

MINNEOLA COLLECTOR ROAD PD&E STUDY

U.S. 27 TO OLD C.R. 50

DECEMBER 2008

FINAL PRELIMINARY ENGINEERING REPORT

PREPARED FOR



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1. Summary

The City of Minneola has conducted a Project Development and Environment Study for a collector road serving the growing communities in the area bound by United States Highway 27 on the west, County Road 561A on the north, Triple E Road on the east and C.R. 50 (Old 50) on the south. Portions of this roadway are in the jurisdictions of the City Minneola and in unincorporated Lake County. The study corridor is identified in the project location map provided in Figure 1.1.

The objective of the PD&E Study is to study, analyze and document the environmental and engineering analyses to assist the City of Minneola in reaching a decision on the type, location and conceptual design of the improvements to the Minneola Collector Road study area. The improvements are necessary to accommodate the future traffic demand safely and efficiently and to address other safety concerns within the corridor.

1.1. Commitments

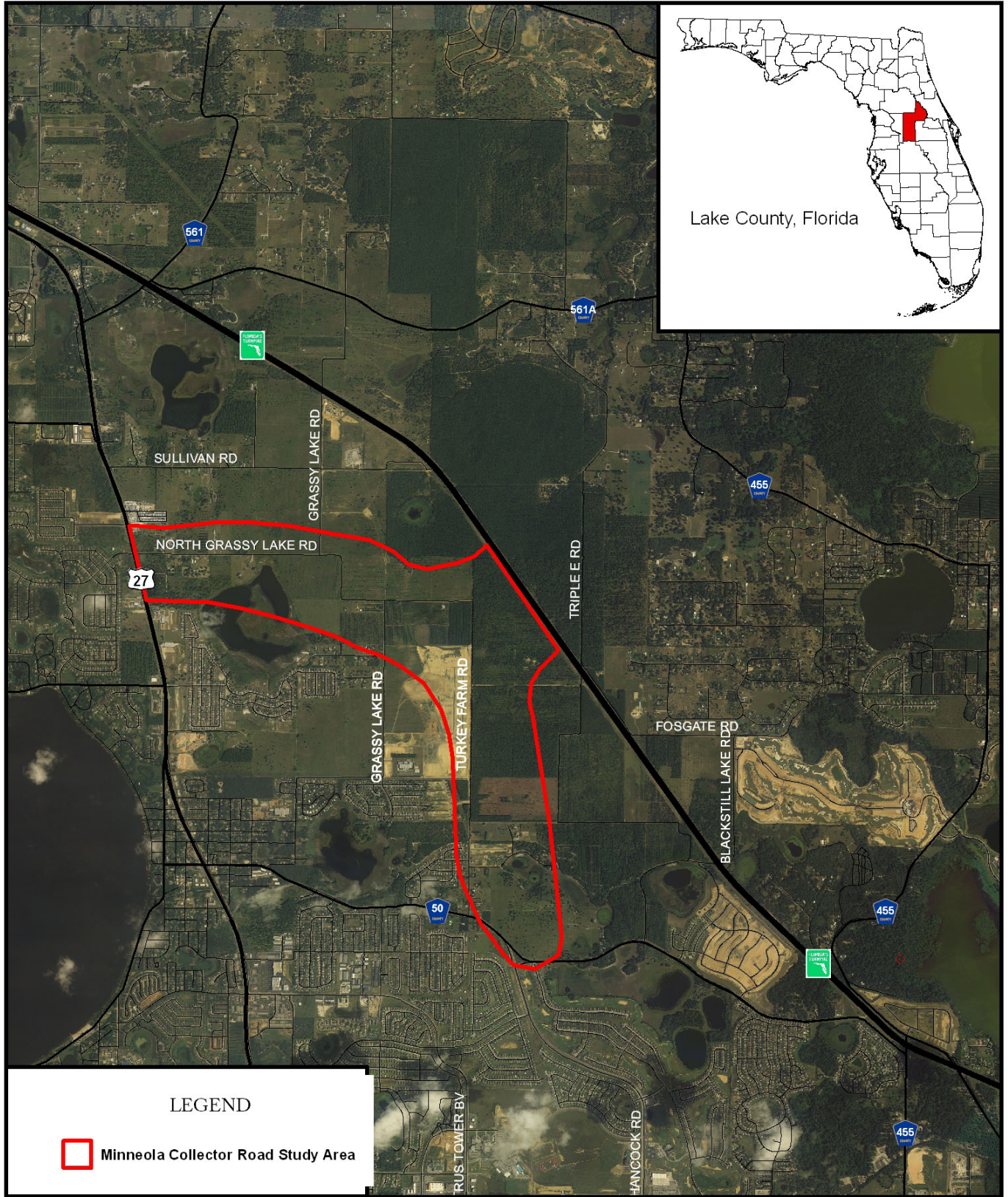
The City of Minneola has made the following commitments during the duration of the project, through the public involvement process, the engineering analysis and the coordination with the environmental and permitting agencies.

- Continuing to work with property owners along the corridor in regards to right-of-way needs.
- Continuing to work with large tract developers to coordinate right-of-way donations appropriate for the project and the ability to construct joint use ponds.
- The roadway improvements and drainage system will be designed and constructed with measures taken to minimize impacting existing utilities.
- Lake County and the City of Minneola are committed to developing drainage and typical section plans that promote the minimization of wetland impacts.
- Construction of the improvements will be performed in accordance with Lake County's standard construction practices, with emphasis on maintaining acceptable driving conditions through the construction zone and maintaining access to all businesses and residences on the Minneola Collector Road.
- If, during construction activities, mitigation for contamination sites is found to be necessary, environmentally responsive actions will be taken in accordance with applicable Florida Department of Environmental Protection regulations.
- Consideration will be given to aesthetics during the design.
- Coordination with City of Clermont will continue to occur throughout the process
- A public involvement program, developed in conjunction with the City of Minneola and Lake County will be implemented during the design and construction phases of the project.
- The project team has worked with the developer of the Hills of Minneola to identify an alignment for a portion of the north-south section of the Minneola Collector Road. The city has committed to continuing to consider this alignment as part of the preferred alignment for the roadway network.
- The project team has worked with the developer of the Center Lake property, Black West, to identify an alignment for a portion of the north-south section of the Minneola Collector Road. The city has committed to continuing to consider this alignment as part of the preferred alignment for the roadway network.

1.2. Study Alternatives

Numerous alternatives have been studied including those developed by the study team and at the request of Lake County Public Works and the Lake County Commissioner for the project area. A large portion of the total alignment has been defined by a single alignment. Alternative segments were developed for the

Figure 1.1: Project Location Map



SOURCE: City of Minneola RFP, Lake County, and FGDL.

remaining two portions of the existing corridor. There were three segments studied for the intersection of Citrus Grove Road and Hancock Road Extension. Five segments were reviewed for the area south of the Hills of Minneola southern property boundary to the southern project terminus. Each of these alternatives is discussed in detail in Section 8 of this report.

All other segments, and the portion that remains consistent through each alternative, were thoroughly investigated and analyzed in terms of natural, social and economical impacts. The results of this analysis are presented in Section 8 of this report. Every combination of segments was considered during this evaluation.

1.3. Preferred Alternative

Based upon the results of the engineering and environmental analysis, input received from the public and local governmental bodies, Alternative 1 has been identified as the recommended alternative. The northern section of Alternative 1 includes the revised Segment A that modifies the alignment of Hancock Road Extension and the connecting portion of Citrus Grove Road to form an appropriate intersection for this project that would then be the primary feed to the interchange.

The southern section of Alternative 1 which runs from the northern boundary of the Big Sky development to the project terminus was also revised as per the Minneola City Council. The original recommendation included Segment C as the preferred alignment for this section. However, following the results of the Public Hearing, City Council voted to select segment C2 as the preferred alignment for the southern section of the project. The segment C2 alignment originates at the Hancock Road/Old CR 50 intersection and traverses to the north along the east side of the power easement. This alignment continues along the east side of the power easement until it intersects with the existing alignment of the Hancock Road Extension, north of Jim Hunt Road via a small horizontal curve.

The preferred alignment is detailed in the concept plans provided in Appendix I. This alternative created the additional capacity required to meet the requirements of the projected traffic within the study area. This recommendation was approved by the Minneola City Council on September 16, 2008. A resolution ratifying this recommendation was approved by the Minneola City Council on October 21, 2008 and was forwarded to the Lake County Board County Commissioners for final approval of the preferred alignment.

A brief presentation was made to the Lake County Board of County Commissioners regarding the study process, the alternatives analyzed and the recommended alternative, the Commission received public comment. Following the receipt of public comment, Mr. Jim Stivender, Lake County Public Works, noted that a motion was requested to approve the recommended alternative as presented and previously approved by the Minneola City Council. Following a brief discussion by the commission, a motion was made to approve the preferred alternative for the Minneola Collector Road (Hancock Road/Citrus Grove Road). The motion was seconded and was passed unanimously. A record of the presentation and subsequent discussion will be available from Lake County as part of the regular minutes of the Board of County Commissioners Meeting.

2. Introduction

This Preliminary Engineering Report documents the City of Minneola and Lake County PD&E Study for the improvements to the Minneola Collector Road study area. The project area, as shown in Figure 1.1, is bound by Citrus Grove Road in the north, County Road 50 in the south, U.S. 27 on the west and the Turnpike on the east.

2.1. Purpose

The purpose of this PER is to present the findings of the studies conducted for this project, describe the results of the evaluation and document the justification for the recommended improvements. This document describes the determinations made regarding potential corridors, typical roadway cross sections, a summary of existing and future traffic conditions and the comparative analysis of improvement alternatives that would satisfy existing and future transportation demands.

Based upon the engineering and environmental resource data collected, a review of the city and county goals, and the application of the current roadway design standards, potential alternatives were developed and evaluated based on impacts resulting from their alignment locations and configurations. Each alternative was assessed against the others using evaluation criteria developed for that purpose. From that comparative evaluation, the best potential location(s) and most appropriate design configurations were identified for those alternatives that warranted further review.

This report has been prepared to assist the city and the county in identifying a recommended design concept alternative and will serve as the document of record for support of subsequent engineering decisions for the final design and construction stages that follow.

The conceptual roadway alignment plans with right-of-way identification lines, included in Appendix I, are an integral part of this document and should be reviewed in concert with this document. The plans reflect specific detail concerning each area of the project and will supplement information contained within this report.

2.2. Project Description

The proposed project involves the identification of improvements to the Minneola Collector Road corridor. This roadway is situated within the judicial jurisdictions of the City of Minneola, the City of Clermont and unincorporated Lake County.

The proposed improvements are needed to accommodate the population increase, and therefore traffic, growth in the project area. Numerous developments of regional impact have recently received approval or are in the approval stages within this area of the city. The city has made efforts during each of the approvals to require the dedication of roadway right of way, construction of portions of roadway and in some cases providing stormwater retention for the roadway within the property. Due to these developments, the city pursued this project to identify an alignment for a roadway to meet the growing needs of the community and to identify where additional requirements may be placed on developments not approved to date.

3. Need for Improvement

The need for the improvements to the Minneola Collector Road is based on several factors. First is the need to establish an alignment that the city can use to continue planning for the corridor with developers of the area. Second is the need to provide an alternative that provides for congestion relief to U.S. 27 and S.R. 50. Third is that the improvements are consistent with the goals, objectives and policies of the Lake County Comprehensive Policy Plan and of the City of Minneola. This section of the report presents the findings relative to each of these areas and a review of the recommendations presented by the local comprehensive planning efforts.

3.1. System Linkage

Currently the main thoroughfares through the area are U.S. 27, north and south, and S.R. 50, east and west. Both of these roadways are near or over capacity in the existing conditions. The intersection of U.S. 27 and S.R. 50 operates at LOS F today. With the future growth planned for the Clermont, Minneola and Lake County area, this intersection will continue to fail into the foreseeable future. The Minneola Collector Road improvements will serve to provide a bypass for vehicles traveling through the area.

The future Florida's Turnpike interchange proposed by the Hills of Minneola developer is in the direct vicinity of this project. The Minneola Collector Road project can provide the needed linkage between the Turnpike, U.S. 27, S.R. 50 and the outlying areas of Lake County.

3.2. Modal Interrelationships

The trails master plan has been created by Lake County Public Works. While there are pedestrian and bicycle facilities in the study area, they are an incomplete network. There are currently sidewalks along U.S. 27, installed as part of the recent construction widening project. Along Old C.R. 50 to the north into Orange County, a trail/multi-use path is available. There is a need to provide the growing communities in the area with appropriate alternative means of transportation. Also there are schools in the area for all ages of children. Providing a sidewalk or trail system for the children will enhance the safety of the area.

3.3. Capacity

The *Minneola Ridge Area-Wide Traffic Study*, conducted in 2005, identified the growing need in the community for additional capacity on the roadway network. It indicated that the already failing roadways were not able to handle additional capacity and even with the widening of some of those roads, there was still a need to provide alternate travelways. With the large numbers of developments in various stages of the approval process in the City of Minneola and Clermont it is critical to have plans to address the necessary infrastructure. This project will allow the City of Minneola to be prepared well into the future to address and new development that is proposed for the surrounding area.

3.4. Safety

The condition of the existing corridor is unsatisfactory and does not meet current design standards. Crashes have been recorded in the corridor as well as outside of the corridor due to the overcapacity of the roadway network. Additional capacity added through this project will alleviate the external network and will help to enhance safety on those roadways.

The existing alignment includes portions of paved and unpaved roadways. There are also numerous vertical and horizontal curves that produce a safety concerns for those vehicles using the roadway. This project will serve to present a roadway that meets the standards for a 45 mile per hour roadway.

4. Existing Conditions

4.1. Existing Roadway Characteristics

The following subsections depict the conditions and characteristics of the existing Minneola Collector Road corridor. The corridor currently includes portions of North Hancock Road, Hancock Road Extension and Citrus Grove Road.

4.1.1. Functional Classification

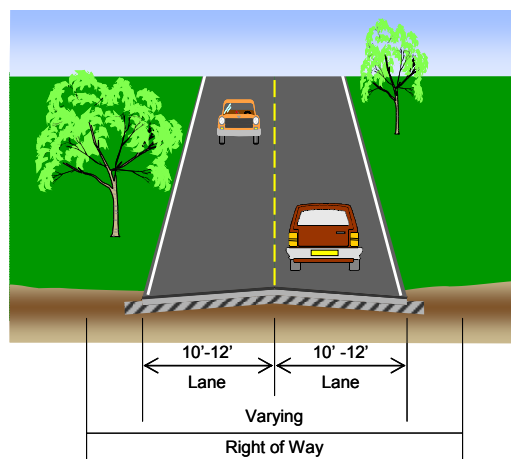
Functional classification is the process when streets and highways are grouped into classes, or systems, according to the character of service they provide. In the latest update to the functional classification tables, the Minneola Collector Road corridor has been classified as an urban arterial roadway in Lake County.

4.1.2. Typical Sections

The existing typical cross section, shown in Figure 4.1, of the roads encompassed by the corridor is generally described by two, undivided ten-foot to twelve-foot lanes. There are no shoulders provided along the road and there is no formal drainage system. The roadway is mostly unpaved from north of the Reserve at Minneola to Citrus Grove Road. The majority of Citrus Grove Road is paved.

The posted speed limit along North Hancock Road is 45 miles per hour (mph). The posted speed limit along Hancock Road Extension is 30 mph and along Citrus Grove Road is 40 mph.

Figure 4.1: Existing Typical Section



4.1.3. Pedestrian and Bicycle Facilities

There are minimal pedestrian or bicycle facilities provided along the existing corridor. Sidewalks have been constructed along the west side of Citrus Grove Road for the limits of the County Ridge and Reserve at Minneola developments. Sidewalks have been constructed along the east side of Hancock Road Extension for the limits of the Bridger Estates and Big Sky developments. The Lake Minneola Scenic Trail borders the south end of the project while no pedestrian features are present at the western end of the project, intersecting U.S. 27.

4.1.4. Right of Way

The right of way for Hancock Road Extension varies from 80 feet at the intersection of North Hancock Road to 85 feet along Pine Bluff, being as narrow as 32 feet at the southeast corner of Pine Bluff. North of Pine Bluff the right of way is 50 feet until the southwest corner of Section 4, T 22 S, R 26 E. Continuing north, the right of way is 68 feet until the western turn where it is 48 feet until Grassy Lake Road, where it becomes 50 feet and continues until Grassy Lake. The right of way along Citrus Grove Road varies, but is approximately 35 feet until U.S. 27.

4.1.5. Horizontal Alignment

The project corridor includes three ninety degree horizontal curves. The first is on Hancock Road Extension, which curves from north-south to east-west with a 60-foot radius. The second and third are on Citrus Grove Road, which curves from east-west to north-south with a 100-foot radius, then curves back to east-west with a 160-foot radius.

4.1.6. Vertical Alignment

The vertical alignment varies in elevation from a high of 290 feet to a low of 120 feet, based on United States Geological Survey quadrangle maps. The profile generally dips for the first 1,000 feet east of the intersection with U.S. 27. It then falls steeply until reaching Grassy Lake before increasing until the end of the east-west portion of the corridor. From that high point, it again falls more gradually to a low at the intersection of Hancock Road Extension and North Hancock Road.

4.1.7. Drainage

The Minneola Collector project is within the jurisdiction of the St. Johns River Water Management District and lies within the Ocklawaha River Hydrologic Basin. A map of the drainage basins is provided in Appendix II.

On existing Citrus Grove Road from U.S. 27 (Sta. 80+00) to a point (Sta. 95+00) approximately 150 feet east of U.S. 27, stormwater runoff sheet flows to a series of depressions south of Citrus Grove Road. Stormwater runoff is composed of roadway runoff and runoff from contributing offsite areas from the north side of the road. There is no apparent outfall for the existing depressions. Therefore, runoff is assumed to collect and infiltrate into the ground.

Between a point (Sta. 95+00) to a point (Sta. 161+20) approximately 1,330 feet east of the second S-curve on Citrus Grove Road stormwater runoff sheet flows directly to Grassy Lake south of Citrus Grove Road. Stormwater runoff is composed of roadway runoff and runoff from contributing offsite areas from the north side of the road.

From the second S-curve on Citrus Grove Road to a point (Sta. 192+20) approximately 1,000 feet south of the third S-curve on Citrus Grove Road where Citrus Grove Road becomes Hancock Road Extension, stormwater runoff is captured in a depression south of Citrus Grove Road and west of Hancock Road Extension. Stormwater runoff is composed of roadway runoff and runoff from contributing offsite areas from the east side of the road. There is no apparent outfall for the existing depression. Therefore, runoff is assumed to collect and infiltrate into the ground.

From a point (Sta. 192+20) approximately 1,000 feet south of the third S-curve on Citrus Grove Road where Citrus Grove Road becomes Hancock Road Extension to a point (Sta. 327+50) approximately 875 feet north of the intersection of Citrus Grove Road and Hancock Road Extension, stormwater runoff, primarily composed of roadway runoff and runoff from contributing offsite areas is captured in the storm sewer system in the Reserve at Minneola subdivision west of Hancock Road Extension. The storm sewer conveys the runoff to the dry retention pond in the center of the Reserve at Minneola approximately 1,000 feet west of Hancock Road Extension designed to retain the 100 year storm event.

From a point (Sta. 327+50) approximately 875 feet north of the intersection of Citrus Grove Road and Hancock Road Extension to a point (Sta. 336+50) at the intersection of Citrus Grove Road and Hancock Road Extension, stormwater runoff, primarily composed of roadway runoff and runoff from contributing offsite areas is captured in the storm sewer system in the Reserve at Minneola subdivision west of Hancock Road Extension. The storm sewer conveys the runoff to the dry retention pond in the southwest corner of the Reserve at Minneola designed to retain the 100 year storm event.

From a point (Sta. 336+50) at the intersection of Citrus Grove Road and Hancock Road Extension to a point (Sta. 355+50) approximately 1,900 feet south of the intersection of Citrus Grove Road and Hancock Road Extension, stormwater runoff, primarily composed of roadway runoff and runoff from contributing offsite areas is captured in roadside swales east and west of Hancock Road Extension. There is no apparent outfall for the existing roadside swales. Therefore, runoff is assumed to collect and infiltrate into the ground.

From a point (Sta. 355+50) at approximately 1,900 feet south of the intersection of Citrus Grove Road and Hancock Road Extension to a point where Hancock Road Extension ends at Old C.R. 50, stormwater runoff, primarily composed of roadway runoff and runoff from contributing offsite areas is captured in

roadside swales east and west of Hancock Road Extension. There is no apparent outfall for the existing roadside swales. Therefore, runoff is assumed to collect and infiltrate into the ground.

From a point where Hancock Road Extension ends at Old C.R. 50 to a point where Old C.R. 50 meets Old Highway 50, stormwater runoff, primarily composed of roadway runoff and runoff from contributing offsite areas is sheet flows to the existing dry retention pond west of Old C.R. 50 and north of the Skyridge Valley Subdivision.

4.1.8. Geotechnical Data

A preliminary roadway soil survey was conducted for the project area based on the preferred alternative. The purpose of this exploration was to explore shallow subsurface conditions within the proposed roadway alignment and pond areas and to provide geotechnical engineering evaluation of the conditions encountered.

Based on the 1973 Soil Survey for Lake County, Florida, as prepared by the U.S. Department of Agriculture Soil Conservation Service, the site is located in an area mapped as the "Astatula sand, dark surface, 0 to 5 percent slopes", the "Astatula sand, dark surface 5 to 12 percent slopes", the "Astatula sand, dark surface, 12 to 40 percent slopes", the "Lake sand, 0 to 5 percent slopes", the "Lake sand, 5 to 12 percent slopes" and the "Lake sand, 12 to 22 percent slopes" soil series. The "Astatula sand, dark surface" soil series consists of nearly level to very steep soils occurring on the undulating upland ridges. The internal drainage of the "Astatula sand, dark surface" is excessive and the soil permeability is very rapid throughout. According to the Soil Survey, the seasonal high water table for the "Astatula sand, dark surface" soil series is typically at a depth of more than 120 inches from the natural ground surface.

The "Lake sand" soil series consists of nearly level to steeply sloping soil formed in thick beds of marine and eolian sands. The internal drainage of the "Lake sand" soil series is well drained to excessive and the soil permeability is very rapid throughout. According to the Soil Survey, the seasonal high water table for the "Lake sand" soil series is typically at a depth more than 120 inches from the natural ground surface.

Based on a review of the "Potentiometric Surface of the Upper Floridian Aquifer in the SJRWMD and Vicinity, Florida" (dated September, 2002) published by the United States Geological Survey, the potentiometric elevation within the project area is approximately +79 feet NGVD, or approximately 16 to 216 feet below the prevailing ground surface elevation.

Twenty-three auger borings were performed within the roadway alignment using a four-inch diameter continuous-flight auger advanced to a depth of 20 feet below the ground surface. Six auger borings were performed within the proposed retention pond areas in a similar manner as the borings within the roadway.

An attempt was made to measure the groundwater level in the boreholes after stabilization of the downhole water level after the holes were drilled. Groundwater was not encountered in more of the boreholes. Groundwater was encountered in Boring AB-5 at a depth of 16.5 feet below the existing ground surface on the date indicated. Fluctuations in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted. The absence of groundwater data at most of the boring locations indicates that groundwater was not encountered within the vertical reach of the borings on the date drilled. However, this does not necessarily mean that groundwater would not be encountered at some other time.

The results of the exploration indicate the general soil types as specified in Table 4-1.

Table 4-1: General Soil Types

Strata No.	Description	Classification	
		AASHTO	FDOT Index 505
1	Light brown to brown, dark brown, very dark brown, orange, orange brown, yellow brown, pale brown fine sand to fine sand with silt, with occasional roots	A-3	S
2	Light brown, orange, orange brown red fine sand with clay to clayey fine sand and silty fine sand.	A-3, A-2-4	S
3	Orange, orange brown, purple clayey fine sand	A-2-6	P

The results of the exploration indicate that the soil conditions are acceptable for construction except where plastic soils (Stratum 3) were encountered, in accordance with standard FDOT design and construction practices.

Strata 1 and 2 soils are considered Select for use as fill for roadway construction. Strata 3 soils should not be used in the subgrade portion of the road and should be considered "plastic", and therefore unsuitable and should not be used as fill except as allowed by Index 505.

If the control of the groundwater will be required during construction, the actual methods of dewatering should be determined by the contractor. However, regardless of the methods used, it is suggested to draw down the water table sufficiently, 2 to 3 feet, below the bottom of any excavation or compaction surface to preclude "pumping" and/or compaction-related problems with the foundation soils.

Based on an interpretation of the site conditions using the boring log data, the seasonal high water table is estimated at the 20-foot deep boring locations where groundwater was not encountered, to be greater than 15 feet below the ground surface. Water may perch temporarily at higher levels on top of the clayey soils (Stratum 2) during periods of heavy or prolonged rainfall.

Soil boring information, results of the permeability tests and detailed soil survey information can be found in the *Preliminary Roadway Soil Survey* completed for this project and located in the project files.

4.1.9. Collision Data

Information relating to collision frequency within the study area for the period between January 2004 and June 2007 was obtained from the Lake County Public Works Department. Based on data provided by Lake County, the majority of the reported collisions occurred in the vicinity of the intersection of U.S. 27 at Citrus Grove Road. During the 42 month period evaluated, 30 of the 72 collisions reported occurred at the intersection of U.S. 27 at Citrus Grove Road.

Table 4-2 shows a summary of the collision information, by type and year, for the intersections where the majority of the crashes occurred. A review of this summary shows that the predominant collisions reported in the project area from January 2004 through June 2007 were angle collisions. A detailed summary of the collision data is included in Appendix E of the *Design Traffic Report* prepared for this project.

