**	**	480	760	810
Webster Avenue - W of SR 15/600	E	1	605	254	351	B	**	**	480	760	810
Webster Avenue - E of SR 15/600	E	1	1,416	817	599	F	**	**	480	760	810
SR 423 (Lee Road) - W of SR 15/600	E	2	2,598	1,178	1,420	D	**	220	1,360	1,710	1,800
Solona Avenue E of SR 15/600	E	1	215	101	114	B	**	**	480	760	810
Park Avenue - E of SR 15/600	E	1	1,130	727	403	D	**	**	480	760	810

Source: 2002 Florida DOT's Quality/LOS Handbook, Table 4-7

The peak hour peak directional capacities for all the roadway segments were obtained from Table 4-7 of 2002 *FDOT Quality/Level of Service Handbook*. Table 6-5 also includes the adopted LOS standard, number of lanes for peak direction, and adopted LOS capacities for all the roadway segments within the study area.

Based on the comparison of peak hour peak directional volumes with the corresponding P.M. peak hour peak direction capacities in Table 6-4, only three roadway segments operate below their adopted LOS standard:

- SR 15/600 (US 17/92), between Morse Boulevard and Gay Road – LOS F
- SR 15/600 (US 17/92), between Gay Road and Webster Avenue – LOS F
- Webster Avenue at East of SR 15/600 (US 17/92) – LOS F

6.3 Traffic Volume Projections

Based on information provided by the Department, the following periods were used to forecast design traffic volumes for the SR 15/600 (US 17/92) and Denning Drive corridor:

- Existing Year- 2001
- Opening Year- 2005
- Mid-Design Year- 2015
- Design Year- 2025

Design traffic volumes were developed for the no build alternatives. A description of each of the build alternatives is provided below. It should be noted that Build Alternative 5 was considered the most viable alternative and is presented in more detail in later Sections of this PE Report.

- Build Alternative 1 – SR 15/600 (US 17/92) as a 4-Lane divided roadway with full median openings at signalized intersections.
- Build Alternative 2 – SR 15/600 (US 17/92) as a 6-Lane divided roadway throughout the study limits of the project.
- Build Alternative 3 – A one-way pair scenario with SR 15/600 (US 17/92) as a 4-Lane in the southbound direction, while Denning Drive being a 4-lane in the northbound direction.
- Build Alternative 4 – Implementation of the Park Avenue signal relocation to Solana Avenue and re-alignment of Elvin Avenue with Solana/Denning Drive. Solana would remain as a 2-lane

facility. The existing southbound left turn lane from SR 15/600 (US 17/92) to Park Avenue would be eliminated while the existing westbound lane merging to SR 15/600 (US 17/92) northbound would be remained. The SR 15/600 (US 17/92) and Solana intersection would be fully signalized after realigning Elvin Avenue.

- Build Alternative 5 – Extension of Lee Road from SR 15/600 (US 17/92) to Denning Drive. Lee Road would be implemented as a 4-lane divided roadway, in addition to the improvements listed in Build Alternative 4.

The No-Build alternative includes the existing roadway geometry along the SR15/600 (US 17/92) corridor, which is a 5-Lane undivided roadway with a two-way center left turn lane. The difference between the No Build and the Build Alternative 1 is that Build Alternative 1 has a divided median with turn lanes at signalized intersections.

The FDOT Year 2002-2006 adopted Work Program was reviewed for any roadway improvements planned within the study area of the project. In addition, the Transportation Improvement Program (TIP) for fiscal year 2001/02-2005/06, obtained from METROPLAN ORLANDO, was reviewed for any roadway improvements programmed within the study area of the project. There are no roadway improvements planned or programmed within the vicinity of the project study area.

6.3.1 FUTURE CORRIDOR TRAVEL DEMAND

The development of traffic projections for SR 15/600 (US 17/92) and other roadways within the study area requires the examination of historical traffic growth, proposed development and a basic understanding of traffic circulation patterns and characteristics of the study area. In arriving at the volume forecasts for SR 15/600 (US 17/92), Denning Drive, and other roadways, various growth rates were examined. The following sections discuss how the future corridor travel demand was determined.

Trends Analysis

The trends analysis was performed for the study area roadways using historical count data information from Orange County and FDOT. Based on historical data, future growth rates were calculated using the least square linear regression method. The FDOT defines an acceptable Historic Trends Growth Rate as that which has an R square value of 75.00% or greater. The trends analysis resulted in average growth rates of 1.55% for SR 15/600 (US 17/92), and an average growth rate of 1.70% for the side streets including Lee Road, Fairbanks Avenue, and Orange Avenue. There were no historical counts available for Denning Drive;

therefore the trend analysis was not performed for Denning Drive. The R square value obtained for SR 15/600 (US 17/92) was very low (for example, 60.5% on SR 15/600 (US 17/92) 0.2 miles south of SR 423 and 49.8% in SR 15/600 (US 17/92) 0.33 miles north of SR 423), so the growth rates obtained from the trends analysis for SR 15/600 (US 17/92) are not recommended.

6.3.2 FLORIDA STANDARD URBAN TRANSPORTATION MODEL STRUCTURE (FSUTMS)

The most recent Orlando Area Urban Transportation Study (OUATS) 2020 FSUTMS model (cost feasible network) was used in the modeling efforts for forecasting future volumes along SR 15/600 (US 17/92) for the no build and build alternatives which codes SR 15/600 (US 17/92) as a four lane facility. The model runs were performed for the year 2020 and the results were compared with the base year 1990 OUATS model volumes in order to calculate the growth rates for each alternative. Following is a description of each of the model runs performed for this study.

1990 OUATS Model: The validated OUATS Model for the year of 1990 was simulated to project annual growth rates between 1990 and 2020. The roadway segments of SR 15/600 (US 17/92) between Lee Road and Orange Avenue were coded as a 4 lane undivided urban arterial while the segments between from Lee Road to Park Avenue were coded as a 6 lane divided arterial.

For Denning Drive, the 1990 model was presented as a 2 lane urban collector from Park Avenue and Orange Avenue. SR 15/600 (US 17/92) carries approximately 43,600 vpd south of Lee Road, and approximately 62,100 vpd north of Lee Road. Denning Drive carries approximately 10,300 vpd through the section parallel to SR 15/600 (US 17/92).

6.3.3 NO BUILD ALTERNATIVE

The year 2020 model run for the No Build alternative was performed with coding SR 15/600 (US 17/92) as a 4-Lane undivided arterial from Norfolk Avenue to Lee Road. Under this alternative, SR 15/600 (US 17/92) carries approximately 38,600 vpd south of Lee Road, and approximately 48,300 vpd north of Lee Road. Denning Drive carries approximately 27,600 vpd through the section parallel to SR 15/600 (US 17/92).

6.3.4 BUILD ALTERNATIVES

Build Alternative 1: This alternative was not specifically coded in the

FSUTMS model. Therefore, the results from the No-Build alternative were used.

Build Alternative 2: The year 2020 model run for the Build Alternative 2 was performed with coding SR 15/600 (US 17/92) as a 6-Lane divided arterial from Norfolk Avenue to Lee Road. Under this alternative, SR 15/600 (US 17/92) carries approximately 52,100 vpd south of Lee Road, and approximately 50,400 vpd north of Lee Road. Denning Drive carries approximately 20,900 vpd through the section parallel to SR 15/600 (US 17/92).

Build Alternative 3: The year 2020 model run for the Build Alternative 3 was performed with coding SR 15/600 (US 17/92) as a 4-Lane one-way facility, in the southbound direction, from Solana Road to Orange Avenue, and coding Denning Drive as a 4-Lane one-way facility, in the northbound direction, from Orange Avenue to Solana Road. Under this alternative, SR 15/600 (US 17/92) carries approximately 40,500 vpd south of Lee Road, and approximately 41,200 vpd north of Lee Road. Denning Drive carries approximately 24,200 vpd through the section parallel to SR 15/600 (US 17/92).

Build Alternative 4: The year 2020 model run for the Build Alternative 4 was performed with coding the realignment of Solana Avenue and relocating the signal from Park Avenue to Solana, and closing the median at Park Avenue. Under this alternative, SR 15/600 (US 17/92) carries approximately 40,200 vpd south of Lee Road, and approximately 46,500 vpd north of Lee Road. Denning Drive carries approximately 27,500 vpd through the section parallel to SR 15/600 (US 17/92).

Build Alternative 5: The year 2020 model run for the Build Alternative 5 was performed with coding the realignment of Solana Avenue and relocating the signal from Park Avenue to Solana, and closing the median at Park Avenue, in addition to extending Lee Road to Denning Avenue. Under this alternative, SR 15/600 (US 17/92) carries approximately 35,700 vpd south of Lee Road, and approximately 48,600 vpd north of Lee Road. Denning Drive carries approximately 28,700 vpd through the section parallel to SR 15/600 (US 17/92).

Table 6-6 presents a comparison of the model AADT and annual growth rates, for each alternative, between 1990 and 2020. In the 2020 OUATS, Interstate 4 is coded as an 8 lane freeway including a 2 lane High Occupancy Vehicle (HOV) lanes resulting in a 65% increase in capacity improvements are compared to 1990 model. Other major roadways such as SR 436 (Semoran Boulevard), SR 423 (Lee Road), and SR 434 are coded as a 6 lane divided arterials. These capacity increases resulted in negative growth rates on segments of SR 15/600 (US 17/92). On Denning Drive, the growth rates ranged from 2.9% to 5.1%. The 2020 OUATS had Denning Drive coded as a 4 lane collector from 2 lane collector in 1990.

Based on a comparison of the trends growth rates, the model growth rates and using engineering judgment recommended growth rates were estimated for each alternative. Table 6-7 presents the recommended annual growth rates of each segment on SR 15/600 (US 17/92), Denning Drive, and the side streets for No Build and four (4) Build Alternatives.

Table 6-6
S.R. 15/600 (US 17/92) PD & E and Design
Model AADT and Annual Growth Rate Comparisons

Roadways	Segments	1990 OUATS AADT	2020 OUATS								Alt 5	
			No Build		Alt 2		Alt 3		Alt 4		AADT	Annual Growth Rates
			AADT	Annual Growth Rates	AADT	Annual Growth Rates	AADT	Annual Growth Rates	AADT	Annual Growth Rates		
US17/92	Norfolk Ave to SR 527 (Orange Avenue)	29,900	43,000	1.5%	44,700	1.6%	33,600	0.4%	43,300	1.5%	43,700	1.5%
	SR 527 (Orange Avenue) to Minnesota Avenue	39,100	39,100	0.0%	5,400	-2.9%	37,000	-0.2%	39,600	0.0%	40,900	0.2%
	Minnesota Avenue to SR 426 (Fairbanks Avenue)	36,800	37,300	0.0%	5,240	-2.9%	34,100	-0.2%	37,500	0.1%	39,200	0.2%
	SR 426 (Fairbanks Avenue) to Morse Boulevard	44,400	37,900	-0.5%	48,000	0.3%	41,200	-0.2%	37,500	-0.5%	37,800	-0.5%
	Morse Boulevard to Gay Road	45,000	33,400	-0.9%	41,600	-0.3%	41,800	-0.2%	34,800	-0.8%	36,300	-0.6%
	Gay Road to Webster Avenue	41,500	31,200	-0.8%	41,400	0.0%	38,900	-0.2%	30,900	-0.9%	35,200	-0.5%
	Webster Avenue to SR 423 (Lee Road)	43,600	38,600	-0.4%	52,100	0.6%	40,500	-0.2%	40,200	-0.3%	35,700	-0.6%
	SR 423 (Lee Road) to Solona Avenue	62,100	48,300	-0.7%	50,400	-0.6%	41,200	-1.1%	46,500	-0.8%	48,600	-0.7%
	Solona Avenue to Park Avenue	67,400	65,900	-0.1%	60,800	-0.3%	34,900	-1.6%	70,500	0.2%	72,600	0.3%
	Total/Average	409,800	374,700	-0.3%	349,640	-0.5%	343,200	-0.5%	380,800	-0.2%	390,000	-0.2%
DENNING AVE.	Orange Ave. to Minnesota Ave.	11,200	21,100	2.9%	13,600	0.7%	17,500	1.9%	20,700	2.8%	6,100	-1.5%
	Minnesota Ave. to SR 426 (Fairbanks Ave.)	14,900	27,600	2.8%	20,400	1.2%	19,700	1.1%	27,000	2.7%	20,500	1.3%
	SR 426 (Fairbanks Ave.) to Morse Blvd.	12,400	32,000	5.3%	29,100	4.5%	26,400	3.8%	31,500	5.1%	32,200	5.3%
	Morse Blvd. to Canton Ave.	12,800	31,300	4.8%	26,900	3.7%	24,100	2.9%	30,700	4.7%	30,200	4.5%
	Canton Ave. to Webster Ave.	10,400	28,800	5.9%	26,400	5.1%	24,000	4.4%	56,700	14.8%	27,700	5.5%
	Webster Ave. to Solana Avenue	10,300	27,600	5.6%	20,900	3.4%	24,200	4.5%	27,500	5.6%	30,700	6.6%
	Solana Ave. to Park Ave.	8,500	11,500	1.2%	12,300	1.5%	17,100	3.4%	8,900	0.2%	14,600	2.4%
	Total/Average	80,500	179,900	4.1%	149,600	2.9%	153,000	3.0%	203,000	5.1%	162,000	3.4%
	SR 527 (Orange Avenue) - W of SR 15/600	47,200	46,800	0.0%	51,100	0.3%	48,000	0.1%	46,500	0.0%	46,200	-0.1%
	SR 527 (Orange Avenue) - E of SR 15/600	38,200	50,800	1.1%	41,800	0.3%	46,200	0.7%	50,400	1.1%	49,000	0.9%
SIDE STREETS	Minnesota Avenue - W of SR 15/600	6,300	7,400	0.6%	8,200	1.0%	6,300	0.0%	7,600	0.7%	7,600	0.7%
	Minnesota Avenue - E of SR 15/600	4,700	5,400	0.5%	5,500	0.6%	3,800	-0.6%	5,500	0.6%	5,300	0.4%
	SR 426 (Fairbanks Avenue) - W of SR 15/600	46,100	4,650	-3.0%	47,800	0.1%	50,200	0.3%	46,200	0.0%	45,300	-0.1%
	SR 426 (Fairbanks Avenue) - E of SR 15/600	39,200	37,300	-0.2%	38,700	0.0%	40,700	0.1%	39,300	0.0%	28,900	-0.9%
	Morse Boulevard - E of SR 15/600	3,500	4,700	1.1%	8,800	5.0%	9,100	5.3%	3,400	-0.1%	3,500	-0.5%
	Gay Road - E of SR 15/600	2,900	3,400	0.6%	4,400	1.7%	9,000	7.0%	7,300	5.1%	3,500	0.7%
	Webster Avenue - E of SR 15/600	7,900	12,600	2.0%	14,900	3.0%	9,800	0.8%	14,900	3.0%	6,400	-0.6%
	SR 423 (Lee Road) - W of SR 15/600	37,000	37,700	0.1%	39,400	0.2%	31,600	-0.5%	39,000	0.2%	44,200	0.6%
	Solona Avenue - E of SR 15/600	8,600	20,600	4.7%	11,100	1.0%	8,000	-0.2%	28,900	7.9%	23,000	5.6%
	Park Avenue - E of SR 15/600	15,400	17,100	0.4%	19,500	0.9%	21,500	1.3%	7,500	-1.7%	6,500	-1.9%
Total/Average	257,000	248,450	-0.1%	291,200	0.4%	284,200	0.4%	296,500	0.5%	268,900	0.2%	

Table 6-7
S.R. 15/600 (US 17/92) PD&E and Design
Recommended Annual Growth Rates

Roadways	Segments	No Build		Alt 2		Alt 3**		Alt 4		Alt 5	
		No. of Lanes	Annual Growth Rates	No. of Lanes	Annual Growth Rates	No. of Lanes	Annual Growth Rates	No. of Lanes	Annual Growth Rates	No. of Lanes	Annual Growth Rates
S.R. 15/600 (US17/92)	Norfolk Ave to SR 527 (Orange Avenue)	4	0.5%	6	1.4%	4	0.5%	4	0.5%	4	0.5%
	SR 527 (Orange Avenue) to Minnesota Avenue	4	0.5%	6	1.4%	4	0.5%	4	0.5%	4	0.5%
	Minnesota Avenue to SR 426 (Fairbanks Avenue)	4	0.5%	6	1.4%	4	0.5%	4	0.5%	4	0.5%
	SR 426 (Fairbanks Avenue) to Morse Boulevard	4	0.5%	6	0.7%	4	0.5%	4	0.5%	4	0.3%
	Morse Boulevard to Gay Road	4	0.5%	6	0.7%	4	0.5%	4	0.5%	4	0.3%
	Gay Road to Webster Avenue	4	0.5%	6	0.7%	4	0.5%	4	0.5%	4	0.3%
	Webster Avenue to SR 423 (Lee Road)	4	0.5%	6	0.7%	4	0.5%	4	0.5%	4	0.1%
	SR 423 (Lee Road) to Solana Avenue	6	0.5%	6	0.5%	6	0.5%	6	0.5%	6	0.5%
	Solana Avenue to Park Avenue	6	0.5%	6	0.5%	6	0.5%	6	0.7%	6	0.5%
	Orange Ave. to Minnesota Ave.	4	3.0%	4	1.0%	4	1.5%	4	2.8%	4	2.8%
DENNING DRIVE	Minnesota Ave. to SR 426 (Fairbanks Ave.)	4	3.0%	4	1.0%	4	1.5%	4	2.8%	4	2.8%
	SR 426 (Fairbanks Ave.) to Morse Blvd.	4	5.4%	4	4.2%	4	3.8%	4	5.3%	4	5.3%
	Morse Blvd. to Canton Ave.	4	5.4%	4	4.2%	4	3.8%	4	5.3%	4	5.5%
	Canton Ave. to Webster Ave.	4	5.4%	4	4.2%	4	3.8%	4	5.3%	4	5.5%
	Webster Ave. to Lee Road	4	3.9%	4	2.5%	4	3.9%	4	2.9%	4	7.2%
	Lee Road to Solana Ave.	4	3.9%	4	2.5%	4	3.9%	4	2.9%	4	6.0%
	Solana Ave. to Park Ave.	4	3.9%	4	2.5%	4	3.9%	4	2.9%	4	4.2%
	SR 527 (Orange Avenue) - W of SR 15/600	4	0.5%	4	0.3%	4	0.4%	4	0.5%	4	0.4%
	SR 527 (Orange Avenue) - E of SR 15/600	4	0.5%	4	0.3%	4	0.4%	4	0.5%	4	0.4%
	Minnesota Avenue - W of SR 15/600	2	0.5%	2	0.8%	2	0.5%	2	0.6%	2	0.6%
SIDE STREETS	Minnesota Avenue - E of SR 15/600	2	0.5%	2	0.8%	2	0.5%	2	0.6%	2	0.6%
	SR 426 (Fairbanks Avenue) - W of SR 15/600	3	0.5%	3	0.6%	3	0.2%	3	0.0%	3	0.0%
	SR 426 (Fairbanks Avenue) - E of SR 15/600	3	0.5%	3	0.6%	3	0.2%	3	0.0%	3	0.0%
	Morse Boulevard - E of SR 15/600	2	1.1%	2	5.0%	2	5.3%	2	-0.1%	2	-0.5%
	Gay Road - W of SR 15/600	2	0.8%	2	2.4%	2	8.5%	2	2.8%	2	1.2%
	Gay Road - E of SR 15/601	2	0.8%	2	2.4%	2	8.5%	2	2.8%	2	1.2%
	Webster Avenue - W of SR 15/600	2	1.9%	2	2.8%	2	2.1%	2	2.8%	2	-0.7%
	Webster Avenue - E of SR 15/600	2	1.9%	2	2.8%	2	2.1%	2	2.8%	2	-0.7%
	SR 423 (Lee Road) - W of SR 15/600	4	0.1%	4	0.2%	4	0.2%	4	0.2%	4	0.6%
	SR 423 (Lee Road) - E of SR 15/600*	-	-	-	-	-	-	-	-	4	0.6%
	Solana Avenue - E of SR 15/600	2	4.7%	2	1.0%	2	0.2%	2	7.9%	2	5.6%
	Park Avenue - E of SR 15/600	2	0.4%	2	0.9%	2	1.3%	2	-1.7%	2	-0.2%

* For only Alternative Five.

**S.R. 15/600 and Denning Drive are 4-lane one-way pairs.

6.3.5 DESIGN TRAFFIC FACTORS

The traffic forecast for the opening year 2005, mid-design year 2015 and design year 2025 were obtained by applying the annual growth rates presented in Table 6-7 to the existing traffic volumes using a straight line projection. The following sections present the design volume forecasts for the No-Build and Build Alternative 5 which was considered the most viable alternative for the SR 15/600 (US 17/92) PD&E Study. Alternatives 2, 3, and 4 were eliminated from further study.

6.3.6 NO-BUILD AND BUILD TRAFFIC FORECASTS

Figures 6-3 and 6-4 illustrate estimated existing and projected average annual daily traffic (AADT) volumes for opening year 2005, mid-design year 2015 and design year 2025, for the No Build and Build Alternatives, respectively.

6.3.7 DESIGN HOUR VOLUMES AT THE INTERSECTIONS

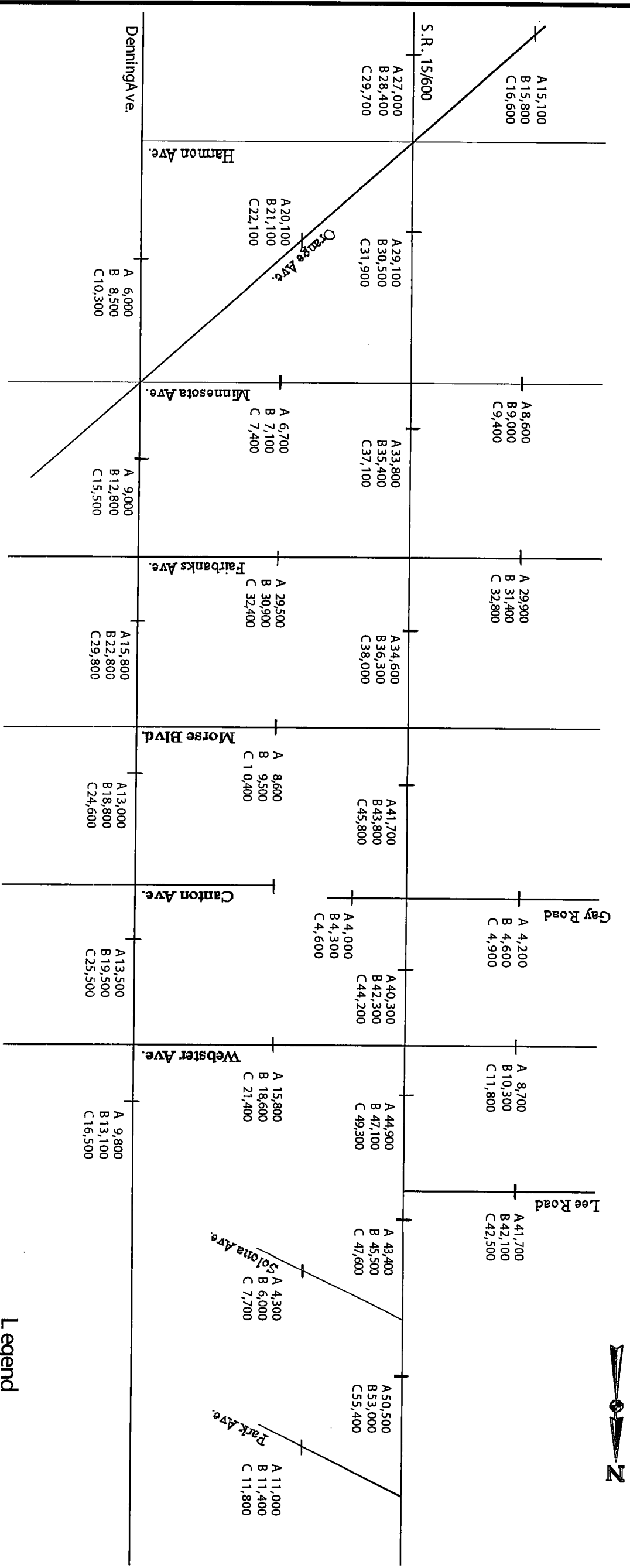
The design hour volumes (DHV's) for the intersections were developed for the No Build and Build Alternative 5 utilizing the TURNS-5 Spreadsheets. The outputs of the spreadsheets were examined and manual adjustments were conducted to eliminate unacceptable turning movement projections.

Directional Design Hourly Volumes (DDHV) depicted in Figures 6-5 and 6-6 for the No Build and Build Alternative 5 respectively represent an application of K30 and D factors (summarized in Table 6-4) to the AADT volumes.

6.4 *Level of Service*

A level of Service (LOS) analysis was performed for the No-Build and Build Alternative 5. Level of Service for the existing conditions were previously provided on Figures 6-1 and 6-2

This section presents the results of the operational analyses for the future No-Build and Build Alternative 5. Conditions were analyzed using the most current adopted procedures as outlined in the Transportation Research Board's Highway Capacity Manual (HCM 2000) report.