Table 4-2: Collision Summary

Jan 2004 - Dec 2004		Jan 2005 - Dec 2005		Jan 2006 - Dec 2006		Jan 2007 - Jun 2007	
Accident Type	Number of Occurrences	Accident Type	Number of Occurrences	Accident Type	Number of Occurrences	Accident Type	Number of Occurrences
U.S. 27 at Citrus Grove Road (Signalized)							
Rear End	3	Rear End	1	Rear End	0	Rear End	0
Overturned	0	Overturned	2	Overturned	0	Overturned	0
Angle	4	Angle	6	Angle	1	Angle	0
Left-Turn	0	Left-Turn	1	Left-Turn	2	Left-Turn	0
Other	2	Other	3	Other	3	Other	2
C.R. 50 at Hancock Road (Unsignalized)							
Rear End	0	Rear End	3	Rear End	3	Rear End	2
Overturned	0	Overturned	1	Overturned	0	Overturned	0
Angle	1	Angle	3	Angle	0	Angle	0
Left-Turn	1	Left-Turn	1	Left-Turn	0	Left-Turn	0
Other	1	Other	3	Other	1	Other	1
C.R. 50 at Hancock Road Extension (Unsignalized)							
Rear End	0	Rear End	1	Rear End	0	Rear End	0
Overturned	0	Overturned	0	Overturned	0	Overturned	0
Angle	0	Angle	0	Angle	0	Angle	0
Left-Turn	0	Left-Turn	0	Left-Turn	0	Left-Turn	0
Other	1	Other	0	Other	1	Other	3
Hancock Road Extension at Citrus Grove Road (Unsignalized)							
Rear End	1	Rear End	0	Rear End	0	Rear End	0
Overturned	1	Overturned	0	Overturned	0	Overturned	0
Angle	0	Angle	0	Angle	0	Angle	0
Left-Turn	0	Left-Turn	0	Left-Turn	0	Left-Turn	0
Other	0	Other	0	Other	0	Other	0
Total	15		25		11		8

4.1.10. Intersection and Signalization

There is one signalized intersection, within the project limits, at U.S. 27, where all movements from Citrus Grove Road are made from a single lane.

4.1.11. Lighting

There is currently no street lighting on either Citrus Grove Road or Hancock Road Extension.

4.1.12. Pavement Conditions

Lake County does not have a formal pavement management system for inspecting roadway pavement within the county. Visual inspection of the pavement revealed that the older pavement is deteriorated in various locations throughout the corridor, primarily along Citrus Grove Road. The roadway was recently paved for the limits of Bridger Estates, Big Sky, Pine Bluff and Reserve at Minneola and the pavement is in good condition.

4.2. Environmental Characteristics

4.2.1. Land Use Data

The county's existing land use within the project area, depicted in Figure 4.2, consists primarily of residential developments, vacant parcels and agricultural uses. There are several large tracts that are vacant or have a single family own situated on them. The 2005 zoning map for the City of Minneola indicates a similar situation in the areas within the city's jurisdiction. Figure 4.3 is the 2005 Zoning Map for the City of Minneola indicating a similar situation in the areas within the city's jurisdiction. The agricultural uses are tree farming and citrus groves, both active and inactive.

Figure 4.4 provides a graphic of the Future Land Use of the area. This information indicates that the land uses are expected to remain similar to existing in the future with the exception of the vacant and agricultural land uses now included in the urban expansion and suburban category.

4.2.2. Cultural Features

A Cultural Resource Assessment Survey has been conducted within the 330-foot buffer of the area of potential effects for the preferred alignment for this project. All work was performed in accordance with Part 2, Chapter 12 of the FDOT *PD&E Manual*, the FDOT *Cultural Resource Management Handbook*, as well as the Florida Division of Historical Resources recommendations for such projects as stipulated in the FDHR's *Cultural Resource Management Standards & Operations Manual, Module Three: Guidelines for Use by Historic Preservation Professionals* and Rule Chapter 1A-46, Florida Administrative Code. Within the APE, consideration was given to any visual, audible and atmospheric effects that the road construction may have to historic properties. The *Cultural Resource Assessment Survey for the Minneola Collector Road PD&E Study* details the survey and all historic and cultural elements of the corridor.

Seventy-nine shovel tests were excavated within the APE resulting in the update on one previously recorded site (8LA2875). One archeological occurrence (AO 1) also was defined and the Orange Belt Railway (8LA4042) was recorded within the APE.

A single flake was recovered from within the previously recorded site 8LA2875. This recovery did not result in a boundary amendment to the site. Additional testing around the shovel test containing the single flake did not yield additional artifacts, supporting the State Historic Preservation Officer determination that 8LA 2875 is ineligible for listing on the National Register of Historic Places. As an isolated find AO 1 is inherently ineligible for listing on the NRHP. Recorded site 8LA2281 could not be relocated but was previously found to be ineligible for listing on the NRHP.

The Orange Belt Railway (8LA4042) has unexceptional architecture and engineering, lack of association with historical events and lack of integrity of setting and feeling; therefore the Orange Belt Railway Group (8LA4042) is not eligible for listing on the NRHP.

Cultural Resources identified within the APE are presented in Figure 4.5

Figure 4.2: Existing Land Use

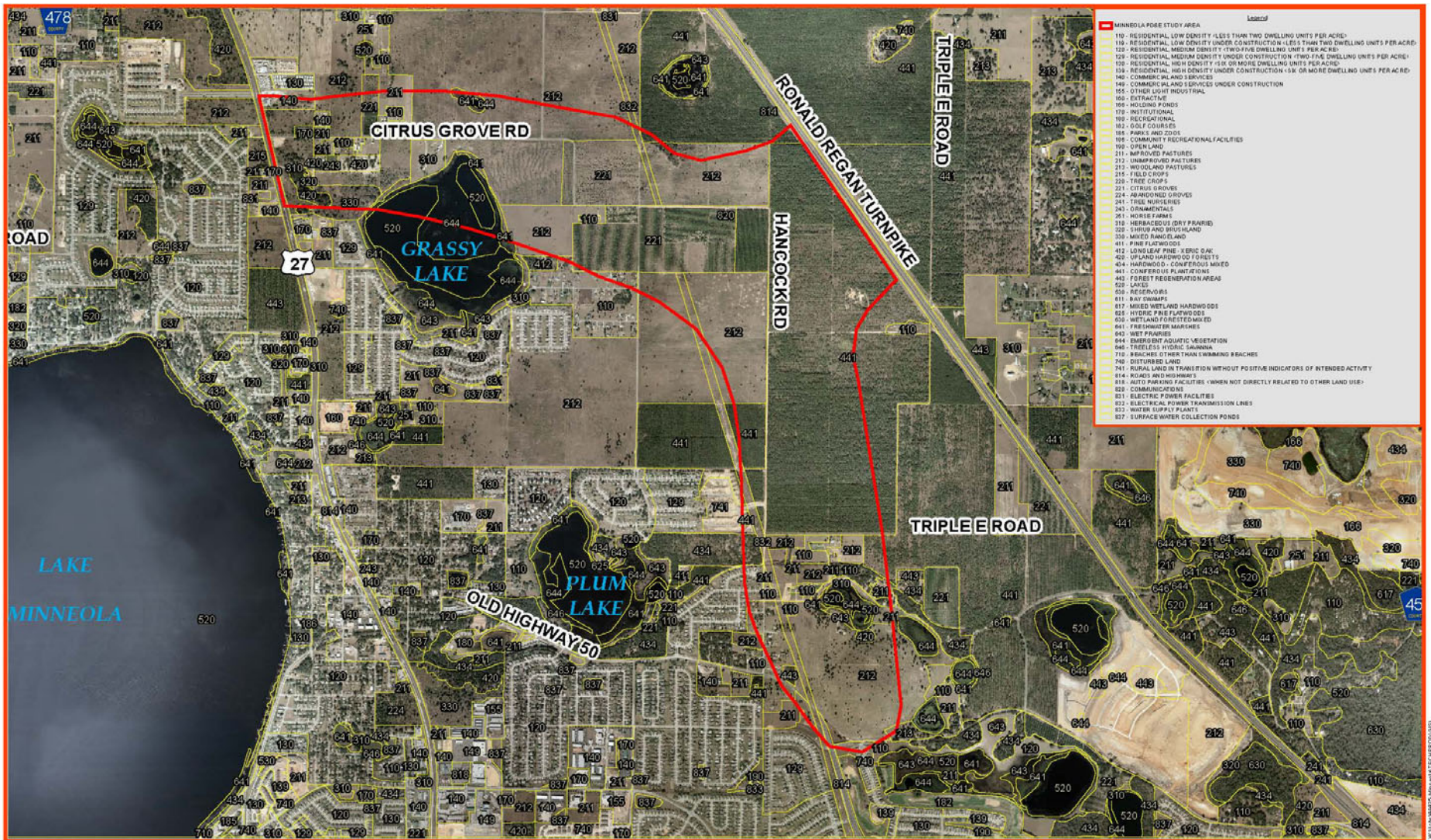


Figure 4.3: 2005 City of Minneola Zoning Map

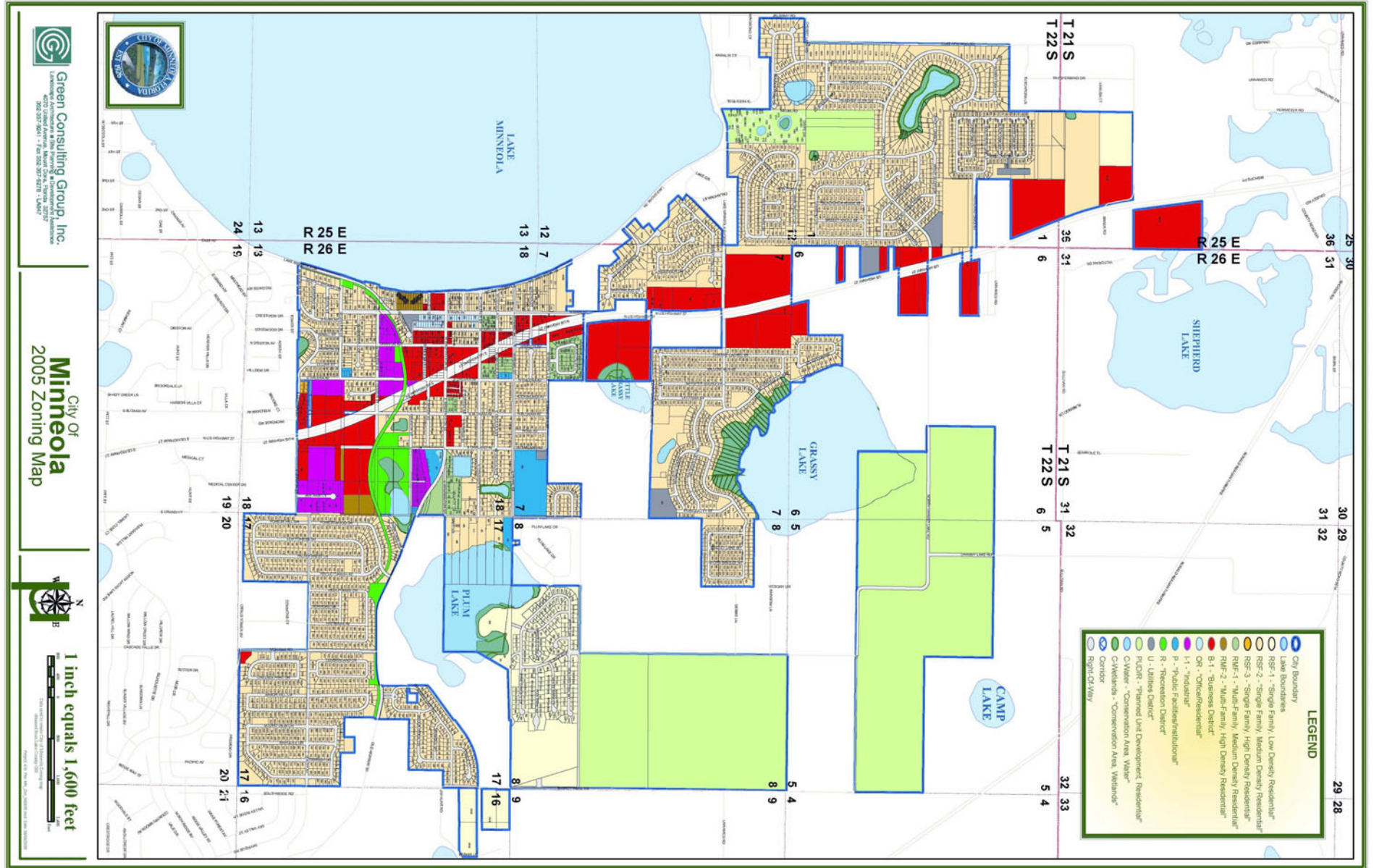
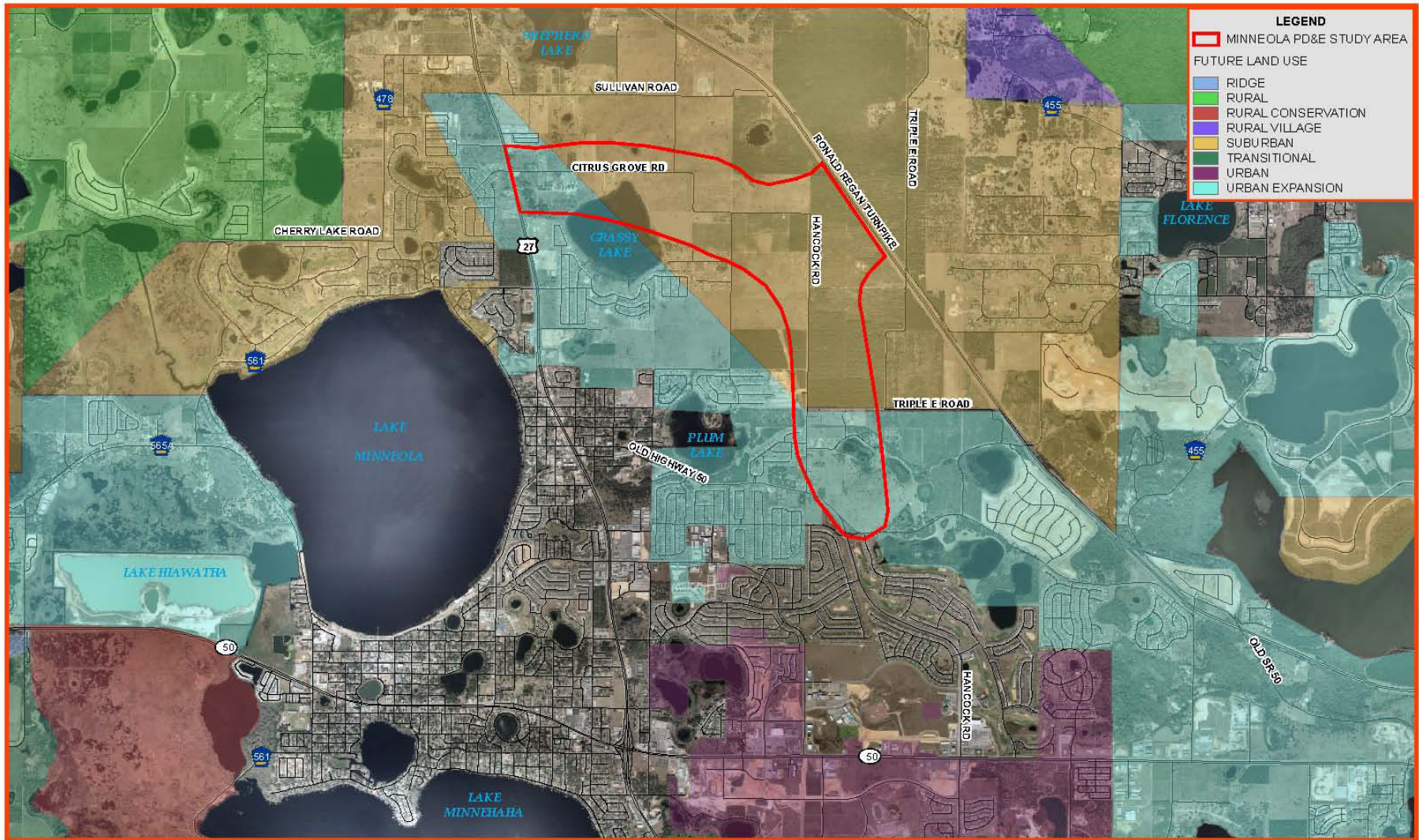


Figure 4.4: Future Land Use



**Future Land Use Map
Minneola Collector Road
PD&E Study**

1 Inch equals 3,000 Feet

3,000 Feet

Map Production Date: 10/19/07
Aerial Photography Date: July 2006



Figure 4.5: Cultural Resources Recorded within the Minneola Collector Road PD&E Study Corridor APE



Source: Cultural Resource Assessment Survey for Minneola Collector Road, 2008, SEARCH

4.2.3. Natural and Biological Features

4.2.3.1. Wetlands

EMS, scientists, engineers, planners, Inc. conducted a field assessment of the project corridor and proposed stormwater pond sites on January 30, 2008. The purpose of the assessment is to determine the presence of wetlands (if any) jurisdictional to the SJRWMD or the United States Army Corps of Engineers.

A two-person team of environmental scientists inspected the project corridor and proposed stormwater pond sites via vehicular and pedestrian transects. Observations made included dominant vegetation and hydrologic indicators. The jurisdictional wetland determination was based on vegetation, soil, and hydrological criteria outlined in the Corps of Engineers Wetlands Delineation Manual (1987), and the SJRWMD Applicants' Handbook: Management and Storage of Surface Waters.

Eight pond sites were field reviewed to determine the presence of wetlands jurisdictional to the permitting agencies. All of the pond sites were located in upland habitats and do not contain wetlands. Habitat types at the pond sites include fallow citrus groves, planted pine plantations, and cattle pastures. Pond site locations can be found on the Observed Species Map in Appendix III.

One wetland habitat was observed within the north portion of the project corridor adjacent to Grassy Lake, the wetland lies within the littoral zone of the lake. The dominant vegetative species observed were wax myrtle (*Myrica cerifera*), cordgrass (*Spartina bakeri*), torpedo grass (*Panicum repens*) and black sedge (*Carex* spp.). Water levels appear to be much lower than normal due to low rainfall levels over the past few years.

Adjacent land uses to this wetland area are fallow citrus groves and single family residential units. The fallow groves contain scattered citrus trees, cherry laurel, lantana, beauty berry, muhly grass and prickly-pear cactus.

The Lake County Soil Survey shows two soil types that are classified as hydric within this survey area: Myakka Sand (35) and Placid and Myakka Sands; Depressional (47).

Myakka Sand (35): This nearly level, poorly drained soil is found in the southeast portion of the project area. This soil is characterized by a surface layer containing sand and a moderate amount of organic matter, otop of a subsurface layer that contains sand with organic streaking. The water table is usually at a depth of 10 to 40 inches from the surface and permeability is rapid. Typical vegetation includes slash pine (*Pinus ellitotti*), saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), creeping bluestem (*Schizachyrium scoparium*), indiagrass (*Scorgastrum nutans*) and swamp sunflower (*Hibiscus moscheutos*).

Placid and Myakka Sand; depressional (47): These poorly to very poorly drained soils are found along Grassy Lake in the northern portion of the project area. These soils occur together without a regular pattern. The water table is usually nearer to the surface for longer periods of time than Myakka sand. Vegetation that was observed within this area was wax myrtle (*Myrica cerifera*), cord grass (*Spartina bakeri*), torpedo grass (*Panicum repens*) and black sedge (*Carex nigra*).

A preliminary wetland assessment using the Unified Mitigation Assessment Methodology has been performed for this wetland area. Location and landscape support characteristics were given a score of 6, reflective of the on-going development in the area and isolated nature of the lake and wetland. Water environment characteristics were scored at 5 due to low water levels present during field reviews of the project corridor. Vegetative structure characteristics were scored at 7 based on the appropriate wetland vegetation found along the lake shore and a lack of invasive species. Overall wetland quality is rated as moderate.

4.2.3.2. Wildlife Habitat Survey

The purpose of the wildlife habitat assessment is to determine the presence of, or potential for, Threatened and Endangered (collectively referred to as "protected") species, and to comment on other potential environmental constraints. EMS, Scientists, Engineers, Planners, Inc. conducted a field assessment of the project corridor and proposed stormwater pond sites on January 30, 2008. Details on the habitat survey can be found in the *Wildlife Technical Memorandum* completed for this project.

A two-person team of environmental scientists inspected the project corridor and proposed stormwater pond sites via vehicular and pedestrian transects. Observations were made along each transect for any "protected" animal or plant species that have the potential to occur within the specified cover types. The occurrence of protected animal species was documented through direct visual or aural observation of an animal or through observations of distinctive signs, such as tracks, scat, burrows, nests or food remains. All areas surveyed, habitats, species locations or evidence of occurrence, were recorded in our field notes. This study did not include any trapping or night observations. The habitat survey maps can be found in Appendix IV.

All land use/habitat types within the project were recorded by dominant species for each vegetative stratum. Habitat types were based on the FDOT's Florida Land Use, Cover and Forms Classification System. Habitat boundaries were determined by photo-interpretation of the aerial signatures and selectively verified through ground-truthing. Habitat types were cross-referenced with soil and habitat descriptions found in the Natural Resource Conservation Service's Soil Survey of Lake County, Florida.

Three protected animal species, the gopher tortoise, Florida scrub jay and osprey, or associated signs (such as nests, burrows, tracks and scat) were observed within the northern portion of the project corridor, although appropriate habitat was observed throughout. The Florida scrub jay has been documented by others as occurring within the study area; however none were sited during the field visits. No protected plant species were observed within the project corridor, but six are documented by the Florida Natural Areas Inventory as occurring: Florida bonamia, Florida jointtail, scrub wild buckwheat, scrub bear grass, Lewton's polygala and clasping warea. Due to current use and past agricultural use of the area, low development density and close proximity to Lake Minneola, the probability of occurrence and/or impact to any other potentially protected species within the proposed right of way or stormwater pond sites is moderate.

4.2.3.3. Floodplains / Floodways

The existing Minneola Collector Road corridor does not lie within a 100-year floodplain. However, one of the existing proposed pond sites located in the Founder's Ridge subdivision is located in the existing 100-year floodplain associated with a wetland connected to Grassy Lake. The FEMA Flood Insurance Rate Map No. 12069C0666D dated July 3, 2002, indicates that the wetland is in Zone A where the base flood was established to be at elevation 85.40 per the Founder's Ridge SJRWMD permit #4-069-10887-1. Grassy Lake has a confirmed 100-year flood elevation from FEMA of 85.40 feet. The floodplain area is shown in Appendix V.

4.2.3.4. Water Quality

EMS, scientists, engineers, planners, Inc. conducted a water quality assessment of the project corridor and proposed stormwater pond sites in accordance with Part II, Chapter 20 of the FDOT's *PD&E Manual*. The purpose of the assessment is to determine the potential impacts to surface and ground water within the project area.

The project is not located within an area that has been determined to be a Sole Source Aquifer under the Safe Drinking Water Act, Section 1424(e). Therefore consultation with the EPA is not required to determine if the project will create a significant hazard to public health.

4.2.3.5. Permit Review

The following section will describe, briefly, the role of various government regulatory agencies with jurisdiction over lands or development practices within the project area. The SJRWMD and the ACOE directly regulate natural resources through the issuance of permits, but the United States Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission have memorandums of agreement with these permitting agencies that require their input and approval on specific issues, such as wildlife, prior to permit issuance.

St Johns River Water Management District

The SJRWMD maintains jurisdiction and permitting authority over all stormwater related projects (part IV Chapter 373, F.S.). Included in this is a review of all jurisdictional wetlands (as defined by 62-340, F.A.C., see Section 2.1) and wildlife impacts within the proposed work area. The SJRWMD uses one permit called the Environmental Resource Permit for all stormwater and wetland impacts (Chapters 40-1, 40-4, 40-40, 40-41, 40-42, 40-44 & 40-400, F.A.C). If the wetland and stormwater impacts are minor (less than an acre); a staff issued Standard General Environmental Resource

Permit may apply. Regardless of the size, a SJRWMD permit will be required for any impacts to jurisdictional wetlands.

Included in the ERP Application is a review of impacts to Protected Species and other wildlife. And, as part of the application preparation, coordination with the FFWCC will be required for any proposed impacts to Protected Species or their habitat. This may also include species-specific surveys to determine density and habitat size. Any impacts to Protected Species or their habitat will require the development of a Management Plan and possibly mitigation. The *Wildlife Assessment Technical Memorandum* prepared as part of this study contains further details concerning protected species and permitting requirements.

U.S. Army Corps of Engineers

The ACOE maintains regulatory authority over all navigable waters and wetlands (under their jurisdiction (33CFR328.3(b), 1984, see Section 2.1) pursuant to Section 404 of the Clean Water Act, 1977 and Section 10 of the Rivers and Harbors Act, 1899.

As it stands today, the ACOE can only regulate fill activities within Waters of the United States. They do not regulate stormwater systems. Any proposed fill more than 0.29 acres is subject to an Individual Permit. Wetland fill under 0.30 acres will most likely be subject to the most commonly used nationwide series of permits. It should be noted that these thresholds are based on cumulative, project-wide totals. The ACOE is sensitive to piece-mealing and requires that all proposed impacts, both present and future, be identified and permitted at the same time.

An Individual Permit requires much of the ecological and biological data included with the ERP, and coordination with the USFWS. The ACOE also requires mitigation for impacts under an Individual Permit.

4.2.4. Contamination

Based on visual observations and other research contained in the Contamination Screening Evaluation Report, evidence of soil and/or groundwater contamination impacts at known contamination sites may have occurred within or near the Minneola Collector Road alignment or pond sites. Any sites rated as "medium" or "high" may warrant further intrusive investigation prior to construction. These ratings are based on known contamination sites, distance of known contamination plumes from the roadway or water retention areas, lack of detailed contamination records for reported sites at the county or Florida Department of Environmental Protection (FDEP) offices, or suspected sites based on visual observation only, of which no county or FDEP files were found. More information regarding the location of potential contamination sites can be found in the *Contamination Screening Evaluation Report*.