Annual Average Daily Traffic Volumes (No Build)

S R 15/600 (US 17/92)

Norfolk Avenue to Monroe Street

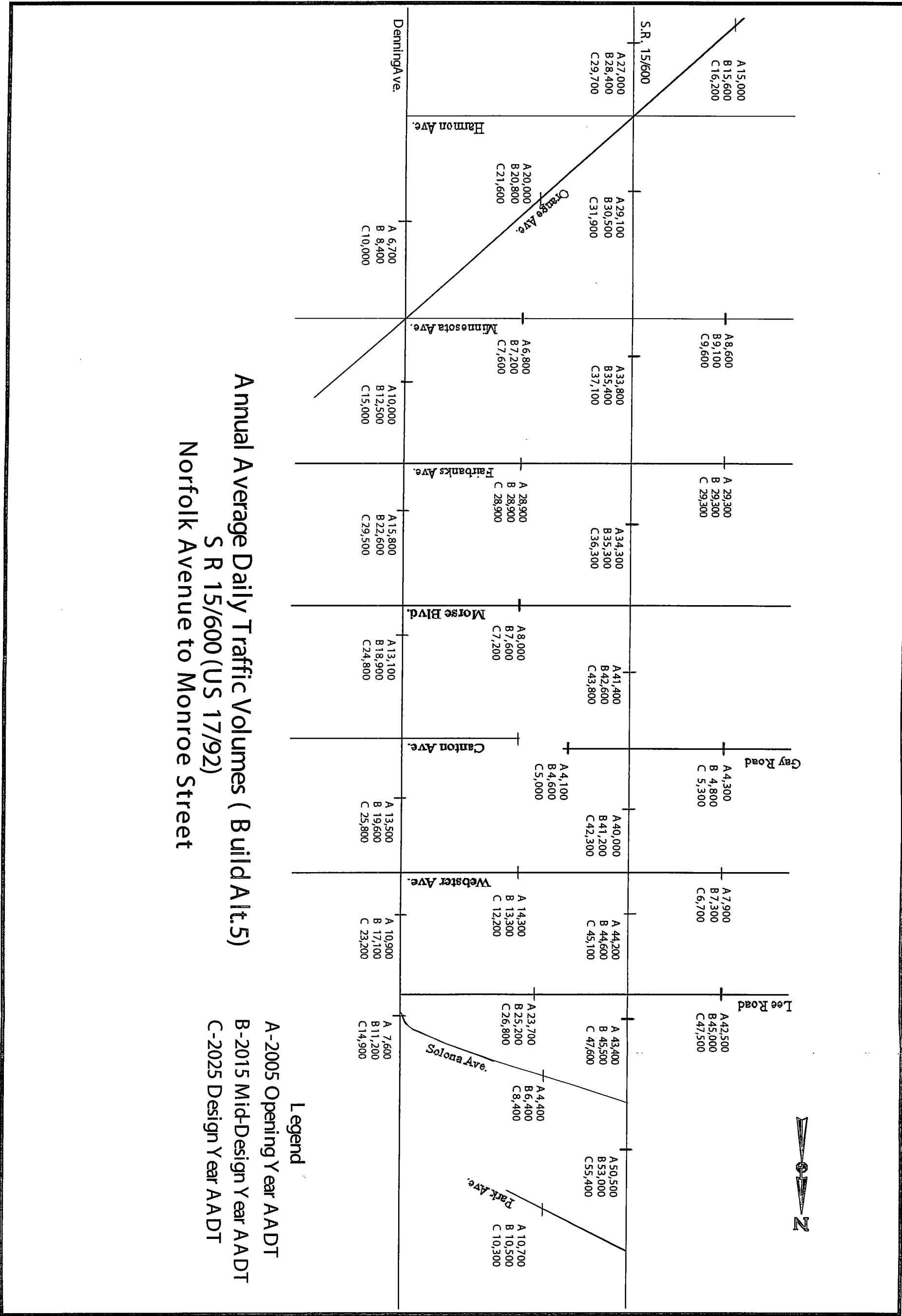
- Legend
- A-2005 Opening Year AADT
 - B-2015 Mid-Design Year AADT
 - C-2025 Design Year AADT

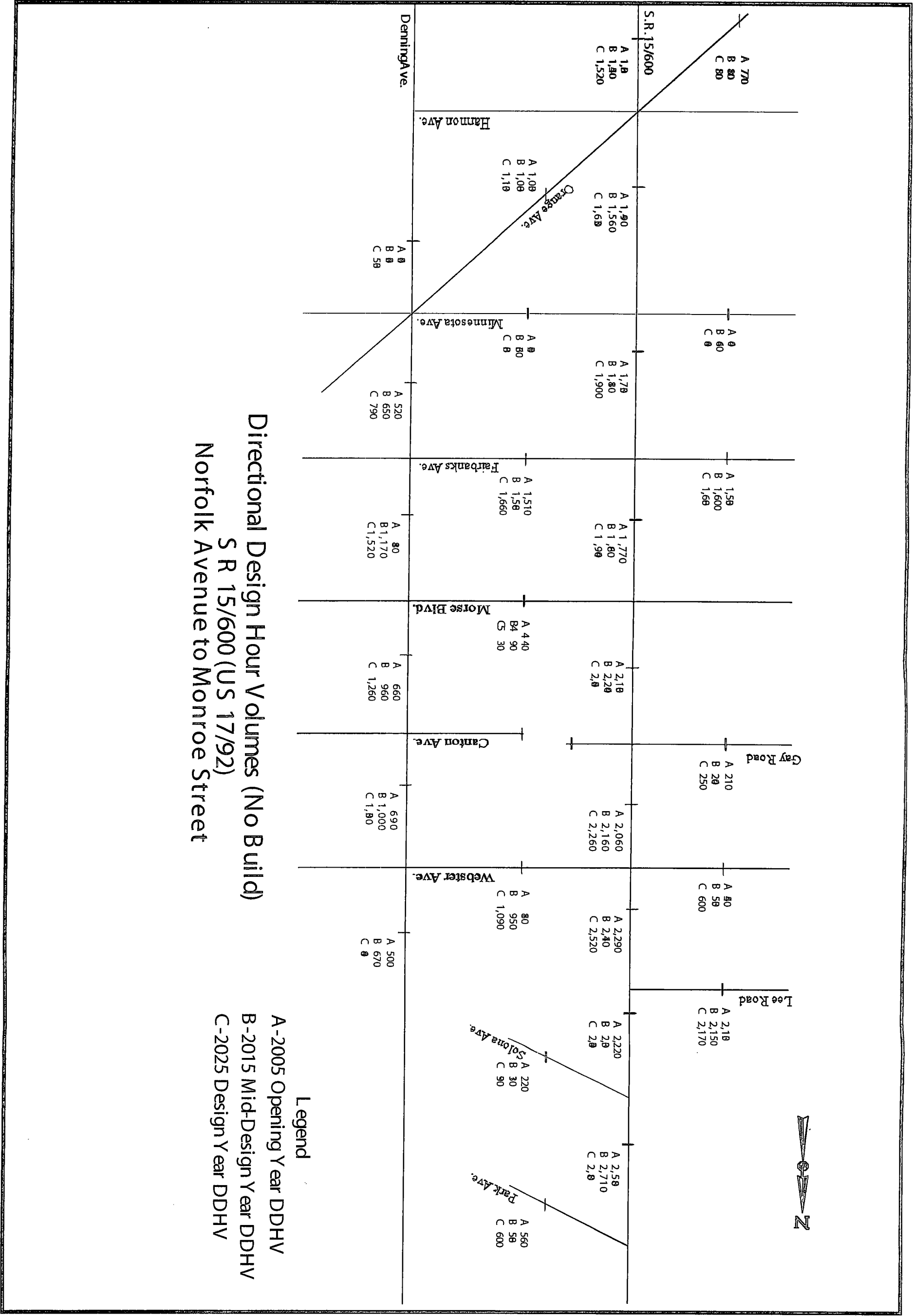
SR 15/600 (US 17/92) Project Development and Environment Study

From Norfolk Avenue to Monroe Street

Orange County, Florida

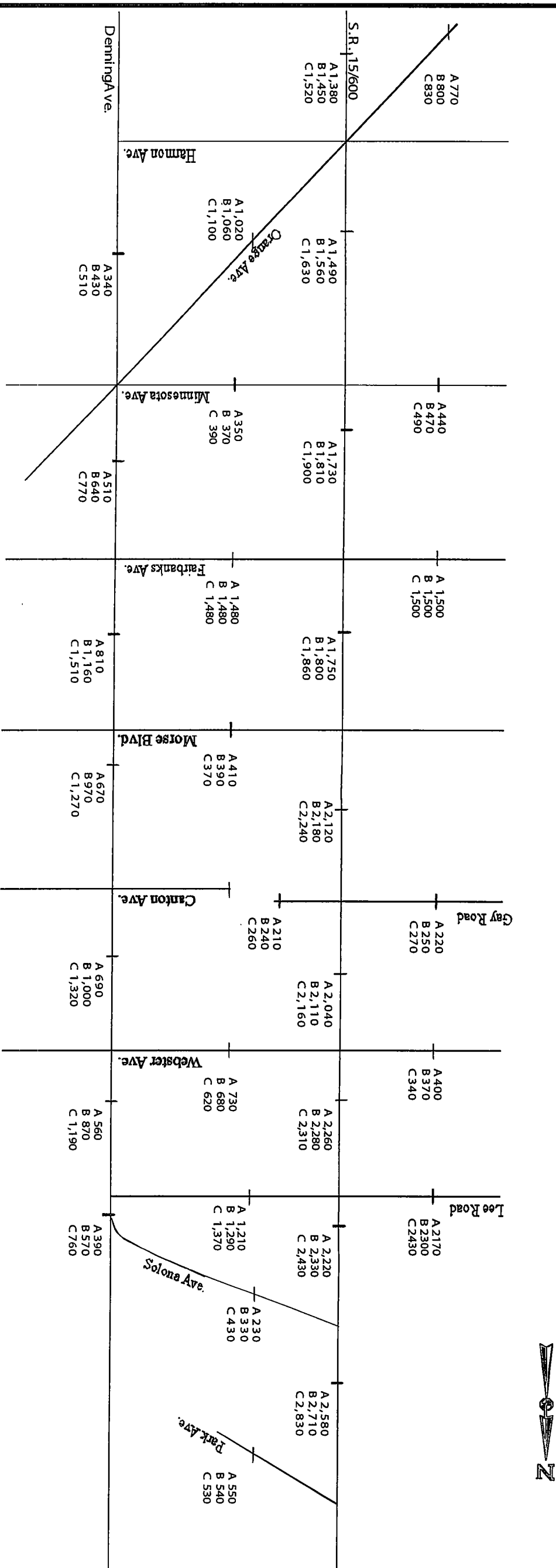
Financial Project ID Number: 408429-1-22-01





Directional Design Hour Volumes (Build Alt. 5)
S R 15/600 (US 17/92)
Norfolk Avenue to Monroe Street

Legend
A-2005 Opening Year DDHV
B-2015 Mid-Design Year DDHV
C-2025 Design Year DDHV



6.4.1 INTERSECTION OPERATIONS ANALYSIS

Intersection operational analyses were performed for the Opening, Mid-Design, and Design years for the future No-Build and Build Alternatives 2, 3, 4, and 5. The intersection analyses for the future years were performed using the SYNCRO software, which is based on the most current adopted procedures as outlined in the Transportation Research Board's Highway Capacity Manual (HCM 2000) report. Table 6-8 presents the summary of the intersection Levels of Service for the future No-Build and Build Alternatives 2, 3, 4, and 5.

6.4.1.1 No Build Alternative Intersection Level of Service

Opening Year 2005

Based on the No Build geometry, intersection operational characteristics were analyzed for the opening year 2005 design hour volumes. Figure 6-7 illustrates design hour volumes along with the intersection LOS for each intersection within the study area.

Table 6-8 indicates that in the opening year 2005, five (5) of the thirteen (13) intersections analyzed operate at LOS E or better. The eight (8) intersections that were found to operate at LOS F include:

- SR 15/600 (US 17/92) at Lee Road
- SR 15/600 (US 17/92) at Webster Avenue
- SR 15/600 (US 17/92) at Morse Boulevard
- SR 15/600 (US 17/92) at Fairbanks Avenue
- SR 15/600 (US 17/92) at Orange Avenue/Harmon Avenue
- Denning Drive at Webster Avenue
- Denning Drive at Fairbanks Avenue
- Denning Drive at Orange Avenue/Minnesota Avenue

Mid Design Year 2015

Figure 6-8 illustrates the design hour volumes and intersection LOS for the mid-design year 2015. Table 6-8 indicates that there are no additional intersections operating at a deficient LOS F.

Design Year 2025

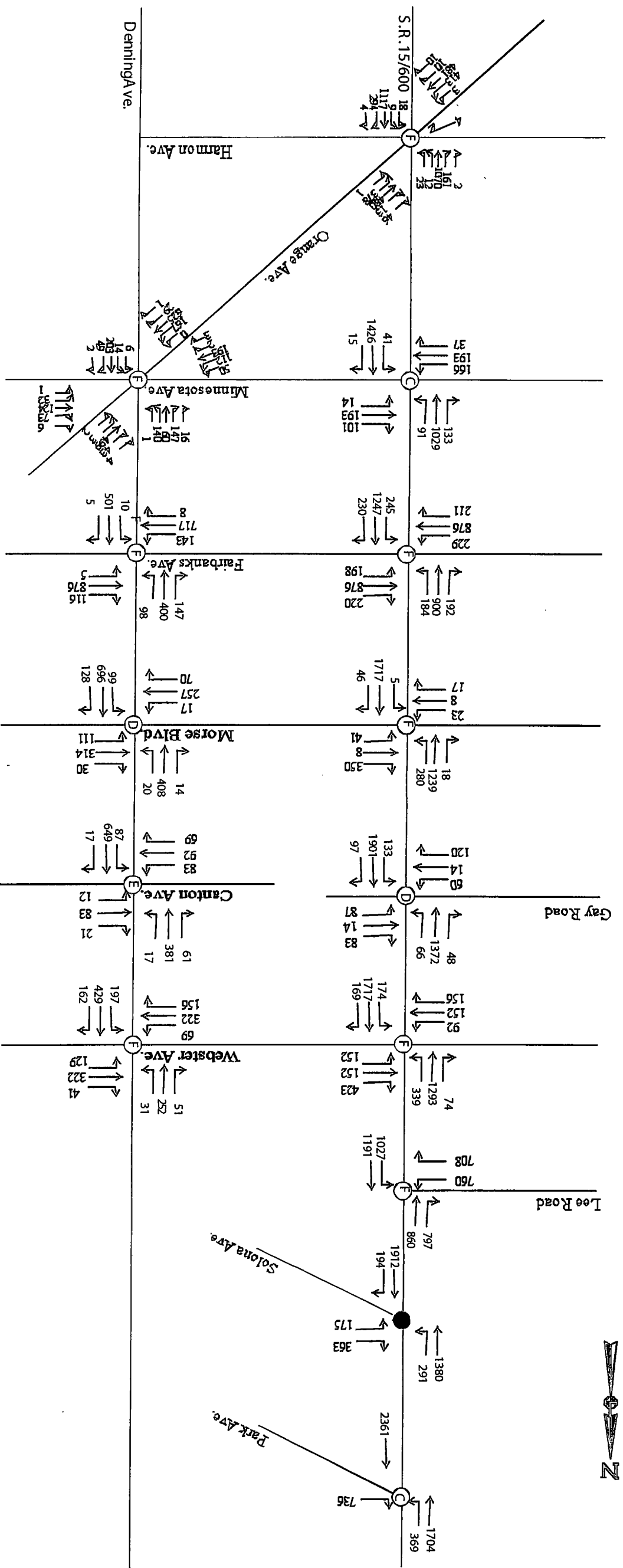
Figure 6-9 illustrates the design hour volumes and intersection LOS for the design year 2025. Table 6-8 indicates that four (4) of the thirteen (13) intersections analyzed are expected to operate at LOS E or better and nine

Table 6-8
S.R. 15/600 (US 17/92) PD&E and Design
Intersection Levels of Service (LOS) Projections

Intersections	No Build			Alternative 2			Alternative 3			Alternative 4			Alternative 5		
	2005	2015	2025	2005	2015	2025	2005	2015	2025	2005	2015	2025	2005	2015	2025
S.R. 15/600 & Park Avenue	C	C	D	A	B	B	N/A*	C	C	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
S.R. 15/600 & Solana Avenue	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	F	F	F	F	F	F
S.R. 15/600 & Lee Road	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
S.R. 15/600 & Webster Avenue	F	F	F	D	F	F	F	F	F	F	F	F	D	D	D
S.R. 15/600 & Gay Road	D	D	D	D	D	D	C	C	C	D	D	D	D	D	D
S.R. 15/600 & Morse Boulevard	F	F	F	E	F	F	B	B	B	F	F	F	F	F	F
S.R. 15/600 & Fairbanks Avenue	F	F	F	F	F	F	C	D	D	F	F	F	F	F	F
S.R. 15/600 & Minnesota Avenue	C	D	D	C	C	D	C	C	C	C	C	C	D	D	D
S.R. 15/600 & Harmon Ave. & Orange Ave.	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Denning Drive & Lee Road Extension**	-	-	-	-	-	-	-	-	-	-	-	-	F	F	F
Denning Drive & Webster Avenue	F	F	F	E	E	F	F	F	F	F	F	F	F	F	F
Denning Drive & Canton Avenue	E	E	E	E	E	E	C	C	C	E	E	E	D	E	F
Denning Drive & Morse Boulevard	D	D	F	E	F	F	C	C	C	D	D	F	D	E	F
Denning Drive & Fairbanks Avenue	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Denning Drive & Minnesota Ave. & Orange Ave.	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

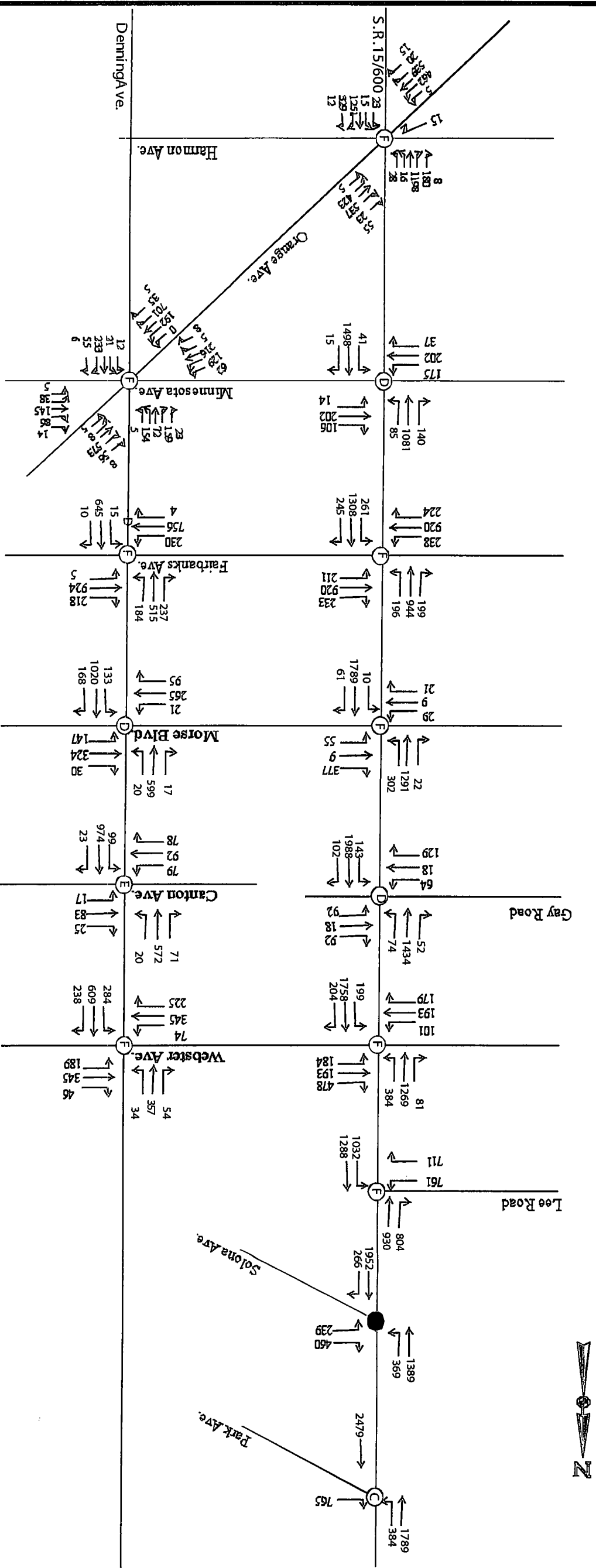
*HCM does not provide LOS analysis for Un-Signalized Intersections.

**Lee Road Extension from SR 15/600 to Denning Drive was applied for only Alternative 5.

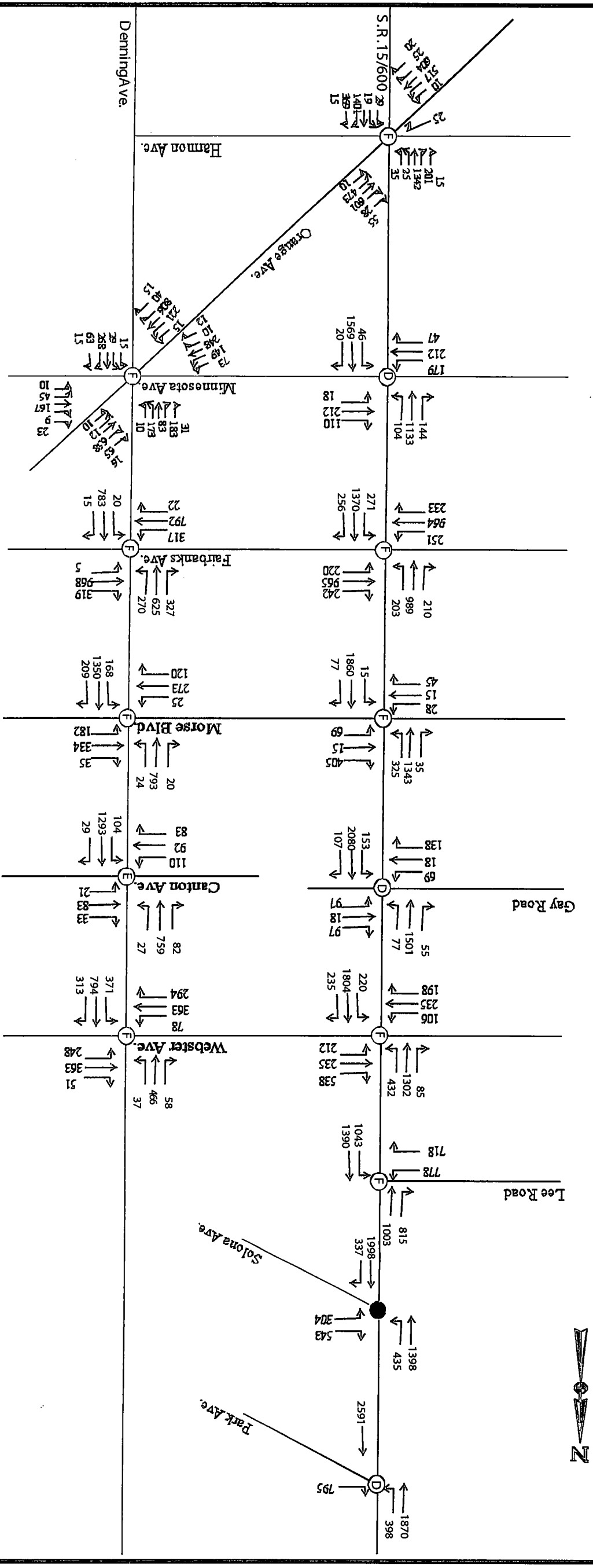


Year 2005 Design Hour Volumes & Intersection LOS (No Build)
S R 15/600 (US 17/92)
Norfolk Avenue to Monroe Street

Figure 6-7



Year 2015 Design Hour Volumes & Intersection LOS (No Build)
S R 15/600 (US 17/92)
Norfolk Avenue to Monroe Street



Year 2025 Design Hour Volumes & Intersection LOS(No Build)
SR 15/600 (US 17/92)
Norfolk Avenue to Monroe Street

Figure 6-9

(9) intersections are expected to operate at LOS F. In addition to the eight (8) intersections that operate at LOS F during the mid-design year, the intersection of Denning Drive and Morse Boulevard is expected to operate at LOS F during the design year 2025.

6.4.1.2 Build Alternative 5 Intersection Level of Service

Opening Year 2005

Based on the Build Alternative 5 geometry, intersection operational characteristics were tested with the opening year 2005 design hour volumes. Figure 6-10 illustrates design hour volumes along with the intersection LOS for each intersection within the study area.