4.2.5. Noise

EMS conducted a study to determine the location and type of noise receptors, the approximate location of the 66 decibel (dBA) contour for future planning purposes and the Existing (2008) and 2030 Build traffic-related noise levels at each of the receivers. The noise sensitive sites are generally located along the southern portions of Hancock Road Extension and along Citrus Grove Road east of US 27.

Noise barrier analysis is warranted according to FDOT guidelines if predicted noise levels along the existing roadway equal or exceed 66 dBAs or, are 15 dBAs over ambient noise levels on the A-weighted scale. The A-weighted scale encompasses the range of sound levels detectable by the human ear. This study did not include noise barrier analysis.

The ambient noise level recorded during the evening hours was approximately 52 dBAs. Noticeable traffic-related noise from the nearby Florida's Turnpike to the east was detected at this location. Other noise generators near the project corridor include numerous surface streets and US 27 to the west.

Thirty-four potential noise receptor sites adjacent to the project corridor were modeled to determine Existing (2008) levels. More information regarding the existing noise levels can be found in the *Noise Study Technical Memorandum* prepared for this project found in Appendix VI.

5. Design Criteria

Design and construction criteria for the proposed Minneola Collector Road PD&E Study corridor must adhere to FDOT and Lake County standards for the design of such roadways and also must comply with recommended standard practices as set forth in the following documents:

- Manual on Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways, FDOT (2007)
- A Policy on Geometric Design of Highways and Streets (Green Book), AASHTO, 5th Edition (2004)
- Plans Preparation Manual (PPM), FDOT (2008)
- Drainage Manual, and Supplements, FDOT
- Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration (2003)
- Highway Capacity Manual (HCM), Transportation Research Board (2000)
- Lake County Design Standards

The design criteria listed in Table 5-1 is current. This table shows the design criteria for the typical sections used for this project. Some criteria vary as a function of traffic volume and FDOT has established ranges for low, medium and high volumes. The year 2025 projected traffic volumes indicate that the design criteria should be based on a moderately high volume roadway. All criteria are subject to change and only current criteria will be used during the final design.

Table 5-1: Design Criteria

Design Element	Minneola Collector Recommended Design	Source
Design Speed	40 mph	
Posted Speed	40 mph	
Thru Lane Widths	12 feet	Table 2.1.1 ¹
Bike Lanes	4 feet	Table 2.1.2 ¹
Horizontal Clearance (with curb and gutter)	4 feet	Index 700, Table C ¹
Median Width (Typical/Minimum)	22 / 15.5 feet	Table 2.2.1
Cross Slope	0.02	Figure 2.1.1 ¹
Outside Curb and Gutter	Type F	
Sidewalk	5 feet	Section 8.3.1 ¹
When adjacent to curb and gutter	6 feet	Section 8.3.1 ¹
Border width	10 feet	Table 2.5.2 ¹
Vertical Grade	0.3% minimum 8.0% maximum 0.80 change without curve	Table 2.6.4 ¹ Table 2.6.1 ¹ Table 2.6.2 ¹
Base Clearance	1 foot	Table 2.6.3 ¹
Minimum Length of Vertical Curve	K = 70 crest of 120 feet K = 64 sag or 120 feet	Table 2.8.5 ¹ Table 2.8.6 ¹

- References:
1. 2008 FDOT *Plans Preparation Manual*, Volume 1
 2. 2008 FDOT *Design Standard for Design, Construction, Maintenance and Utility Operations on State Highway System*
 3. 2004 AASHTO *Green Book*

6. Traffic

6.1. Existing Roadway Network

The existing roadway network and lane configuration within the project area of influence is shown in Figure 6.1. The project influence area includes a road network consisting of two arterials and ten collector roadways in Clermont, Lake County.

The two arterial facilities are U.S. 27, a six-lane divided north-south roadway, S.R. 50, an east-west four-lane divided roadway. The widening construction for U.S. 27 in the project area has just completed. During the time of the traffic counts, the roadway was a four-lane roadway. The collector roads within the study area that follow a north-south route are C.R. 561, C.R. 455, Hancock Road Extension, Hancock Road, Grand Highway, Citrus Tower Boulevard and Blackstill Lake Road. Other collector roads following an east-west route are C.R. 561A, C.R. 50 and Citrus Grove Road.

6.2. Multi-modal Transportation System Considerations

The project is located within an area of largely commercial and industrial uses bordered by older residential development. There are no park and ride facilities within the area. Travel through the area is largely by personal automobile or large cargo transportation vehicles.

Bus service is not provided within the corridor. There are no existing sidewalks or bicycle lanes that provide pedestrian facilities; however, pedestrians and bicyclists have been observed sporadically within the study corridor.

6.3. Traffic Analysis Assumptions

6.3.1. Design Assumptions

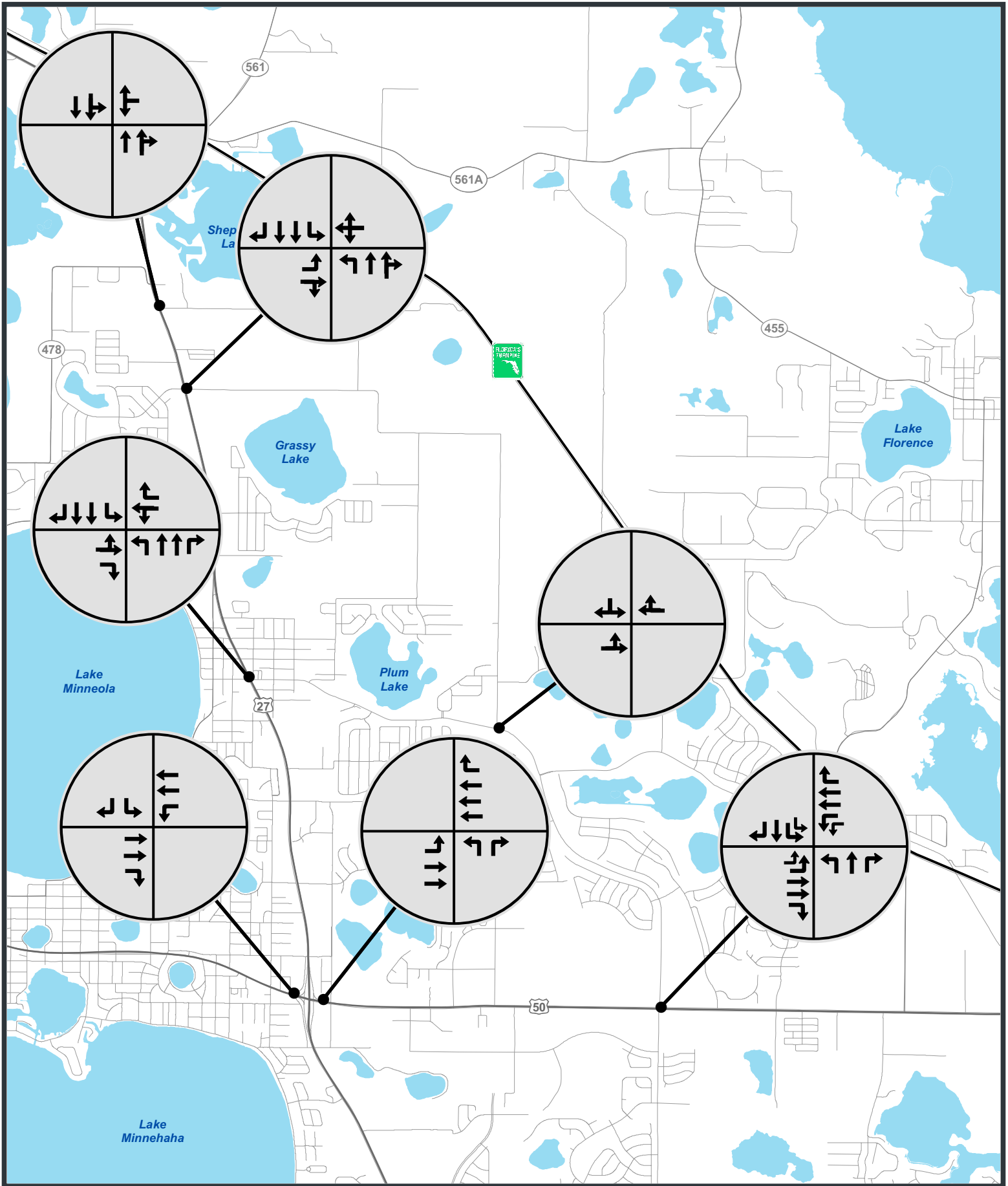
Based on information provided by the county, the following periods were used to provide design traffic forecasts for the Minneola Collector Road corridor:

- Existing Year - 2006/2007
- Opening Year - 2010
- Mid-Design Year - 2020
- Design Year - 2030

Several documents, including the 2008-2012 Lake County Transportation Construction Program, the Lake-Sumter 2025 Long Range Transportation Program, the adopted FDOT Work Programs, the FDOT 2025 Cost Feasible Florida Intrastate Highway System Plan and the FDOT Strategic Intermodal Systems projects selected for funding in 2005, were reviewed to determine planned and programmed improvements that would impact the traffic projections. The planned improvements within the study area are identified in Table 6-1 and Table 6-2.

Table 6-1: Programmed Roadway Improvements (2008-2012)

Roadway	From	To	Improvement	Status
U.S. 27	S.R. 50	C.R. 561A	Widen to 6 lanes	Under Construction
U.S. 27	Lake Louisa Road	S.R. 50	Widen to 6 lanes	Construction FY 2012
S.R. 50	Bloxam Avenue	Hancock Road	Widen to 6 lanes	Right of Way FY '08/'09
S.R. 50	Hancock Road	Orange County Line	Widen to 6 lanes	Construction FY '09
C.R. 561	Intersection with U.S. 27		Construct right and dual left-turn lanes	Design FY '10



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**Figure 6.1: Existing Geometry
Minneola Collector Road
Lake County, Florida**



4,000 Feet



Table 6-2: Planned Roadway Improvements (2012-2025)

Roadway	From	To	Improvement
U.S. 27	C.R. 561A	O'Brien Road	Widen to 6 lanes
C.R. 561	U.S. 27	S.R. 19	Widen to 4 lanes
C.R. 561A	C.R. 561	Fosgate Road	Widen to 4 lanes
Fosgate Road	Turnpike Interchange Road	C.R. 455	New 4-lane road
Hancock Road	Lake Louisa Road	S.R. 50	Widen to 4 lanes
Citrus Grove Road	U.S. 27	Hancock Road Extension	Widen to 4 lanes
Hancock Road Extension	C.R. 50	Citrus Grove Road	Widen to 4 lanes
Citrus Tower Boulevard	U.S. 27	Mohawk Road	Widen to 4 lanes

6.3.2. Analysis Scenarios

Three scenarios, or alternatives, were evaluated in the development of the design traffic forecasts and for the operational analysis of the Minneola Collector Road PD&E Study corridor. These scenarios consist of a no-build scenario which includes the widening of U.S. 27 from Sullivan Road south to S.R. 50 to six lanes, the widening on S.R. 50 from U.S. 27 east to Hancock Road to six lanes and other changes to the network as presented in Table 6-1 and Table 6-2. The Build 1 and Build 2 scenarios include the improvements for the No-Build Scenario as well as other improvements to the Minneola Collector Road corridor.

The Build 1 scenario includes a new 4-lane Minneola Collector Road to begin at C.R. 50 and extend north on Hancock Road Extension to Citrus Grove Road and then west to U.S. 27, creating a regional connection between S.R. 50 and U.S. 27.

The Build 2 scenario includes a new 4-lane Minneola Collector Road to begin at C.R. 50 and extend north on Hancock Road Extension to Citrus Grove Road and then west to U.S. 27, creating a regional connection between S.R. 50 and U.S. 27. This alternative also provides a connection between the Minneola Collector Road corridor and a new Florida's Turnpike interchange, proposed by others.

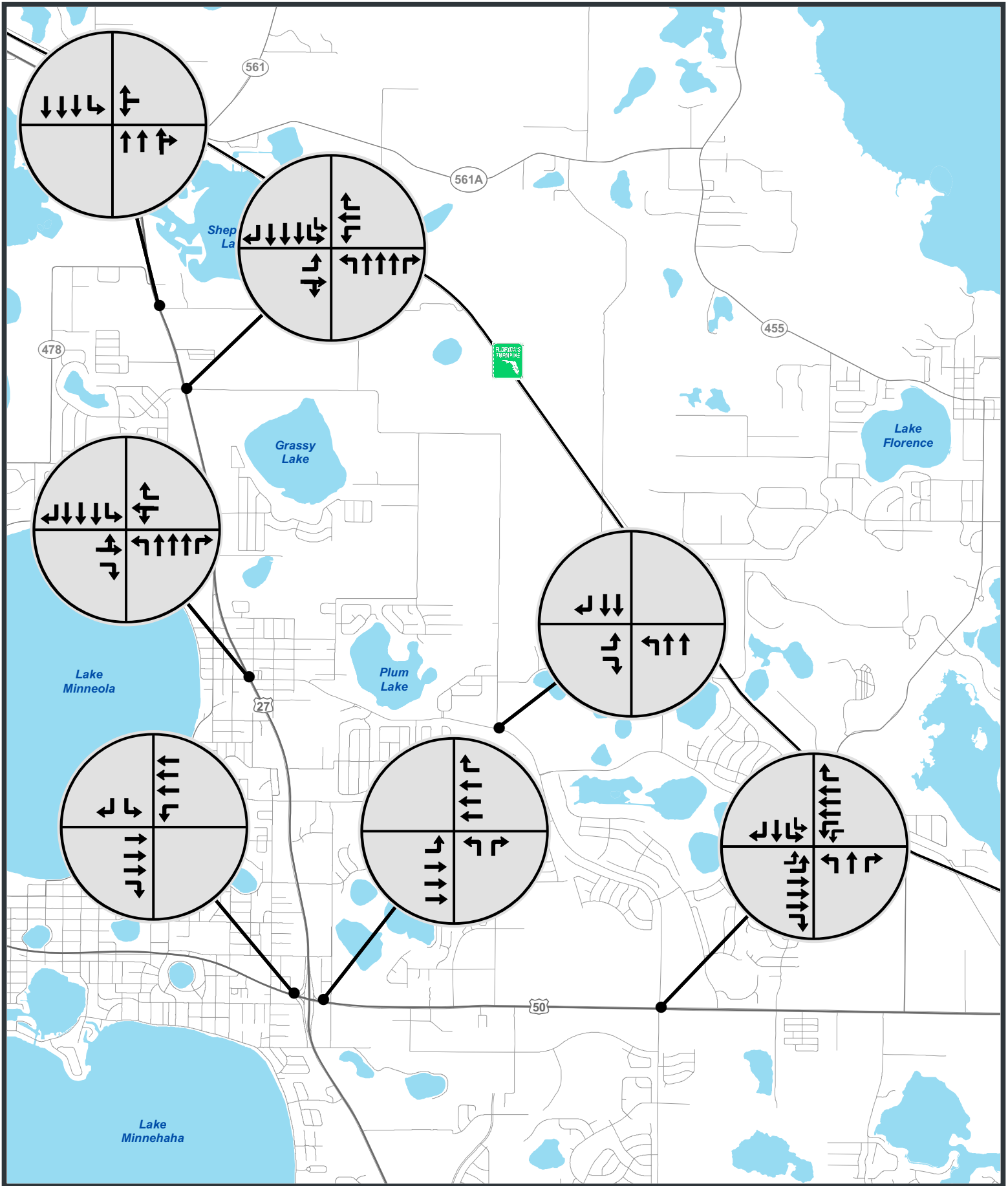
The proposed build scenario geometry for Build 1 and Build 2, respectively, for the year 2030 is shown in Figure 6.2 and Figure 6.3.

6.3.3. Design Characteristics

Information from the 2006 Florida Traffic Information CD was used to determine project traffic characteristics for the arterial facilities in the project area. These traffic characteristics include the 30th Analysis Hour Factor- K_{30} , the Directional Distribution Factor- D_{30} and the Daily Truck Factor- T_{daily} . The K_{30} factor is the proportion of the AADT occurring during the 30th highest hour of the design year. The D_{30} factor is the proportion of the 30th highest hour traffic that is traveling in the peak direction. The application of the K_{30} and D_{30} factors to the AADT volume produces the Directional Design Hourly Volume, which is the traffic volume for which a facility should be designed. The T_{daily} factor is the estimated percentage of the AADT that is truck traffic. The established K_{30} , D_{30} and T_{daily} factors for the arterial facilities are an average of the K's, D's and T's from the similar roadway segments within the project area. All traffic characteristics information included in the FTI CD is shown in Table 6-3.

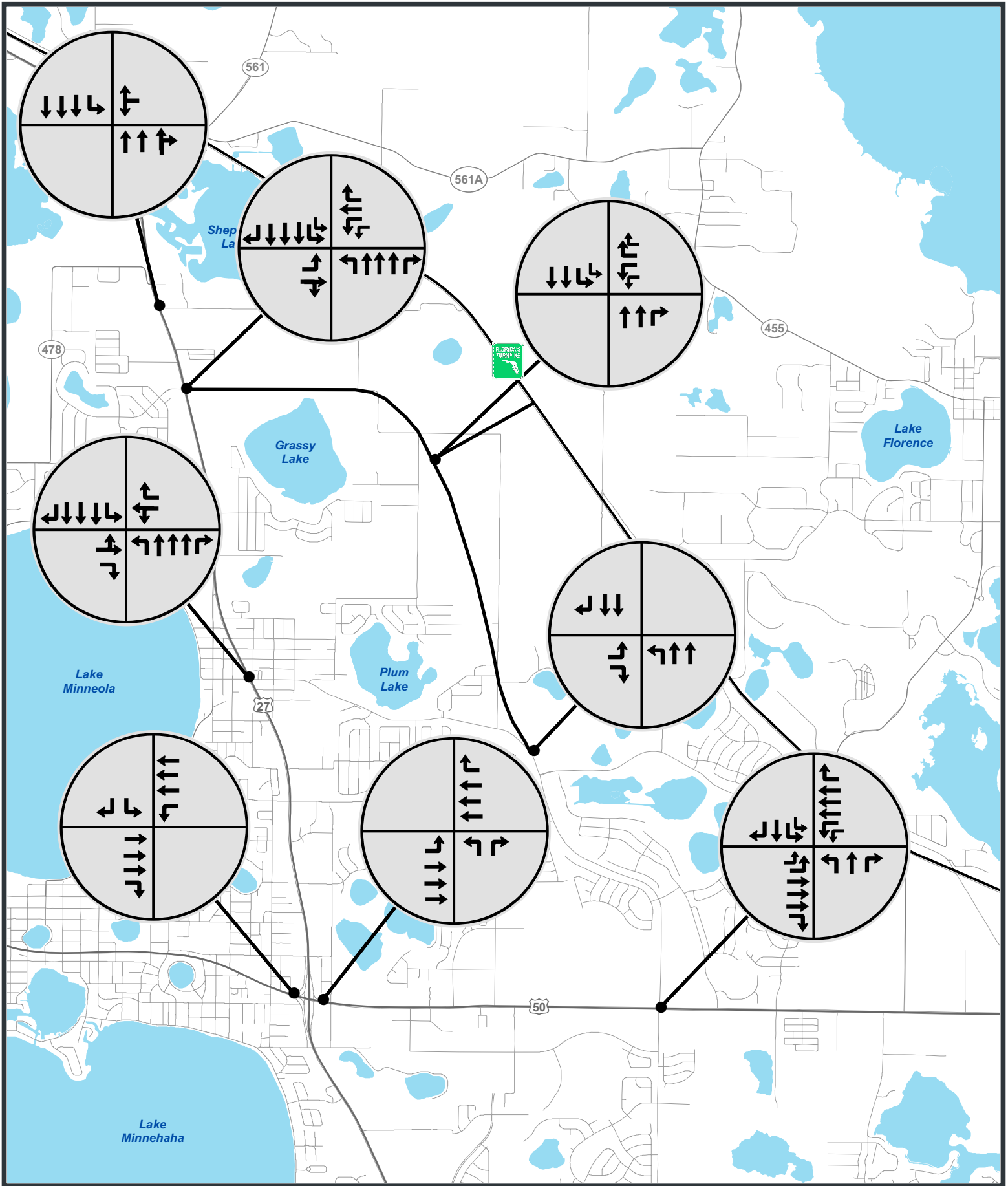
Table 6-3: Roadway Traffic Factors

Roadway	Description	K_{30}	D_{30}	T
U.S. 27	North of C.R. 561A	10.23%	59.48%	13.62%
	South of C.R.-561/561A (North of C.R. 50)	10.23%	59.48%	13.62%
	1.556 mi. N of S.R.-50	10.23%	59.48%	11.92%
	0.897 mi. N of S.R.-50	10.23%	59.48%	13.62%
	Average	10.23%	59.48%	13.20%
S.R. 50	West of U.S. 27	10.23%	59.48%	11.80%
	West of Hancock Road	10.23%	59.48%	6.34%
	East of Hancock Road	10.23%	59.48%	8.00%
	Average	10.23%	59.48%	8.71%



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**Figure 6.2: Build 1 Geometry
Minneola Collector Road
Lake County, Florida**



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**Figure 6.3: Build 2 Geometry
Minneola Collector Road
Lake County, Florida**



4,000 Feet



K and D factors for the side streets were considered separately. Existing travel characteristics and data from the traffic counts were used to develop Traffic Characteristics for the side streets within the project area. Based on 24-hour volume counts, $K_{measured}$ and $D_{measured}$ were determined. Using measured peak-to-daily ratios, an estimated value for K_{30} was developed based on the ratios of the median seasonal factor for the highest 13 weeks and the median seasonal factor for the lowest 13 weeks. For this study, an adjustment factor of 1.13 was used for side streets in Lake County. The average estimated K_{30} from the calculations is 10.65 percent. The average $D_{measured}$ based on the 24-hour volume counts on the side streets is 62.28 percent. A truck percentage of 2 percent was used on the minor side streets.

The recommended traffic characteristics provided in Table 6-4 represent the current travel patterns throughout the project area and provide the best indication of travel patterns for the future conditions. The recommended K_{30} and D_{30} shown for the various facility types are within the acceptable ranges as shown in the FDOT *Project Traffic Forecasting Handbook* and agreed upon by the project study team.

Table 6-4: Recommended Traffic Factors

Roadway		K_{30}	D_{30}	T
Arterials	U.S. 27 ¹	10.23	59.48	13.20
	S.R. 50 ¹	10.23	59.48	8.71
	Average	10.23	59.48	10.95
Side Streets	$K_{(Measured)}$	$K_{30(Estimated)}$	$D_{(Measured)}$	
	9.43	10.65	62.28	

⁽¹⁾ 2006 FDOT Florida Traffic Information CD

Traffic count information from the FTI CD as well as the field measured traffic factors are summarized in Appendix C.

6.4. Existing Traffic Volumes

The AADTs shown in Figure 6.4, as well as the recommended design characteristics in Table 6-4, were used to develop the DDHVs that are shown in Figure 6.5. The DDHVs were used to determine the roadway segments LOS that are summarized in Table 6-5. The roadway characteristics information, also used to determine the segment LOS, is found in Appendix D of the *Design Traffic Report* prepared for this project.

Table 6-5: Existing Conditions Segment Level of Service

Roadway	Description	LOS
Citrus Grove Road	East of U.S. 27	C
Hancock Road Extension	North of C.R. 50	C

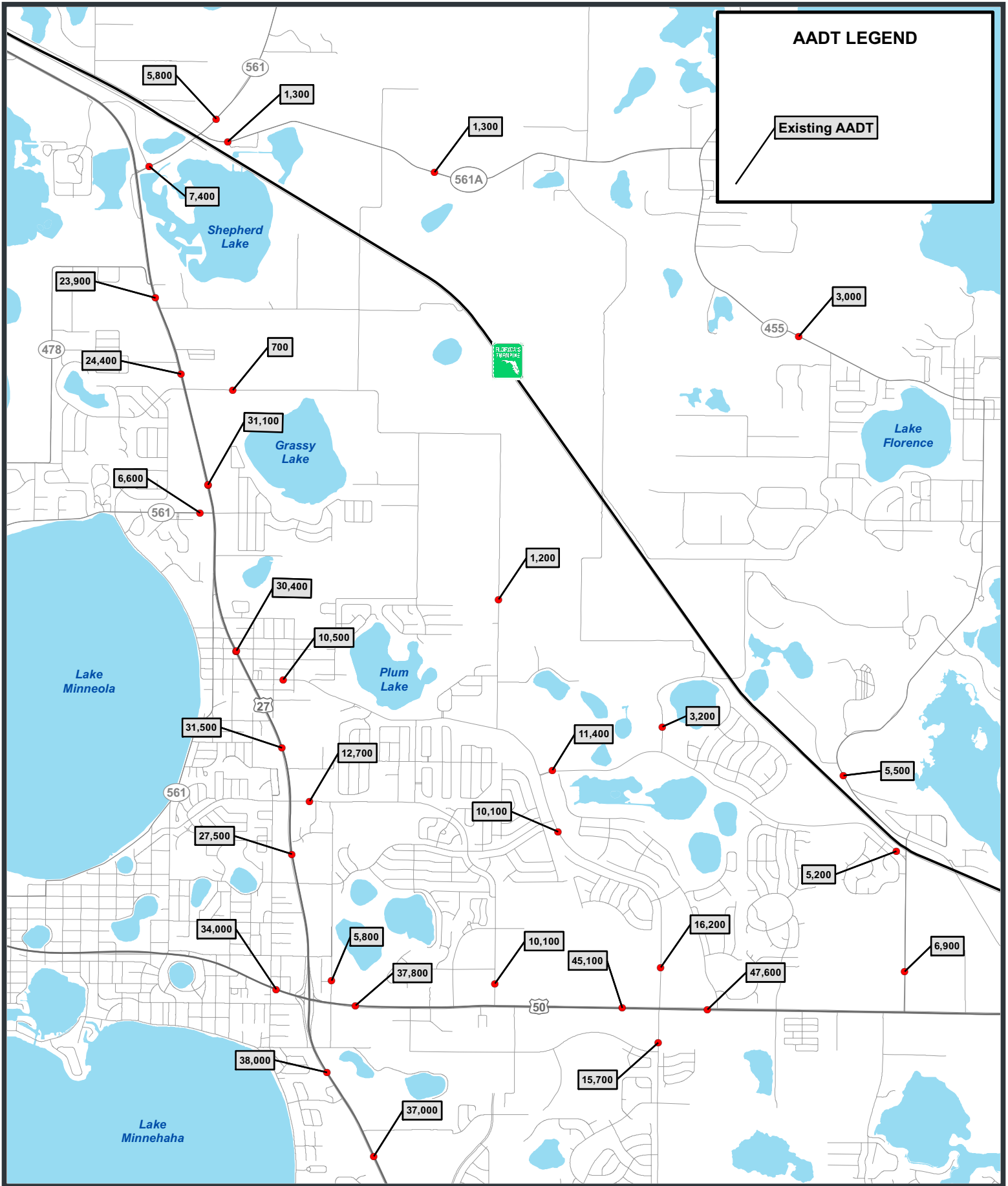
6.5. Existing Intersection Level of Service

The existing turning movement counts shown in Figure 6.6 were utilized along with the existing geometry illustrated in Figure 6.1 to determine the LOS at the existing intersections within the study area. Table 6-6 shows that the intersections of U.S. 27 and C.R. 50 and of S.R. 50 and Hancock Road operate at LOS E during the PM peak period due to heavy traffic volumes. All other signalized intersections are operating at an acceptable LOS D or better for the existing PM peak traffic conditions. The mainline movement is operating at LOS B or better for both unsignalized intersections, as shown in Table 6-6. The intersection LOS is also shown in Figure 6.6.

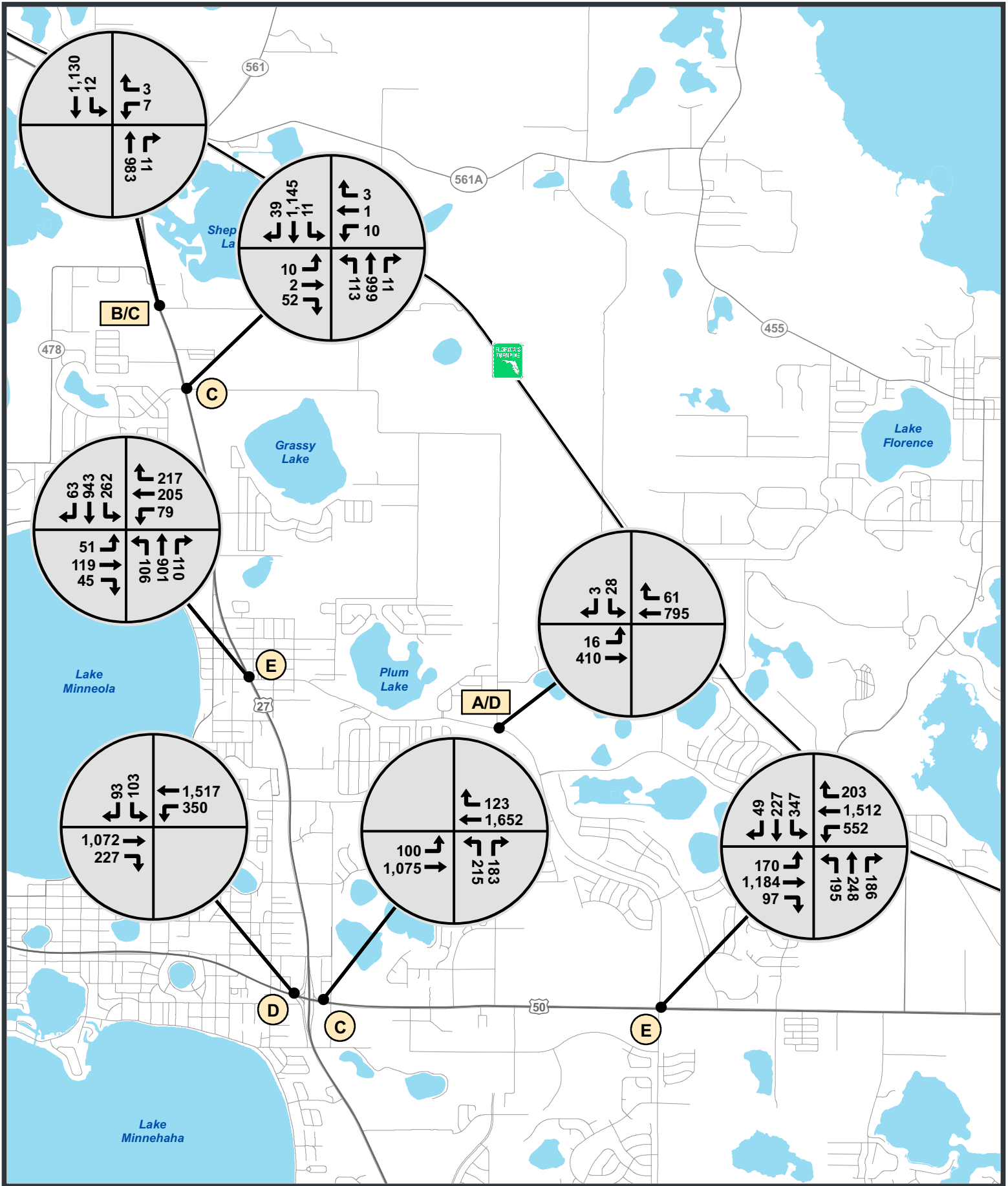
Table 6-6: Existing Intersection LOS Summary

Intersection	Control Type	Delay(sec/veh)	LOS
U.S. 27 and Sullivan Road	Stop	19.3	B/C ¹
U.S. 27 and Citrus Grove Road	Signal	26.2	C
U.S. 27 and C.R. 50	Signal	63.9	E
C.R. 50 and Hancock Road Extension	Stop	29.3	A/D ¹
S.R. 50 and U.S. 27 SB Ramps	Signal	51.2	D
S.R. 50 and U.S. 27 NB Ramps	Signal	30.2	C
S.R. 50 and Hancock Road	Signal	73.5	E

⁽¹⁾ Mainline/Side Street



**Figure 6.4: Existing Conditions AADT
Minneola Collector Road
Lake County, Florida**



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Figure 6.6:
Existing PM Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida



4,000 Feet



6.6. Future Traffic Projections

The development of traffic projections for the Minneola Collector Road PD&E Study requires the examination of historical traffic growth, the most current transportation model, proposed development within the corridor vicinity and a basic understanding of the traffic circulation patterns and characteristics of the corridor.

6.6.1. Trends Analysis

Based on the historical traffic count information trends analyses were performed to evaluate future traffic growth in the project corridor based on the count stations identified in Table 6-7.

Table 6-7: Historical Growth Rate Analysis

Location	2006/2007 Trend ⁽¹⁾ Projected Volumes	2030 Trend Projected Volumes	Growth Rate 2006/2007 Trend to 2030 Trend	R ²
U.S. 27, 0.207 mi. N of C.R.-561A	29,000	55,900	3.86%	90.8%
U.S. 27, 0.174 mi. S of C.R.-561/561A	30,100	56,500	3.65%	79.5%
U.S. 27, 1.556 mi. N of S.R.-50	32,100	59,300	3.53%	95.0%
U.S. 27, 0.897 mi. N of S.R.-50	27,400	48,300	3.18%	93.1%
U.S. 27, 0.48 mi. S of S.R.-50	37,500	81,200	4.86%	94.7%
U.S. 27, 1.05 mi. S of S.R.-50	37,200	133,200	10.75%	99.5%
U.S. 27 Average ⁽²⁾			4.97%	92.10%
S.R. 50, 0.245 mi. W of U.S.-27	38,100	70,200	3.51%	95.4%
S.R. 50, 0.557 mi. W of Hancock Road	15,500	31,400	4.27%	96.8%
S.R. 50, 0.3 mi. E of Hancock Road	55,900	137,500	6.08%	83.6%
S.R. 50 Average ⁽²⁾			4.62%	91.93%
C.R. 561, 0.04 mi. N of C.R. 561A	6,100	8,900	2.00%	32.1%
C.R. 561/C.R. 561A, 0.09 mi. E of U.S. 27	8,000	9,600	0.87%	4.7%
C.R. 561A, 0.18 mi. E of C.R. 561	1,400	3,000	4.97%	72.1%
C.R. 561A, 0.35 mi. E of Citrus Grove Road	1,300	3,200	6.35%	88.9%
C.R. 561, 0.11 mi. W of U.S. 27	7,000	11,900	3.04%	46.9%
C.R. 50, 0.05 mi. W of Park Trail Dr.	11,300	35,000	9.12%	75.8%
C.R. 50, 0.08 mi. W of C.R. 455	5,500	14,700	7.27%	87.3%
C.R. 455, 0.05 mi. W of Fosgate Road	3,000	5,300	3.33%	92.6%
C.R. 455, 0.10 mi. N of Magnolia Creek Lane	6,300	11,100	3.31%	22.4%
C.R. 455, 0.25 mi. N of S.R. 50	7,700	26,100	10.39%	81.5%
Citrus Grove Road, 0.14 mi. E of U.S. 27	600	1,700	7.97%	75.0%
Hancock Road, 0.102 mi. N of S.R. 50	16,100	80,300	17.34%	85.6%
Grand Highway, 0.14 mi. N of S.R. 50	4,800	-800	-5.07%	14.1%
Citrus Tower Blvd., 0.14 mi. N of S.R. 50	10,500	6,600	-1.55%	16.0%
Citrus Tower Blvd., 0.113 mi. E of U.S. 27	12,700	35,400	7.77%	97.7%
Blackstill Lake Road, 0.16 mi. N of C.R. 50	3,200	10,100	9.38%	96.4%
County Roads Average ⁽²⁾			8.77%	86.76%
Overall Average ⁽²⁾			6.81%	

(1) Trends projected 2006 or 2007 volumes are used to calculate growth rate and may be different from existing 2006 or 2007 AADT used in this study.

(2) Average of all Trends growth rates with an R² greater than 75%.

Future growth trends were established by a least square linear regression of historic counts. These analysis sheets are included in Appendix F of the *Design Traffic Report* prepared for this project. Based on this analysis, a resulting annual simple growth rate (average of all count stations within the corridor) of approximately 6.81 percent per year (simple compounding) was estimated using projected trends between the years 2006 or 2007 (depending on the location) and 2030.

It should be noted that future travel demands estimated from trends analyses are based on historical traffic, driven by past economic and development growth in the Minneola Collector Road study area, under the existing roadway system. The future travel demand projections based on the trends analysis are not reflective of a no-build or build condition but on the ability of the area to sustain economic growth and the available roadway capacity through the roadway facilities.

6.6.2. Transportation Models

In addition to the historical count based trends analysis, the most current Year 2025 CFRPM v4.1 FSUTMS model was also used in assessing future demand for the corridors in the project area.

The CFRPM v4.1 modeling effort was representative of the 2025 Cost Feasible Plan network and contains all updated model input information which was available at the time of the preparation of this report. The 2025 Cost Feasible Plan network is also reflective of all adopted improvements as indicated in the Lake-Sumter MPO and METROPLAN ORLANDO LRTPs. Based on these modeling efforts, forecasts for travel demand were developed using the anticipated future roadway network as indicated in the adopted long range transportation plan and MPO adopted socio-economic data for the area. Initial 2025 AADT volumes were derived by applying the appropriate Model Output Conversion Factor to the model output. The results of the initial 2025 AADTs and growth rates are shown in Table 6-8 for the no-build and build scenarios.

Table 6-8: Initial AADTs and Growth Rates

Roadway	Location	Existing 2006/07 AADT	No-Build 2025 AADT	Build Scenario 1 2025 AADT	Build Scenario 2 2025 AADT	No-Build Growth Rate	Build Scenario 1 Growth Rate	Build Scenario 2 Growth Rate
U.S. 27	North of Sullivan Road	23,860	59,170	58,660	66,740	8.22%	8.10%	9.98%
U.S. 27	North of Citrus Grove Rd	24,390	56,610	56,450	64,690	7.34%	7.30%	9.18%
U.S.-27	North of C.R. 561A	31,090	54,060	51,040	42,790	4.10%	3.56%	2.09%
U.S.-27	South of C.R.-561/561A (North of C.R. 50)	30,380	57,840	53,700	45,110	5.02%	4.26%	2.69%
U.S.-27	1.556 mi. N of S.R.-50	31,500	45,680	43,630	39,210	2.50%	2.14%	1.36%
U.S.-27	0.897 mi. N of S.R.-50	27,500	45,410	43,540	39,070	3.62%	3.24%	2.34%
U.S.-27	0.48 mi. S of S.R.-50	38,000	51,090	49,240	45,840	1.91%	1.64%	1.15%
U.S.-27	1.05 mi. S of S.R.-50	37,000	50,210	48,470	44,550	1.98%	1.72%	1.13%
S.R.-50	West of U.S.-27	33,970	57,270	57,450	58,480	3.81%	3.84%	4.01%
S.R. 50	East of U.S. 27	37,810	51,310	51,210	50,620	1.98%	1.97%	1.88%
S.R. 50	West of Hancock Road	45,130	67,360	64,450	63,460	2.74%	2.38%	2.26%
S.R.-50	East of Hancock Road	47,610	77,160	78,450	71,880	3.45%	3.60%	2.83%
C.R. 561	0.04 mi. N of C.R. 561A	5,815	11,780	10,920	8,550	5.70%	4.88%	2.61%
C.R. 561/C.R. 561A	0.09 mi. E of U.S. 27	7,386	22,380	18,100	14,990	11.28%	8.06%	5.72%
C.R. 561A	0.18 mi. E of C.R. 561	1,333	10,600	7,180	6,440	38.62%	24.37%	21.28%
C.R. 561A	0.35 mi. E of Citrus Grove Road	1,276	13,710	10,250	7,550	54.14%	39.07%	27.32%
C.R. 561	0.11 mi. W of U.S. 27	6,644	7,890	8,190	8,560	1.04%	1.29%	1.60%
Citrus Grove Road	East of U.S. 27	700	11,140	13,230	30,440	82.86%	99.44%	236.03%
Hancock Road Extension	North of C.R. 50	1,200	14,380	20,820	17,440	61.02%	90.83%	75.19%
C.R. 50	East of U.S. 27	10,470	6,640	4,900	2,550	-2.03%	-2.96%	-4.20%
C.R. 50	East of Hancock Road Extension	11,350	10,000	5,720	3,690	-0.66%	-2.76%	-3.75%
C.R. 50	0.08 mi. W of C.R. 455	5,215	10,360	8,930	8,410	5.48%	3.96%	3.40%
Hancock Road	0.106 mi. S of C.R. 50	10,066	17,310	26,420	17,810	4.00%	9.03%	4.27%
Hancock Road	North of S.R. 50	16,220	18,810	28,140	20,830	0.89%	4.08%	1.58%
Hancock Road	South of S.R. 50	15,670	13,830	16,990	16,660	-0.65%	0.47%	0.35%
C.R. 455	0.05 mi. W of Fosgate Road	3,002	12,970	11,380	8,820	18.45%	15.50%	10.77%
C.R. 455	0.10 mi. N of Magnolia Creek Lane	5,549	18,930	17,670	15,790	13.40%	12.14%	10.25%
C.R. 455	0.25 mi. N of S.R. 50	6,866	21,560	18,690	17,730	11.89%	9.57%	8.79%
Grand Highway	0.14 mi. N of S.R. 50	5,753	5,570	5,250	4,490	-0.18%	-0.49%	-1.22%
Citrus Tower Blvd	0.14 mi. N of S.R. 50	10,120	17,470	14,520	10,620	4.03%	2.42%	0.27%
Citrus Tower Blvd	0.113 mi. E of U.S. 27	12,716	9,950	8,730	7,970	-1.21%	-1.74%	-2.07%
Blackstill Lake Road	0.16 mi. N of C.R. 50	3,184	9,850	10,510	6,060	11.63%	12.78%	5.02%
Total		548,775	938,300		922,830	867,840		
No-Build Growth Rate				3.94%				3.79%

6.6.3. Design Traffic Forecasts for Design Hour

Due to the specific conditions associated with any roadway, it is necessary to utilize the various methods in projecting future traffic forecasts as a basis for comparison. In addition, actual road characteristics such as access, existing and anticipated operational conditions, proposed future roadway network improvements, specific land use developments, traffic patterns/mix and driver perception must also be assessed and analyzed in developing future traffic forecasts.

Most of the above considerations are based on engineering judgment, field observations and knowledge of the operations of the existing facility. Before accepting the model results as appropriate for use in the design traffic report, the results of the transportation model for this area were reviewed closely to determine the validity of the traffic forecasts. This information is used with the existing traffic volumes to develop future forecasts of travel demand (design traffic forecasts) which would be representative of traffic volume increases expected in the future.

The results of the FSUTMS model runs were adjusted from peak season to AADTs by applying a MOCF factor of 0.94. The growth rates for each of the roadway segments were derived by comparison of the known 2006 and 2007 AADT volumes to the initial 2025 AADT volumes. The design year 2030 AADT forecasts were then developed by projecting up the initial 2025 AADTs using the annual growth rate for each roadway segment. The known 2006 and 2007 AADT volumes derived from count data and the design year 2030 forecasts for the project were the basis for interpolating the 2010 and 2020 AADTs along the roadways within the study area.

An alternate method was used for the following roadway segments with a negative growth rate for the no-build scenario:

- C.R. 50, East of U.S. 27
- C.R. 50, East of Hancock Road Extension
- Hancock Road, South of S.R. 50
- Grand Highway, 0.14 mi. North of S.R. 50
- Citrus Tower Boulevard, 0.113 mi. East of U.S. 27

6.7. Build 1 Geometry

Figure 6.2 shows the proposed Build 1 Scenario geometry for the Minneola Collector Road for 2030. In addition to the roadway improvements included in the No-Build Scenario, the four-lane Minneola Collector Road corridor is included in the Build 1 Scenario. To improve the operations of the existing intersections, improvements are proposed for the intersections noted below for 2010, 2020 and 2030:

U.S. 27 at Citrus Grove Road:

- Provide a left turn-lane in the westbound direction (2010)
- Add additional through lane in the NB and SB directions (2020)
- Add an additional left-turn lane in the southbound direction (2020)
- In the northbound direction make a separate through and right-turn lane (2020)
- Provide a separate left-, through and right-turn lane in the WB direction (2020)

C.R. 50 at Hancock Road Extension:

- Add an additional through lane in both the NB and SB directions (2010)
- Provide a left-turn lane in the NB direction (2010)
- Provide a separate left- and right-turn lane in the EB direction (2020)
- Provide a right-turn lane in the SB direction (2030)

6.8. Build 2 Geometry

Figure 6.3 shows the proposed geometry for the Minneola Collector Road in the Build 2 Scenario for the year 2030. In addition to the roadway improvements assumed to be in place in the No-Build Scenario, the four-lane Minneola Collector corridor is included in the Build 2 Scenario, including a connection to the Florida Turnpike at a new interchange. To improve operations of the existing intersections, improvements are proposed for the intersections noted below for 2010, 2020 and 2030:

U.S. 27 at Citrus Grove Road:

- Add an additional left-turn lane in the SB direction (2010)
- Provide a left-turn lane in the WB direction (2010)
- Add an additional through lane in both the NB and SB directions (2020)
- In the NB direction provide a separate through and right turn lane (2020)
- Provide a separate left-, through and right- turn lane in the WB direction (2020)
- Add an additional left-turn lane in the WB direction (2030)

C.R. 50 at Hancock Road Extension:

- Install a traffic signal (2010)
- Add an additional through lane in both the NB and SB directions (2010)
- Provide separate left- and right-turn lane in the EB direction (2010)
- Provide a left-turn lane in the NB direction (2020)
- Provide a right-turn lane in the SB direction (2030)

Citrus Grove Road/Hancock Road Extension at Turnpike Connector:

- Install a traffic signal (2010)
- Add an additional through lane in the EB direction (2010)
- Provide a separate left- and right-turn lane in the NB direction (2010)
- Provide dual left-turn lanes and two through lanes in the WB direction (2010)
- Provide a right-turn lane in the EB direction (2020)
- Add an additional left-turn lane in the NB direction (2030)

6.9. Level of Service Analysis

For each analysis year, AADTs and DDHVs were developed, reflecting each condition, for roadways within the project study area. Operational and LOS analyses were performed on study area roadway segments and intersections for each analysis year. Build geometries were utilized to evaluate improvements, after adopted generalized improvements no longer provide acceptable LOS standards. The projected AADTs are shown in Figure 6.7 and Figure 6.8 and Figure 6.9 for 2010, 2020 and 2030, respectively, for the existing conditions and No-Build and Build alternatives. Figure 6.10, Figure 6.11 and Figure 6.12 indicate the projected DDHVs for 2010, 2020 and 2030, respectively.

The three scenarios were analyzed using Highway Capacity Software (HCS+) Version 5.2, which utilizes the most current adopted procedures, as outlined in the Highway Capacity Manual 2000 (HCM 2000). Specific analysis techniques utilized in this study include signalized intersection and unsignalized intersection analyses and the FDOT 2002 Quality/Level of Service Handbook.

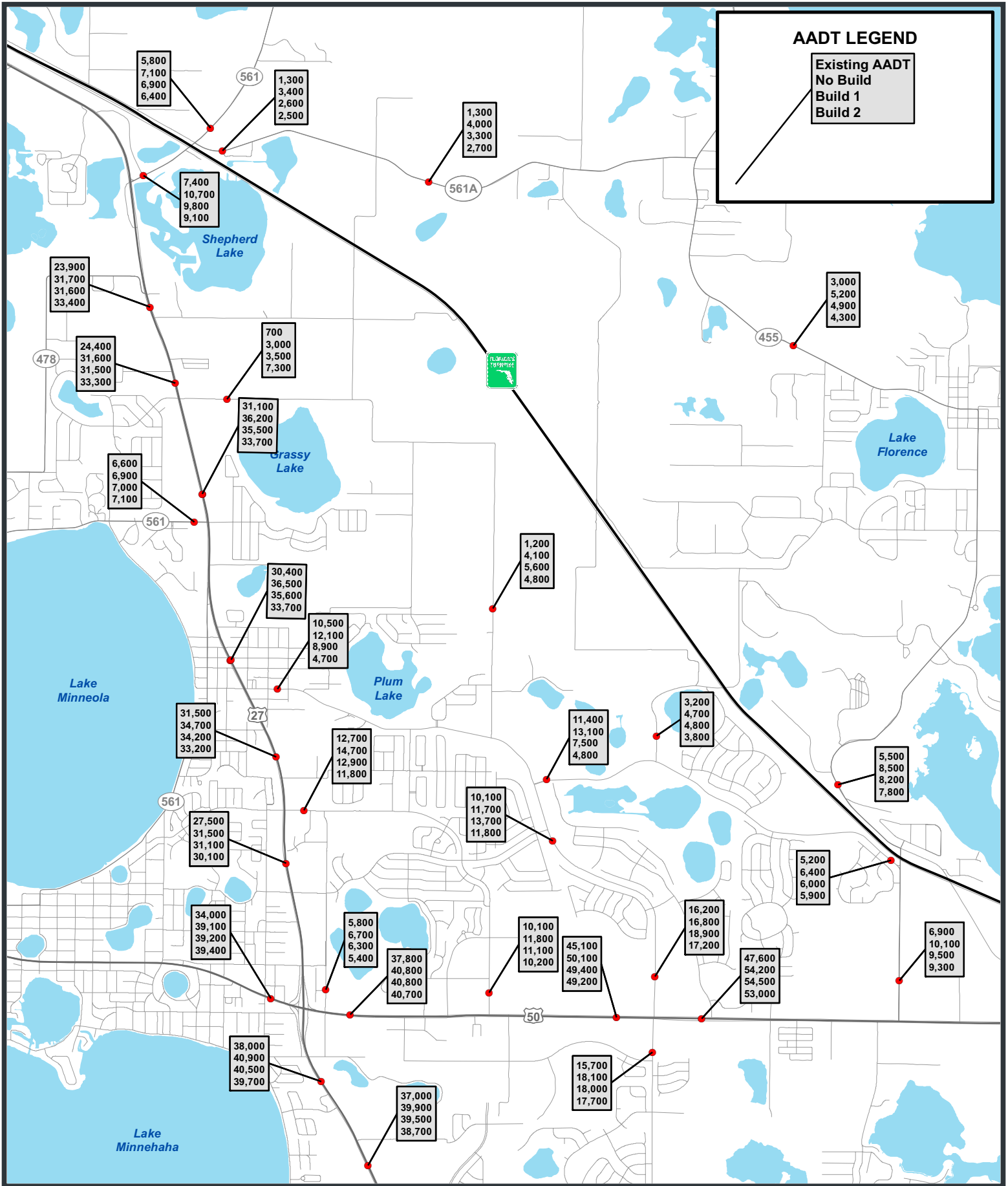
6.9.1. No Build Levels of Service

Roadway operational characteristics were tested for the No-Build geometry for the opening, mid and design years. Figure 6.13, Figure 6.14 and Figure 6.15 provide the design hour turning movement volumes and intersection LOS for each year. The roadway characteristics information used to determine the segment LOS is provided in Appendix G of the *Design Traffic Report*. Existing intersection signal timing and phasing, provided by Lake County, were used to analyze the future No-Build conditions.