Table 6-8 indicates that in the opening year 2005, five (5) of the fourteen (14) intersections analyzed operate at LOS E or better. The nine (9) intersections that were found to operate at LOS F include:

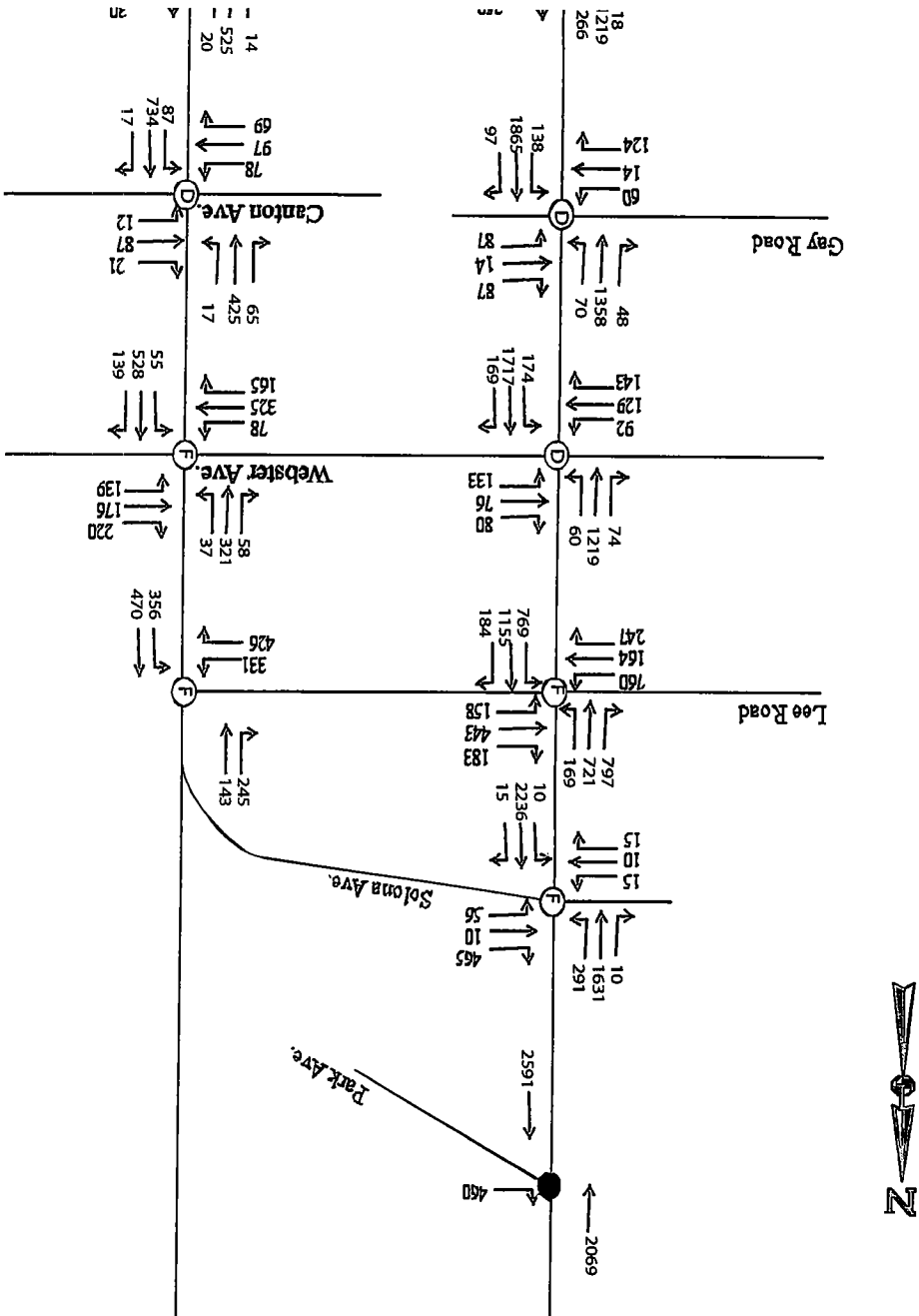
- SR 15/600 (US 17/92) at Solana Avenue
- SR 15/600 (US 17/92) at Lee Road
- SR 15/600 (US 17/92) at Morse Boulevard
- SR 15/600 (US 17/92) at Fairbanks Avenue
- SR 15/600 (US 17/92) at Orange Avenue/Harmon Avenue
- Denning Drive at Lee Road Extension
- Denning Drive at Webster Avenue
- Denning Drive at Fairbanks Avenue
- Denning Drive at Orange Avenue/Minnesota Avenue

Mid Design Year 2015

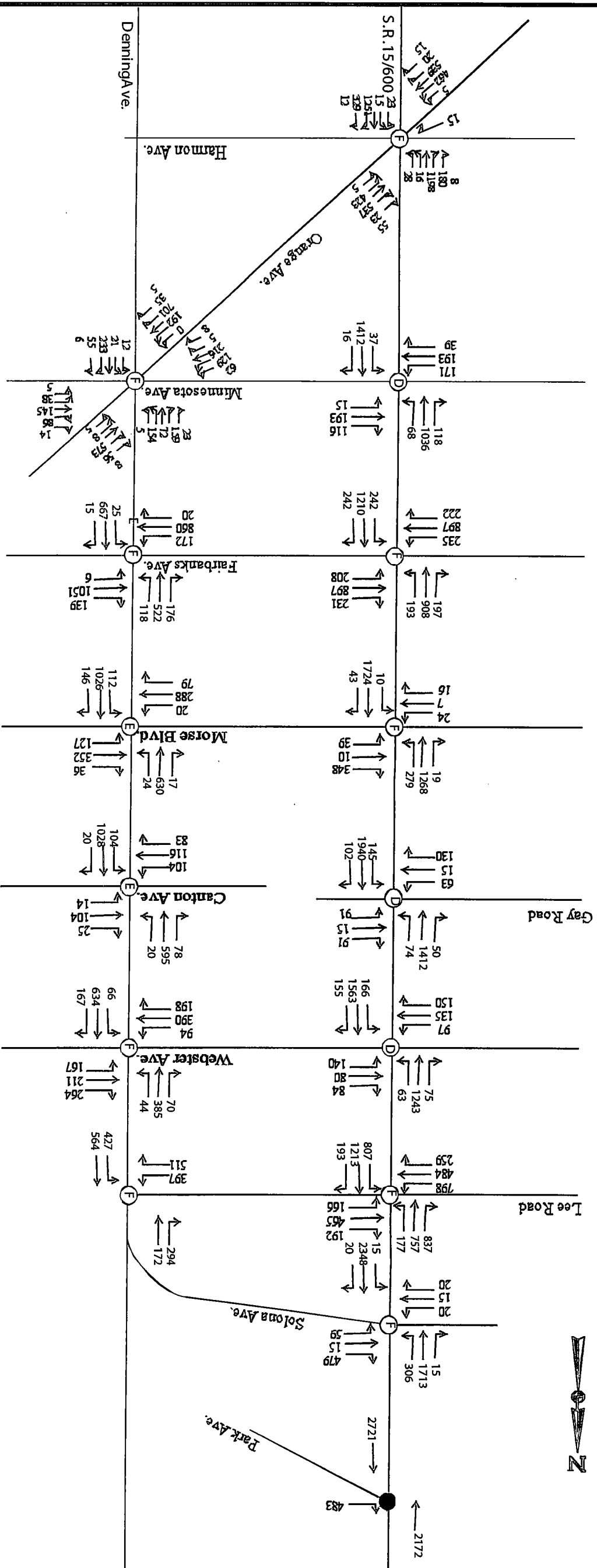
Figure 6-11 illustrates the design hour volumes and the intersection LOS for the mid design year 2015. Table 6-8 indicates that two (2) intersections of Denning Drive at Canton Avenue and Morse Boulevard would be deteriorated as LOS 'E' from 'D'. The nine (9) intersections that are expected to operate at LOS 'F' remain as open year 2005.

Design Year 2025

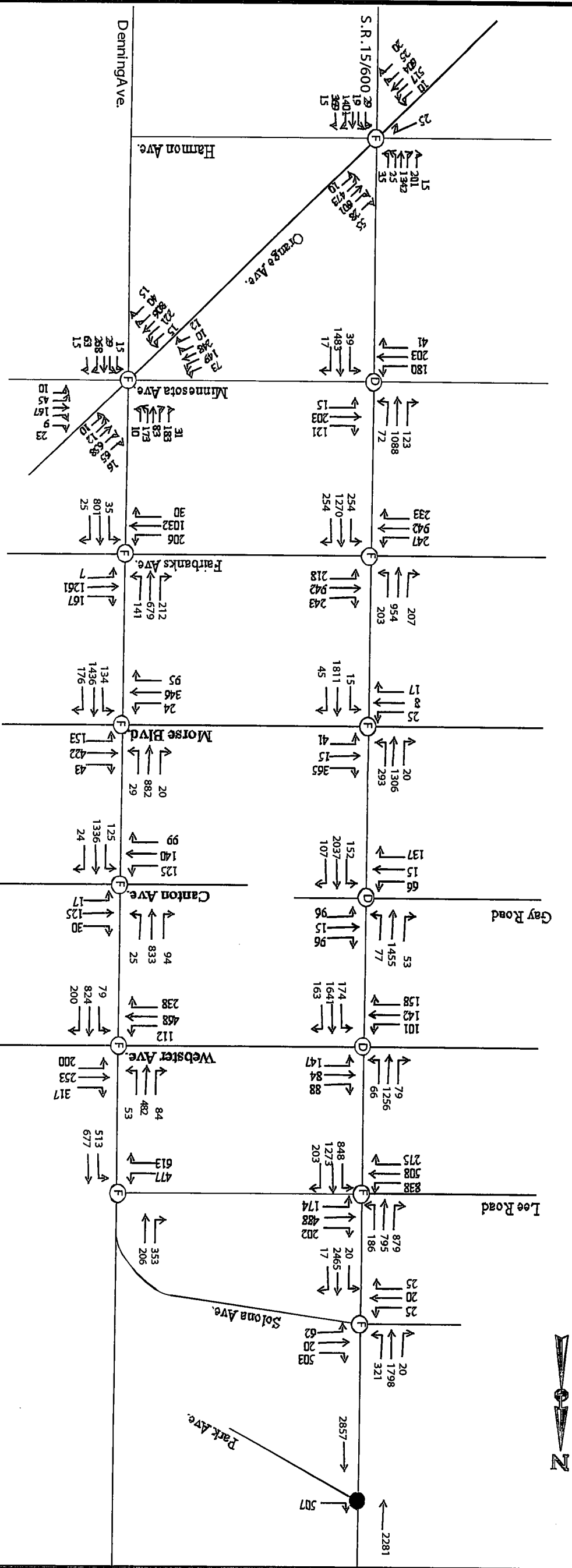
Figure 6-12 illustrates the design hour volumes and the intersection LOS for the design year 2025. Table 6-8 indicates that three (3) of the fourteen (14) intersections analyzed are expected to operate at LOS E or better and eleven (11) intersections are expected to operate at LOS F. In addition to the nine (9) intersections that operate at LOS F during the mid-design year, the intersections of Denning Avenue at Canton Avenue and Morse Boulevard are expected to operate at LOS F during the design year 2025.



James & Intersection LOS (Alt. 5)
0 (US 17/92)
to Monroe Street



Year 2015 Design Hour Volumes & Intersection LOS (Alt. 5)
 S R 15/600 (US 17/92)
 Norfolk Avenue to Monroe Street



Year 2025 Design Hour Volumes & Intersection LOS (Alt. 5)
S R 600/15 (US 17/92)
Norfolk Avenue to Monroe Street

SR 15/600 (US 17/92) Project Development and Environment Study
From Norfolk Avenue to Monroe Street
Orange County, Florida
Financial Project ID Number: 408429-1-22-01

6.4.2 ROADWAY OPERATIONAL ANALYSIS

Roadway operational analyses were performed for Opening Year, Mid-design Year and Design Year for the No-Build and Build Alternatives 2, 3, 4, and 5. The roadway operational level of service analysis was performed by comparing the directional design hour volumes against the directional peak hour capacities.

For SR 15/600 (US 17/92) and Denning Drive, 2002 ARTPLAN Spreadsheets are utilized after inputting optimized cycle lengths and green to cycle length ratios resulted from SYNCHRO simulations. Table 4-7 of 2002 FDOT Quality/Level of Service Handbook was applied for side streets segments LOS analyses.

6.4.2.1 *No Build Alternative Roadway Link Level of Service*

Table 6-9 summarizes the ARTPLAN results of SR 15/600 (US 17/92) and Denning Drive. It also includes the roadway segments LOS of side streets for the No Build alternative for the opening, mid-design, and design years.

Based on Table 6-9 it is shown that four (4) roadway segments along SR 15/600 (US 17/92) within the study area are expected to operate at LOS F during the design year 2025 under the No Build conditions. In Denning Drive, all roadway segments except Webster Avenue to Solana Avenue are also expected to operate at LOS F in design year.

6.4.2.3 *Build Alternatives 4 & 5 Roadway Link Level of Service*

Table 6-10, the roadway segments LOS results along SR 15/600 (US 17/92) and Denning Drive are identical as Alternative 4 except only one segment from Lee Road and Solana Avenue on SR 15/600 (US 17/92). The segment LOS is changed as E in alternative 5 from C on alternative 4. As a result, the four (4) segments from Minnesota Avenue to Webster Avenue expect to operate at LOS F as No Build presents.

Table 6-9
S.R. 15/600 (US 17/92) PD&E and Design
Roadway Segments LOS Analyses for No Build

Roadways	Segments	Cycle Length (sec)			g/c			v/c			Control Delay			Segment LOS			
		2005	2015	2025	2005	2015	2025	2005	2015	2025	2005	2015	2025	2005	2015	2025	
S.R. 15/600 (US 17/92)	SR 527 (Orange Avenue) to Minnesota Avenue	180	180	180	0.49	0.48	0.47	0.84	0.97	1.10	32.93	43.78	88.11	F	F	F	
	Minnesota Avenue to SR 426 (Fairbanks Avenue)	180	180	180	0.52	0.51	0.52	0.81	0.86	0.89	27.40	29.71	28.92	F	F	F	
	SR 426 (Fairbanks Avenue) to Morse Boulevard	180	180	180	0.41	0.41	0.41	1.05	1.12	1.16	80.11	106.72	122.61	F	F	F	
	Morse Boulevard to Gay Road	180	180	180	0.61	0.60	0.60	0.85	0.90	0.94	15.87	18.62	20.20	E	E	E	
	Gay Road to Webster Avenue	180	180	180	0.72	0.72	0.72	0.77	0.81	0.84	3.22	3.37	3.57	D	D	D	
	Webster Avenue to SR 423 (Lee Road)	180	180	180	0.50	0.47	0.44	1.11	1.22	1.35	87.86	141.66	202.13	F	F	F	
	SR 423 (Lee Road) to Solana Avenue	180	180	180	0.71	0.71	0.71	0.50	0.53	0.56	2.51	2.61	2.69	C	C	C	
	Solana Avenue to Park Avenue	40	40	40	0.95	0.95	0.95	0.64	0.56	0.67	0.34	0.17	0.40	C	C	C	
Denning Drive	Minnesota Ave. to SR 426 (Fairbanks Ave.)	180	180	180	0.24	0.35	0.43	0.33	0.27	0.18	58.33	39.74	27.35	F	F	F	
	SR 426 (Fairbanks Ave.) to Morse Blvd.	180	180	180	0.17	0.18	0.18	0.89	1.09	1.33	91.83	140.49	239.97	F	F	F	
	Morse Blvd. to Canton Ave.	180	180	180	0.42	0.43	0.44	0.64	0.90	1.14	36.46	41.69	108.95	F	F	F	
	Canton Ave. to Webster Ave.	100	100	100	0.54	0.47	0.45	0.41	0.68	0.92	9.59	17.08	22.68	D	E	F	
	Webster Ave. to Solana Avenue	40	40	40	0.35	0.41	0.41	0.49	0.60	0.79	9.91	8.64	9.86	C	D	D	
	SR 527 (Orange Avenue) - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	C	C
SIDE STREETS	SR 527 (Orange Avenue) - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	C	C
	Minnesota Avenue - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	C
	Minnesota Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	B
	SR 426 (Fairbanks Avenue) - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	D	D
	SR 426 (Fairbanks Avenue) - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	D	D
	Morse Boulevard - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	D	D
	Gay Road - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	B
	Gay Road - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	B
	Webster Avenue - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	C	C
	Webster Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	E	F	F
	SR 423 (Lee Road) - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F	F	F
	Solana Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	B

Note:

1. S.R. 15/600 (US 17/92) and Denning Drive - ARTPLAN (2002 Conceptual Planning Analysis) Results.
2. Side Street - FDOT 2002 Quality/LOS Handbook, Table 4-7.

Table 6-10
S.R. 15/600 (US 17/92) PD&E and Design
Roadway Segments LOS Analyses for Alternative 5

Roadways	Segments	Cycle Length (sec)						g/c						v/c						Control Delay						Segment LOS					
		2005		2015		2025		2005		2015		2025		2005		2015		2025		2005		2015		2025		2005		2015		2025	
		180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
S.R. 15/600 (US 17/92)	SR 527 (Orange Avenue) to Minnesota Avenue	180	180	180	180	180	180	0.49	0.48	0.47	0.66	0.76	1.09	0.76	0.66	0.76	1.09	0.76	0.66	0.76	1.09	0.76	0.66	0.76	1.09	0.76	0.66	0.76	1.09	0.76	0.66
	Minnesota Avenue to SR 426 (Fairbanks Avenue)	180	180	180	180	180	180	0.53	0.50	0.51	0.74	0.82	0.85	0.74	0.82	0.85	0.74	0.82	0.85	0.74	0.82	0.85	0.74	0.82	0.85	0.74	0.82	0.85	0.74	0.82	0.85
	Morse Boulevard to Gay Road	180	180	180	180	180	180	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
	Gay Road to Webster Avenue	180	180	180	180	180	180	0.61	0.61	0.61	0.81	0.85	0.89	0.81	0.85	0.89	0.81	0.85	0.89	0.81	0.85	0.89	0.81	0.85	0.89	0.81	0.85	0.89	0.81	0.85	0.89
	Webster Avenue to SR 423 (Lee Road)	180	180	180	180	180	180	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	SR 423 (Lee Road) to Solana Avenue	180	180	180	180	180	180	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Denning Drive	Solana Avenue to Park Avenue	180	180	180	180	180	180	0.59	0.58	0.57	0.82	0.85	0.89	0.82	0.85	0.89	0.82	0.85	0.89	0.82	0.85	0.89	0.82	0.85	0.89	0.82	0.85	0.89	0.82	0.85	0.89
	Minnesota Ave. to SR 426 (Fairbanks Ave.)	40	40	40	40	40	40	0.59	0.58	0.57	0.67	0.71	0.76	0.67	0.71	0.76	0.67	0.71	0.76	0.67	0.71	0.76	0.67	0.71	0.76	0.67	0.71	0.76	0.67	0.71	0.76
	SR 426 (Fairbanks Ave.) to Morse Blvd.	180	180	180	180	180	180	0.25	0.38	0.48	0.31	0.25	0.24	0.31	0.25	0.24	0.31	0.25	0.24	0.31	0.25	0.24	0.31	0.25	0.24	0.31	0.25	0.24	0.31	0.25	0.24
	Morse Blvd. to Canton Ave.	180	180	180	180	180	180	0.17	0.18	0.19	0.98	1.15	1.32	0.98	1.15	1.32	0.98	1.15	1.32	0.98	1.15	1.32	0.98	1.15	1.32	0.98	1.15	1.32	0.98	1.15	1.32
	Canton Ave. to Webster Ave.	180	180	180	180	180	180	0.40	0.39	0.38	0.73	0.96	1.34	0.73	0.96	1.34	0.73	0.96	1.34	0.73	0.96	1.34	0.73	0.96	1.34	0.73	0.96	1.34	0.73	0.96	1.34
	Webster Ave. to Solana Avenue	100	100	100	100	100	100	0.52	0.45	0.43	0.47	0.75	1.01	0.47	0.75	1.01	0.47	0.75	1.01	0.47	0.75	1.01	0.47	0.75	1.01	0.47	0.75	1.01	0.47	0.75	1.01
SIDE STREETS	SR 527 (Orange Avenue) - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	0.39	0.37	0.37	0.50	0.63	0.80	0.50	0.63	0.80	0.50	0.63	0.80	0.50	0.63	0.80	0.50	0.63	0.80	0.50	0.63	0.80	0.50	0.63	0.80
	SR 527 (Orange Avenue) - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Minnesota Avenue - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Minnesota Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SR 426 (Fairbanks Avenue) - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SR 426 (Fairbanks Avenue) - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Morse Boulevard - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Gay Road - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Webster Avenue - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Webster Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SR 423 (Lee Road) - W of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Solana Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Park Avenue - E of SR 15/600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note:
 1. S.R. 15/600 (US 17/92) and Denning Drive - ARTPLAN (2002 Conceptual Planning Analysis) Results.
 2. Side Street - FDOT 2002 Quality/LOS Handbook, Table 4-7.

7.0 CORRIDOR ANALYSIS

The SR 15/600 (US 17/92) PD&E Study was conducted to develop and evaluate alternatives to improve corridor mobility and safety within the existing SR 15/600 (US 17/92) corridor. Existing and projected traffic operational characteristics and access management requirements on the existing alignment were evaluated in order to develop transportation solutions that addressed congestion management in this heavily urbanized corridor.

In 1998, the City of Winter Park prepared a Community Re-development Enhancement Area (CREA) Plan that also considered the relationship between land use development and transportation particularly along SR 15/600 (US 17/92). In addition to the CREA Plan, the City prepared a Corridor Master Plan for SR 15/600 (US 17/92) to identify and document corridor mobility and congestion management alternatives as well as improved access management, bicycle and pedestrian improvements and landscape/streetscape enhancements. The City's Corridor Master Plan for SR 15/600 (US 17/92) was utilized as the point of departure for the PD&E Study and served to define the City's vision for the roadway at that time.

Utilization of parallel "off system" roadways was a key element of the City's Corridor Master Plan. The utilization of Harper Street and Denning Drive, for example, which parallel SR 15/600 (US 17/92) within ¼ mile to the east, were considered viable corridors for providing additional north-south capacity within the study area as well as providing alternatives for experienced bicyclists. In addition, Harper Street was identified as a viable alternative to providing an alternate means of access to properties fronting both SR 15/600 (US 17/92) and Harper Street. The Harper Street alternative was expected to solve a majority of the access management issues along the east side of SR 15/600 (US 17/92) from Fairbanks Avenue to north of Webster Avenue since the City's Corridor Master Plan identified a raised median alternative for the SR 15/600 (US 17/92) mainline improvement.

Another important element of the Corridor Master Plan was the extension of SR 423 (Lee Road) from SR 15/600 (US 17/92) eastward to Denning Drive. This improvement was predicted to alleviate the heavily congested segment of SR 15/600 (US 17/92) between Gay Road and Lee Road, particularly the intersections of SR 15/600 (US 17/92) and Lee Road and SR 15/60 (US 17/92) and Webster Avenue. Denning Drive is an existing four-lane undivided urban collector located ¼ mile east of SR 15/600 (US 17/92). Additional north-south travel capacity would be provided by Denning Drive through the Lee Road extension. Another benefit of the Denning Drive alternative is the connection to major east-west corridors within the SR 15/600 (US 17/92) corridor.

Related to the extension of Lee Road would be the removal of the existing traffic signal at Webster Avenue, a condition of the development order and construction permit issued for the Winter Park Village in 1998. The City had agreed at that time to conduct a traffic

operational analysis for the segment of SR 15/600 (US 17/92) between Gay Road and Lee Road in order to assess whether the roadway could function at an acceptable level of service with the Webster Avenue signal even though the Gay Road signal was permitted upon the condition that the Webster Avenue signal would be removed within a year of opening the Winter Park Village. At the time this final Preliminary Engineering Report was written (June 2004), this permit condition remained unresolved.

Alternate corridors to the west of the existing SR 15/600 (US 17/92) alignment are not as well defined as on the east side. Due to the natural constraints presented by Lake Killarney, there is no continuous well-defined east-west, north-south grid system of roadways on the west side; however, there are limited opportunities in the vicinity of Gay Road, Webster Avenue and Lee Road. An off system corridor alternative involving Gay Road/Country Club Road, Executive Drive and Lee Road would provide the same level of congestion relief and alternate access as the Harper Road alternative. This system potential network is being further evaluated by the City of Winter Park.

In conclusion, alternate off system corridors parallel to SR 15/600 (US 17/92) exist in varying degrees and may play a vital role in the overall corridor mobility within the study area. The overall congestion management plan for SR 15/600 (US 17/92) from Norfolk Avenue to Monroe Street should seek to maximize the use of these corridors if possible to help resolve capacity, mobility and access requirements.

considered for the SR 15/600 (US 17/92) corridor either as part of the regional long range transportation planning process or in the development of local government comprehensive plans. Due to the significant degree of urbanization along the SR 15/600 (US 17/92) and lack of available right-of-way, certain TSM or congestion management strategies were identified as the only viable alternative to maximize efficiency, improve mobility and enhance safety along this facility. The only improvement options which would substantially improve capacity and mobility on SR 15/600 (US 17/92) would involve additional through travel lanes and require significant right-of-way acquisition (ie: widening to six lanes between Orange Avenue and Lee Road). For the purpose of this study, certain TSM measures or congestion management alternatives such as intersection improvements, access management, and enhanced bicycle and pedestrian facilities were considered as viable alternatives.

8.3 *Project Alternatives*

The evaluation of alternative transportation improvements along the SR 15/600 (US 17/92) corridor involved several conceptual design elements. These included alternative typical sections, median modifications, drainage system improvements, utilization of parallel "off system" facilities, bicycle and pedestrian facility improvements and highway beautification. The alternatives analysis conducted for the SR 15/600 (US 17/92) PD&E Study is presented in the following sections of this Report.

8.3.1 ALTERNATIVES DEVELOPMENT

In 1998, the City of Winter Park adopted a Community Re-development Enhancement Area (CREA) Plan that included the SR 15/600 (US 17/92) corridor. The CREA Plan addressed the relationship between transportation and potential land use development in the western section of Winter Park and was used to support the City's community re-development efforts. In addition, a Corridor Master Plan was developed for the roadway from Norfolk Avenue to Monroe Street. The SR 15/600 (US 17/92) Corridor Master Plan identified several transportation related improvements for the roadway which were re-evaluated during the FDOT PD&E Study. The City's Corridor Master Plan for SR 15/600 (US 17/92) was considered the point of departure for moving into the development of project alternatives during the PD&E Study.

Congestion management strategies and corridor improvements were identified in the City's Corridor Master Plan including: the implementation of a raised median to enhance corridor mobility and safety; the use of parallel "off system" roadway networks for improving traffic distribution, bicycle travel, and access management; traffic signal modifications; and, the extension of SR 423 (Lee Road). These strategies were among those evaluated during this study.