While the No-Build scenario did not include the Minneola Collector Road project, it does include all the programmed and planned roadway improvements within the project study area. Even with the anticipated capacity improvements within the study area, significant LOS deficiencies are expected on many of the major and minor roadways by 2030. U.S. 27 is expected to operate at LOS F and be significantly over capacity from Sullivan Road to S.R. 50 in 2030. Likewise, S.R. 50 is expected to operate at LOS F and be significantly over capacity between U.S. 27 and Hancock Road. Hancock Road Extension, Citrus Grove Road, Grand Highway, Blackstill Lake Road and portions of C.R. 455 are expected to operate under LOS F conditions. HCS+ analysis tools confirmed the LOS failures and capacity deficiencies along U.S. 27 and S.R. 50, showing overcapacity and failing conditions in 2010, 2020 and 2030. Extended discussions of the no-build level of service for each study year can be found in the *Design Traffic Report*.

6.9.2. Build 1 Levels of Service

Roadway operational characteristics were tested on the Build 1 scenario geometry for the opening, mid and design years. Figure 6.16, Figure 6.17 and Figure 6.18 illustrate the design hour turning movement



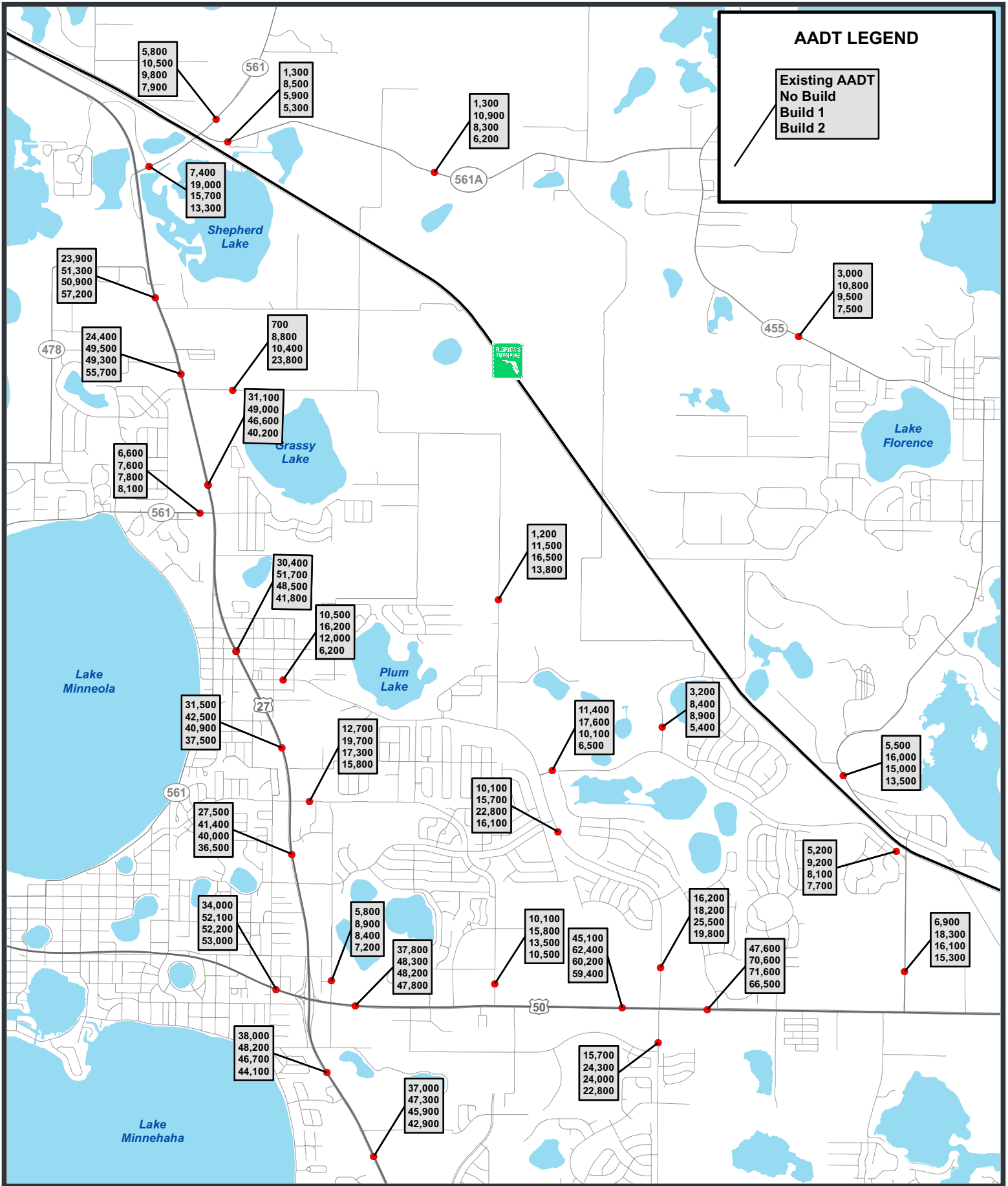
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**Figure 6.7: 2010 Projected AADT
Minneola Collector Road
Lake County, Florida**



4,000 Feet





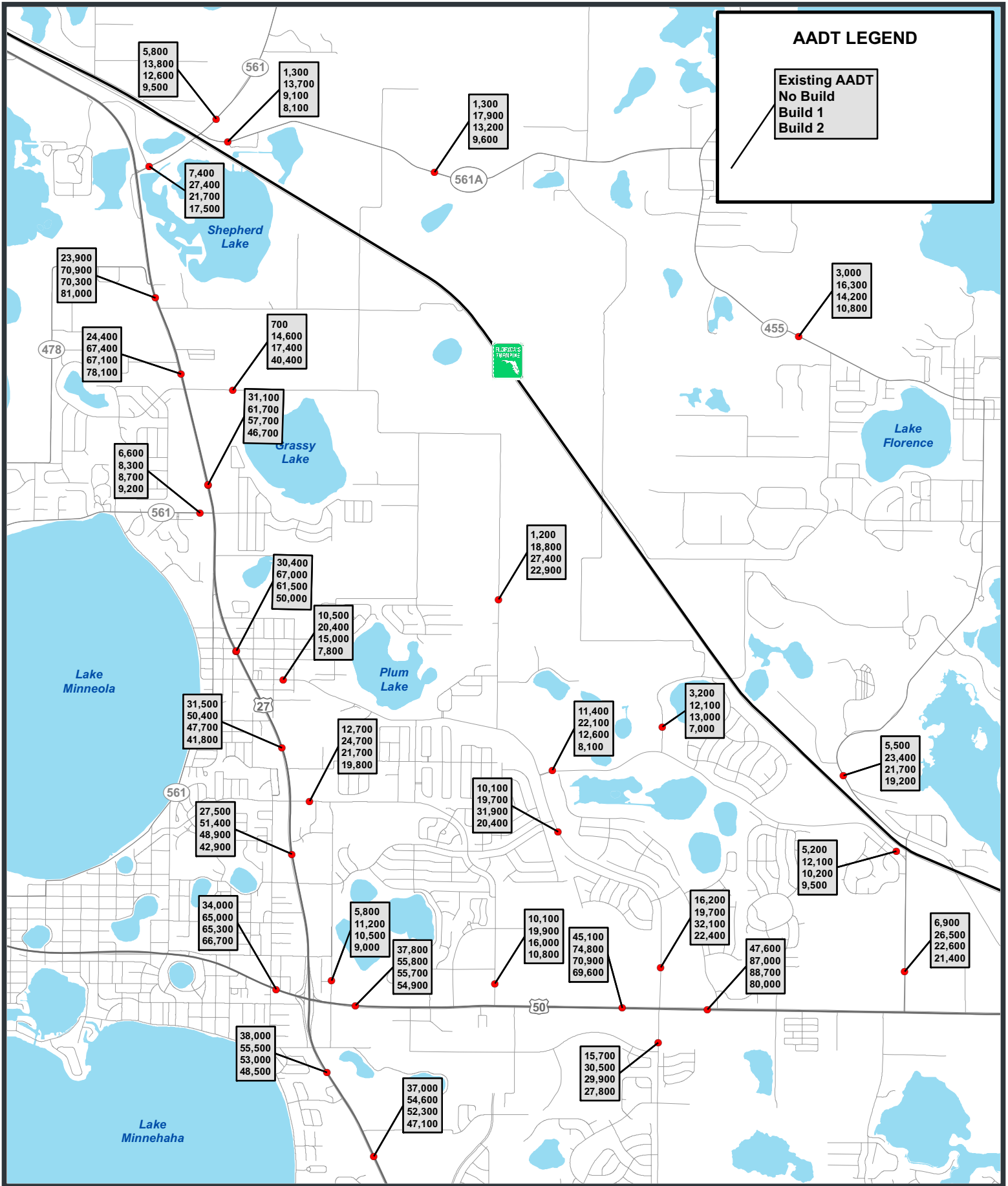
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**Figure 6.8: 2020 Projected AADTs
Minneola Collector Road
Lake County, Florida**



4,000 Feet





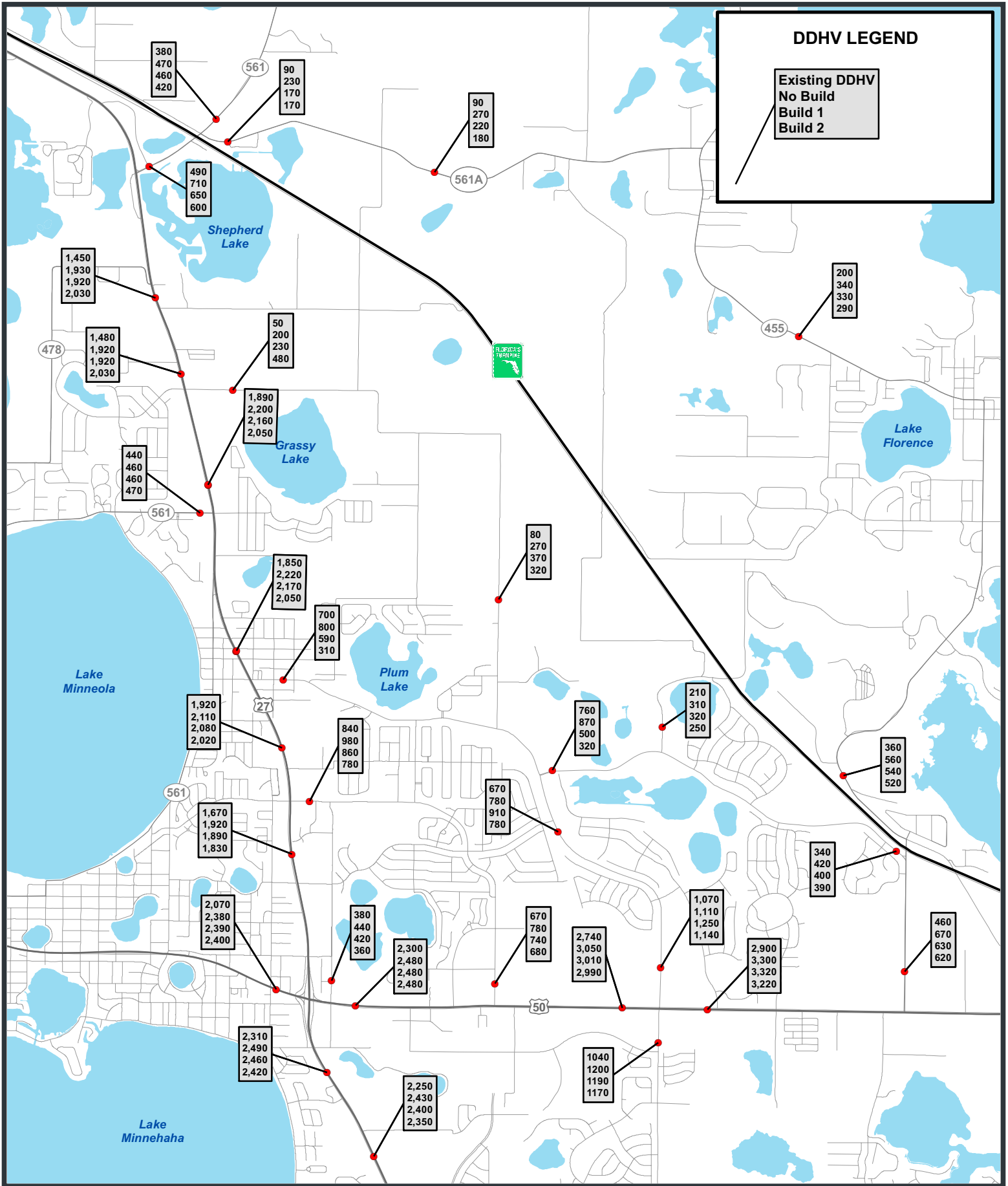
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**Figure 6.9: 2030 Projected AADTs
Minneola Collector Road
Lake County, Florida**



4,000 Feet





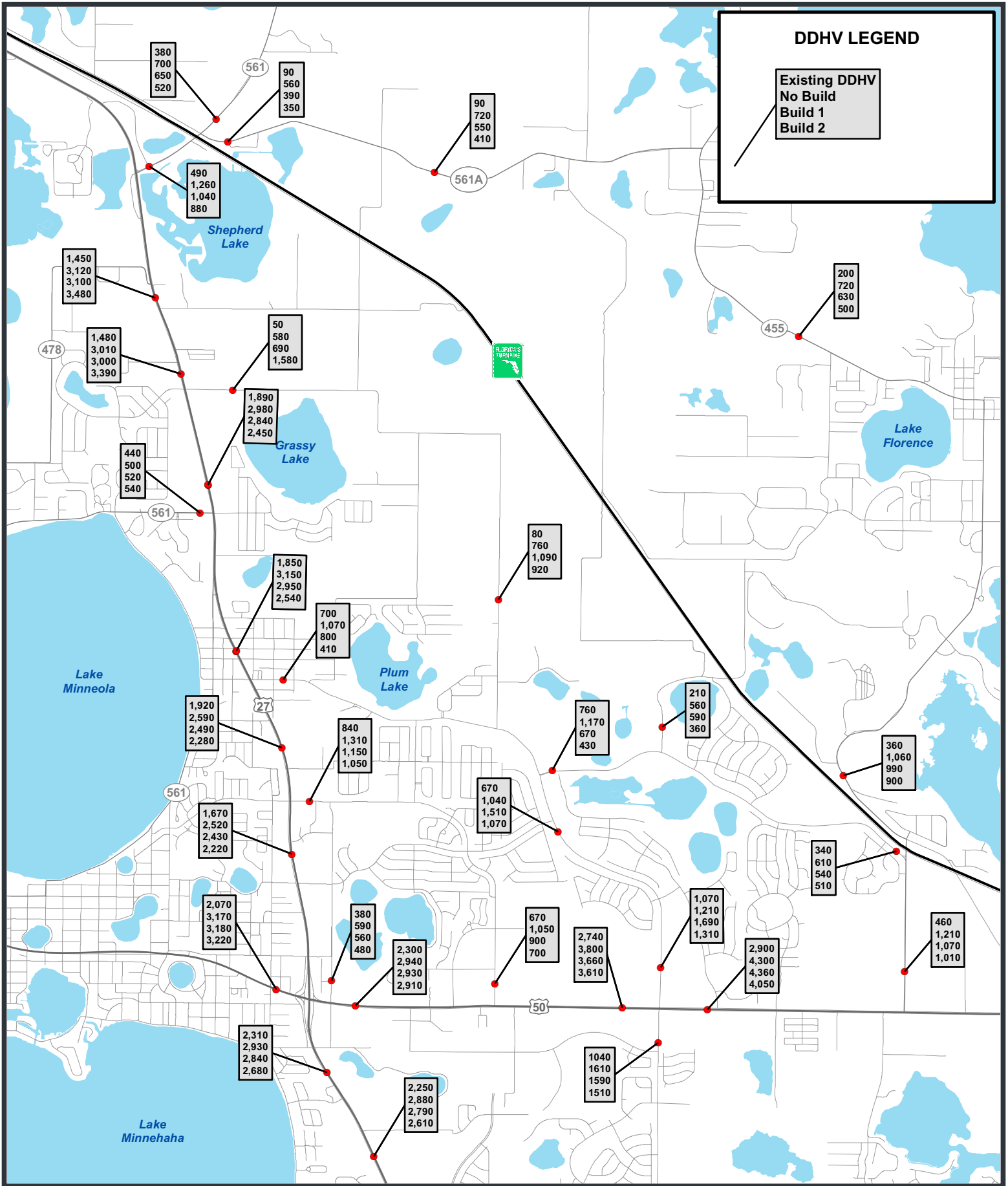
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**Figure 6.10: 2010 Projected DDHVs
Minneola Collector Road
Lake County, Florida**



4,000 Feet





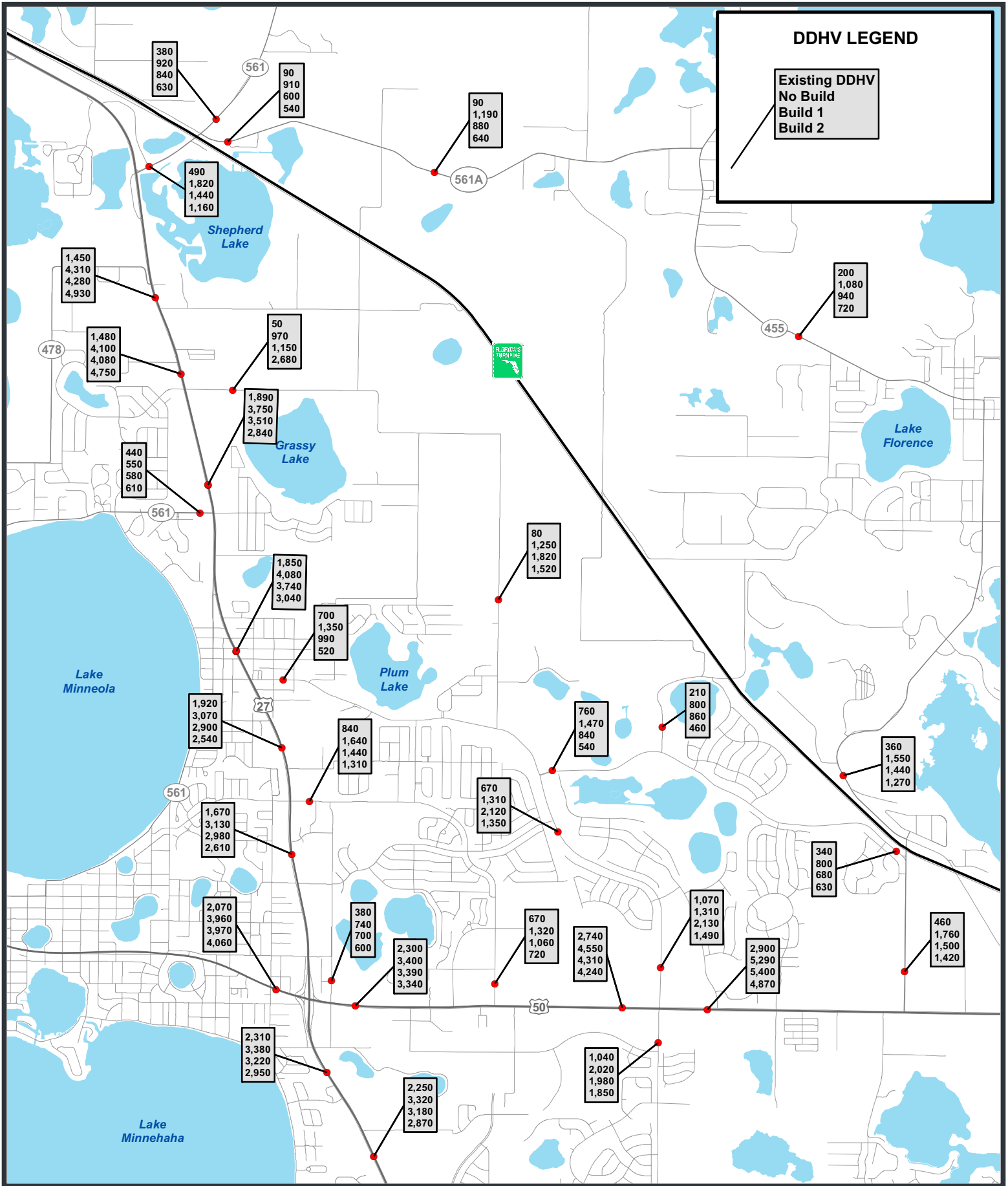
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**Figure 6.11: 2020 Projected DDHVs
Minneola Collector Road
Lake County, Florida**



4,000 Feet





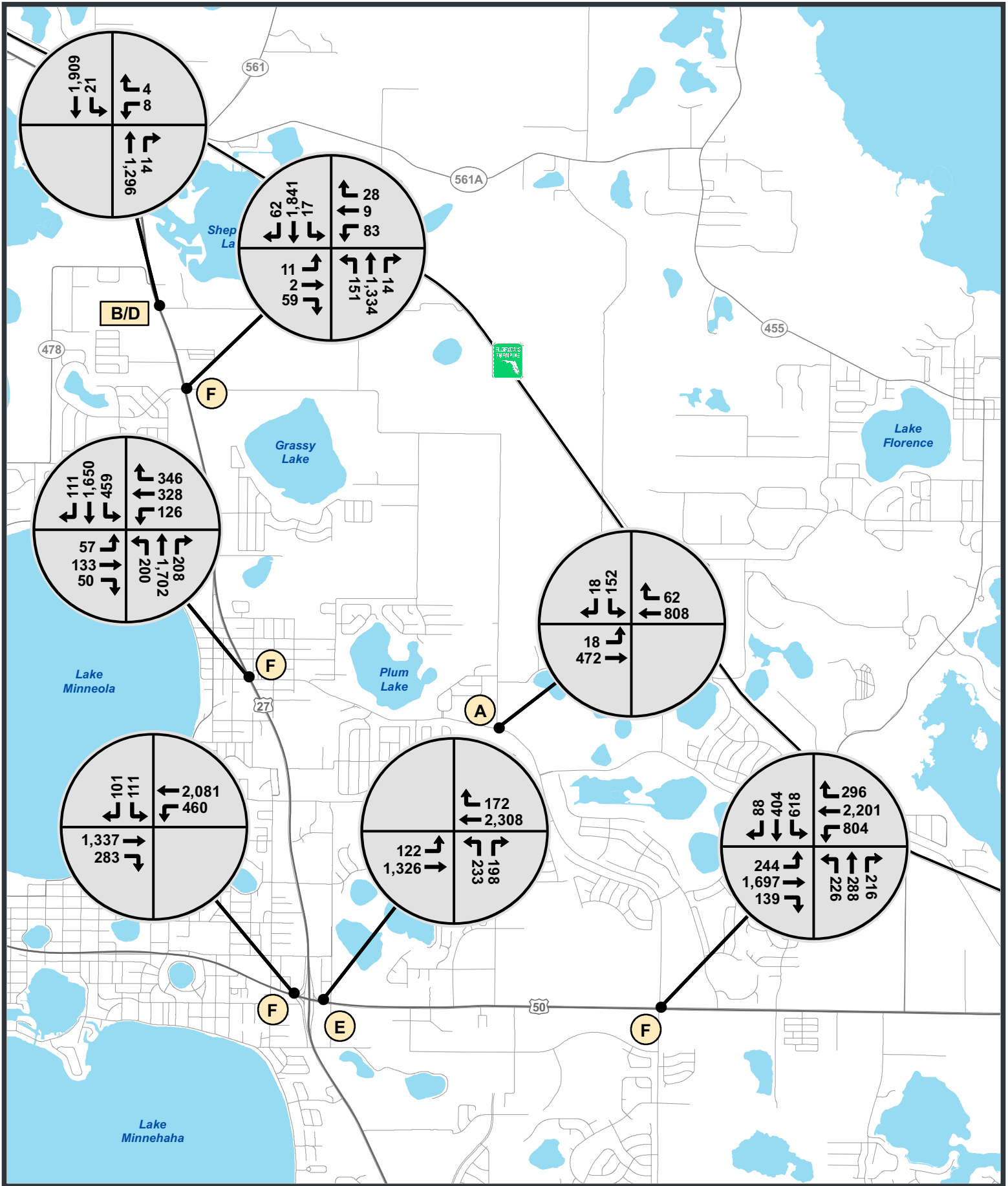
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**Figure 6.12: 2030 Projected DDHVs
Minneola Collector Road
Lake County, Florida**



4,000 Feet



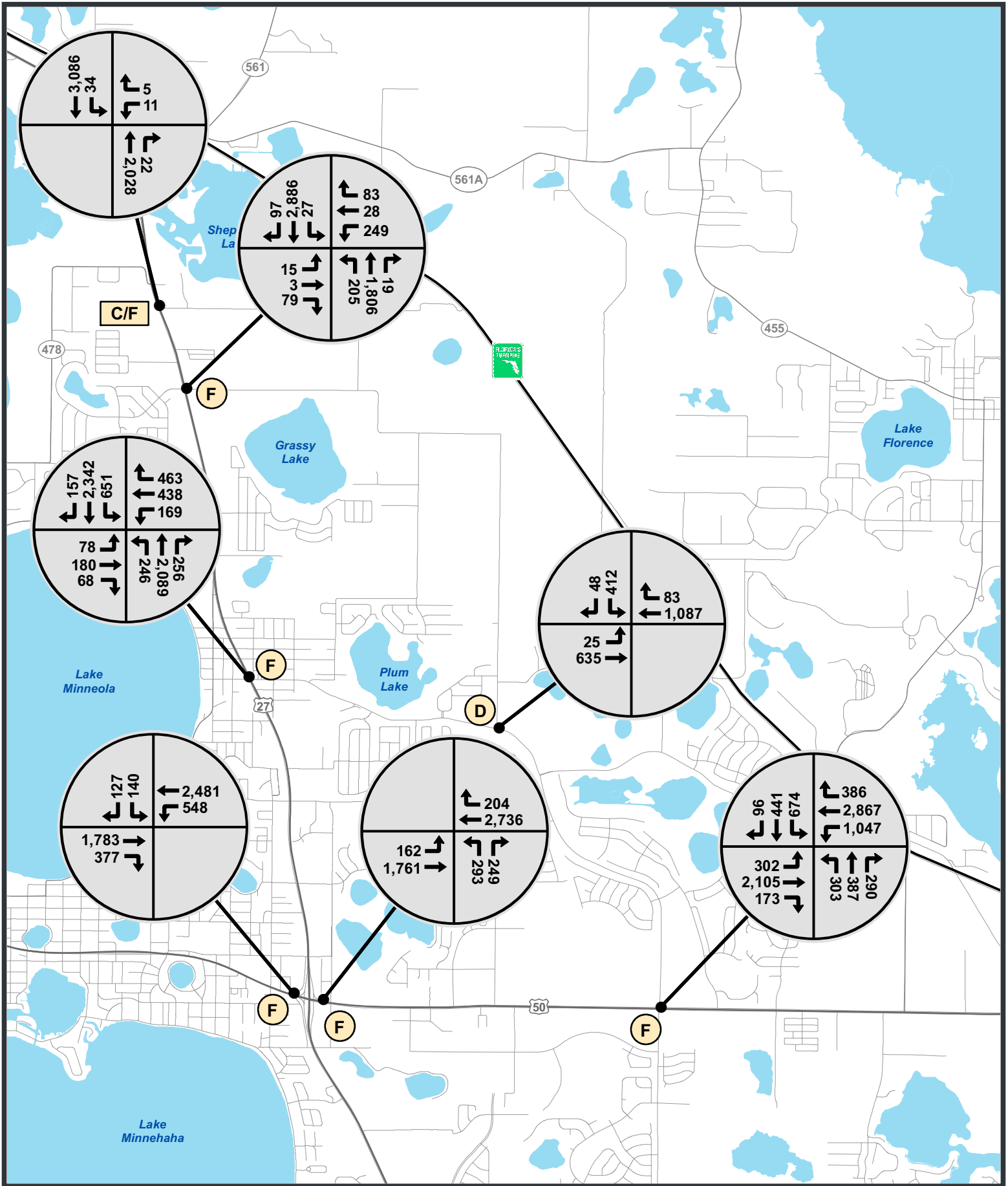


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Figure 6.13:
2010 No-Build Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida





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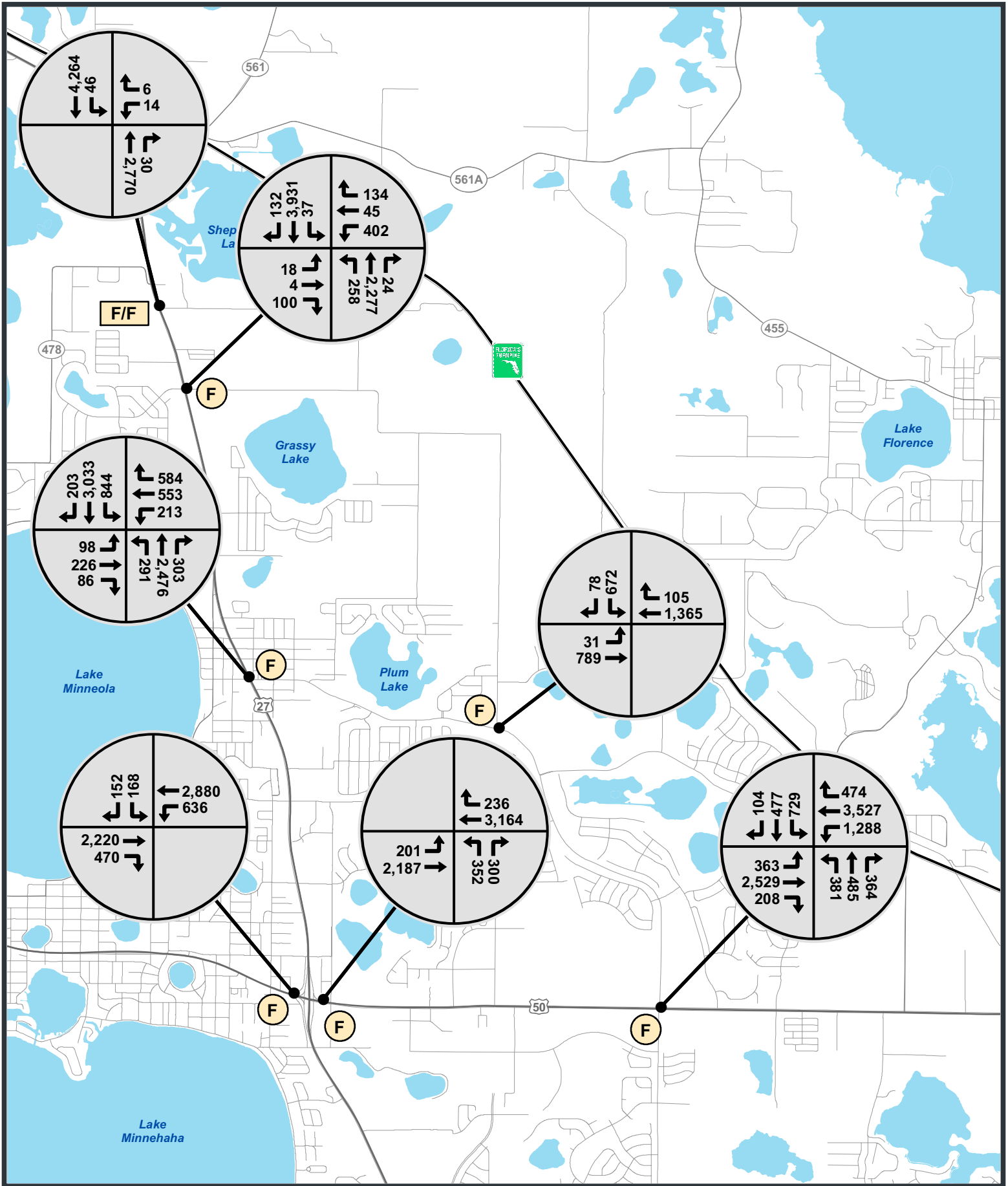


Figure 6.14:
2020 No-Build Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida

4,000 Feet

1/10/2008





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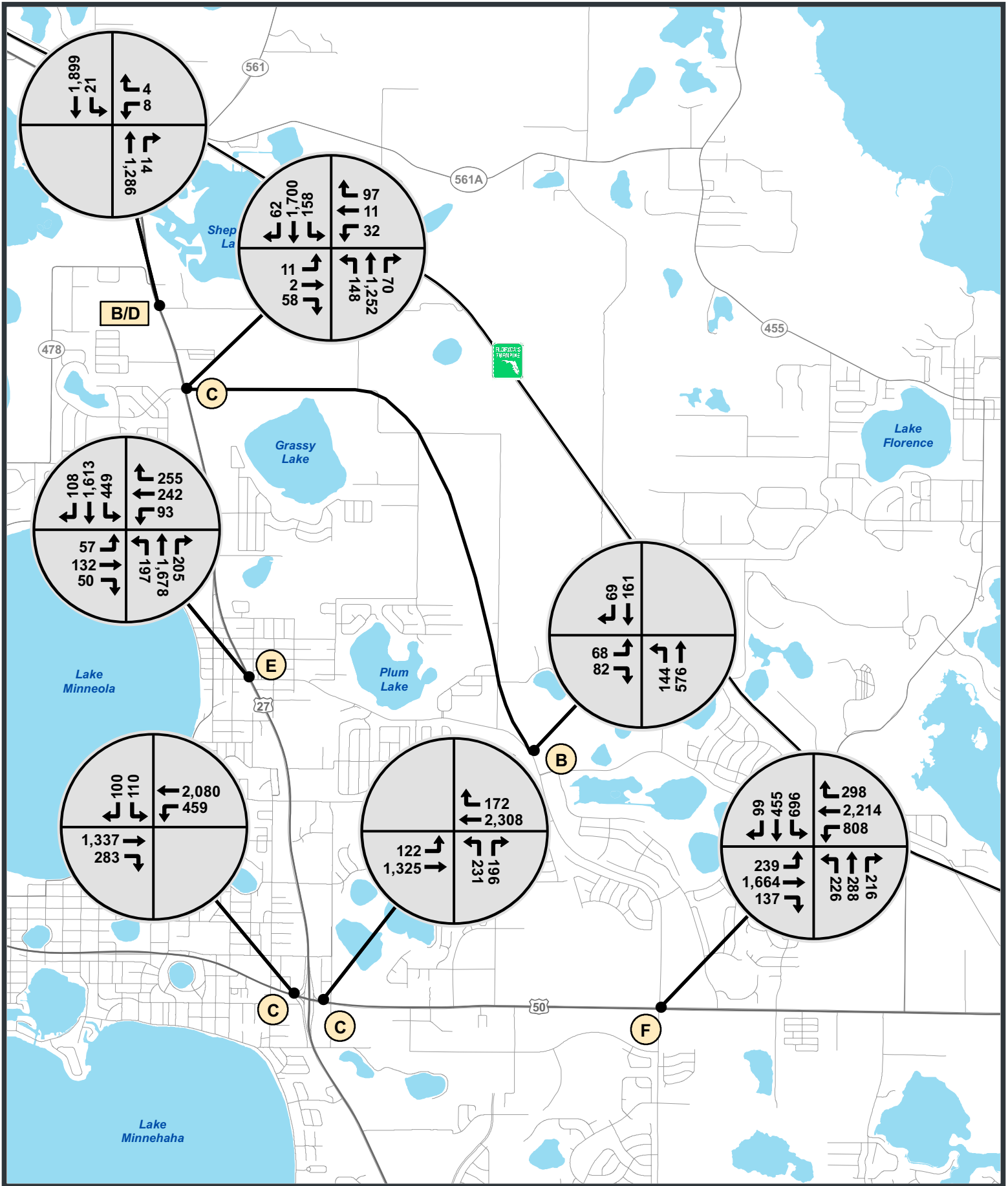


Figure 6.15:
2030 No-Build Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida

4,000 Feet

1/10/2008





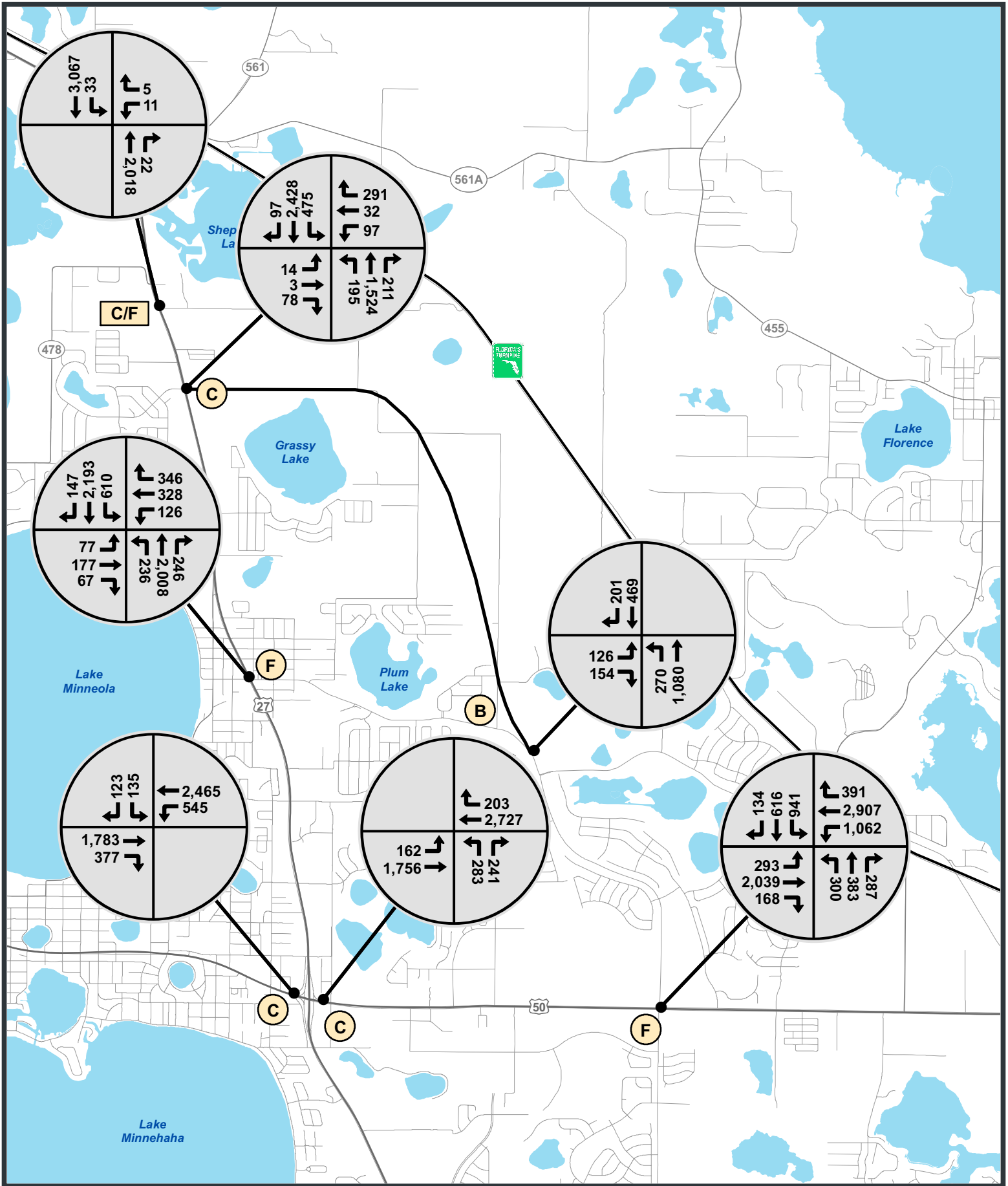
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Figure 6.16:
2010 Build 1 Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida



4,000 Feet





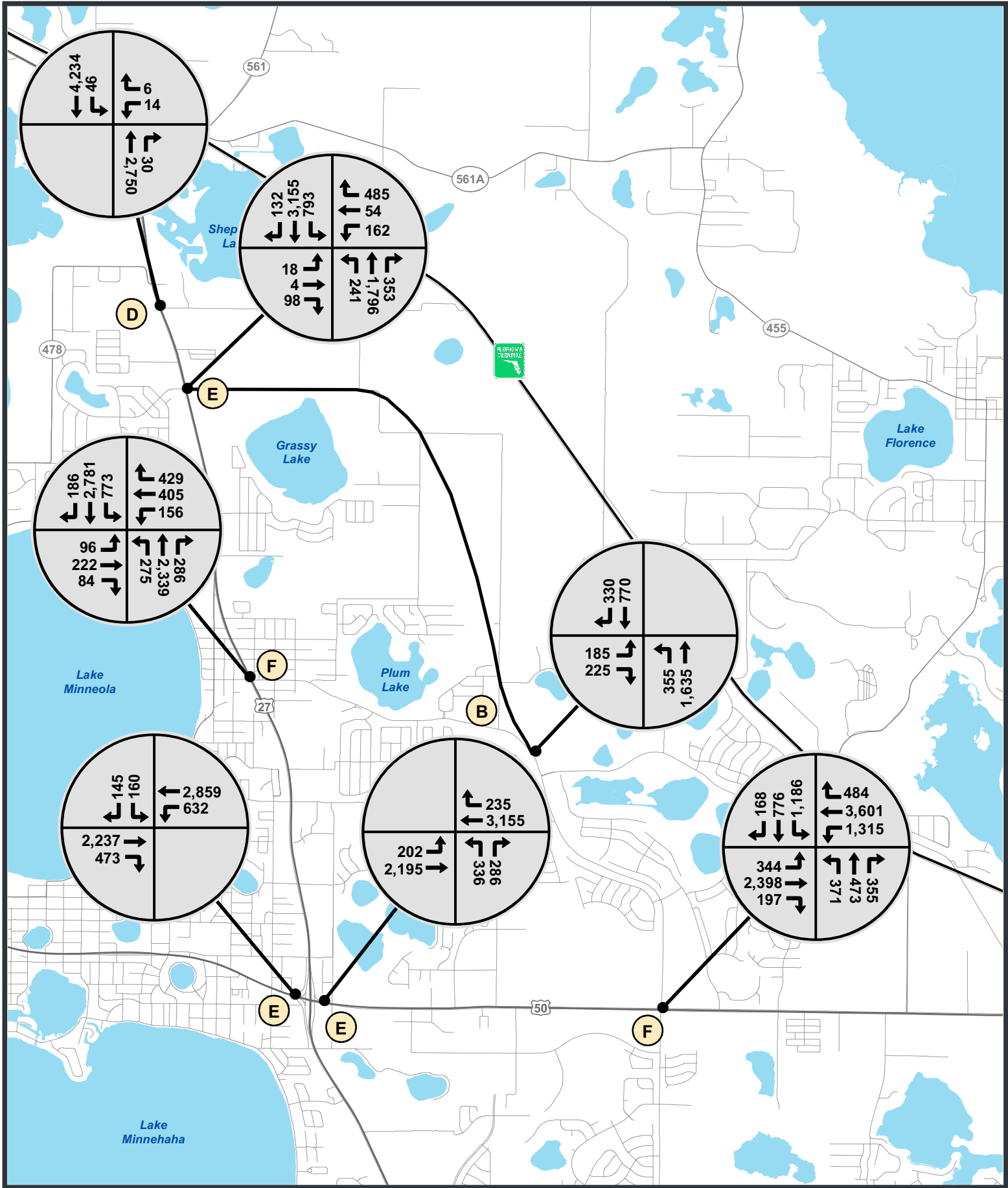
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Figure 6.17:
2020 Build 1 Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida



4,000 Feet





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Figure 6.18:
2030 Build 1 Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida



4,000 Feet



volumes and intersection LOS for each year. Intersection signal timing and phasing provided by Lake County were optimized to analyze the Build 1 scenario. Operational and geometric parameters used in the LOS analysis discussed below can be found in the Appendix K of the *Design Traffic Report* prepared for this project.

The congestion delays within the study area under the Build 1 scenario are significantly lower as compared to the No-Build condition. The Build 1 scenario for the Minneola Collector Road results in improved mobility and traffic conditions within the study area. The project significantly reduces traffic congestion on U.S. 27 between C.R. 50 and Citrus Grove Road due to the diversion of through traffic onto the Minneola Collector Road. This project also relieves traffic congestion on portions of C.R. 561, C.R. 561A, C.R. 50 and Citrus Tower Boulevard. Extended discussions of the Build 1 level of service for each study year can be found in the *Design Traffic Report*.

6.9.3. Build 2 Levels of Service

Roadway operational characteristics were tested on the Build 2 scenario. Figure 6.19, Figure 6.20 and Figure 6.21 show the 2010, 2020 and 2030 design hour turning movement volumes and the corresponding intersection LOS. Intersection signal timing and phasing provided by Lake County were optimized to analyze the Build 2 scenario. Operation and geometric parameters used in the LOS analysis discussed below can be found in the Appendix O of the *Design Traffic Report* completed for this project.

The congestion delays within the study area under the Build 2 scenario are significantly lower as compared to the No-Build condition. The congestion delays are also lower as compared to the Build 1 scenario. The Build 2 scenario for the Minneola Collector Road project results in improved mobility and traffic conditions within the project study area. The project significantly reduces traffic congestion on U.S. 27 between S.R. 50 and Citrus Grove Road due to the diversion of through traffic onto the Minneola Collector Road. This project also relieves traffic congestion on other parallel collector roadways in Lake County including Grand Highway, Blackstill Lake Road and portions of U.S. 27, C.R. 561, C.R. 561A, C.R. 50, C.R. 455 and Citrus Tower Boulevard. Extended discussions of the Build 2 level of service for each study year can be found in the *Design Traffic Report*.

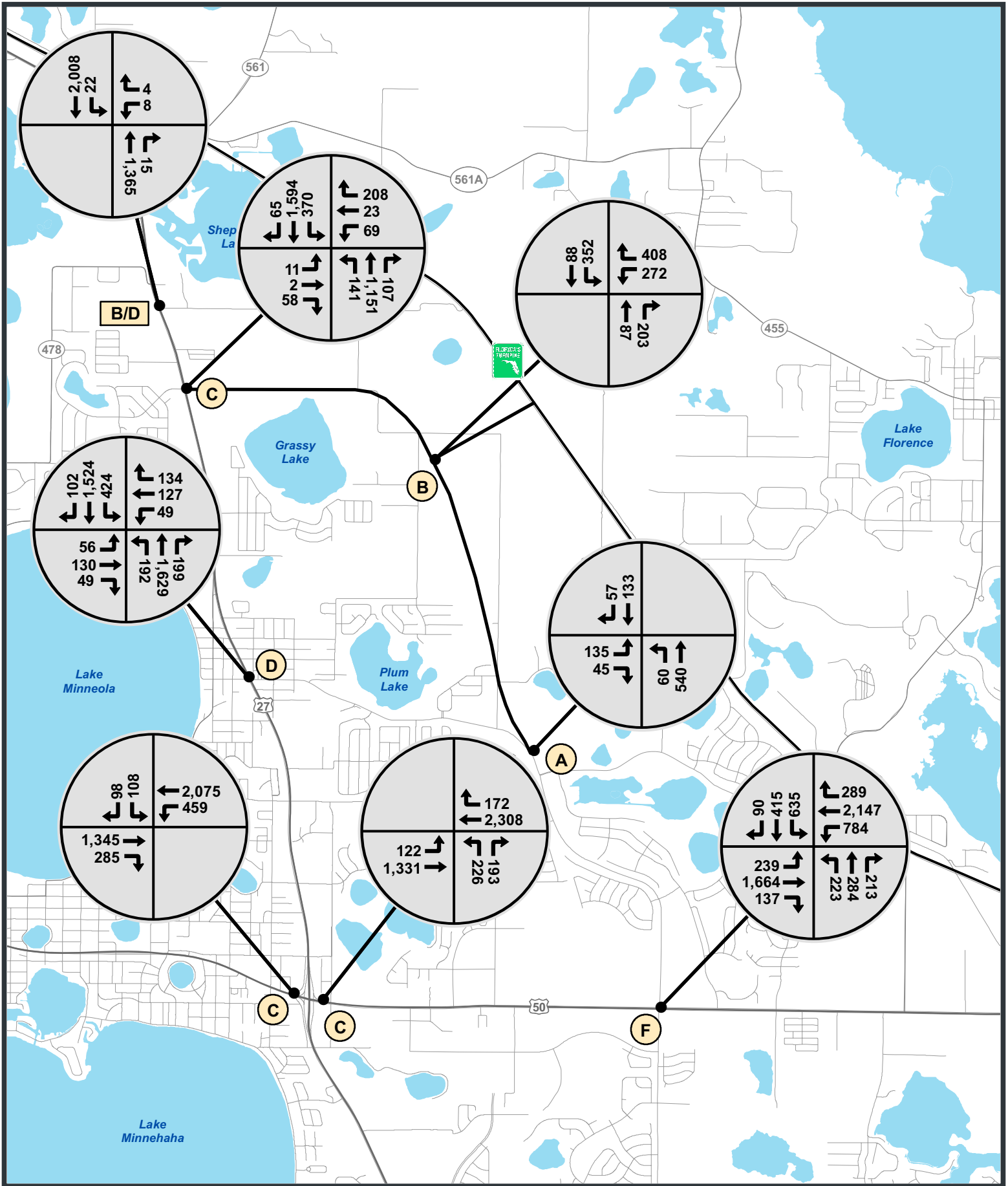
6.10. Recommended Improvements

Table 6-9 provides a comparison of the LOS by segment for project roadways for all years in the No-Build, Build and Build 2 condition. In general, the roadway segments are expected to operate more efficiently in both Build conditions when compared to the No-Build condition. The segments are expected to operate better under the Build 2 conditions when compared to the Build 1 conditions.

Table 6-9: Roadway Segment LOS Comparison

Roadway Segment	No-Build			Build 1			Build 2		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Citrus Grove Road East of U.S. 27	C	E	F	C	C	D	C	D	F
Hancock Road Extension North of C.R. 50	D	F	F	C	C	D	C	C	D

In Table 6-10, the intersection LOS and delay is shown for the No-Build, Build 1 and Build 2 scenarios. The intersection of U.S. 27 and Citrus Grove Road operates better in the Build 1 scenario than in the Build 2 scenario due to the higher volumes associated with the interchange connection to Florida’s Turnpike in the Build 2 scenario. However, the majority of the intersections within the project area of influence are expected to operate better in the Build 2 scenario than the Build 1 scenario. In the design year, the delay per vehicle (265.1 sec/veh) at the Hancock Road and S.R. 50 intersection is lower in the Build 2 scenario than in the Build 1 scenario (354.9 sec/veh). The intersection of U.S. 27 and C.R. 50 will operate 104.4 sec/veh better in the Build 2 scenario than the Build 1 scenario. The intersections of C.R. 50 at Hancock Road Extension and S.R. 50 at the U.S. 27 northbound and southbound ramps are also expected to operate better in the Build 2 scenario. Therefore, the Build 2 scenario is recommended based on the traffic analysis.