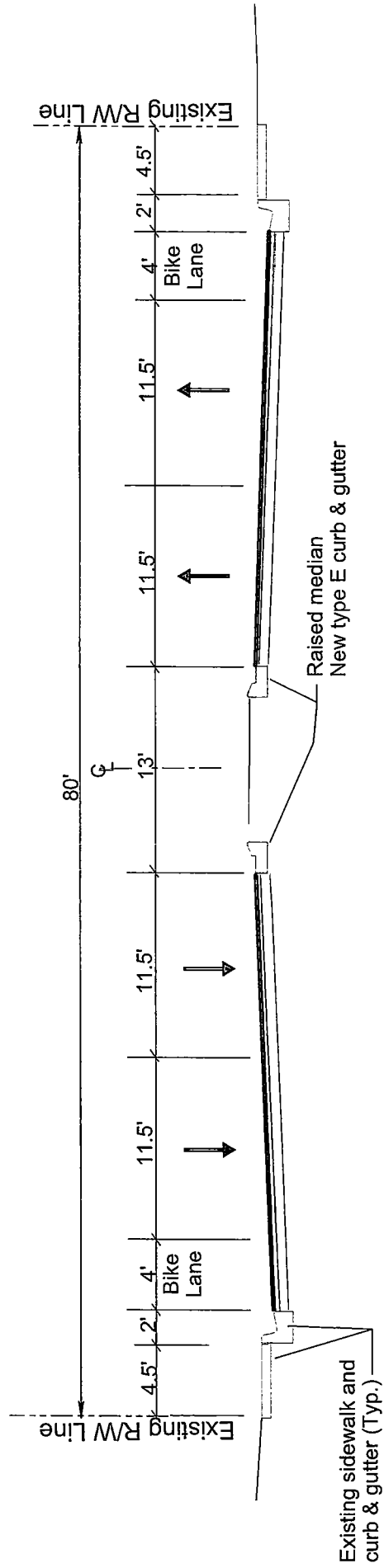
8.3.2 ALTERNATIVES CONSIDERED

The alternatives analysis for the SR 15/600 (US 17/92) PD&E Study began with a re-evaluation of the City's Corridor Master Plan. The initial effort in this regard was related to developing alternative typical section concepts that presented alternatives for travel lane widths, median types and widths and border areas. Figures 8-1 through 8-4 show the initial alternatives developed for the SR 15/600 (US 17/92) mainline improvement from Orange Avenue to Lee Road. Due to existing land use and property access characteristics between Norfolk Avenue and Orange Avenue, the initial alternatives analysis considered the existing four lane roadway with center turn lane to be the most viable alternative in this segment. North of Lee Road the existing SR 15/600 (US 17/92) consists of a five- and six-lane divided roadway; therefore, typical section alternatives were not evaluated for this segment.

Each of the initial alternatives considered for the mainline from Orange Avenue to Lee Road included a raised median concept which, at the time, was consistent with the City of Winter Park's Corridor Master Plan for SR 15/600 (US 17/92). Figure 8-5 shows the initial typical section developed for the extension of SR 423 (Lee Road). The following is a brief description of each of the initial alternative typical sections.

Alternative Typical Section Number 1 (Figure 8-1) for the SR 15/600 (US 17/92) mainline improvement from Orange Avenue to Lee Road provides four (4) 11 ½ foot wide travel lanes, two (2) in each direction, separated by a 13 foot wide raised median (with Type E curb and gutter). The border area along both sides of this typical section alternative provides a 4 foot wide bicycle lane for experienced cyclists and would tie into the existing 2 foot wide curb and gutter for stormwater conveyance and 4 ½ foot wide concrete sidewalk, located flush with the back of curb. These improvements would be accommodated within the existing 80 foot right-of-way.

Alternative Typical Section Number 2 (Figure 8-2) for the SR 15/600 (US 17/92) mainline improvement from Orange Avenue to Lee Road provides two (2) 11 ½ foot wide inside travel lanes and two (2) 14 ½ foot wide outside travel lanes, separated by a 15 foot wide raised median (with Type E curb and gutter). The wide outside travel lane could be used to accommodate experienced cyclists, similar to the existing typical section. The border area along both sides of this typical section alternative includes the existing 2 foot wide curb and gutter for stormwater conveyance and 4 ½ foot wide concrete sidewalk, located flush with the back of curb. These

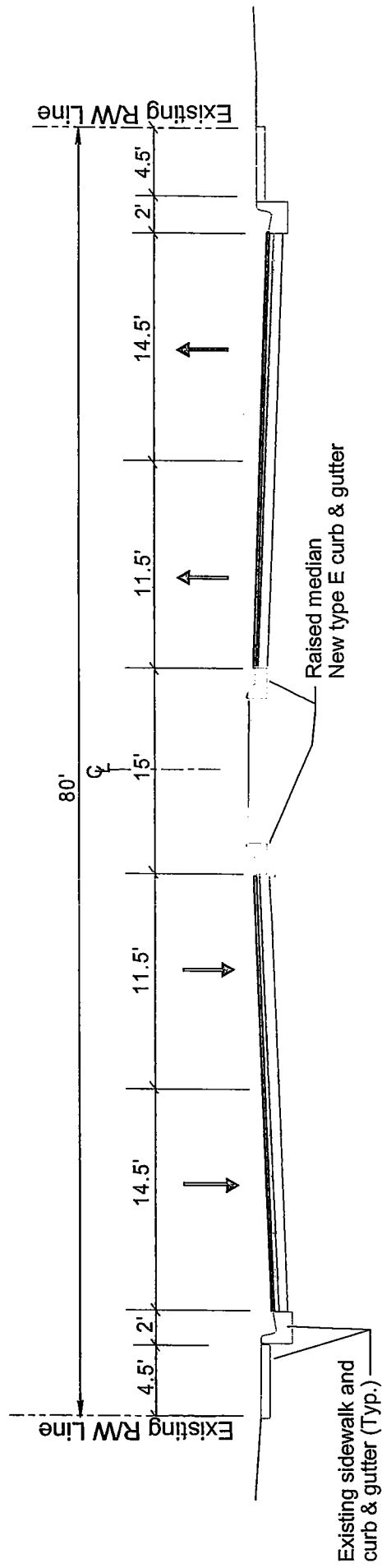


Four-Lane Urban Typical Section (Raised Median)

From Orange Avenue to Lee Road

Existing Posted Speed: 35 mph

Alternative Typical Section Number 1



Four-Lane Urban Typical Section (Raised Median)
 From Orange Avenue to Lee Road
 Existing Posted Speed: 35 mph

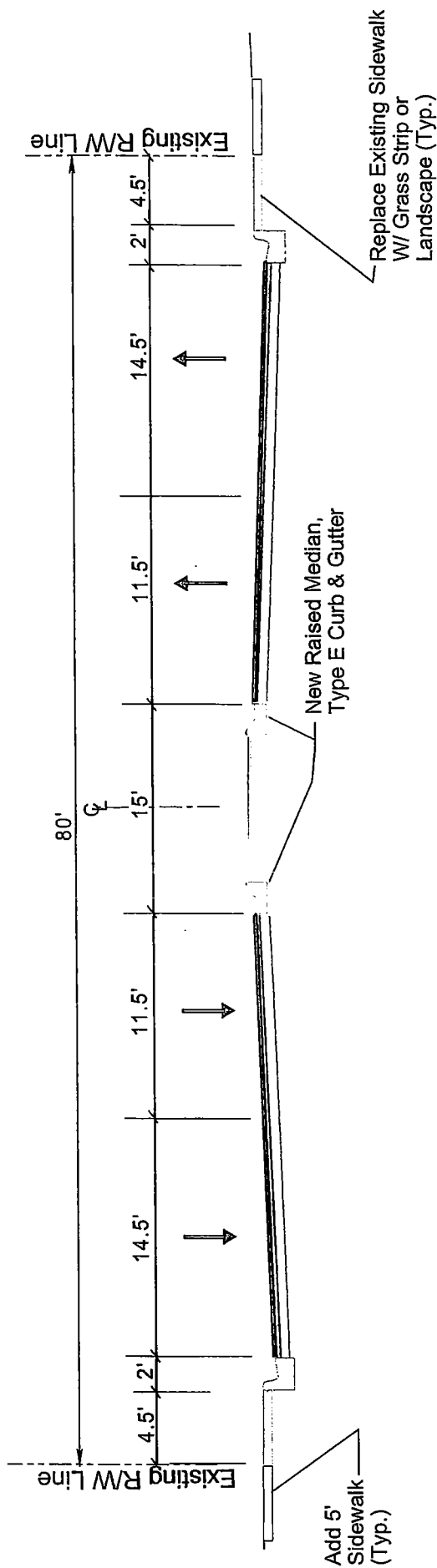
Alternative Typical Section Number 2

improvements would be accommodated within the existing 80 foot right-of-way.

Alternative Typical Section Number 3 (Figure 8-3) for the SR 15/600 (US 17/92) mainline improvement from Orange Avenue to Lee Road is similar to Alternative Typical Section Number 2 and provides two (2) 11 ½ foot wide inside travel lanes and two (2) 14 ½ foot wide outside travel lanes, separated by a 15 foot wide raised median (with Type E curb and gutter). The wide outside travel lane could be used to accommodate experienced cyclists, similar to the existing typical section. The border area along both sides of this typical section alternative includes the existing 2 foot wide curb and gutter for stormwater conveyance; however, a wider sidewalk would be proposed and located flush with the back of curb. This sidewalk alternative would require either direct right-of-way acquisition from adjacent property owners or an easement agreement between property owners and the City of Winter Park to accommodate the additional width. The City of Winter Park had initially expressed a desire to provide a 12 foot wide sidewalk which would require a minimum 7 ½ foot wide acquisition or easement along both sides of the existing roadway to accommodate this alternative. If the easements could be secured, the remaining elements of these improvements would be accommodated within the existing 80 foot right-of-way.

Alternative Typical Section Number 4 (Figure 8-4) for the SR 15/600 (US 17/92) mainline improvement from Orange Avenue to Lee Road provides four (4) 11 ½ foot wide travel lanes, two (2) in each direction, separated by a 15 foot wide raised median (with Type E curb and gutter). The border area along both sides of this typical section alternative includes a 2 foot wide curb and gutter for stormwater conveyance and a minimum 6 foot wide concrete sidewalk, located flush with the back of curb. The actual sidewalk width would vary up to 7 ½ feet and would be accomplished by relocating the existing curb line inward toward the existing roadway centerline. Existing curb inlet tops would be replaced and additional drainage structures would be required to tie into the existing stormwater conveyance system. These improvements would be accommodated within the existing 80 foot right-of-way.

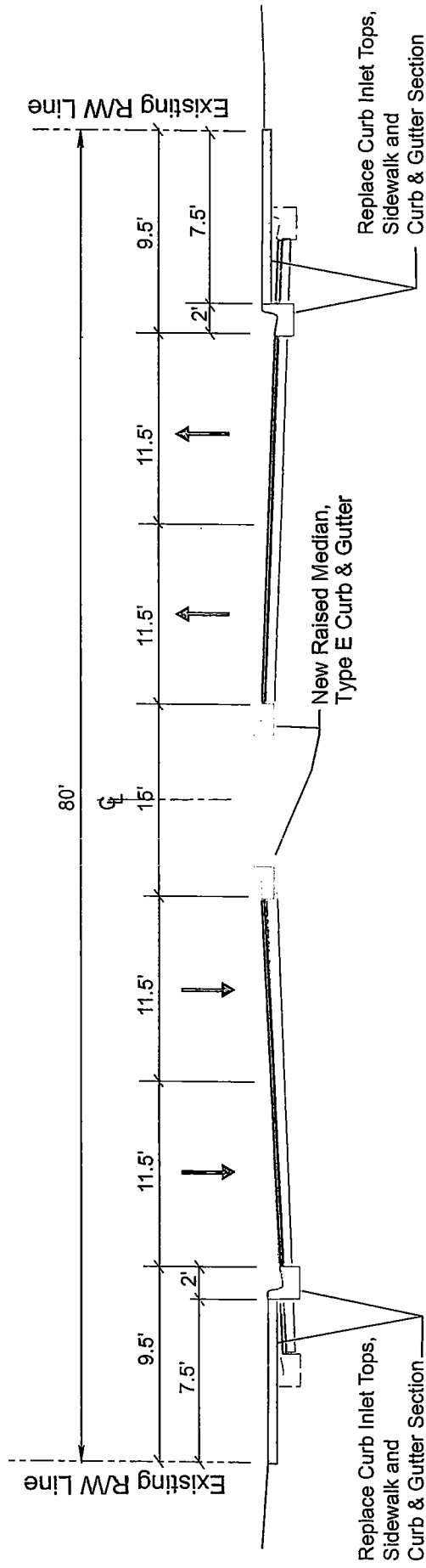
The initial Lee Road Extension Typical Section alternative is shown on Figure 8-5. Situated within a 100 foot right-of-way, the extension would represent a new alignment location. Four (4) 12 foot wide travel lanes would be provided, two (2) in each direction, separated by a 22 foot raised median. A 15 foot wide border area would be provided and would support a 2 foot wide curb and gutter system, 3 foot wide grass strip, 5 foot wide concrete sidewalk and 5 foot wide area to tie into existing grade along both sides of the proposed extension.



Four-Lane Urban Typical Section (Raised Median)
 From Orange Avenue to Lee Road
 Existing Posted Speed: 35 mph

Alternative Typical Section Number 3

Figure 8-3



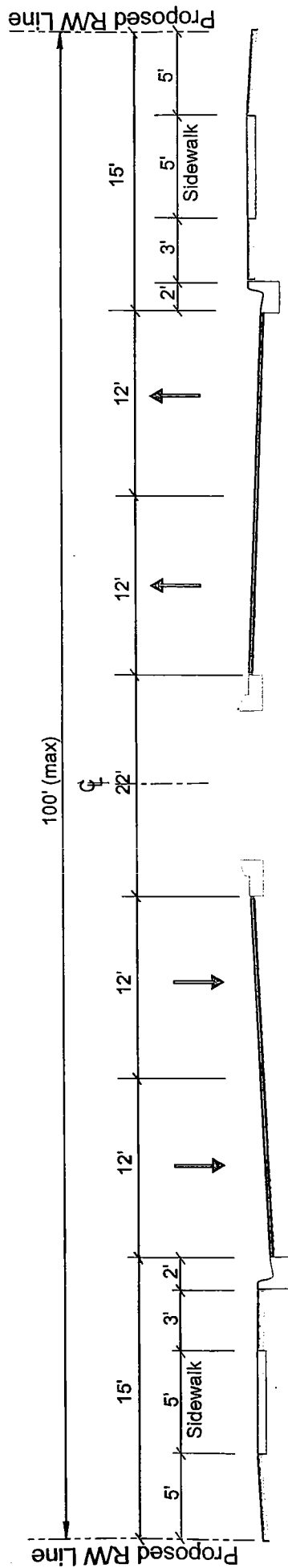
Four-Lane Urban Typical Section (Raised Median)

From Orange Avenue to Lee Road

Existing Posted Speed: 35 mph

Alternative Typical Section Number 4

Figure 8-4



Four-Lane Urban Typical Section
From SR 15/600 US (17/92) to Denning Drive
Posted Speed: 35 mph

Initial Lee Road Extension Typical Section

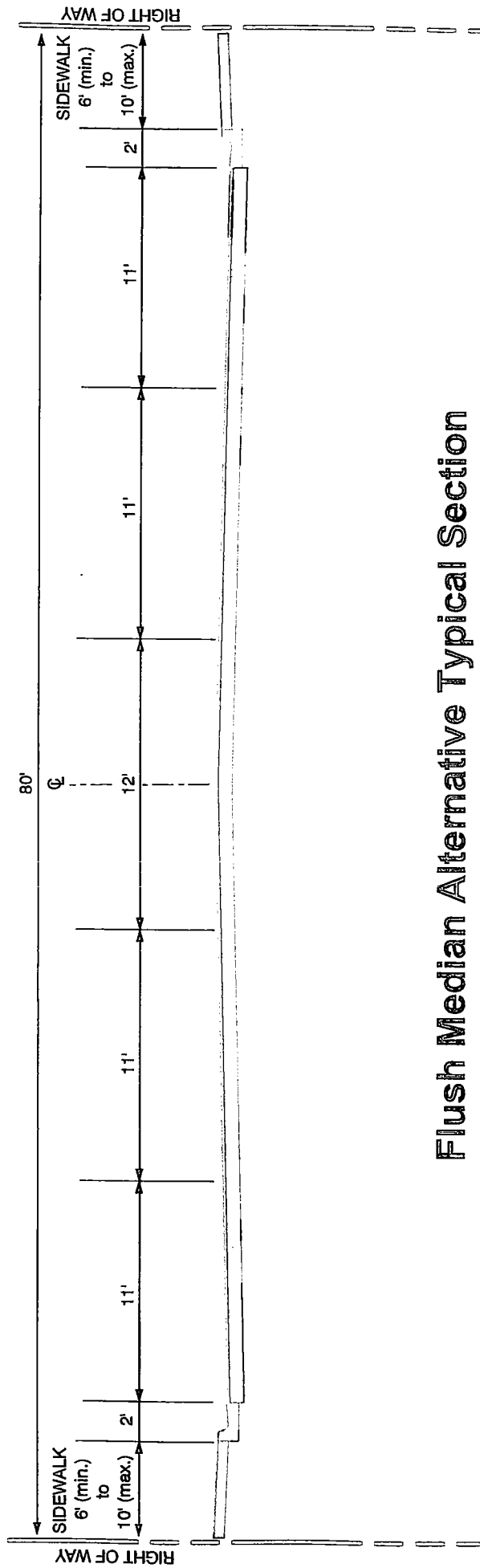
Figure 8-5

In May 2002, the City of Winter Park initiated an independent study of an additional typical section alternative for the SR 15/600 (US 17/92) mainline improvement. This alternative is shown in Figure 8-6 and provides four (4) 11 foot wide travel lanes, two (2) in each direction, separated by a 12 foot wide flush median (continuous two-way center left-turn lane). The border area along both sides of this alternative would support a 2 foot wide curb and gutter system and a minimum 6 foot wide concrete sidewalk, located flush with the back of curb. The actual sidewalk width would vary up to 10 feet and would be accomplished by relocating the existing curb line inward toward the existing roadway centerline. Existing curb inlet tops would be replaced and additional drainage structures would be required to tie into the existing stormwater conveyance system. These improvements would be accommodated within the existing 80 foot right-of-way.

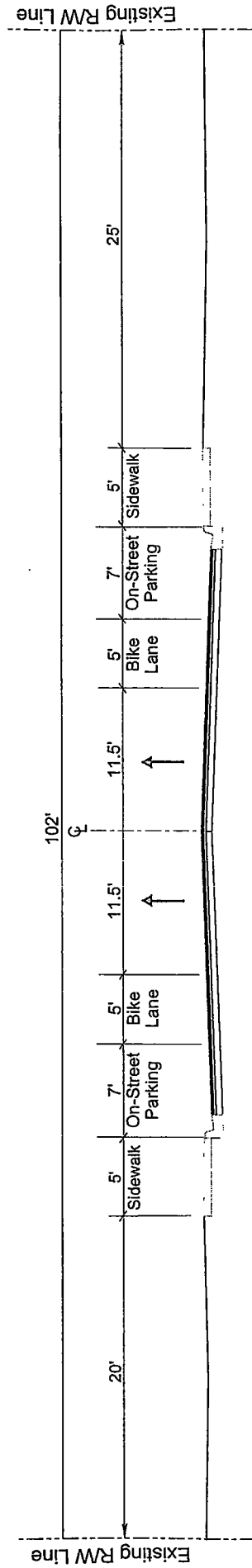
The City of Winter Park completed its development of the Flush Median Alternative in September 2002. The City also advised FDOT of its plan to modify the existing four-lane Denning Drive corridor and developed an improvement alternative for Denning Drive that consists of a two (2) lane undivided collector (one lane in each travel direction) with on-street parking, bicycle lanes and sidewalks along both sides of the proposed roadway. The City of Winter Park's proposed typical section for Denning Drive is shown in Figure 8-7.

A series of coordination meetings were subsequently held with the City of Winter Park during the evaluation of the alternatives described above. Several issues were discussed regarding the advantages and disadvantages of a Raised Median Alternative (Figures 8-1 through 8-4) and a Flush Median Alternative (Figure 8-6). Additional factors were evaluated for these mainline improvement alternatives including: safety and access management; construction impacts related to relocating the existing curb line and overall constructability of the proposed roadway improvements; maintenance of traffic during construction; opportunities for bicycle, pedestrian and landscape features; capacity of parallel corridors (ie Denning Drive, Harper Street, Executive Drive); signal modifications at Webster Avenue and Solana Avenue; and, the Lee Road Extension. Below is a summary of these evaluation factors.

Safety and Access Management: Case studies from Florida and throughout the United States have shown that the potential for crash occurrences may be reduced along heavily congested facilities such as SR 15/600 (US 17/92) when median modifications are introduced. Restricted left-turns and limited median openings reduce the potential for turning movement conflicts. Proper channelization and the



Flush Median Alternative Typical Section



Denning Drive Proposed Typical Section

(Typical Section Based on Isometric Rendering from Glatting Jackson Kercher Anglin Lopez Rinehart, Inc. & City of Winter Park)

Figure 8-7

use of left turn lanes at signalized intersections also helps minimize vehicular conflicts. Median modification as an access management tool has been successful on similar corridors in Central Florida. In most cases, however, the ability to negotiate u-turns at mid-block openings or at signalized intersections has contributed to the success of these improvements. Given the right-of-way and pavement width constraints along SR 15/600 (US 17/92) from Orange Avenue to Lee Road, provisions for u-turns at select locations would require right-of-way acquisition. Due to the commercialized nature of the existing corridor, right-of-way acquisition for any type of improvement will be costly. The use of parallel corridors such as Denning Drive, Harper Street and Executive Drive becomes even more important in developing an access management strategy that minimizes disruption to existing travel patterns.

For Alternative Typical Sections Number 1, 2, 3 and 4, a viable access management plan would need to be developed to maintain an acceptable level of service for access to adjacent properties. The Flush Median Alternative essentially maintains the existing travel behavior pattern with regard to access to adjacent properties to and from the mainline.

Construction Impacts: Several construction and constructability issues were evaluated during the alternatives analysis for SR 15/600 (US 17/92). Among the most significant of these issues was the proposed relocation of the existing curb line associated with Alternative Typical Section Number 4 and the Flush Median Alternative. An extensive analysis of this condition was performed and concluded that the relocation of the curb line for either a Raised Median Alternative or Flush Median Alternative would be viable. The relocation of the curb line for the Flush Median Alternative involves more distance; however, it allows more opportunity to develop a wider sidewalk.

Overall constructability of the proposed roadway improvements was another construction-related issue addressed during the study. Portions of the existing concrete pavement will need to be removed to accommodate either alternative. The placement of existing and proposed longitudinal joints along the existing vehicle wheel path may pose an operational problem. In addition, the existing roadway was constructed using a parabolic crown. Impacts to the existing and proposed cross slope were evaluated for Alternative Typical Section Number 4 and the Flush Median Alternative, both of which propose to relocate the existing curb line toward the roadway centerline.

Maintenance of Traffic (MOT) During Construction: This is an important element in the alternatives analysis and affects each concept, particularly the alternatives that propose to relocate the existing curb line.

MOT will be handled using standard FDOT Indices. Traffic will be shifted to one side using all existing pavement outside of the work zone and the drainage system/new curb will be constructed while traffic has been shifted. Work will then be shifted to the newly constructed side along with the remaining existing pavement to allow for construction of the opposite drainage system/new curb. The number of lanes to be maintained (4 versus 5) during construction will be determined by the existing traffic requirements.

Options may include shifting traffic and maintaining four (4) lanes which requires the two inside lanes to serve as both through and turn lanes. This provides the maximum work zone area. If traffic dictates, the work zone would be minimized and travel lane width reduced to provide a five (5) lane section. In either option, access to the existing businesses is critical. This is handled by standard details which specify "Business Entrance" signs. The median work will likely be completed after the outside work is completed. Due to right-of-way and traffic constraints, there may be no option except go to a four (4) lane section. All work will most likely be done behind concrete traffic barrier. This presents a problem due to the numerous openings required for businesses but is possible.

Pavement markings are removed through methods in the FDOT Specifications Book. These methods include water blasting or grinding. Water blasting may work best on the existing concrete pavement. Once the existing pavement markings are removed, temporary striping will be placed for the MOT either using tape or paint. Tape is ideal because it is easier to remove and reapply for the different lane shifts; however, there may be concerns with the temporary tape coming up during long durations. Final treatment of the concrete pavement should include a diamond grind of the entire area and then apply final pavement markings.

Bicycle, Pedestrian and Landscape Features: Each of the alternative typical sections would provide varying degrees of bicycle, pedestrian and landscape features.

Alternative Typical Section Number 1 provides a designated 4 foot wide bicycle lane facility adjacent to the outside travel lane in both directions; however, the existing 4 ½ foot wide sidewalk, which is located adjacent to the curb, would remain. This would not meet current FDOT standards established in the Plans Preparation Manual which specifies a minimum 6 foot wide sidewalk when located adjacent to the curb. Limited landscaping opportunities would be provided within the 13 foot wide median.

Alternative Typical Section Number 2 provides a 14 ½ foot wide outside travel lane in both directions which would accommodate experienced

bicyclists; however, the existing 4 ½ foot wide sidewalk, which is located adjacent to the curb, would remain. This would not meet current FDOT standards established in the Plans Preparation Manual which specifies a minimum 6 foot wide sidewalk when located adjacent to the curb. Landscaping opportunities would be improved compared to Alternative Typical Section Number 1 and would be accommodated within the 15 foot wide median.

Alternative Typical Section Number 3 also provides a 14 ½ foot wide outside travel lane in both directions which would accommodate experienced bicyclists; however, the existing 4 ½ foot wide sidewalk would be widened to the outside either by direct right-of-way acquisition or easement agreement. This would allow a minimum 6 foot wide sidewalk which meets current standards established in the FDOT Plans Preparation Manual. Landscaping opportunities would be improved compared to Alternative Typical Section Number 1 and would be accommodated within the 15 foot wide median. Additional roadside edge treatments may be accommodated within the wider sidewalk dimension.

Alternative Typical Section Number 4 would not accommodate bicyclists directly on the mainline. The existing 4 ½ foot wide sidewalk would be widened to the inside by relocating the existing curb line toward the existing centerline. This would allow a minimum 6 foot wide sidewalk which meets current standards established in the FDOT Plans Preparation Manual. Landscaping opportunities would be improved compared to Alternative Typical Section Number 1 and would be accommodated within the 15 foot wide median. Additional roadside edge treatments may be accommodated within the wider sidewalk dimension.