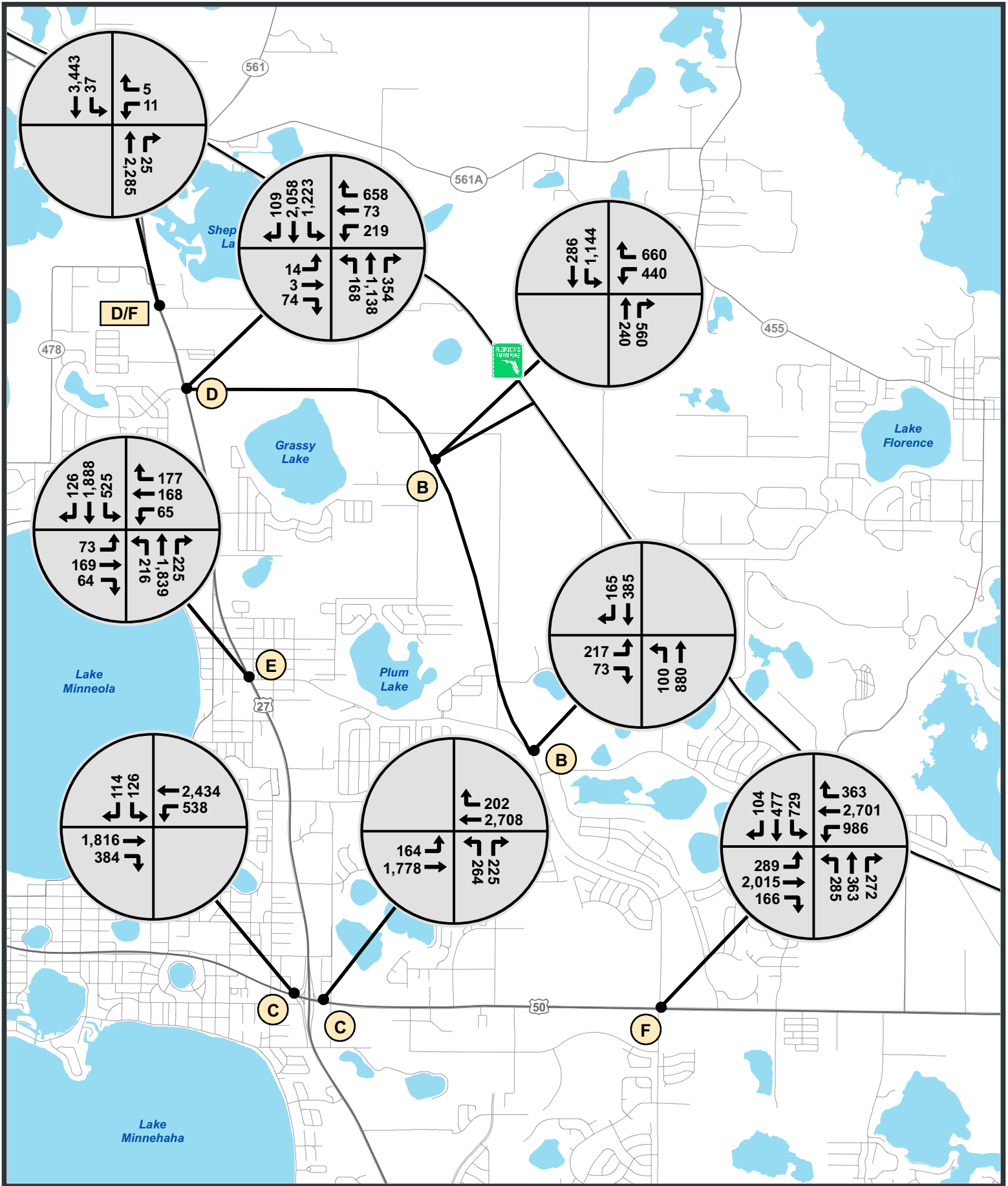
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Figure 6.19:
2010 Build 2 Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida

4,000 Feet





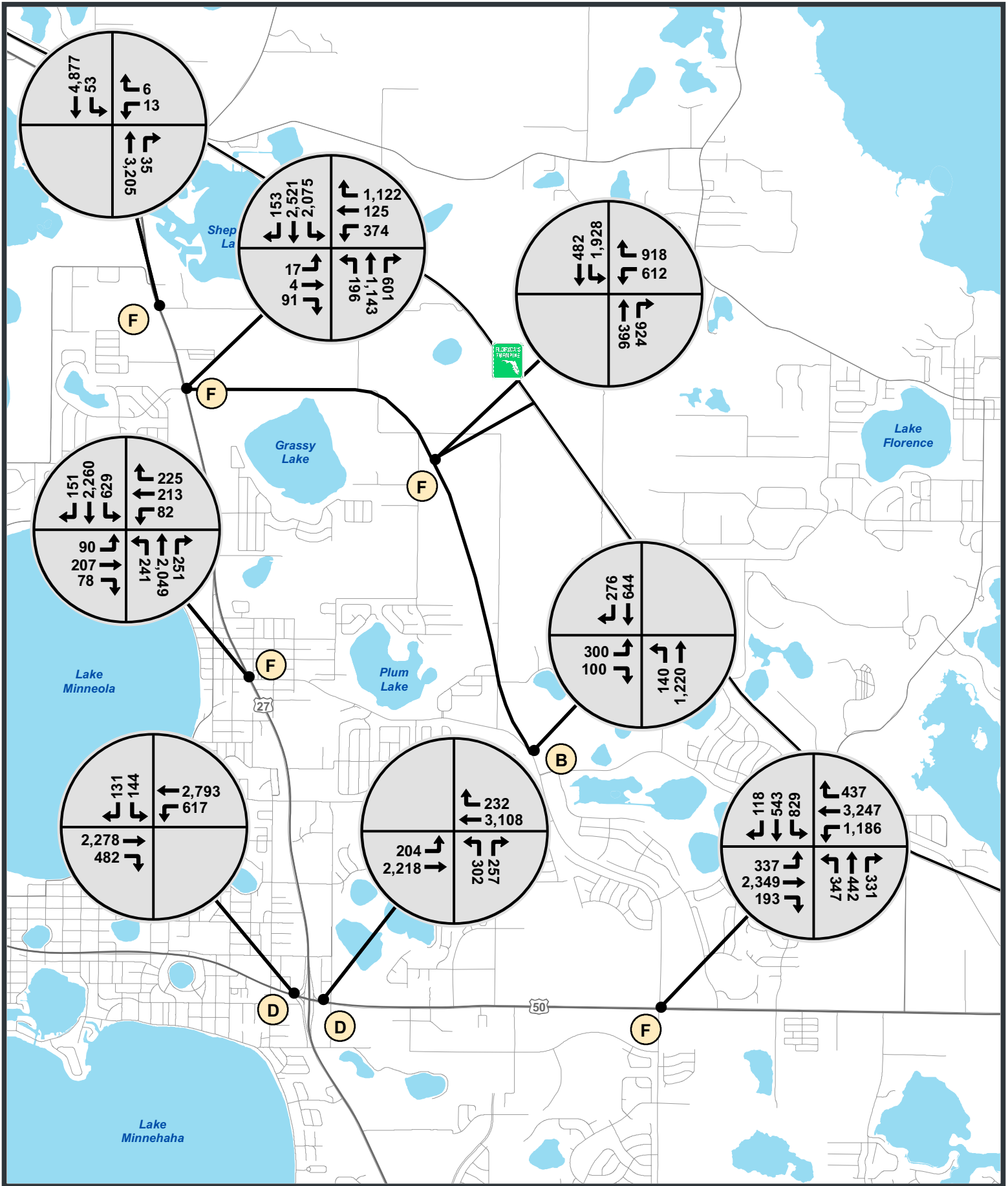
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Figure 6.20:
2020 Build 2 Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida



4,000 Feet





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Figure 6.21:
2030 Build 2 Turning Movement Volumes and Intersection LOS
Minneola Collector Road
Lake County, Florida



4,000 Feet



Table 6-10: Intersection LOS Comparison

Intersection	No-Build LOS (Delay - sec/veh)			Build 1 LOS (Delay - sec/veh)			Build 2 LOS (Delay - sec/veh)		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
U.S. 27 and Sullivan Road	B/D ¹ (29.3)	C/F ¹ (85.5)	F/F ¹ (506.1)	B/D ¹ (29.0)	C/F ¹ (85.5)	D (39.8)	B/D ¹ (31.7)	D/F ¹ (136.1)	F (84.7)
U.S. 27 and Citrus Grove Road	F (99.3)	F (139.8)	F (338.1)	C (24.5)	C (27.4)	E (72.7)	C (34.0)	D (39.7)	F (144.4)
U.S. 27 and C.R. 50	F (139.9)	F (318.0)	F (568.6)	E (60.9)	F (142.4)	F (232.5)	D (39.3)	E (72.4)	F (128.1)
C.R. 50 and Hancock Road Extension	A (9.7)	D (46.6)	F (156.0)	B (11.2)	B (12.2)	B (13.6)	A (7.9)	B (11.7)	B (12.9)
S.R. 50 and U.S. 27 SB Ramps	F (120.8)	F (98.4)	F (170.7)	C (26.5)	C (29.6)	E (58.5)	C (26.0)	C (27.9)	D (54.8)
S.R. 50 and U.S. 27 NB Ramps	E (74.2)	F (120.4)	F (168.5)	C (21.8)	C (34.7)	E (62.0)	C (21.0)	C (32.0)	D (54.1)
S.R. 50 and Hancock Road	F (125.1)	F (213.1)	F (323.3)	F (110.0)	F (226.8)	F (354.9)	F (102.3)	F (174.4)	F (265.1)
Citrus Grove Road and Hancock Road Extension	N/A	N/A	N/A	N/A	N/A	N/A	B (12.4)	B (19.0)	F (84.4)

Based on the LOS analysis and the overall regional connectivity provided by the Build 2 scenario, it is recommended that the Build 2 scenario geometry, as shown in Figure 6.3, be utilized for the Minneola Collector Road corridor and its primary intersections. The Build 2 scenario is representative of the maximum geometry required to sustain through traffic flow within the corridor through the Design Year. In addition to the four-lane Minneola Collector Road and the interchange connection to the Florida's Turnpike, the improvements proposed for the Build 2 scenario consist of the following intersection improvements:

U.S. 27 at Citrus Grove Road:

- Add an additional through lane in both the northbound and southbound directions
- Add an additional left-turn lane in the southbound direction
- In the northbound direction instead of a through-right-turn lane make a separate through and right-turn lane
- Add dual left-turn lanes and a separate through and right-turn lane in the westbound direction

C.R. 50 at Hancock Road Extension:

- Install a traffic signal
- Add an additional through lane in both the northbound and southbound directions
- Provide a left-turn lane in the northbound direction
- Provide a right-turn lane in the southbound direction
- Provide a separate left- and right- turn lane in the eastbound direction

Citrus Grove Road/Hancock Road Extension at Florida's Turnpike Interchange:

- Install a traffic signal
- Add an additional through lane and provide a right turn lane in the eastbound direction
- Add dual left-turn lanes and two through lanes in the westbound direction
- Add dual left-turn lanes and a right-turn lane in the northbound direction

U.S. 27 at Sullivan Road:

- Install a traffic signal
- Add an additional through lane in both the northbound and southbound directions
- Provide a left-turn lane in the southbound direction

U.S. 27 at C.R. 50:

- Add an additional through lane in both the northbound and southbound directions

S.R. 50 at the U.S. 27 northbound and southbound ramps:

- Add an additional through lane in both the eastbound and westbound directions

S.R. 50 at Hancock Road:

- Add an additional through lane in both the eastbound and westbound directions

7. Corridor Analysis

The objective of the corridor analysis process is to select a viable corridor in which to provide technically and environmentally sound alignment alternatives that are cost effective and acceptable to the community. Environmental, cultural and social features overlay the aerial image to develop corridors which provide the greatest benefit and avoid significant environmental or social impacts. Available right of way is also denoted through which a facility could be planned that would meet the needs identified during the study process.

The Minneola Collector Road PD&E Study began initially by identifying potential corridors within the study area. Based on a review of the agreements in place between the city and various developers for the donation of right of way, of the existing platted and approved locations of developments and their proposed access and of the proposed social facilities, including schools, in the project area, a single corridor was identified for the proposed alignment. The study team reviewed a corridor that generally follows the existing roadway network of Citrus Grove Road and Hancock Road Extension as the most feasible corridor to connect to the existing roadway network.

8. Alternative Alignment Analysis

The sections following describe the various improvement alternatives that have been considered during this study process.

8.1. No Project (No Build) Alternative

The No-Build Alternative involves maintaining the existing corridor characteristics including partly paved and unpaved roads. The implications of this No-Build Alternative include acceptance of decreasing LOS for intersections and roadway links through the study area as traffic volumes continue to increase with the growth in the area.

There are advantages and disadvantages that are typical when considering a No-Build Alternative. The advantages include the following:

- No costs for roadway design plans preparation, right-of-way acquisition, roadway construction and utility relocations and
- No business damages or residential relocations
- No environmental impacts
- No inconvenience caused by roadway construction

The disadvantages include the following:

- Facilities will not be able to serve the projected traffic volumes, levels of service will be low
- Other area roadways may become congested due to the reduced level of service on this roadway and no completed roadway network
- Motorists will experience significant delay
- Crash rates will likely increase as capacity decreases
- Deficiencies in pedestrian and bicycle facilities will not be improved
- Roadway design and safety standards will continue to not be met.

8.2. Typical Section Analysis

At the outset of this project, three typical cross sections were considered. These included urban typical sections ranging from three- to five-lane widening. Each of these alternatives was presented at the Public Kick-off Meeting. Based on the comments received during the meeting and on the right-of-way impacts required by the five lane section, only the three- and four- lane typical sections were considered viable and further analyzed during the remainder of the study process. During the review of the design traffic projections, the three-lane section was ruled out due to the need to accommodate more traffic on the roadway network resulting from the expected growth in the project area.

8.3. Alternative Alignment Analysis

Throughout the duration of this project, several variations of alternative alignments have been analyzed. The majority of the project is bound by the requirements placed on the developers of the region by the city. This includes the alignment within the Founder's Ridge property on Citrus Grove Road and along the Reserve at Minneola and the future Hills of Minneola on Hancock Road Extension. The roadway from U.S. 27 to the western edge of Founder's Ridge is constrained by residential properties on the north and Grassy Lake and vertical profile issues on the south. Within these existing portions of the roadway, the right of way will be widened to 120 feet to accommodate the necessary improvements.

Based on the combination of these constraints, alternative segments have been developed for only the remaining two sections of the alignment. The portions of the alignment that are constrained are shown in the preferred alignment concept plans. The following sections discuss the alternative segments that have been analyzed for the section of roadway where Citrus Grove Road and Hancock Road Extension intersect and for the section of roadway on the southern limits of the project at the beginning from the southern limits of the Reserve at Minneola extending to the terminus of the project.

8.3.1. Fixed Portions of the Alignment Alternatives

8.3.1.1. Citrus Grove Road from U.S. 27 to the Western Boundary of Founder's Ridge

This section of the corridor is paved but is in poor condition due to its age, continued use by heavy equipment and poor drainage system. The Developer's Agreement between the city and the developer of Founder's Ridge indicates that they must resurface the roadway in this section. There is currently varying right-of-way widths through this section due to the right of way resulting from land owned by the county recorded through a maintenance map. There is a church facility located 500 feet from the intersection on the north side of Citrus Grove Road. In general, this alignment has been planned so that the right-of-way line on the southern side of the roadway does not shift. This is in keeping with the design of the roadway through Founder's Ridge, completed as part of their Developer's Agreement. However, in order to move away from the front doors of the church and to be least impactful to the church parking and operations, the alignment curves to the south. This will likely require retaining wall on the southern side due to the steep decline of the natural ground on the southern side of the roadway. Approximately 50 feet of additional right-of-way is required from parcels with Alternate Key I.D. 1744059, 1028990, 1108985, 1037166, 1031184, 1095786, 3375246, 1095794 and 1411793. A smaller width of right of way is also required from parcels 1028973, 2753757 and 2831910. The latter two parcels are on the southern side of the roadway and are required due to the shift in the alignment around the church. A portion of 1070929 is also required on the southern side due to the shift in alignment, the inclusion of turn lanes at the intersection with U.S. 27 and a pond site for stormwater management.

8.3.1.2. Within the Founder's Ridge Development Area

As part of the Developer's Agreement between the city and the Founder's Ridge developer, the developer is responsible for the design of a four lane-roadway from the western edge of the property to the eastern edge at Hancock Road Extension. The typical section for the four-lane roadway is the same as the typical section for this project. The developer is also responsible for the construction of the northern half of the typical section, including the 12.5-foot multi-use path and 30 feet of travel pavement to be striped for two 12-foot lanes on the north side and a four-foot bike lane on the south side. As part of this project, the remaining portion of the typical section will be constructed on the land previously graded by the developer and the pavement will be restriped to be consistent with the remainder of the roadway.

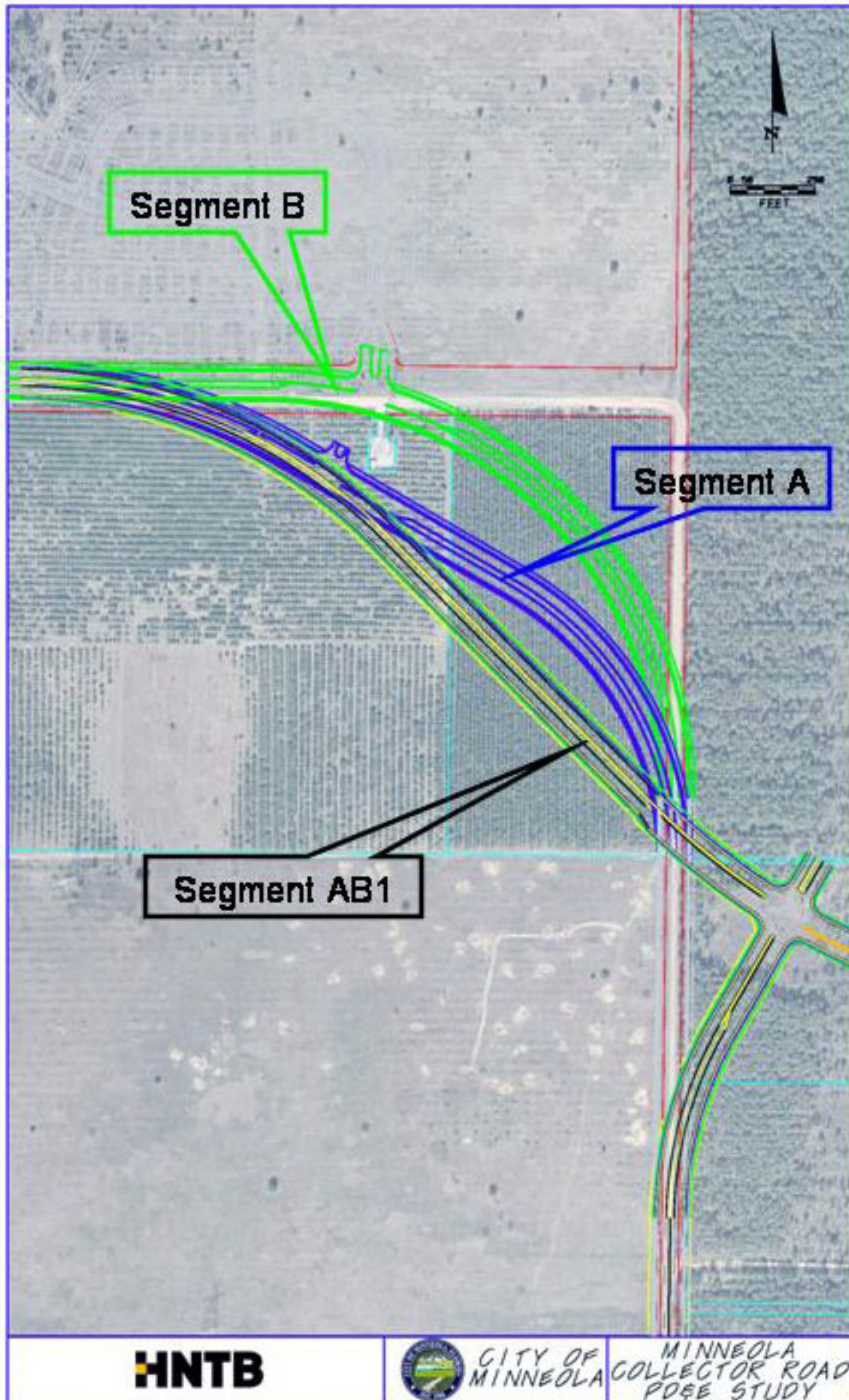
8.3.1.3. Northern Limits of the Reserve at Minneola to the Southern Limits of the Hills of Minneola

Following this section is a discussion on the segment alternatives for the intersection of Citrus Grove Road and Hancock Road Extension. Each of the segments described below ties into the existing alignment generally at the northern boundary of the Reserve at Minneola. The existing right-of-way width through this corridor is approximately 68 feet. The Reserve at Minneola has donated a 40 feet of additional right of way along the eastern boundary of their limits to create half of the total right-of-way width, 60 feet, for the typical section needed for this project. The Reserve at Minneola has also constructed half of the typical section of this roadway as part of their agreement. The new construction begins north of the entrance to the Pine Bluff subdivision and ends just south of the properties northern boundary. The alignment in this portion is centered along the existing right of way and therefore requires additional right of way from the Hills of Minneola.

8.3.2. Citrus Grove Road and Hancock Road Extension Intersection

This section of the existing roadway is unpaved. The intersection is made in a ninety degree curve which does not meet current design standards for a 45 mile per hour roadway. This section is bordered on the north by the Founder's Ridge development, on the west by the proposed Hills of Minneola development and on the west by vacant property owned by a single property owner. The final entrance to Founder's Ridge is just west of this intersection and a communications tower is located on leased land opposite this entrance on the south side of the roadway. Each of these identifying traits is denoted in Figure 8.1 which provides a graphic of the following segment alternatives.

Figure 8.1: Citrus Grove Road and Hancock Road Extension Intersection



8.3.2.1. Segment A

Segment A serves to remove the ninety degree curve and bring the existing roadway up to current design standards. This segment utilizes two curves separated by a straight section. This allows for the roadway to move south of the communications tower. This alignment requires right of way to be purchased from two parcel owners, Alt Key I.D. 3850819 and 1028957. This alignment was reviewed with the owner of 3850819 during the course of the study. The owner is currently working to prepare plans to develop the parcel that currently operates as a citrus grove. No final comments were provided by the owner as to preference of either segment.

A revised Segment A resulted following the Alternatives Public Meeting based discussions with representatives of the Hills of Minneola Development of Regional Impact. Several meetings were held with the planning and engineering consultants for the DRI to discuss additional variations of Segments A and B. These revisions are needed due to the proposed future Florida's Turnpike interchange and the connection of these two projects. The revised Segment A modifies the alignment of Hancock Road Extension and the connecting portion of Citrus Grove Road to form an appropriate intersection of this project that would then be the primary feed to the interchange. This requires the transition of Hancock Road Extension east and away from the existing alignment and the acquisition of property from an additional property owner, the DRI property. As seen in Figure 8.1, Hancock Road Extension becomes the major movement through the proposed interchange with the Turnpike. Hancock Road Extension and Citrus Grove Road intersect at a signalized intersection where vehicles wishing to travel to U.S. 27 will enter the left-turn lane to access Citrus Grove Road. This segment has been approved by the Hills of Minneola team and is referenced in a letter to Lake County Public Works indicating their willingness to provide right of way, construction of two lanes of the roadway within their property and joint-use opportunities for stormwater management. The letter from Family Dynamics, the Hills of Minneola DRI developer, is included in Appendix VII.

8.3.2.2. Segment B

Segment B provides for a smooth transition between the two roadways within the intersection. The radius of the curve meets current design standards for a 45 mph roadway. Segment remains on Citrus Grove Road and Hancock Road Extension longer than Segment B, discussed below, and provides for a direct connection to the proposed location for the Founder's Ridge entrance. The segment remains north of the existing communications tower and requires the acquisition of property from a single property owner, the vacant land of Lake County Property Appraiser Alt Key I.D. 1028957.

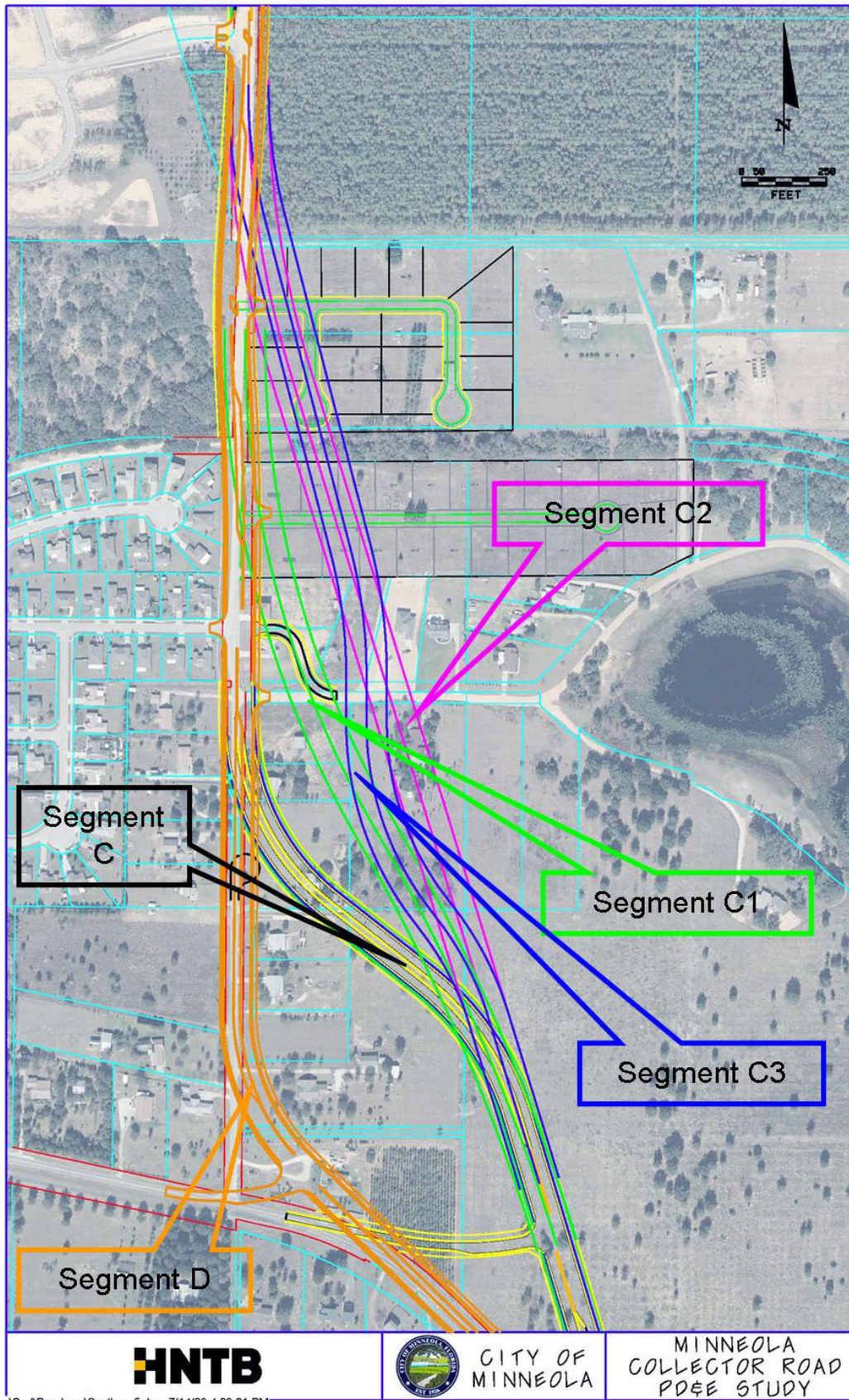
8.3.3. Southern Project Limits

The section of the project, from the northern boundary of the Big Sky development to the project terminus, is currently a poorly paved two lane road. The current intersection of Hancock Road Extension and Old Highway 50 is stop-controlled. Hancock Road merges with Old S.R. 50 before continuing west to U.S. 27. In order to provide for a smooth connection and extension of Hancock Road, several alternatives were reviewed for this section of the corridor. This section of the corridor is bordered by residential development, some within Country Ridge and Pine Bluff subdivisions and some on single tract parcels of land. There is a transmission utility easement that runs west to east across the project. The area under the transmission lines can be used for stormwater retention and the roadways can cross underneath it. The roadway should be designed to stay outside of this easement as much as possible. There is also a proposed development to be undertaken by Pineloch Management, Black West, which is on the south-eastern side of this easement and at the southern end of this project's limits. The identifying characteristics and the segments described below are shown in Figure 8.2.