The Flush Median Alternative would not accommodate bicyclists directly on the mainline. The existing 4 ½ foot wide sidewalk would be widened to the inside by relocating the existing curb line toward the existing centerline. This would allow a minimum 6 foot wide sidewalk which meets current standards in the FDOT Plans Preparation Manual. Landscaping opportunities could be accommodated within the 12 foot wide median and would include pedestrian refuge islands at select locations. Additional roadside edge treatments may be and accommodated within the wider sidewalk dimension. This feature may be enhanced due to the additional width that would be available as compared to Alternative Typical Section Number 4.

Parallel Corridors: As previously mentioned, the use of parallel corridors such as Denning Drive, Harper Street, and Executive Drive is a vital part of the overall congestion management strategy regardless of which alternative is implemented. These off system facilities can be utilized to provide additional capacity, improve overall traffic operations,

provide alternate access to adjacent properties and provide bicycle facility alternatives. The latter is especially important for Alternative Typical Section Number 4 and the Flush Median Alternative where bicycle facility improvements directly on the mainline are not feasible.

Signal Modifications: The alternatives analysis included the evaluation of signal modifications particularly at Webster Avenue and Solana Avenue.

As previously mentioned, the removal of the existing signal at Webster Avenue was a condition of approval for construction of the Winter Park Village and installation of the traffic signal at Gay Road. Removal of the signal at Webster Avenue and the modification of the associated median opening are expected to enhance traffic operations in this area by providing the desirable distance between the remaining signals at Gay Road and Lee Road (minimum 1,320 foot spacing). The median modification at Webster Avenue would involve a northbound directional median opening allowing right turns in all four quadrants and left turns only in the SR 15/600 (US 17/92) northbound direction.

In the City of Winter Park's Corridor Master Plan for SR 15/600 (US 17/92), the existing Park Avenue signal was recommended to be removed and replaced by a signal at Solana Avenue, located approximately 800 feet south of Park Avenue. This was recommended to encourage utilization of Solana Avenue which has a direct connection to Denning Drive. This connection is utilized in the present condition as a "bypass" around the heavily congested SR 15/600 (US 17/92) corridor. The implementation of a signal at Solana Avenue was re-evaluated during the PD&E Study; however, it was determined that the Park Avenue signal should remain. A signal at Solana Avenue would potentially control the turning movements destined for the Denning Drive area; however, a full signal warrant analysis was not performed under this PD&E Study scope of services.

Lee Road Extension: Another critical element of the alternatives analysis is the potential extension of Lee Road from SR 15/600 (US 17/92) to a connection with Denning Drive at Solana Avenue. The Lee Road extension is anticipated to provide better distribution of traffic destined for the municipality of Winter Park and is anticipated to alleviate congestion at the SR 15/600 (US 17/92) intersection at Webster Avenue. This condition may be further alleviated by the removal of the existing signal at Webster Avenue.

Initially, the Lee Road extension was developed as a four-lane arterial which would connect to the existing four-lane Denning Drive. A total of three alignment alternatives were developed to determine the most viable location for this new alignment. Each of these alignment alternatives are

shown in Appendix C of this Report.

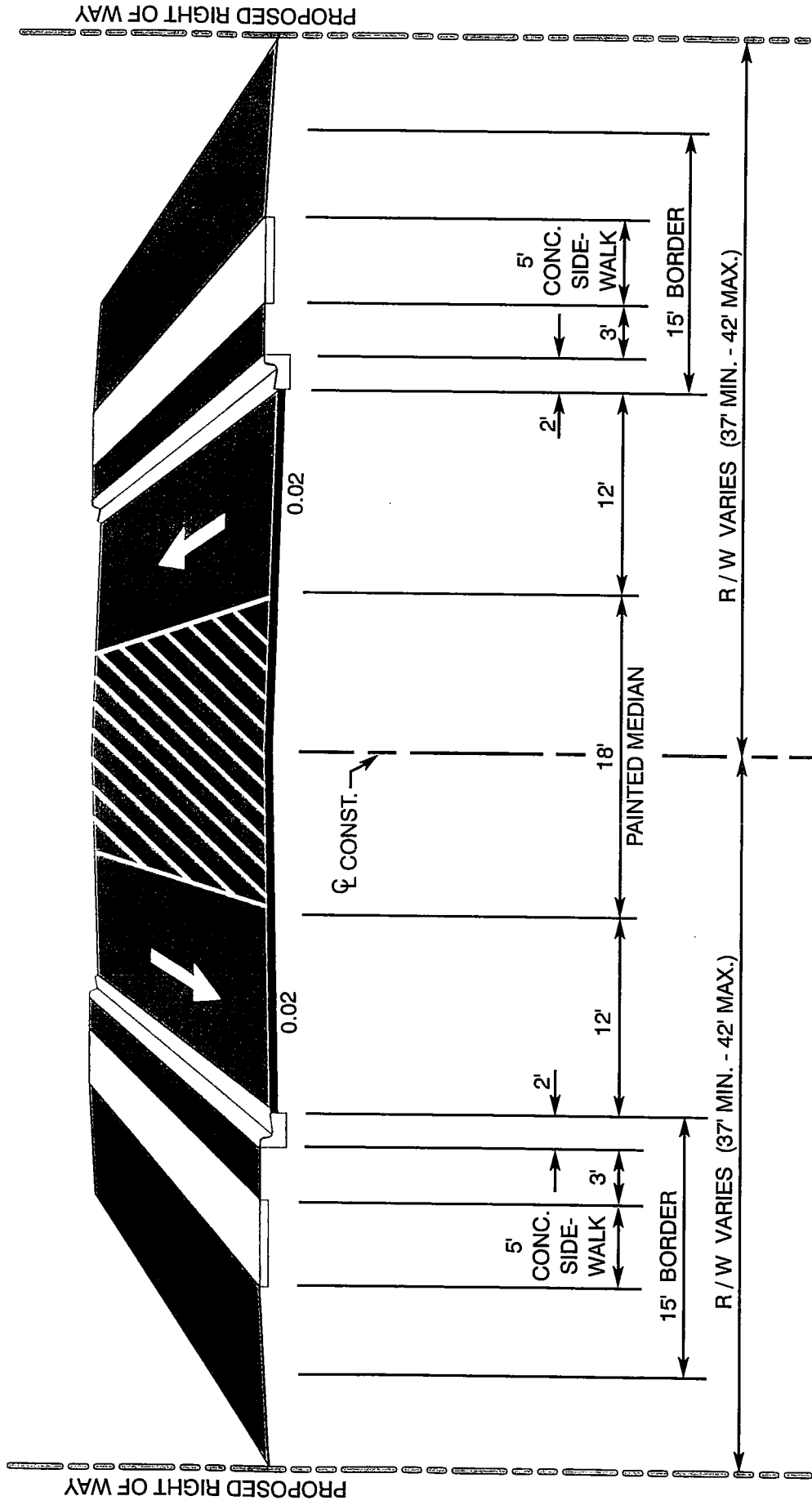
Based on the design year travel demand forecasts at the Lee Road intersection with SR 15/600 (US 17/92), the proposed intersection geometry would affect each of the existing intersection quadrants in varying degree, as shown on the concept maps located in Appendix C. Due to the City of Winter Park's alternative plans for the Denning Drive corridor, the typical section for the Lee Road extension was modified to a two-lane section as shown in Figure 8-8. This also allowed for a modification of the proposed intersection geometry at SR 15/600 (US 17/92) and minimized right-of-way impacts at this location. The revised Lee Road extension conceptual design is shown in Appendix C of this Report.

Based on the results of the alternatives analysis which included extensive coordination with the City of Winter Park, two (2) viable project alternatives were identified and retained for further evaluation. These include Alternative Typical Section Number 4, hereinafter referred to as the Raised Median Alternative, and the Flush Median Alternative. These were presented to the public at an Alternatives Public Meeting which was held on May 8, 2003. Aerial maps showing the viable project alternatives are located in Appendix C along with the revised Lee Road extension conceptual design.

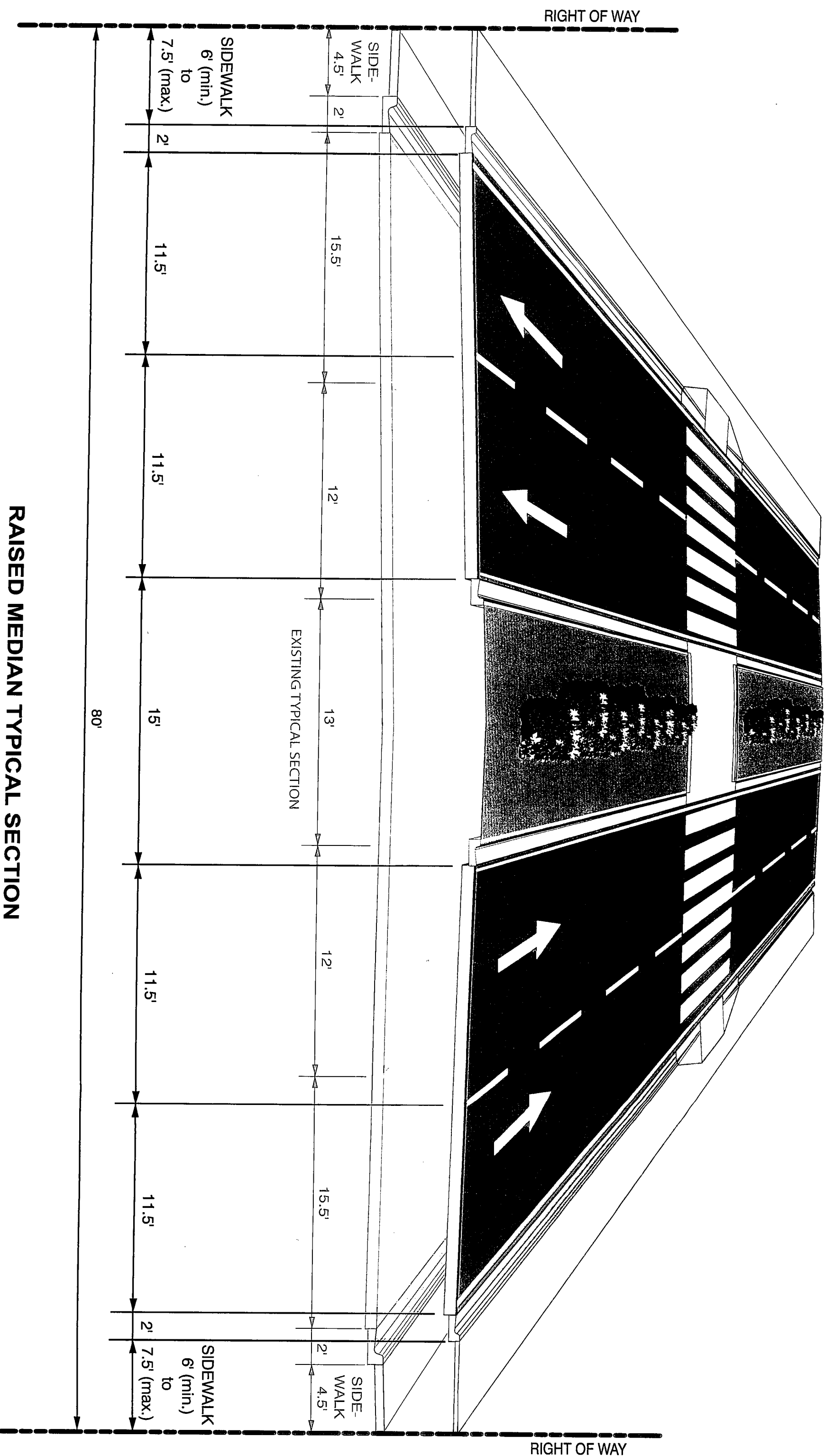
8.3.3 VIABLE ALTERNATIVES CONSIDERED FOR FURTHER STUDY

Based on the technical analysis performed for the SR 15/600 (US 17/92) PD&E Study, two (2) project alternatives were identified as viable alternatives for the proposed congestion management improvements. These are the Raised Median Alternative (Figure 8-9) and Flush Median Alternative (Figure 8-10). Below is a summary description of each alternative. Appendix C contains aerial photographs depicting the conceptual design elements of each alternative. Appendix C also contains the conceptual design plans for the proposed Lee Road extension which is common to both project alternatives.

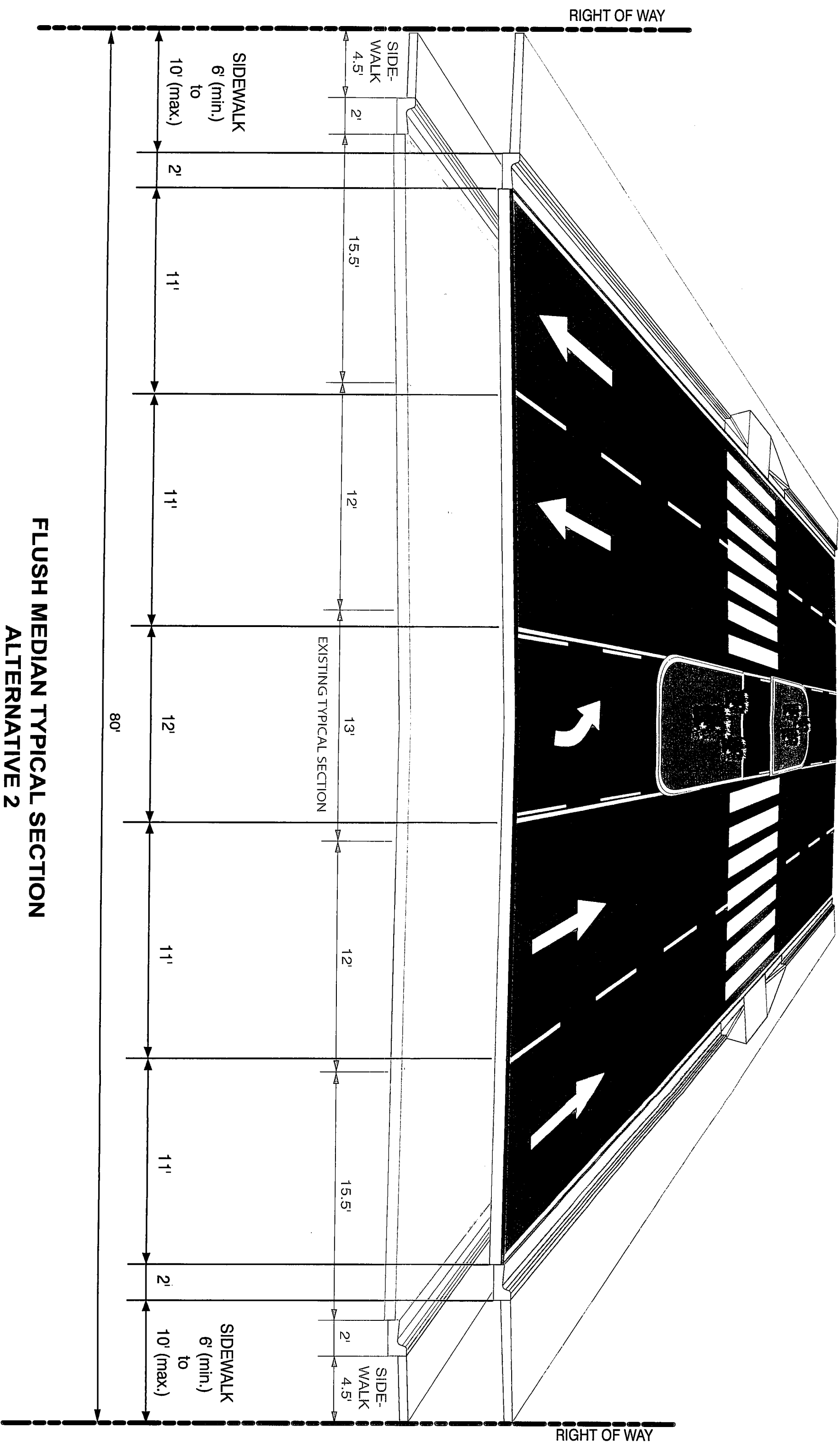
The Raised Median Alternative (Figure 8-9) provides four (4) 11 ½ foot wide travel lanes, two (2) in each direction, separated by a 15 foot wide raised median (with Type E curb and gutter). The border area along both sides of this typical section alternative includes a 2 foot wide curb and gutter for stormwater conveyance and a minimum 6 foot wide concrete sidewalk, located flush with the back of curb. The actual sidewalk width would vary up to 7 ½ feet and would be accomplished by relocating the existing curb line inward toward the outside travel lane. Existing curb inlet tops would be replaced and additional drainage structures would be required to tie into the existing stormwater conveyance system. These



Revised Lee Road Extension Typical Section



**RAISED MEDIAN TYPICAL SECTION
ALTERNATIVE 1**



improvements would be accommodated within the existing 80 foot right-of-way from Orange Avenue to Lee Road. Minor median modifications would be made in the segment from Norfolk Avenue to Orange Avenue and from Lee Road to Monroe Street. These improvements are shown in Appendix D.

This alternative provides a divided median and limits left turn movements to and from the mainline. Turn lane improvements are provided at major intersections and u-turns would be accommodated at select locations. Parallel corridors such as Denning Drive, Harper Street, Schultz Avenue and Balch Avenue would be utilized to provide traffic circulation and access management. Right-of way along the mainline would be required at the following locations:

- Southbound at Miller Avenue: Accommodates bus pull out. U-turns would be allowed at this location in the northbound direction between Orange Avenue and Minnesota Avenue.
- Fairbanks Avenue: Accommodates intersection improvements and bus pull outs. U-turns would be allowed in the northbound and southbound directions at this location.
- Beachview Avenue: Accommodates bus pull out. U-turns would be allowed in the northbound direction at this location between Fairbanks Avenue and Morse Boulevard.
- Symonds Avenue: Accommodates bus pull out. U-turns would be accommodated in the southbound direction at this location between Morse Boulevard and Gay Road.
- Trovillion Avenue: Accommodates bus pull out. U-turns would be accommodated in the northbound direction at this location between Morse Boulevard and Gay Road.
- Solana Avenue: Accommodates intersection improvements.

Additional median openings and turn lane geometry is shown on the conceptual design plans in Appendix D.

The Flush Median Alternative is shown in Figure 8-10 and provides four (4) 11 foot wide travel lanes, two (2) in each direction, separated by a 12 foot wide flush median (continuous two-way center left-turn lane). The border area along both sides of this alternative would support a 2 foot wide curb and gutter system and a minimum 6 foot wide concrete sidewalk, located flush with the back of curb. The actual sidewalk width would vary up to 10 feet and would be accomplished by relocating the

existing curb line inward toward the outside travel lane. Existing curb inlet tops would be replaced and additional drainage structures would be required to tie into the existing stormwater conveyance system. These improvements would be accommodated within the existing 80 foot right-of-way from Orange Avenue to Lee Road. Minor median modifications would be made in the segment from Lee Road to Monroe Street. These improvements are shown in Appendix D.

This alternative provides a flush median similar to the existing condition and essentially allows unrestricted left turn movements to and from the mainline. At select locations (shown in Appendix D) landscaped median islands with mountable curb would be provided. Parallel corridors such as Denning Drive, Harper Street, Schultz Avenue and Balch Avenue would be utilized to provide additional traffic circulation and access management. Right-of way along the mainline would only be required for this alternative at the Fairbanks Avenue intersection (westbound approach).

The City of Winter Park has verbally committed to continue evaluating access management strategies associated with the Flush Median Alternative including the modification of existing driveways along SR 15/600 (US 17/92). Through negotiation with existing property owners and during the implementation of its Community Re-development Plan, the City is in the process of consolidating driveway access points in order to reduce the number of conflict points along the mainline. The proposed driveway closures and/or consolidations documented to date (May 2003) are shown on the conceptual design plans for the Flush Median Alternative (Appendix D).

In addition, as part of the overall system improvements, Lee Road would be extended from its current terminus at SR 15/600 (US 17/92) to a connection with Denning Drive and Solana Avenue. The proposed typical section for this new alignment (Figure 8-8) would require up to 84 feet of right-of-way and would provide a 12-foot wide travel lane in each direction. Intersection improvements along the Lee Road extension would be made at SR 15/600 (US 17/92) and at Denning Drive/Solana Avenue (see Appendix D).

The proposed improvements for both typical section alternatives (Raised Median and Flush Median) include the removal of the existing Webster Avenue signal and development of a northbound directional median opening. Right turns would be permitted in all four quadrants of the Webster Avenue intersection; however, left turns would be restricted to the northbound SR 15/600 (US 17/92) direction only.

The proposed improvements for both typical section alternatives (Raised

Median and Flush Median) also include a potential new signal at Solana Avenue. It is recommended that a full signal warrant analysis be conducted in subsequent project development phases (ie: final design).

8.4 Evaluation Matrix

Each of the viable project alternatives described above were evaluated in terms of potential social, economic and environmental impacts. Table 8-1 shows the evaluation matrix which was prepared to summary these potential project impacts. Below is a brief summary of the potential project impacts associated with each of the viable project alternatives.

Raised Median Alternative: Twenty-six (26) existing properties would be impacted by this alternative. A total of six (6) residential relocations would be required which are associated with the Lee Road extension and up to three (3) businesses may be displaced. One (1) school site, the Orange County Vocational Technical School, would be impacted. Up to sixty-four (64) potential contamination sites may be impacted. Thirty-five of these sites are reported to have a Low probability of contamination while eight (8) have a Medium probability and twenty-one (21) have a High probability. The total estimated cost for this improvement, including the Lee Road extension, is up to \$20.77 million and is accounted for as follows:

Preliminary Engineering:	\$0.33 million
Right-of-way Acquisition:	\$16.7 million
Construction:	\$3.25 million
Construction Engineering and Inspection (CEI):	\$0.49 million
Total Project Cost:	up to 20.77 million

Flush Median Alternative: Fifteen (15) existing properties would be impacted by this alternative. A total of six (6) residential relocations would be required which are associated with the Lee Road extension and up to two (2) businesses may be displaced. One (1) school site, the Orange County Vocational Technical School, would be impacted. Up to sixty-four (64) potential contamination sites may be impacted. Thirty-five of these sites are reported to have a Low probability of contamination while eight (8) have a Medium probability and twenty-one (21) have a High probability. The total estimated cost for this improvement, including the Lee Road extension, is up to \$15.47 million and is accounted for as follows:

Preliminary Engineering:	\$0.28 million
Right-of-way Acquisition:	\$12.0 million
Construction:	\$2.77 million
Construction Engineering	

and Inspection (CEI):	\$0.42 million
Total Project Cost:	up to 15.47 million

8.5 *Preferred Alternative*

Based on the technical analysis performed for the SR 15/600 (US 17/92) PD&E Study and in consideration of the public and public agency input received during the study, the preferred build alternative was identified as the Flush Median Alternative as shown in Figure 8-10. Section 9.0 of this report summarizes the preliminary engineering details for this preferred alternative which was presented at a Public Hearing on November 13, 2003.

Evaluation Matrix

SR 15/600 (US 17/92) Project Development and Environment Study

From Norfolk Avenue to Monroe Street

Orange County, Florida

Financial Project ID Number: 408429-1-22-01



Evaluation Measure	Alternative 1 (Raised Median)	Alternative 2 (Flush Median)	No-Build
Travel Service			
Access Management	Left Turns Restricted	Left Turns Unrestricted	No Improvement
	Alternate Roadways	Alternate Roadways	
	U-turns at Select Locations	Driveway Modifications ⁽¹⁾	
Intersection Improvements	Yes	Yes	No Improvement
Extension of Lee Road	Yes	Yes	No Improvement
Bicycle Facility Improvements	Yes, Along Dehning Drive ⁽²⁾	Yes, Along Dehning Drive ⁽²⁾	No Improvement
Pedestrian Facility Improvements	Yes, 6-foot Minimum Sidewalk	Yes, 6-foot Minimum Sidewalk	No Improvement
Social/Cultural Environment			
Number of Parcels Impacted	26	15	None
Potential Residential Relocations	6	6	None
Potential Business Displacements	3	2	None
School Sites Impacted	1	1	None
Physical Environment			
Potential Contamination Sites Impacted	64 Total	64 Total	None
Low Potential	35	35	None
Medium Potential	8	8	None
High Potential	21	21	None
Project Costs (in Millions, 2002 dollars)			
Preliminary Engineering ⁽³⁾	\$0.33	\$0.28	\$0.00
Right-of-Way Acquisition	Up to \$16.7	Up to \$12.0	\$0.00
Construction ^{(4) (5)}	\$3.25	\$2.77	Annual Maintenance
Construction Engineering and Inspection ⁽⁶⁾	\$0.49	\$0.42	\$0.00
Total Project Costs	Up to \$20.77	Up to \$15.47	Annual Maintenance

Notes:

- (1) Driveway Modifications to be facilitated by the City of Winter Park.
- (2) Bicycle Facility Improvements will involve joint participation between FDOT and the cities of Maitland, Winter Park and Orlando.
- (3) Preliminary Engineering Costs estimated at 10% of total Construction Cost.
- (4) Construction Cost includes Basic Improvement, Lee Road Extension and contingencies for Legal and Administrative costs.
- (5) Construction Cost does not include improvements to be funded by the City of Winter Park.
- (6) Construction Engineering and Inspection estimated at 15% of total Construction Cost and includes Post Design Services.

9.0 PRELIMINARY DESIGN ANALYSIS

The following section presents the results of the preliminary design analysis conducted for the preferred project alternative which was identified in Section 8.7.

9.1 Design Traffic Volumes

The information in this section was developed from the document entitled SR 15/600 (US 17/92) Design Traffic Technical Memorandum prepared by Gyhabi and Associates, Inc. in October 2002. Gyhabi & Associates, Inc. was retained by the Florida Department of Transportation, District Five, to provide transportation engineering services in association with the Project Traffic for PD&E and Design contract. Their technical memorandum was prepared as part of the services covered under this contract pursuant to the Letter of Authorization for Work Order Number 5, dated November 19, 2001. The scope of the Design Traffic Technical Memorandum entailed the development of future traffic forecasts for no-build and build conditions and the evaluation of the characteristics and basic operational conditions of the corridor during the service life of the roadway improvement project.

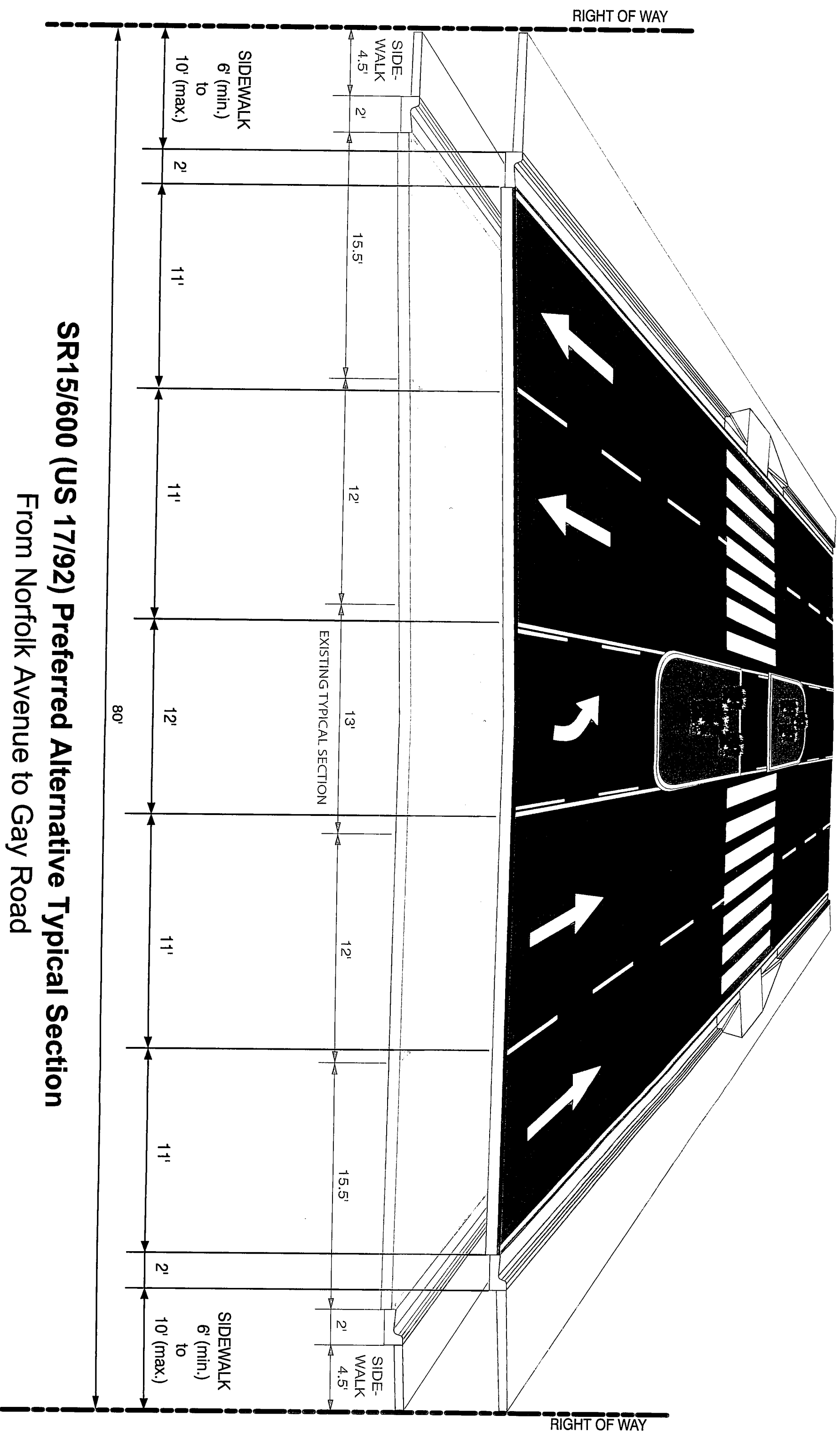
Table 9-1 below presents the recommended design characteristics for the SR 15/600 (US 17/92) PD&E Study.

Table 9-1 Recommended Design Characteristics for SR 15/600 (US 17/92)

Roadway Segment	Recommended		
	K ₃₀	D	T _{daily}
SR 15/600 (US 17/92)	8.80%	58.08%	3.13%
SR 426 (Fairbanks Avenue)	8.80%	58.08%	10.66%
SR 423 (Lee Road)	8.80%	58.08%	1.26%
Denning Drive	9.20%	55.61%	4.55%
Side Streets	9.20%	55.61%	3.13%

9.2 Typical Sections

The preferred typical section for the proposed improvements along SR 15/600 (US 17/92) is shown in Figure 9-1. This improvement would generally extend from Norfolk Avenue to SR 423 (Lee Road). This alternative provides four (4) 11 foot wide travel lanes, two (2) in each direction, separated by a 12 foot wide flush median (continuous two-way center left-turn lane).



The border area along both sides of the proposed improvement would support a 2 foot wide curb and gutter system and a minimum 6 foot wide concrete sidewalk, located flush with the back of curb. The actual sidewalk width may vary up to 10 feet and would be accommodated by relocating the existing curb line inward toward the center of the existing roadway. Existing curb inlet tops would be replaced and additional drainage structures would be required to tie into the existing stormwater conveyance system. These improvements would be accommodated within the existing 80 foot right-of-way. The preliminary engineering concept plans for these improvements are located in Appendix improvements are shown in Appendix B.

This alternative provides a flush median similar to the existing condition and would allow continuous two-way left turn movements to and from the mainline. Landscaped median islands, with mountable curb, are proposed in the vicinity of:

- Leith Avenue (between Camellia Avenue and Garden Drive);
- West Kentucky Avenue in the vicinity of the Chik-Fil-A restaurant;
- West New England Avenue near the Ranch Mall commercial center; and,
- North of Symonds Avenue near the Killarney Condominiums.

The median islands are intended to provide an optional alternative for pedestrian movements across SR 15/600 (US 17/92). The locations indicated above have generally been selected at mid-block locations between existing signalized intersections.

Parallel corridors such as Denning Drive, Harper Street, Schultz Avenue and Balch Avenue would be utilized to provide additional traffic circulation and access management. Right-of way for this alternative would only be required along the westbound approach of the SR 426 (Fairbanks Avenue) intersection.

The City of Winter Park is committed to evaluating additional access management strategies associated with the preferred alternative including the modification, elimination and/or consolidation of existing driveways along SR 15/600 (US 17/92). Through negotiation with existing property owners and during the implementation of its Community Re-development Plan, the City is in the process of consolidating driveway access points in order to reduce the number of conflict points along the mainline. The proposed driveway closures and/or consolidations documented as of the date of the SR 15/600 (US 17/92) Public Hearing (November 13, 2003) are shown on the conceptual design plans in Appendix B.

In addition, as part of the overall system improvements, SR 423 (Lee Road) would be extended from its current terminus at SR 15/600 (US 17/92) to a

connection with Denning Drive and Solana Avenue. The proposed typical section for this new alignment (Figure 9-2) would require up to 84 feet of right-of-way and would provide a 12-foot wide travel lane in each direction. Intersection improvements along the Lee Road extension would be made at SR 15/600 (US 17/92) and at Denning Drive/Solana Avenue, as shown on the conceptual design plans in Appendix B.

9.3 *Intersection Concepts and Signal Analysis*

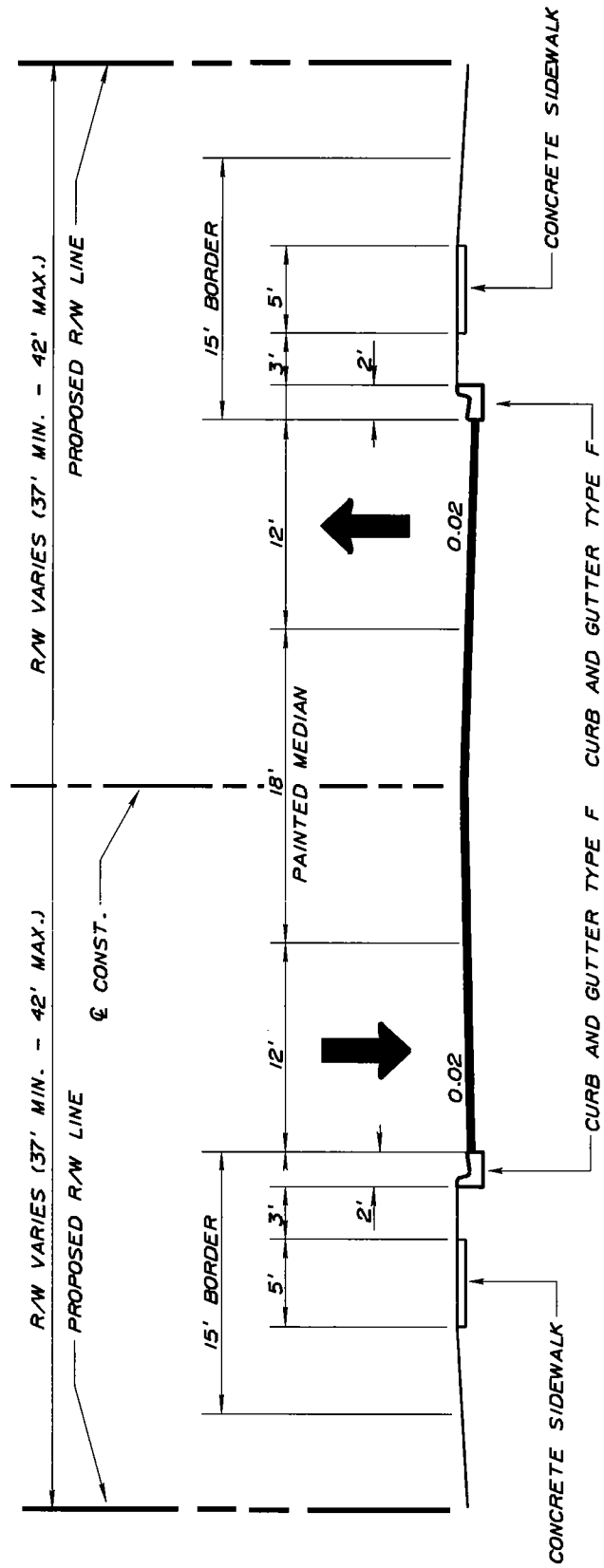
Appendix B contains a set of preliminary engineering plans which shows the conceptual design for intersections along SR 15/600 (US 17/92). Due to the developed nature of the project corridor, intersection improvements were developed to minimize and/or avoid significant right-of-way impacts. As shown on the conceptual design plans in Appendix B, a majority of the improvements involve re-stripping of existing turn lanes to increase turn lane storage with certain exceptions, as noted below:

SR 527 (Orange Avenue): Re-stripping of the eastbound and westbound legs along SR 527 to provide dual left-turn lanes and a combination through/right turn lane on the east and west legs. Signal re-timing and phasing may be required in subsequent project development to accommodate this improvement.

SR 426 (Fairbanks Avenue): Additional right-of-way is recommended in the northeast quadrant in order to provide additional left-turn storage for the westbound-to-southbound movement. The left-turn lane in the west leg of the intersection should also be lengthened as shown to provide additional storage for the eastbound-to-northbound movement.

Webster Avenue: As part of a previous condition of approval for the Winter Park Village, the FDOT had recommended that the existing signal at Webster Avenue be removed. This condition was imposed upon the approval of the existing signal at Gay Road, which is located approximately 800 feet south of the Webster Avenue intersection. This particular area, from Gay Road to Lee Road, was identified as one of the most heavily congested sections along SR 15/600 (US 17/92) due in part to the close signal spacing between the existing Gay Road, Webster Avenue and Lee Road signals. Lee Road is located approximately 750 feet north of Webster Avenue. The current spacing between these signalized intersections would not meet current access management criteria for signal spacing on this facility type.

The operational condition between Gay Road and Lee Road, particularly between Webster Avenue and Lee Road, was re-evaluated in the SR 15/600 (US 17/92) PD&E Study and as part of the preferred alternative, it is recommended that the existing signal at Webster Avenue be removed and a directional median opening be installed. The directional median opening would be developed to accommodate northbound left-turns at Webster Avenue.



SR 423 (Lee Road) Extension Preferred Alternative Typical Section

SR 423 (Lee Road): Improvements to the existing Lee Road intersection are recommended to accommodate the proposed Lee Road Extension to Denning Drive and to allow additional turn lane storage in the eastbound and northbound directions where dual left-turn lanes are proposed. In the eastbound direction, the proposed improvement includes the relocation of the eastbound directional median opening at Lewis Drive to Loren Avenue, located approximately 330 feet west of Lewis Drive. This will allow the development of increased turn lane storage along Lee Road. The proposed intersection details affecting Lee Road and the Lee Road Extension are shown in Appendix B.

Lee Road Extension/Denning Drive: As previously mentioned, the preferred alternative involves the extension of SR 423 (Lee Road) from its existing terminus at SR 15/600 (US 17/92) to a connection with Denning Drive near Solana Avenue. Figure 9-3 shows the proposed intersection layout for the connection at Denning Drive. This concept was developed with input from the City of Winter Park.

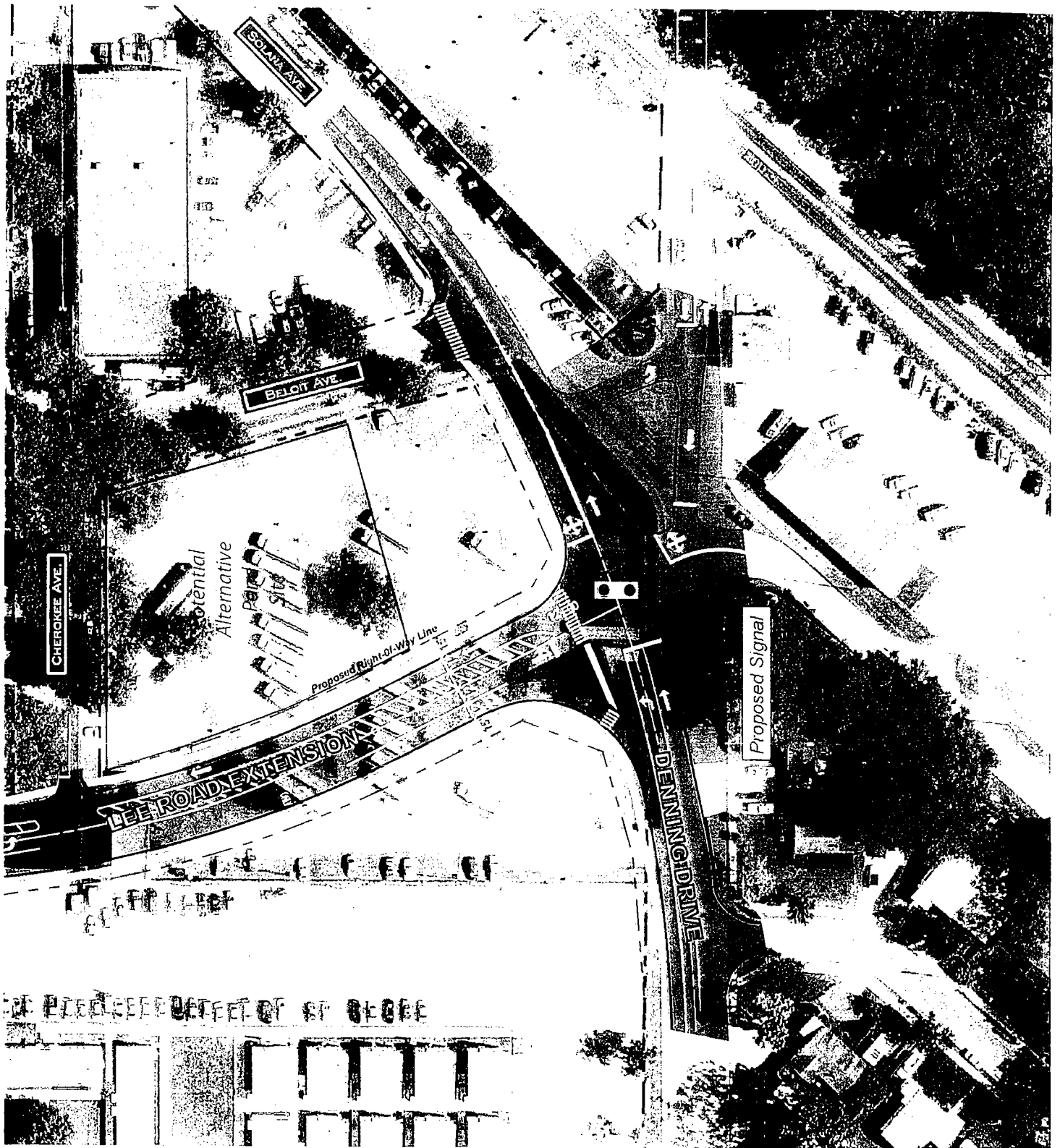
Solana Avenue: Solana Avenue is currently an un-signalized intersection located just south of the study termini near Monroe Street. Solana Avenue provides an alternate access to the Denning Drive corridor and motorists currently use this facility as an alternative to access Webster Avenue and the interior of Winter Park. Minor intersection improvements at the SR 15/600 (US 17/92) intersection with Solana Avenue are recommended as shown on the conceptual design plans in Appendix B. The intersection design concept shown at Solana Avenue would accommodate potential turn lane geometry for a signalized intersection. Based on public and public agency input received during the study, it is recommended that a Traffic Signal Warrant Analysis be conducted during final design at this location.

9.4 Alignment and Right-of-Way Needs

Right-of-way for the proposed improvements identified in this report is required at the following locations:

Fairbanks Avenue: Northeast quadrant of the intersection at the Winter Park Bowling Center.

Lee Road Extension: This improvement involves an alignment on new location and would require right-of-way acquisition. The Lee Road Extension concept and associated intersection improvements is shown in Appendix B. Alternative stormwater management concepts associated with the Lee Road Extension is also shown in Appendix B (Lee Road Extension approximate Station 6+00 and Station 10+00).



Lee Road Extension and Denning Drive

SR 15/600 (US 17/92) Project Development and Environment Study

From Norfolk Avenue to Monroe Street

Orange County, Florida

Financial Project ID Number: 408429-1-22-01

Solana Avenue: Right-of-way acquisition may be required in the southeast quadrant of this intersection in order to accommodate potential intersection improvement as shown in Appendix B. These improvements would improve the turning radii at the intersection and would allow additional turn lane storage for the southbound to eastbound left-turn. This design concept may be re-evaluated during subsequent project development and in conjunction with the Traffic Signal Warrant Analysis, if preformed.

9.5 Relocation

The preferred alternative and recommended stormwater management plan will not displace any single-family residences, multi-family residences, institutional facilities or other community facilities. Up to two (2) business relocations may be required as a result of the Lee Road Extension. These businesses are currently located in the Corporate Square business center in the northeast quadrant to the SR 423 (Lee Road) intersection at SR 15/600 (US 17/92). The potential business displacements should be re-evaluated in subsequent project development to ensure accuracy in the number and type of businesses potentially affected. The Corporate Square complex has experienced a high turn-over rate in the past.

9.6 Project Costs

9.6.1 RIGHT OF WAY COSTS

The preferred alternative as presented in this report, including the Lee Road Extension and proposed stormwater management areas, were plotted on aerial raster imagery depicting the acquisition of each impacted parcel. The area of the acquisition for each affected parcel was then estimated for FDOT's use in developing representative right-of-way costs.

The right-of-way costs, including administrative support costs, operational costs and land costs were estimated for each affected parcel. The total estimated right-of-way costs for the preferred alternative, based on 2003 dollars, is approximately \$12.0 million.

9.6.2 CONSTRUCTION COSTS

The estimated construction cost for the preferred alternative was estimated at \$2.77 million (based on 2003 dollars). This figure includes contingencies for legal and administrative fees, construction engineering and inspection (CEI). The construction cost estimate also includes additional drainage costs associated with the outfall pipe systems for each stormwater management area.

The construction cost estimate does not include additional features which may potentially be funded by the City of Winter Park. These additional

features include additional sidewalk width beyond the 6-foot maximum provided by FDOT, pedestrian refuge islands, brick texture overlay for the continuous two-way center turn lane, and landscaping/streetscaping amenities.

9.6.3 PRELIMINARY ENGINEERING COSTS

The estimated Preliminary Engineering cost for the preferred alternative is approximately \$1,500,000.00 which includes field survey, roadway design, drainage design, signing and marking plans, maintenance of traffic plans and other contingency items.

9.6.4 ENVIRONMENTAL MITIGATION

Impacts to natural environment features such as jurisdictional wetlands and critical wildlife habitat are not expected to occur; therefore, environmental mitigation costs are not anticipated.

9.6.5 TOTAL PROJECT COSTS

The total cost of the preferred alternative, including preliminary engineering, right-of-way acquisition and construction, is estimated at \$16.27 million, based on 2003 dollars.

9.7 *Recycling and Salvageable Material*

The opportunity to recycle any salvageable materials by the contractor is encouraged by the FDOT. Any salvageable materials will be identified during the final design of the project. If these materials should be removed from the construction site, it is to be done as specified in the current FDOT Standard Specifications for Road and Bridge Construction. It is anticipated that a majority of the existing concrete pavement will be salvaged.

9.8 *User Benefits*

Highway user costs are defined by AASHTO's A Manual on User Benefit Analysis of Highway and Bus-Transit Improvements, 1977, as the sum of (1) motor vehicle running costs, (2) the value of the vehicle user travel time and (3) traffic accident cost. User benefits are the cost reductions and other advantages that occur to highway motor vehicle users through the use of a particular transportation facility as compared with the use of another. Benefits are generally measured in terms of a decrease in user costs. The preferred alternative provides user benefits to the extent that it reduces user costs as compared to the "No Project" concept that will operate entirely at an unacceptable level of service. In addition, the improved access management provided with the project should reduce the occurrence rate of many accident types on the roadway.

9.9 *Pedestrian and Bicycle Facilities*

The proposed action includes the reconstruction and widening of existing concrete sidewalks. These improvements would be designed to meet current standards established in the FDOT Plans Preparation Manual. As a minimum, a six-foot wide continuous concrete sidewalk, flush with the back of curb, would be provided on both sides of the roadway from Orange Avenue to Lee Road. This improvement would tie into existing sidewalks south of Orange Avenue and north of Lee Road.

The City of Winter Park has expressed a desire to provide additional sidewalk width and to incorporate opportunities for streetscaping and/or roadside beautification. The additional concrete sidewalk width and potential streetscaping and/or roadside beautification features would be funded by the City of Winter Park and would need to meet FDOT design and permitting standards.

The preferred alternative was developed in association with the City of Winter Park. Due to physical constraints in the existing right-of-way and the desire to minimize and/or avoid significant right-of-way acquisition, the existing bicycle facility along SR 15/600 (US 17/92), which consists of a wide outside travel, would be displaced by the proposed improvement. The City of Winter Park is committed to developing an off system bicycle facility that would be coordinated with the Cities of Orlando and Maitland to ensure compatibility with proposed bicycle system plans south (Orlando) and north (Maitland) of the project. The City of Winter Park has indicated that the proposed off system bicycle facility would involve Denning Drive and would include transitions into and out of the SR 15/600 (US 17/92) at signalized intersections.

9.10 *Safety*

Safety is a major aspect in the development of the project. Improved pavement conditions, adequate drainage systems, sight distances, roadway geometry, signalization improvements, access management, clear recovery areas and pedestrian and bicycle features are all proposed to improve the safety of this roadway.

9.11 *Economic and Community Development*

A majority of the existing land uses found within the study area are commercial. Future land uses are expected to remain predominately commercial. The project will not adversely impact any proposed community development or redevelopment activities.

9.12 Environmental Impacts

Detailed studies and evaluations were conducted to determine the potential for adverse impacts that may result from the proposed project. Baseline data, evaluation procedures and analysis of results are contained in the project files and the following reports: Cultural Resources Assessment Survey; Wetland Evaluation Report; Wildlife Habitat Assessment; Air Quality Report; Noise Study Report; and Contamination Screening Evaluation Report. Due to the developed nature of the study area, the potential for environmental impacts is relatively low within the existing right-of-way. Therefore, the selection of the preferred alternative was not primarily influenced by these factors.

Based upon the findings of the study, 64 sites located along the project corridor have the potential for hazardous materials or petroleum contamination. Of the 64 sites, 35 have been assigned a contamination risk potential of Low, 8 were assigned a risk potential rating of Medium and 21 were assigned a risk potential rating of High.

The sites which were rated High (21 total) or Medium (8 total) should be further investigated during the remaining pre-construction phases. This would include, at a minimum, performing a petroleum contamination assessment (PCA) at each of these sites. Should cleanup procedures be required, FDOT will implement a plan prior to, or during construction, if feasible. Special provisions for handling unexpected contamination discovered during construction will be included in the construction plans package. The potential contamination concerns are not anticipated to affect or delay project implementation significantly. No substantial contamination involvement is anticipated.

9.13 Utility Impacts

The final design of this project will be coordinated with the existing utility owners in such a way as to minimize adjustments and disruption of service. The majority of the utilities are situated on FDOT owned right-of-way by maintenance permits and would be relocated at the owner's expense. All utility providers have been notified about the project.

Utility owners within the study area include: the City of Winter Park (potable water and sanitary sewer); the City of Maitland (potable water and sanitary sewer); TECO/Peoples Gas (natural gas); Progress Energy (overhead and underground electric transmission and distribution, including an active sub-station located along SR 15/600 (US 17/92) at Canton Avenue); and, numerous telecommunications, fiber optic and cable companies including Brighthouse Networks, Bell South, Sprint, Sprint Metropolitan, Level 3, Adelphia Business Solutions, Williams Communications, EPIK Communications, MCI Worldcom, AT&T, FP&L FiberNet, and Progress Telecom.

9.14 Traffic Control Plan

A detailed Traffic Control Plan (TCP) will be developed based upon the procedures outlined in Part IV of the MUTCD and Standard Index No. 600 and 624 of FDOT's Roadway and Traffic Design Standards during the design phase of the project. The TCP will include time limitations on the construction activities if necessary to maintain access to adjacent businesses. It will also address how pedestrian traffic will be maintained.

The conceptual plan is as follows. Traffic would be shifted to one side using all existing pavement outside of the work zone and the drainage system/new curb will be constructed while traffic has been shifted. Work will then be shifted to the newly constructed side along with the remaining existing pavement to allow for construction of the opposite drainage system/new curb. The number of lanes to be maintained (4 versus 5) during construction will be determined by the existing traffic requirements at the time of construction.

Options may include shifting traffic and maintaining four (4) lanes which requires the two inside lanes to serve as both through and turn lanes. This provides the maximum work zone area. If traffic dictates, the work zone would be minimized and travel lane width reduced to provide a five (5) lane section. In either option, access to the existing businesses is critical. This is handled by standard details which specify "Business Entrance" signs. The median work will likely be completed after the outside work is completed. Due to right-of-way and traffic constraints, there may be no option except go to a four (4) lane section. All work will most likely be done behind concrete traffic barrier. This presents a potential problem due to the numerous openings required for businesses but is possible.

Pavement markings may be removed through methods in the FDOT Specifications Book. These methods include water blasting or grinding. Water blasting may work best on the existing concrete pavement. Once the existing pavement markings are removed, temporary striping will be placed for the MOT either using tape or paint. Tape is ideal because it is easier to remove and reapply for the different lane shifts; however, there may be concerns with the temporary tape coming up during long durations. Final treatment of the concrete pavement should include a diamond grind of the entire area and then apply final pavement markings.

It is recommended that a community action plan (CAP) be developed to effectively disseminate public information during construction. Every effort to maintain access to existing business and residential land uses must be made during construction. Disruption to normal operations in these areas must be kept to a minimum.

9.15 Public Involvement

A Public Involvement Program was prepared for the project and an extensive public involvement and public agency coordination program was conducted for this project. This program was developed in compliance with "Project Development and Environment Manual"; Section 339.155, Florida Statute; Executive Orders 11990 and 11988; CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act; and 23 CFR 771. The public involvement and public agency coordination program consisted of several components including Advance Notification, general public involvement (workshops, hearings, small group meetings), a Project Advisory Group (PAG) and local government agency coordination which included the City of Winter Park, the City of Orlando, the City of Maitland, Orange County and the Orlando urban area metropolitan planning organization known as METROPLAN ORLANDO.

The Advance Notification Package was mailed to the Florida State Clearinghouse and local and Federal agencies on February 21, 2002.

As part of the public agency coordination effort, several meetings were held with representatives of local government agencies throughout the course of the study. These included with the City of Orlando, FDOT, and the City of Winter Park. Formal presentations were also provided to METROPLAN ORLANDO and its standing committees at specific project milestone events, as follows:

Project Kickoff: A project kickoff presentation was provided during the January and February 2002 series of METROPLAN ORLANDO meetings.

Project Update: Prior to the Alternatives Public Meeting, a project update was provided to METROPLAN ORLANDO and its committees during the March and April, 2003 series of meetings.

In December 2001, a project kickoff presentation was provided to the City of Winter Park City Council. In May 2002, the City of Winter Park stated that they wished to partner with the FDOT on the SR 15/600 (US 17/92) PD&E Study. Subsequent coordination with the City of Winter Park included the following:

- **June 2002** - An Introductory partnering meeting was held including representatives from the FDOT, the City of Winter Park and their consultants.
- **July 2002** - Design charrettes facilitated by the City of Winter Park were held to involve the community in preliminary project planning.
- **August 2002** - A presentation was made by City staff to the City of

Winter Park City Council summarizing the results of the charrettes.

- **January – March 2002** – Project coordination meetings were held with the City of Winter Park and their consultants to develop, refine and evaluate the project alternatives.
- **June 2003** - A neighborhood meeting, facilitated by the City of Winter Park, was held with the members of the Sunnyside Homeowners' Association and the Park Grove Homeowners' Association.
- **September 2003** – The City of Winter Park conducted a Public Hearing on September 22, 2003 and approved a resolution of support endorsing the multimodal transportation and safety enhancements developed by FDOT.

The PAG was considered a key component of the SR 15/600 (US 17/92) public involvement program. The core PAG consisted of community residents and business owners within the study area. Technical members of the METROPLAN ORLANDO's standing committees included members from the Transportation Technical Committee (TTC) and the Bicycle/Pedestrian Advisory Committee (B/PAC). Agency and local government representation included staff from METROPLAN ORLANDO, Orange County, the City of Winter Park, the City of Maitland, and FDOT. Two (2) PAG meetings were held during the SR 15/600 (US 17/92) study. The PAG was utilized to identify key project issues and develop solutions for addressing certain areas of concern relating to the community.

Several small group meetings and two (2) informal public workshops were held during the study to introduce the project to the general public and to receive public input into the planning process. A series of three (3) project newsletters were developed and distributed throughout the study process. These were used to disseminate project information and to announce upcoming public meetings. Distribution of the project newsletters was accomplished through direct mail to property owners, business owners/operators, elected and appointed officials, and other interested persons. In addition, the newsletters were distributed through the public school system as well as various apartment complexes and condominium associations within the study area. The volume of newsletters distributed varied from 1,800 to 4,200.

Small group meetings were held with residents of the Orwin Manor neighborhood and business owners in the study area.

The first public workshop was held on April 23, 2002 for the purpose of identifying the project limits and proposed scope of work. Approximately 41 persons attended and there was no stated opposition to the project. On May 8, 2003 an Alternatives Public Workshop was held to present the results of the conceptual design analysis and identify the viable project alternatives for the

interim solution. Approximately 81 persons attended. Opposition to the Lee Road extension was voiced by several members of the communities located near and north of Park Avenue and Denning Drive.

On November 13, 2003, a formal Public Hearing was held to which approximately 85 persons attended. Written comments which were submitted as part of the official Public Hearing record as well as the Public Hearing Transcript and Summary are documented under separate cover.

FDOT developed the proposed project with input and consensus from representatives from local government agencies including METROPLAN ORLANDO, and the City of Winter Park, as well as from the general community. As a result of this extensive public involvement program, potential public controversy was minimized.

9.16 Drainage

The preferred alternative for the mainline improvement requires modification of the existing stormwater management and drainage system. The work involves relocating the existing curb line along both sides of the roadway inward toward the center of the existing roadway. The existing curb may be relocated up to 5.5 feet inward along certain sections to accommodate the proposed roadway typical section.

Curb inlets will need to be added to the roadway to maintain an acceptable spread condition while moving the curb lines inward. During the conceptual drainage analysis for the PD&E Study, it was assumed that at least the existing spread conditions would need to be maintained which would necessitate a total of 142 new inlets. This includes replacement of 79 existing curb inlets and the addition of 63 new inlets along the project length. The specific drainage retrofit requirements for the preferred alternative typical section, assuming the requirement to at least maintain existing spread conditions are reflected in the table below. The preliminary drainage analysis also revealed that if the facility were subject to current spread requirements for new roadways, 162 new inlets would be required, bringing the total number of inlets to 241.

New P-5 Curb Inlet with Pipe Work	39
New P-5 Curb Inlet with Pipe Work and P-7 Manhole	63
New P-5 Curb Inlet	<u>40</u>
Total Number of New Inlets	142

Estimated Construction Cost (Drainage Items Only) \$671,000

An important consideration regarding the drainage retrofit work is the necessary excavations and associated potential for utilities conflicts/relocates. The SR 15/600 (US 17/92) corridor is a well-established urban corridor with many

existing utilities. The drainage retrofit associated with the preferred alternative typical section involves 102 new curb inlets with piping likely to cause utility conflicts.

For the Lee Road Extension, the new roadway design will include Type 'F' curb and gutter, standard FDOT inlets and piping to route surface runoff to the stormwater management system. The proposed stormwater management system includes a stormwater retention pond along the proposed new alignment to serve the new roadway. The proposed retention pond was sized conceptually using St. Johns River Water Management District (SJRWMD) criteria for retention volume in a closed basin and treatment volume requirements for a new roadway. The proposed retention pond was conceptually designed to outfall to the existing Lake Francis system, which is a surface water controlled by a drainage well.

Two (2) alternative pond locations for the stormwater management system described above were developed as shown on the conceptual design plans located in Appendix B.

9.17 Bridge Analysis

This section does not apply since no bridge structures are located within the proposed project limits.

9.18 Special Features

The FDOT and City of Winter Park have agreed to continue working together in developing special features including: the use of a brick texture on the surface of the proposed continuous two-way center turn lane; wider sidewalks; the placement of mid-block pedestrian cross walks and median islands; the development of an off-system bicycle facility for experienced bicyclists; and, potential streetscaping and beautification amenities.

9.19 Access Management

The City of Winter Park has developed a conceptual plan for additional access management features and will continue to coordinate these improvements with FDOT during subsequent project development. These features include the consolidation and/or removal of certain driveway connections along SR 15/600 (US 17/92) during future land development and re-development activities as well as promoting the use of parallel off-system roadway networks such as Harper Street and Balch Avenue, both of which provide north-south travel and access alternatives to SR 15/600 (US 17/92) and Denning Drive.

9.20 *Aesthetics and Landscaping*

The City of Winter Park has developed a conceptual plan for proposed aesthetic and streetscaping features and will coordinate these improvements with FDOT during subsequent project development. These features include potential landscaping along the proposed sidewalk, brick texture along the continuous two-way center left-turn lane and pedestrian refuge islands with limited landscaping. The cost of these enhancements would be borne by the City of Winter Park through an executed Memorandum of Understanding and Joint Participation Agreement with FDOT.

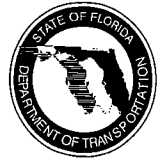
9.21 *Summary of Preferred Alternative*

Table 9-2 provides a summary of the preferred alternative presented in this Section.

Table 9-2

Evaluation Matrix

SR 15/600 (US 17/92) Project Development and Environment Study
From Norfolk Avenue to Monroe Street
Orange County, Florida
Financial Project ID Number: 408429-1-22-01



Evaluation Measure	Preferred Build Alternative (Flush Median)	No-Build
Travel Service		
Access Management	Left Turns Unrestricted	No Improvement
	Alternate Roadways	
	Driveway Modifications ⁽¹⁾	
Intersection Improvements	Yes	No Improvement
Extension of Lee Road	Yes	No Improvement
Bicycle Facility Improvements	Yes, Along Denning Drive ⁽²⁾	No Improvement
Pedestrian Facility Improvements	Yes, 6-foot Minimum Sidewalk	No Improvement
Social/Cultural Environment		
Number of Parcels Impacted	15	None
Potential Residential Relocations	0	None
Potential Business Displacements	2	None
School Sites Impacted	1	None
Physical Environment		
Potential Contamination Sites Impacted	64 Total	None
Low Potential	35	None
Medium Potential	8	None
High Potential	21	None
Project Costs (in Millions, 2003 dollars)		
Preliminary Engineering	\$1.50	\$0.00
Right-of-Way Acquisition	Up to \$12.00	\$0.00
Construction ^{(3) (4)}	\$2.77	Annual Maintenance
Total Project Costs	Up to \$16.27	Annual Maintenance

Notes:

- (1) Driveway Modifications to be facilitated by the City of Winter Park.
- (2) Bicycle Facility Improvements will involve joint participation between FDOT and the cities of Maitland, Winter Park and Orlando.
- (3) Construction Cost includes Basic Improvement, Lee Road Extension and contingencies for Legal and Administrative costs.
- (4) Construction Cost does not include improvements to be funded by the City of Winter Park.



APPENDIX A
Memorandum of Understanding
Between the City of Winter Park and FDOT
Dated June 2, 2004

MEMORANDUM OF UNDERSTANDING

THE STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION

And

THE CITY OF WINTER PARK, A MUNICIPALITY OF THE STATE OF FLORIDA

RECEIVED

JUN - 1 2004

FDOT-DISTRICT V
Cons. Project Mgmt.

WHEREAS, it is the policy of the State of Florida, Department of Transportation (Department) and of the City of Winter Park, a municipality of State of Florida (Winter Park) to cooperate with each other in order to maximize the use and allocation of the monetary resources each are entrusted with, and

WHEREAS, the parties hereto mutually agree that the extension of Lee Road from US 17-92 to Denning Drive and the improvements on US 17/92 from Norfolk Avenue to Monroe Street, will benefit the traveling public and will enhance the transportation system in the area, and

WHEREAS, the parties further agree that the construction of a bicycle trail along Denning Drive within the City limits of Winter Park are in the public interest, and

WHEREAS, the Department has completed a PD&E study associated with the extension of Lee Road between US 17-92 and Denning Drive that indicates the need for and the viability of said extension of Lee Road

IT IS AGREED BY THE PARTIES TO THIS MEMORANDUM OF UNDERSTANDING:

1. The transportation improvements covered by this memorandum of understanding are as follows: (a.) Extension of Lee Road, and the enhancements to US 17/92 (FM #408429) and (b.) the Bicycle Trail within the limits of right of way of Denning Drive.
2. It is the agreement of the parties that the extension of Lee Road shall be funded and completed prior to or at the same time as the construction of the enhancements on US 17/92. The bicycle facilities will be relocated from US 17/92 to Denning Drive by Winter Park prior to the construction of the US 17/92 enhancements. Unless and until the Lee Road extension project is completed, the Department shall have no obligation to fund the enhancements on US 17/92. Alternatively, if both projects can be and are funded together, the Department may elect to proceed with the construction of both projects at or about the same time.
3. The parties agree that the Department's request for FHWA funding for the enhancements along US 17/92 shall be conditioned on the Lee Road extension project being funded for design and construction prior to, or at the same time. Winter Park agrees to fully cooperate in establishing the Lee Road extension project as a high priority with the MPO and in the Department's work program.

4. Winter Park shall fund the cost of any sidewalk widths over 6 feet. Winter Park shall also fund all landscaping enhancements associated with the project. Winter Park will also fund the incremental cost associated with the texturing of the center bi-directional turn-lane on US 17/92. Winter Park and the Department will agree to the funding responsibilities of street lighting during the final design aspects of the study. The Department will be responsible for funding the remaining aspects of the project.

5. The parties agree and understand that the purpose of this memorandum is to establish the expectations of each with respect to the prioritization, funding and construction of these three related projects and that the enhancement of US 17/92 is dependent on the Lee Road extension and the construction of the bicycle trail along Denning Drive. All intentions relative to funding herein are dependent on the placement of funding into the Department's work program and on appropriation and funding of the work program each year by the legislature.

6. This Memorandum of Understanding shall be effective upon the last party to sign and shall remain in effect until the funds have been fully expended by the Department for the purposes set forth hereinabove.

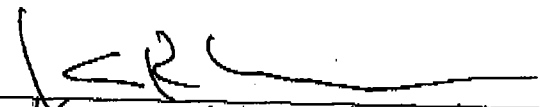
STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION


By: William G. Walsh

Title: Project Manager

Date: 6/2/04

**THE CITY OF WINTER PARK, A MUNICIPALITY INCORPORATED UNDER
THE LAWS OF THE STATE OF FLORIDA**


By: Kenneth R. Marchman

Title: Mayor

Date: 5-24-04

Resolution #:

Date of Resolution:

Attest:

Cynthia S. Bonham

By:

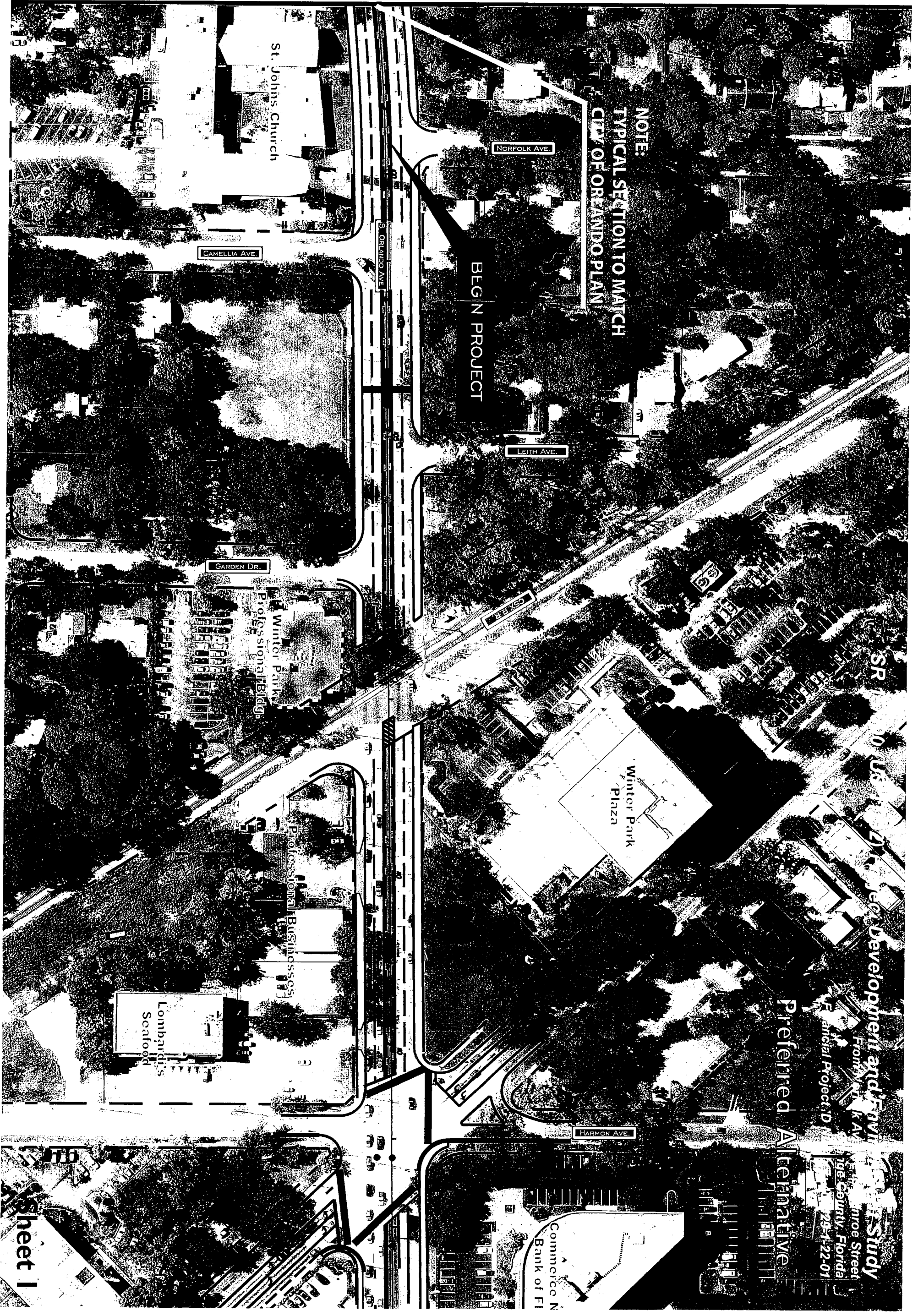
Cynthia S. Bonham

Title:

City Clerk

APPENDIX A
Memorandum of Understanding
Between the City of Winter Park and FDOT
Dated June 2, 2004

APPENDIX B
Conceptual Design Plans, Preferred Alternative



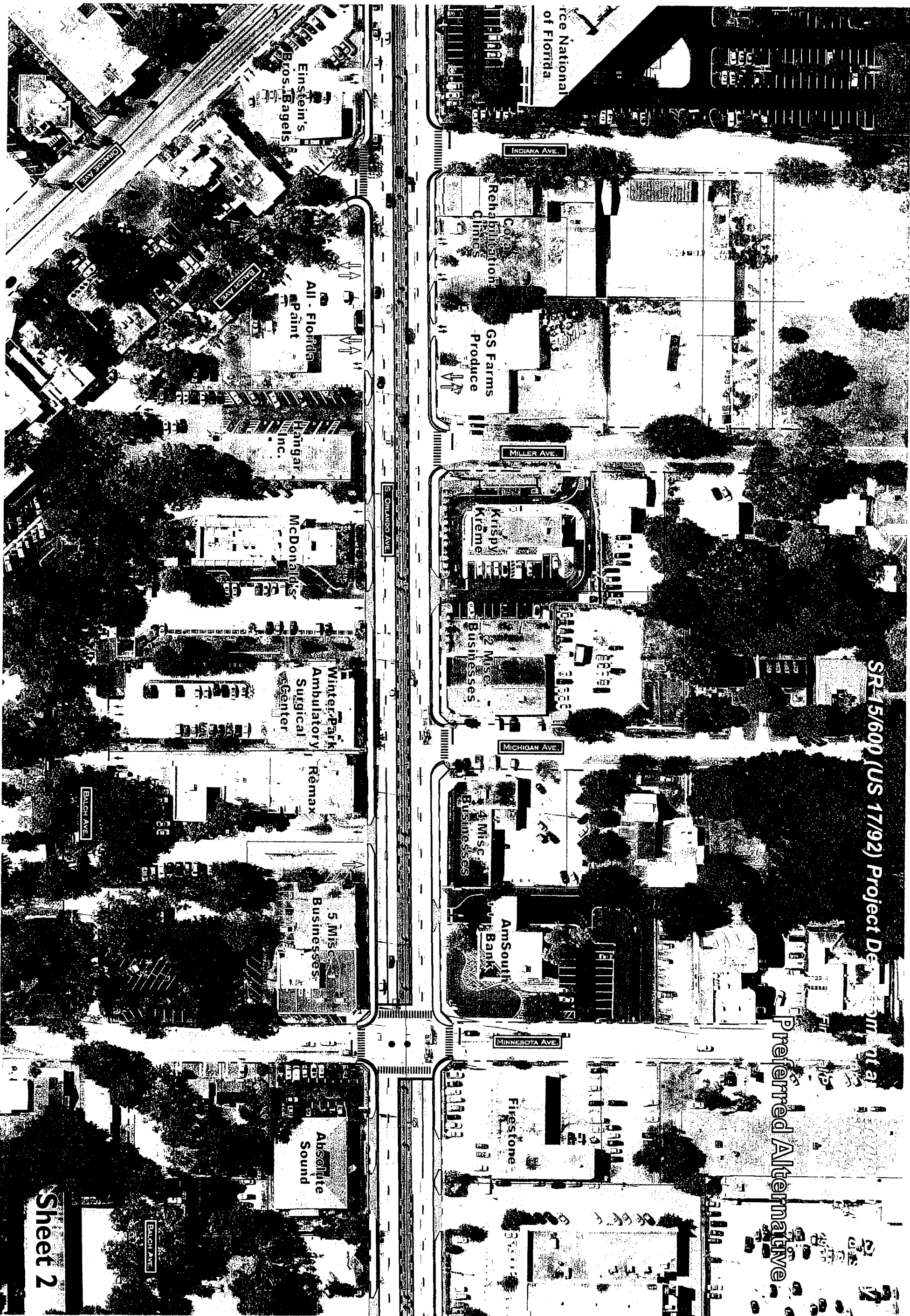
NOTE:
TYPICAL SECTION TO MATCH
CITY OF ORLANDO PLAN

BEGIN PROJECT

Preferred Alternative

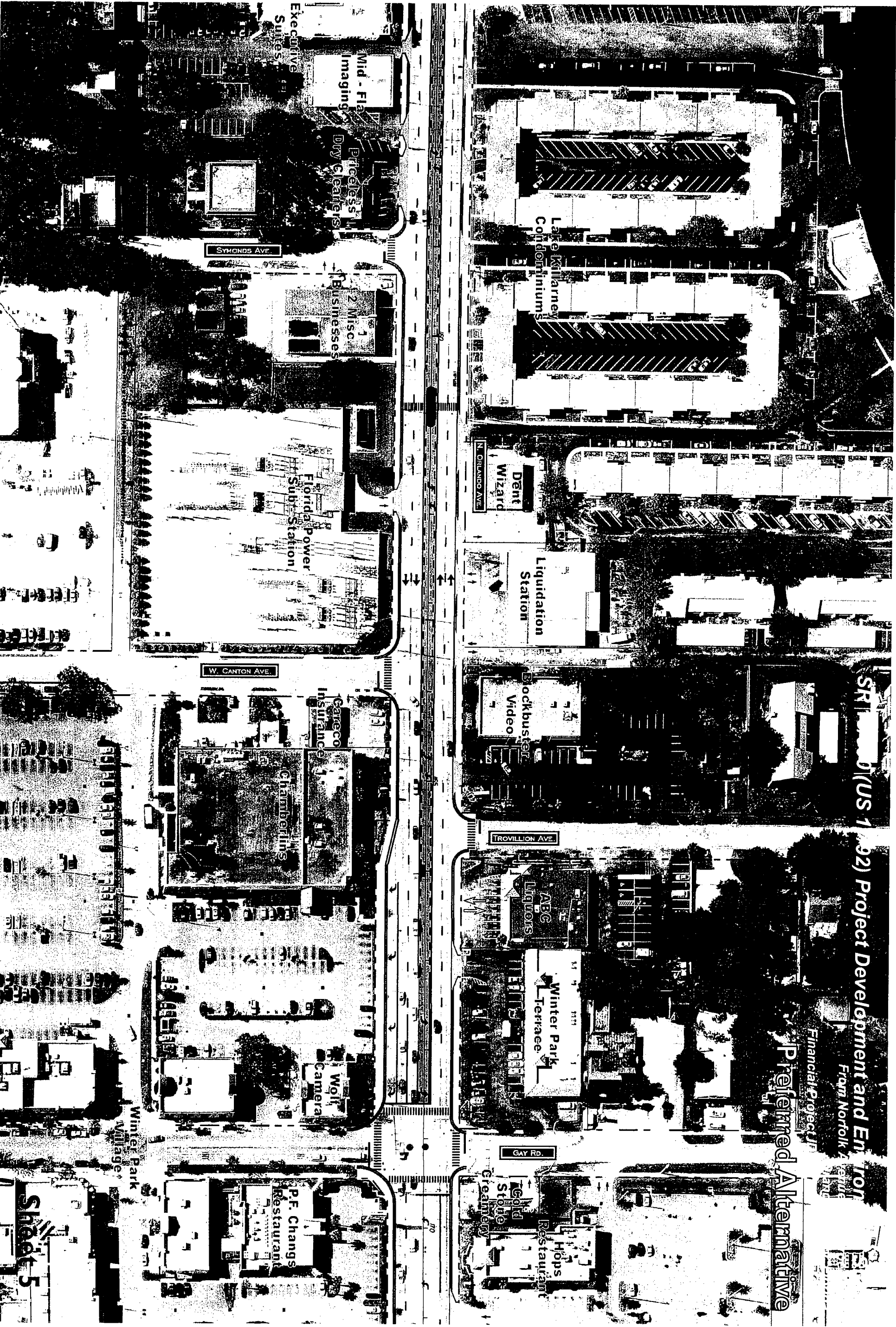
Financial Project D

Study
From Norfolk Ave. to Harmon Ave.
Orange County, Florida
29-122-07



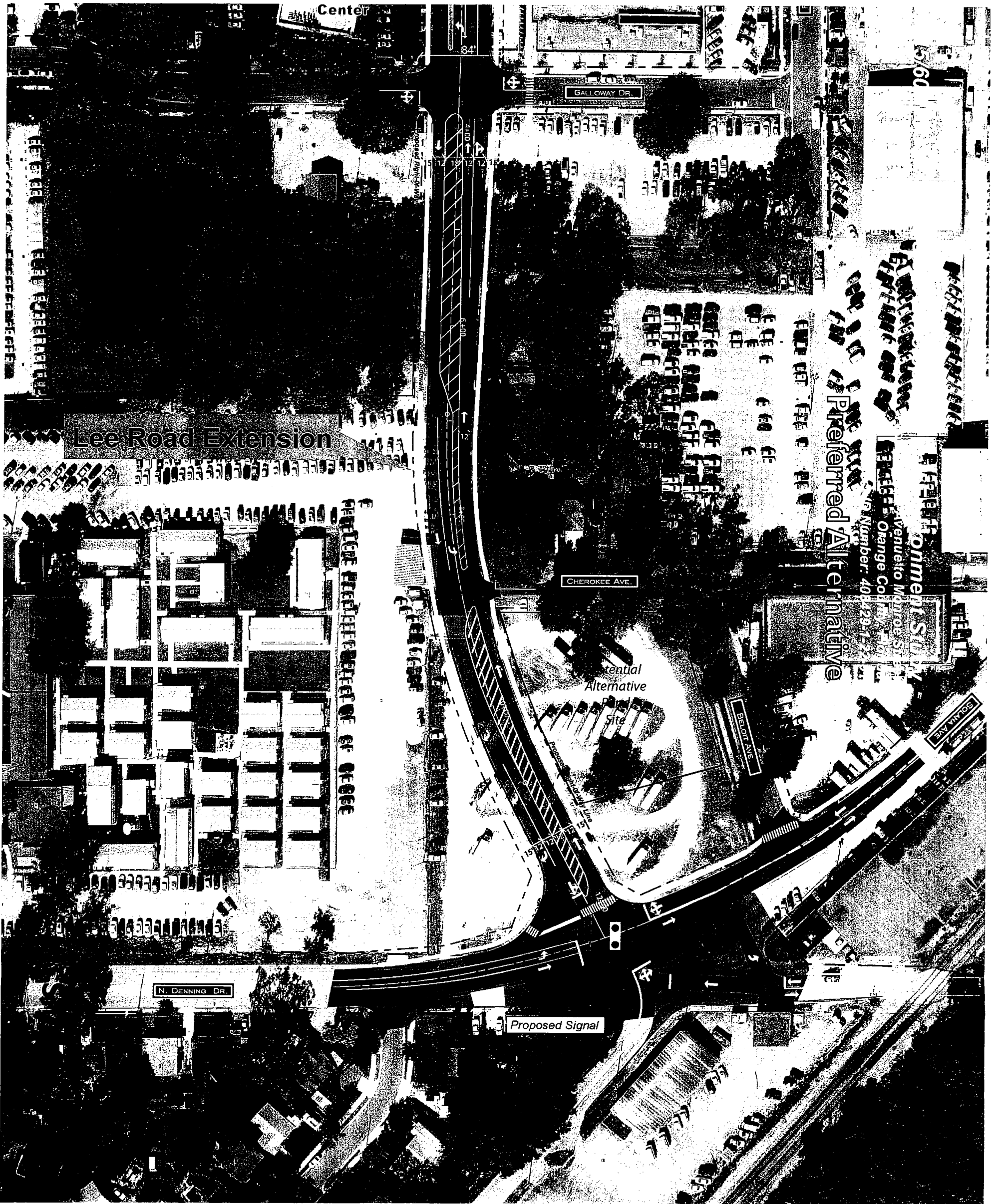
SR45/600 (US 17/92) Project Design Manual at a

Preferred Alternative



SR 1702 Project Development and Environmental Impact Study

Preferred Alternative



Center

GALLOWAY DR.

Lee Road Extension

CHEROKEE AVE.

Rental
Alternative

Proposed Signal

N. DENNING DR.

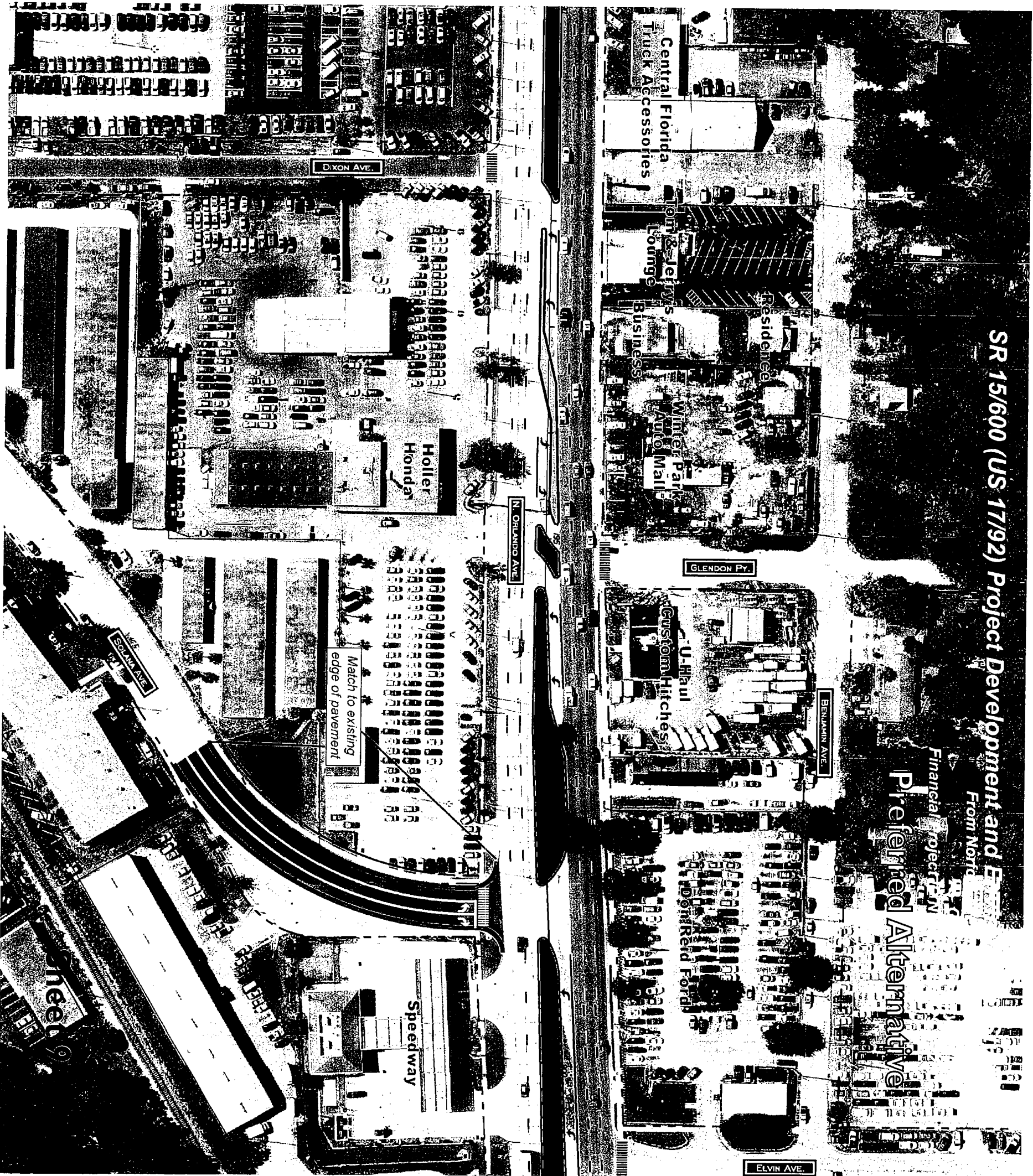
Preferred Alternative

SR 15/600 (US 17/92) Project Development and Engineering

From North

Financial Projection

Preferred Alternative



APPENDIX C
Initial Lee Road Extension Alternatives

LEE ROAD
ALTERNATIVE

SCALE 1"=50'

LEGEND

----- Proposed Right-of-Way
----- Existing Right-of-Way

LEE ROAD

ALTERED

SCALE 1"=50'

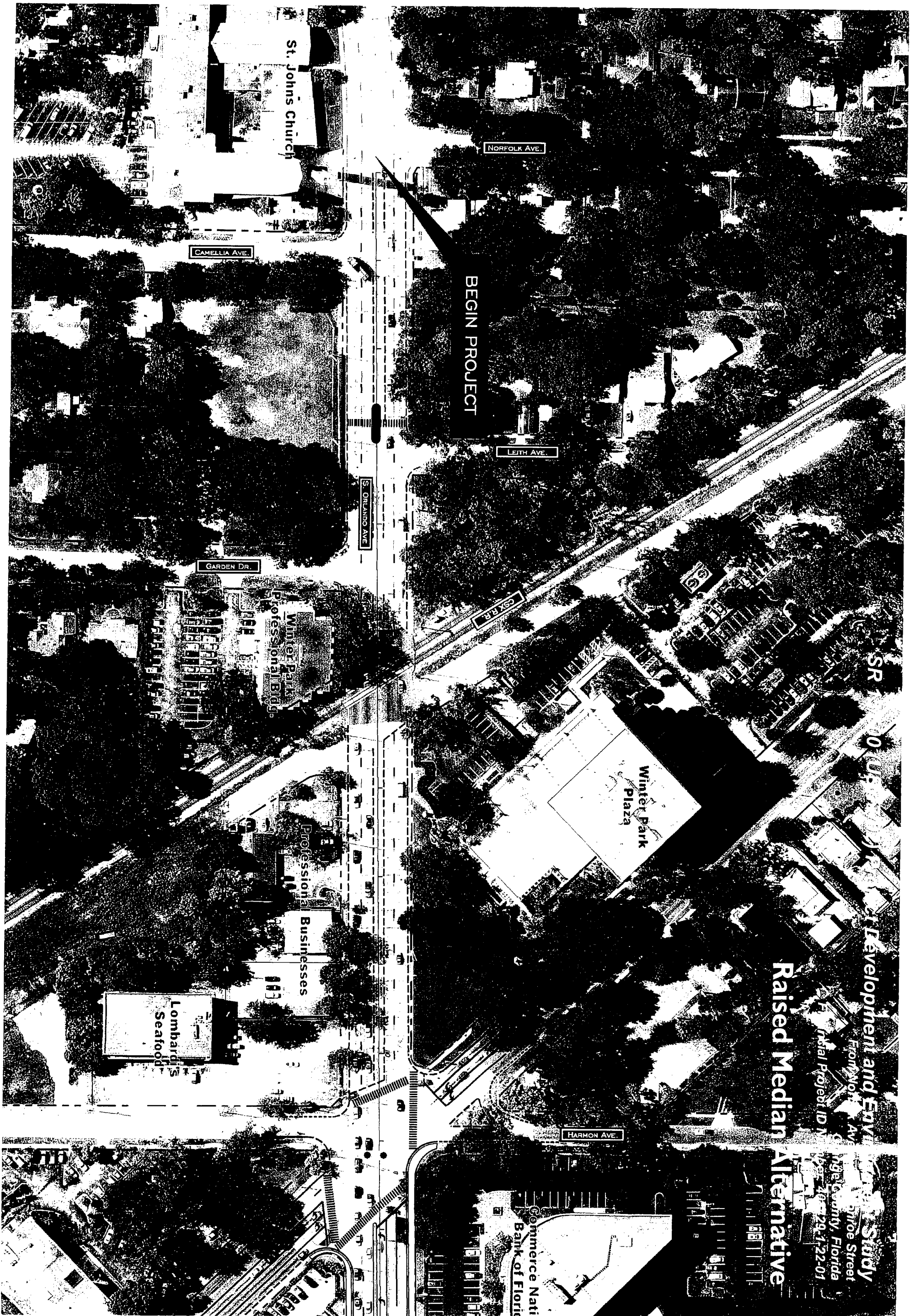
1/2"

LEGEND

----- Proposed Right-of-Way

----- Existing Right-of-Way

APPENDIX D
Conceptual Design Plans, Viable Project Alternatives



Raised Median Alternative

Development and Environmental Study
From North Ave. to
Quince Street
Orange County, Florida
Project ID No. 100-29-1-22-01

BEGIN PROJECT

Winter Park Plaza

St. John's Church

Winter Park Professional Bldg.

Professional Businesses

Lombardi's Seafood

Commerce Natl Bank of Floric

CAMELLIA AVE.

NORFOLK AVE.

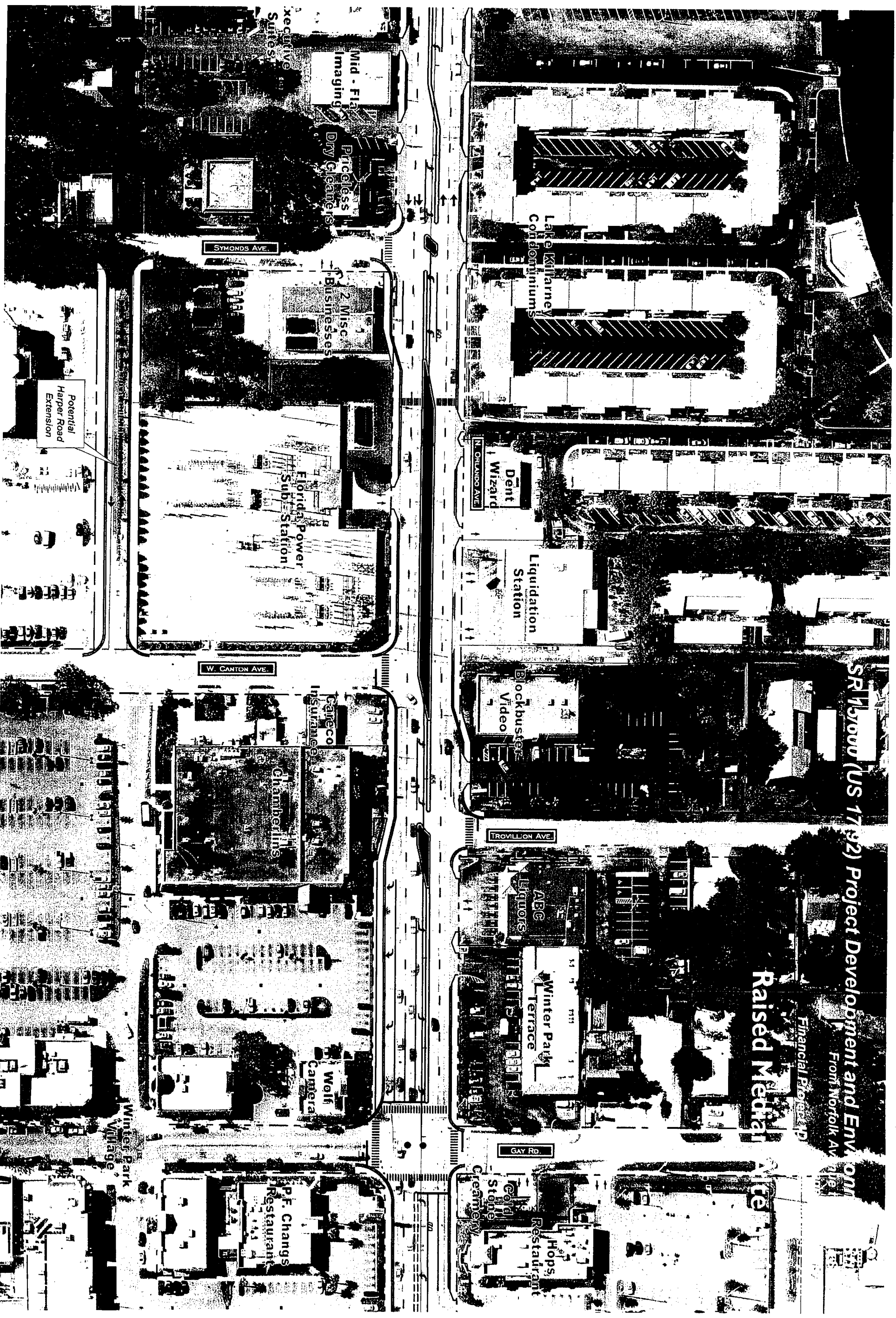
LEITH AVE.

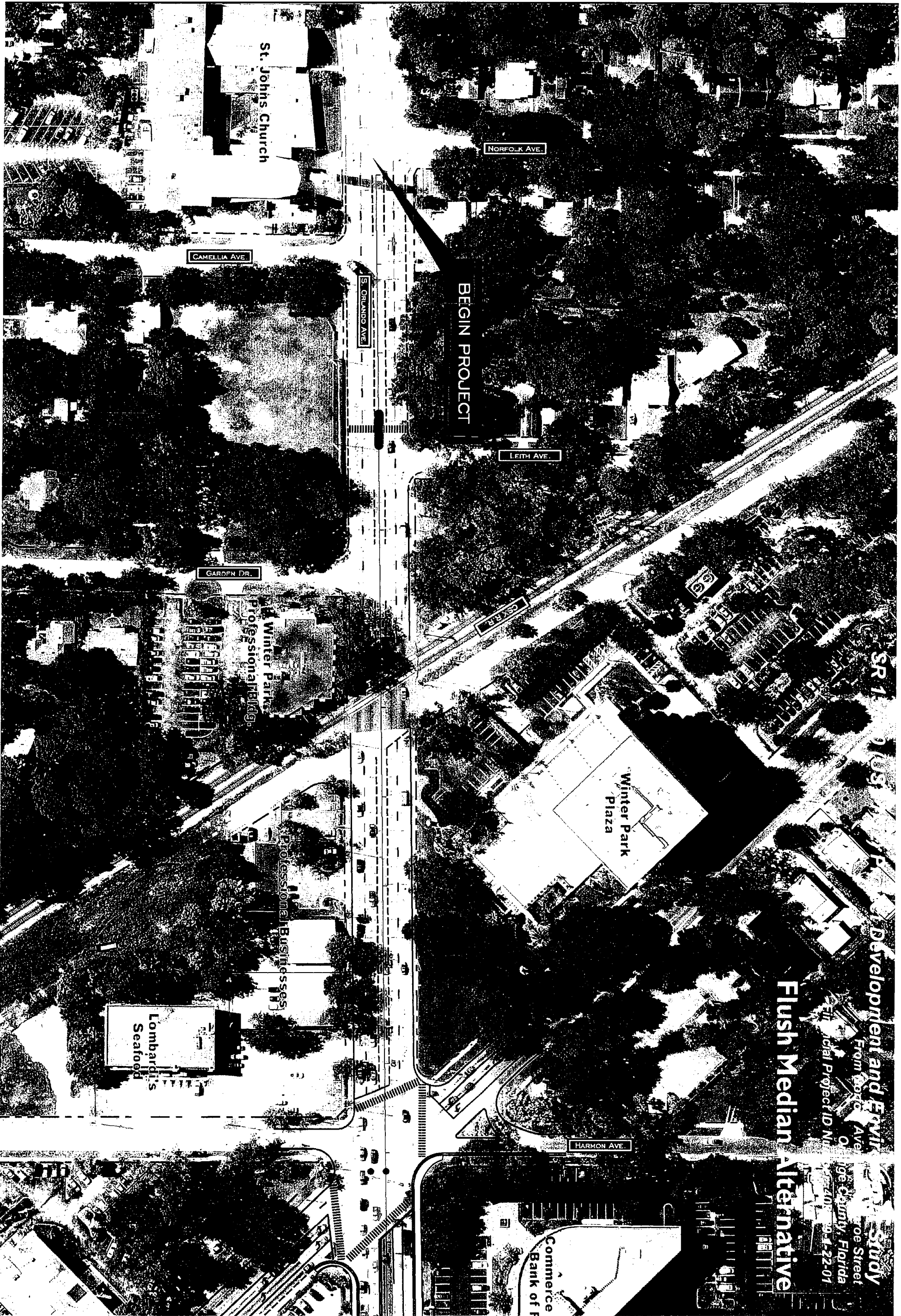
S ORLANDO AVE.

GARDEN DR.

HARMON AVE.

SR 100





Flush Median Alternative

SR 1 (US 1) Development and Environmental Study
Fort Pierce, Florida
Project ID Number 400-22-01

BEGIN PROJECT

Winter Park Plaza

St. John's Church

Professional Business

Lombardi's Seafood

Commerce Bank of F

NORFOLK AVE.

LEITH AVE.

CAMELLIA AVE.

ST. ORLANDO AVE.

GARDEN DR.

HARMON AVE.

SR 1

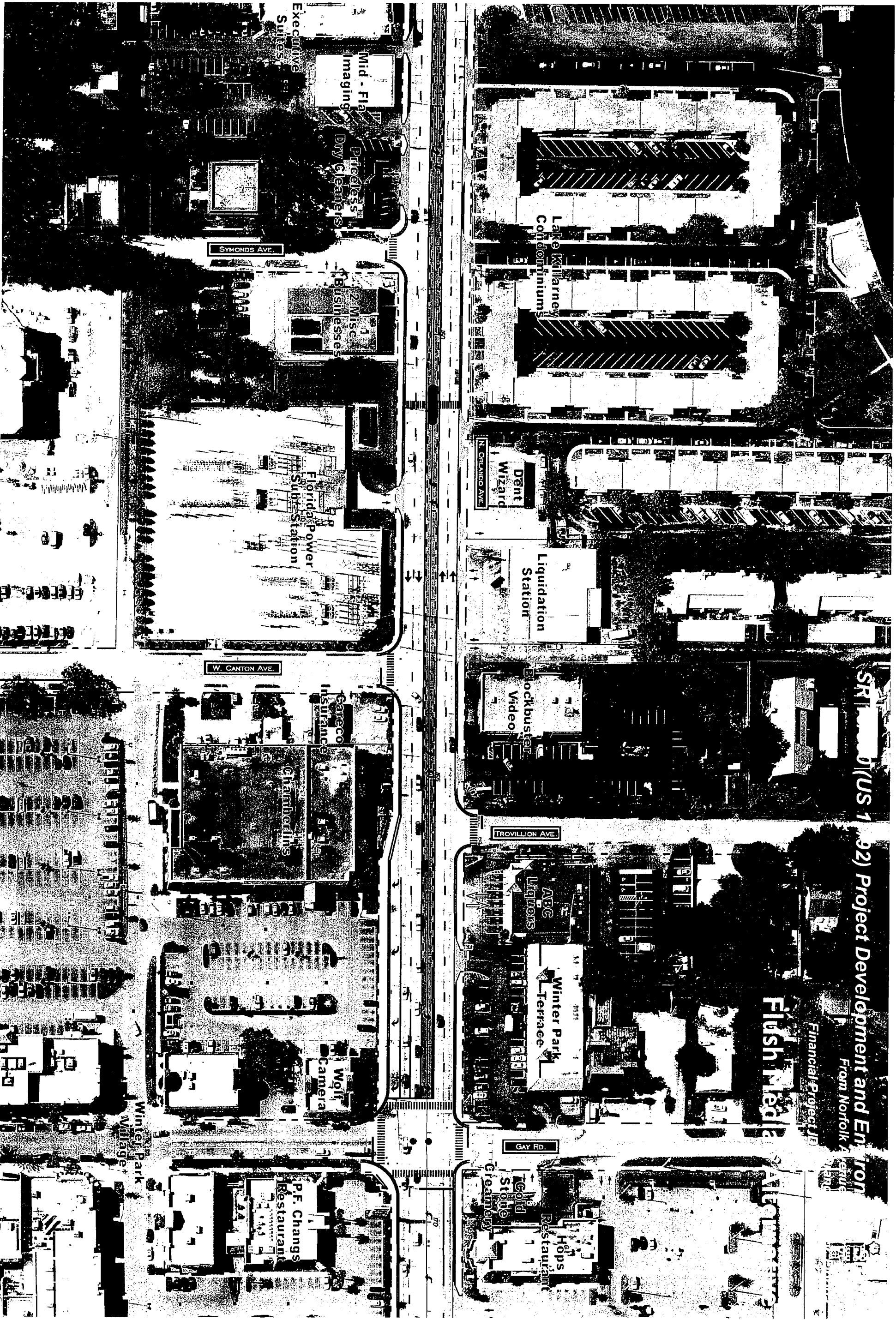
US 1

Fort Pierce

Development and Environmental Study

Fort Pierce, Florida

Project ID Number 400-22-01



SR 100 (US 1)

92) Project Development and Engineering
From Norfolk, Virginia

Financial Project

Flush Media

Hops Restaurant

Gold Stone Creamery

Winter Park Terrace

ABC Liquors

TROVILLON AVE.

Blockbuster Video

Liquidation Station

Dent Wizard

Lake Killarney Condominiums

Pieceless Dry Cleaners

Mid - Fla Imaging

Executive Suites

2 Misc Businesses

Florida Power Sub Station

SYMONDS AVE.

Chamberlins

Careco Insurance

W. CANTON AVE.

Wolf Camera

P.F. Changs Restaurant

Winter Park Village

SR 15/600 (US 17/92) Project Development and Engineering

From North

Fish and Wildlife Management

Financial Projection