8.3.3.1. Segment C

Segment C follows alongside of the eastern side of the power easement, through what is the proposed Black West property, from the existing Hancock Road intersection with Old Highway 50 to the east to Hancock Road Extension just south of Jim Hunt Road. The alignment traverses under the power easement after passing a transmission tower and curves into the existing roadway alignment. Due to right-of-way constraints created by the Country Ridge subdivision and the approved plat for Bridger Estates, the alignment must tie back into the existing alignment quickly. This alignment

Figure 8.2: Southern Project Limits



affects 11 parcels including the following Alt. Key I.D.s: 1062071, 3793502, 3793501, 3837472, 2870788, 1647657, 2514825, 3286294, 2816759, 3315502 and 3809256. Of the parcels identified, four parcels, 3793502, 3793501, 2870788 and 1647657, are residences that will require relocation for construction of the project.

The Parcel numbered 3809256, is owned by Pineloch Management is the proposed site for the Black West development. Meetings were held with the consultants for Black West to determine how to accommodate the needs of this project and the future development. The result of the meeting was an acceptance of Segment C as an alternative that worked with the current plan for the property. Following this meeting, a letter was set from Pineloch Management to Lake County Public Works indicating their preference for this alignment. Similarly to the commitments from the Hills of Minneola, the letter detailed the developments intentions to donate the right of way adjacent to the easement for the roadway, the right of way for the extension of Old Highway 50 needed from the west and land or joint-use opportunities for stormwater management. The letter from Pineloch Management is included Appendix VIII.

As a result of further evaluation several variations to Segment C were developed and assessed in order to determine other alignments that would provide alternatives. These variations are described below.

8.3.3.2. Segment C1

This segment stays along the eastern side of the power easement after deviating from Hancock Road at the existing intersection with Old Highway 50 to the east, similar to Segment C. However, this segment does not tie into the existing Hancock Road Extension until it is north of Jim Hunt Road. This segment impacts seven parcels south of Bridger Estates, including the relocation of the two homes on parcels, 3793502 and 3793501, impacts two platted and approved lots in Bridger Estates and four lots in Big Sky.

8.3.3.3. Segment C2

This segment also stays along the eastern side of the power easement after deviating from Hancock Road at the existing intersection with Old Highway 50 to the east, similar to Segment C. However, like Segment C1, this segment does not tie into the existing Hancock Road Extension until it is north of Jim Hunt Road. Segment C2 stays adjacent to the east side of the transmission easement until the point that it crosses Hancock Road Extension at with time, through a small curve it connects to the existing alignment. This segment impacts six parcels south of Bridger Estates, including the relocation of the two homes on parcels, 2514825 and 1070392, impacts six platted and approved lots in Bridger Estates and four lots in Big Sky. It is assumed that the residence on parcel 1070392 would be relocated due to the proximity of the right of way to the housing structure, approximately nine feet.

8.3.3.4. Segment C3

This segment stays along the eastern side of the transmission line easement until it reaches the northern border of the proposed Black West development. This segment curves to the west to avoid the home on Jim Hunt Road, then curves slightly east to avoid the transmission tower and a home on the north side of Jim Hunt Road, then traverses across the two platted developments. The segment impacts 5 parcels south of the two platted developments, four platted and approved lots in Bridger Estates and seven lots in Big Sky.

Both Bridger Estates and Big Sky developments have been received final plat approval and have constructed the internal roadway network and site facilities. Prior to plat approval and as part of their developers agreement, both developments have dedicated right of way to accommodate the planned roadway improvements along the existing corridor in the front of the respective properties. They have also constructed sidewalk in front of their property per their agreements. Each of the segments, C1, C2 and C3, greatly affect the property layout and the internal roadway network for these developments resulting in potentially high costs.

8.3.3.5. Segment D

Segment D has been conceptually designed to stay along the existing alignment of Hancock Road Extension for a longer distance. In doing so, a curve is introduced into the alignment just prior to the existing intersection with Old C.R. 50 through the connection to Hancock Road. A connection to Old

C.R. 50 to the west is also required for Segment D. This segment impacts 21 parcels including those with Alt Key ID:

- 1062071
- 3445180
- 1083966
- 3018338
- 3326598
- 2868538
- 1062080
- 3256760
- 3352521
- 3793502
- 3793501
- 3837472
- 2870788
- 1647657
- 3286294
- 3286286
- 3286278
- 2816759
- 3315502
- 2868520
- 3809256

Relocation of the residences on the parcels identified as 3793502, 3793501 and 3315502 are required for construction of this segment.

8.4. Comparative Analysis

Each of the viable alternatives was evaluated based on costs, right-of-way impacts, environmental impacts and social impacts. Each impact is described as follows:

- **Commercial Parcel Impact:** This value totals the number of properties that are currently being used for the purposes of business or a proposed school, as best as can be told from field and aerial photography reviews, where additional right-of-way is required. This property owner would not require relocation due to the right-of-way acquisition.
- **Residential Parcel Impact:** This value totals the number of properties that are currently being used for residential purposes, as best as can be told from field and aerial photography reviews, where additional right-of-way is required. This total includes all properties impacted whether considered for relocation or just property impact.
- **Residential Relocation:** This value totals the number of properties that are currently being used as a residence where additional right-of-way is required. This property owner would require relocation assistance to a new residence due to the right-of-way acquisition for the roadway improvements.
- **Vacant Parcel Impact:** This value totals the number of properties that are currently unused, as best as can be told from field and aerial photography reviews, where additional right-of-way is required.
- **Cultural Features:** This value totals the impacts to any cultural features whether historic, archeological or otherwise significant within the project corridor. Cultural features identified but ineligible for listing on the NHRP are not considered impacted.
- **Wetlands:** Wetland areas have been identified during a biological review of the corridor. Each area considered a wetland has been discussed in previous sections of this report. The value defined in the matrix is the number of acres directly impacted by the proposed improvements.
- **Wildlife and Habitat:** Wildlife and habitats occurring within the project corridor have been identified in previous sections of this report. This value denotes the level of impact that the each alternative has on the wildlife and habitat in the corridor.
- **Contamination:** A Contamination Screening Evaluation was conducted for this study and has been summarized in previous sections of this report. The value for contamination impacts denotes the level of impact that each alternative has on contamination sites within the project corridor.

The results of the evaluation are shown in Table 8-1.

Table 8-1: Evaluation Matrix

Evaluation Factors	Alternative				
	No Build	Alt 1	Alt 2	Alt 3	Alt 4
Alignment Used		A & C	A & D	B & C	B & D
Right-of-Way Impacts					
# of Commercial Parcels Impacted	None	5	5	6	6
# of Residential Parcels Impacted	0	13	21	13	21
# of Residential Impacts Considered Relocations	0	4	3	4	3
# of Vacant Parcels Impacted*	0	17	19	17	19
# of Parcels Impacted	0	35	45	36	46
Area of Right of Way to be Acquired for Roadway (acres)	0	24.3	22.4	25.7	23.8
Area of Right of Way to be Acquired for Pond Sites (acres)	0	10.2	10.2	10.2	10.2
Environmental Impacts					
Cultural Site Impacted	0	0	0	0	0
Wetland Impacts (acres)	0	0	0	0	0
Potential to Impact Wildlife	0	Medium	Medium	Medium	Medium
Contamination Impacts (acres)	0				
Estimated Project Cost					
Engineering Design Cost (12%)	\$0	\$2.7 million	\$2.7 million	\$2.7 million	\$2.7 million
Construction Cost with 20% Contingency	\$0	\$22.2 million	\$22.2 million	\$22.3 million	\$22.3 million
Construction Engineering & Inspection Cost (12%)	\$0	\$2.7 million	\$2.7 million	\$2.7 million	\$2.7 million
Total Cost *	\$0	\$27.6 million	\$27.6 million	\$27.7 million	\$27.7 million

*The Hills of Minneola property is, as of the date of this report, listed as individual parcels with the property appraiser's office. Each parcel is counted in this total as a single vacant parcel. There are a total of eight vacant parcels that are part of the Hills of Minneola DRI. The school site donated previously by the Hills of Minneola is included in the commercial property parcel count.

8.5. Preferred Alternative

Based upon the results of the engineering and environmental analysis, input received from the public and local governmental bodies, Alternative 1 has been identified as the recommended alternative. The northern section of Alternative 1 includes the revised Segment A that modifies the alignment of Hancock Road Extension and the connecting portion of Citrus Grove Road to form an appropriate intersection for this project that would then be the primary feed to the interchange.

The southern section of Alternative 1 which runs from the northern boundary of the Big Sky development to the project terminus was also revised as per the Minneola City Council. The original recommendation included Segment C as the preferred alignment for this section. Following the results of the Public Hearing, City Council voted to select segment C2 as the preferred alignment for the southern section of the project. The segment C2 alignment originates at the Hancock Road/Old CR 50 intersection and traverses to the north along the east side of the power easement. This alignment continues along the east side of the power easement until it intersects with the existing alignment of the Hancock Road Extension, north of Jim Hunt Road via a small horizontal curve.

The preferred alignment is detailed in the concept plans provided in Appendix I. This alternative created the additional capacity required to meet the requirements of the projected traffic within the study area. This recommendation was approved by the Minneola City Council on September 16, 2008 and by the Lake County Board of County Commissioners on November 18, 2008.

9. Preliminary Design Analysis

The following sections describe the results of the preliminary design analysis conducted for the preferred alternative discussed in Section 8.5. The concept plans for this alternative can be found in Appendix I.

9.1. Design Traffic Volumes

The information in this section is taken from the *Minneola Collector Road PD&E Study Design Traffic Report* developed for this project, documenting the existing traffic conditions and the analysis of the Build and No-Build scenarios. The traffic information is also summarized in Section 6 of this report. Based on the information contained in the document, the recommended traffic factors were applied to the analysis and design of the improvements recommended.

The recommended traffic characteristics provided in Table 9-1 represent the current travel patterns throughout the project area and provide the best indication of travel patterns for the future conditions. The recommended K_{30} and D_{30} shown for the various facility types are within the acceptable ranges as shown in the *FDOT Project Traffic Forecasting Handbook* and agreed upon by the project study team.

Table 9-1: Recommended Traffic Factors

Roadway		K_{30}	D_{30}	T
Arterials	U.S. 27 ¹	10.23	59.48	13.20
	S.R. 50 ¹	10.23	59.48	8.71
	Average	10.23	59.48	10.95
Side Streets		$K_{(Measured)}$	$K_{30(Estimated)}$	$D_{(Measured)}$
		9.43	10.65	62.28

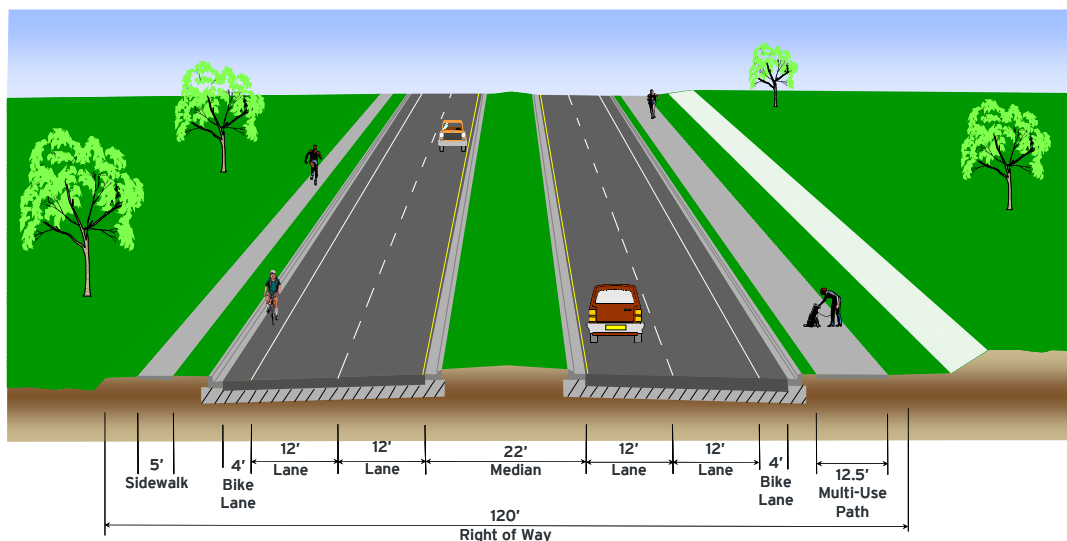
Source: 1. From 2006 FDOT Florida Traffic Information CD

The 2030 projected DDHVs provided in Figure X in Section 6 of this report. The congestion delays within the study area for the preferred alternative are significantly lower as compared to the No-Build condition. The alternative results in improved mobility and traffic conditions within the project study area. The project significantly reduces traffic congestion on U.S. 27 between S.R. 50 and Citrus Grove Road due to the diversion of through traffic onto the Minneola Collector Road. This project also relieves traffic congestion on other parallel collector roadways in Lake County including Grand Highway, Blackstill Lake Road and portions of U.S. 27, C.R. 561, C.R. 561A, C.R. 50, C.R. 455 and Citrus Tower Boulevard.

9.2. Typical Section

The recommended alternative consists of a single typical section for the project corridor. The four-lane section includes a twenty-two foot median, two, twelve-foot through lanes, four-foot bike lanes, a five-foot sidewalk on the west and south side of the roadway and a twelve-and-a-half foot multi-use asphalt path on the east and north side of the roadway. The typical section is graphically depicted in Figure 9.1.

Figure 9.1: Preferred Typical Section



9.3. Intersection Improvements

Several intersection improvements are included as part of this project. The intersection of U.S. 27 and Citrus Grove Road requires the addition of left- and right-turn lanes in the westbound direction. A right-turn lane from U.S. 27 to Citrus Grove Road is to be constructed by Founder's Ridge. The intersection of Citrus Grove Road and Hancock Road Extension currently exists as a ninety degree turn. A new intersection is proposed within the Hills of Minneola DRI that will connect these two roads and the proposed interchange with Florida's Turnpike. Left- and right-turn lanes will be provided for eastbound and northbound vehicles. Other movements within the intersection will be coordinated by the Hills of Minneola DRI and the Florida's Turnpike. The intersection of Hancock Road Extension and Old Highway 50 is currently stop-controlled. Old Highway 50 will be extended to the preferred alignment and left-turn, right-turn and through lanes will be provided for within the new intersection. The project ties into Hancock Road at the intersection with Old Highway 50 to the east. At this intersection, the four-lane section will be extended and the appropriate turning movements will be included in the final design.

9.4. Alignment and Right-of-Way Needs

The existing right-of-way is insufficient to accommodate the majority of the roadway improvements. Some right of way is being acquired adjacent to current and proposed developments, but significant areas will still be required. Right-of-way will also be required for the construction of stormwater retention ponds along the corridor. A description of these ponds is provided in detail in Section 9.16 of this report.

9.5. Relocation

The proposed alignment will require the relocation of four residences along the project corridor. There will be no displacements of institutional or community facilities.

9.6. Project Cost Estimates

9.6.1. Construction Costs

The estimated construction cost for the preferred alignment was developed using historical pricing information for past FDOT roadway construction projects. The estimated construction cost is \$22.2 million. The construction costs do not include any utility relocation costs. These costs include a 10 percent contingency and assume completion of certain roadway portions by developer agreements.

9.6.2. Engineering Design Costs

The estimated engineering design costs for the preferred alignment are \$2.7 million. The engineering design costs are based on ten percent of the estimated construction costs.

9.6.3. Total Project Costs

The estimated total project costs are summarized as follows:

Design	\$2,700,000
Construction	\$22,200,000
Construction Engineering and Inspection	<u>\$2,700,000</u>
Total Estimated Project Cost	\$27,600,000

Right-of-way costs and utility relocation costs are not included in the total project cost estimates. For budgeting purposes the project costs have been broken down into the following 3 distinct sections.

- From Old Highway 50 to Fosgate Road - \$7,980,000
- From Fosgate Road to Citrus Grove Road - \$4,905,000
- From Hancock Road Extension to US 27 - \$14,715,000

9.7. Recycling of Salvageable Material

The opportunity to recycle any salvageable materials by the contractor is encouraged by Lake County. Such materials may include old asphaltic concrete pavement, base material and drainage structures.

The existing pavement may be milled for recycling during the construction of the project. Any other salvageable materials will be identified during the 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. The opportunity to utilize existing pavement will also be identified during the design of the project.

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 cost, (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 Build" concept that will operate at an unacceptable Level of Service. In addition, the improved horizontal geometry and access management provided with the project should reduce the occurrence rate of many collision types on the roadway. The roadway is also not design to current design standards and presents safety risks. This project will deliver the added benefit of a safely designed roadway.

9.9. Pedestrian and Bicycle Facilities

A four-foot bicycle lane will be provided in both directions along the outside travel lane. Additionally, a five-foot sidewalk will be provided on the west and south sides of the roadway and a 12.5-foot multi-use asphalt path will be provided on the east and north sides of the roadway.

Pedestrian features, including curb cut ramps, crosswalks and pedestrian signals will be provided at each signalized intersection.

9.10. Safety

Safety is a major aspect in 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. In addition, the raised median that is proposed along most of the project will provide a refuge area for pedestrians.

9.11. Economic and Community Development

A variety of existing land uses can be found within the study area. These include commercial, residential and agricultural, as well as vacant land that is expected to be developed in the future. The project will not adversely impact any proposed community development or redevelopment activities. It will, in fact, enhance the economic viability of the corridor providing appropriate roadway networks to develop the corridor to its fullest potential. It will also serve to reduce congestion and delay throughout other parts of the area surrounding the project.

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 the results are contained in the project files and the following reports: *Cultural Resource Assessment Survey*, *Wetland Technical Memorandum*, *Wildlife and Habitat Technical Memorandum* and the *Contamination Screening Report*, prepared for this project.

The potential for environmental impacts is low within the existing right-of-way and proposed pond sites; the selection of a preferred alternative was not influenced by these factors.

9.12.1. Cultural Resources

Based on the results of the Cultural Resource Assessment Survey, it is the opinion of the Principal Investigator that proposed construction within the Minneola Collector Road PD&E study area will have no effect on historic properties eligible or potentially eligible for listing on the NRHP. No further work is recommended.

9.12.2. Wetlands

Based on SJRWMD and ACOE criteria outlined in their respective regulatory manuals, the project corridor contains one habitat that may be jurisdictional to both agencies. Grassy Lake and associated wetland vegetation is located within the northern section of the project area. No impacts are currently proposed to this wetland. If impacts identified during further design, then coordination and permitting with SJRWMD and ACOE will be required prior to construction.

9.12.3. Water Quality

The project is not located within an area that has been determined to be a Sole Source Aquifer under the Safe Drinking Water Act, Section 1424(e).

9.12.4. Wildlife and Habitat

Three protected wildlife species, the Florida scrub jay, gopher tortoise and osprey, were observed within the project corridor, or have been observed by others. During final design, additional surveying for the presence of scrub jays and gopher tortoises will be necessary. If any disturbance is to occur within 25 feet of a gopher tortoise burrow, agency coordination and a relocation permit will be necessary. If an osprey nest is found to be within the construction zone, nest avoidance measures and agency coordination will be necessary. Due to the large amount of agricultural habitat, a formal survey for the Southeastern American kestrel is recommended. Due to the current and past agricultural use of the area, low development density, and close proximity to Grassy Lake, there is a moderate chance that other protected species could occur within the project corridor or associated stormwater pond sites. Coordination with the USFWS and FFCC is recommended prior to development for concurrence of these findings.

9.12.5. Noise

For the preferred alternative, six noise receptors would experience noise levels at or above 66 dBAs. The predicted noise levels at those sites range from 66.0 to 69.7 dBAs. The noise levels at the remaining twenty-eight sites range from 46.1 to 65.8 dBAs. Based on the predicted 66 dBA contour, any future development plans should consider noise abatement measures such as vegetative buffer zones or noise barriers to mitigate for future traffic-related noise impacts at any locations where noise levels exceed 66 dBAs. Based on numerous noise studies along similar roadways, noise barriers, if considered, should have a minimum height of no less than 12 feet. The six noise receptors are as listed in Table 9-2 and as shown in Appendix IV.

Table 9-2: Noise Receivers Experiencing Levels at or above 66 dBAs

Receiver	Existing (2008) Leq	2030 Build Leq
9	53.3	66.0
11	55.6	66.2
14	56.3	66.4
21	56.1	66.7
29	53.0	69.1
30	53.7	69.7

9.12.6. Contamination

Based on visual observations and other research contained in the Contamination Screening Evaluation Report, evidence of soil and/or groundwater contamination impacts at known contamination sites may have occurred within or near the Minneola Collector Road recommended alignment or pond sites. Any sites rated as “medium” or “high” may warrant further intrusive investigation prior to construction. These ratings are based on known contamination sites, distance of known contamination plumes from the roadway or water retention areas, lack of detailed contamination records for reported sites at the county or Florida Department of Environmental Protection (FDEP) offices, or suspected sites based on visual observation only, of which no county or FDEP files were found.

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. Utility owners in the project corridor have been identified by Sunshine One Call in July 2008. The utility companies shown as having utilities within the project corridor are shown in Table 9-3. The utility contact name and utility type is also provided in the table. Any design plans should be coordinated with the utility companies in the project area to determine impacts and requirements for relocations.

Table 9-3: Utility Owners within the Project Corridor

Utility Owner	Contact Information	Utility Type
City of Minneola	Mark Odell P.O. Box 678 Minneola, Florida 34755	Water
Bright House Networks, LLC	Larry Henderson 211 St. Joe Plaza Palm Coast, Florida 32164	Cable Television
Progress Energy	Customer Service Center	Electric
Level 3 Communications, LLC	Network Relocations Department 1025 Eldorado Boulevard, Bldg 13C04 Broomfield, Colorado 80021	Fiber Optic
Lake Apopka Natural Gas District	Alex Wosgien 1320 Winter Garden-Vineland Road Winter Garden, Florida 34787	Natural Gas Lines
Comcast Cablevision	Bill Graham 8130 C.R. 44, Leg A Leesburg, Florida 34788	Unknown
Embarq - Winter Garden	Jeff Griffin 33 N. Main Street Winter Garden, Florida 34787	Fiber Optic

9.14. Results of Public Involvement Program

Two Public Meetings were held during the course of this study at the gymnasium at Minneola City Hall. This section summarizes the results of each of these meetings.

Public Kick-off Meeting

The Public Kick-off Meeting was held on August 28, 2007, by the City of Minneola, Florida. Newsletters with meeting notification information were mailed on August 17, 2007, to appropriate elected and appointed public officials, to appropriate regional and reviewing agencies and to property owners of record. Pursuant to Florida Statute 334.211, notifications were mailed to property owners of record whose property is located within 300 feet of each side of the centerline of the existing Hancock Road Extension and Citrus Grove Road corridor as well as to others in the vicinity of the extended project corridor. Approximately 1,580 newsletters were mailed out prior to the meeting. Additionally, other persons expressing interest in the project were also notified. Two public notice display ads were published in the Orlando Sentinel - Lake Section on August 20 and 26, 2007. Copies of the newsletter and the display ad can be found in Appendix IX.

The Open House/Material Review period of the hearing began at 6:00 p.m. Members of the community began arriving at approximately 5:30 p.m. During this period, attendees could peruse the available boards and documentation as well as ask questions of any staff member in attendance. Attendees were asked to sign-in at the entrance to the room and were provided handouts including a copy of the newsletter for those who may not have received one in the mail, a meeting handout providing more project specific information and a meeting comment sheet. A copy of each handout is included Appendix IX.

The formal portion of the presentation began at 6:30 p.m. Mr. Luis Diaz, HNTB Project Manager, provided a brief description of each item available at the sign in table and urged attendees to provide comments via the comment sheet. Utilizing a PowerPoint presentation, Mr. Diaz provided project related information regarding the study process, the project timeline, the purpose and need, design issues along the corridor, pedestrian features of the area, an explanation of the type of information analyzed during the process and the public

involvement efforts that will take place as part of the process. A copy of the presentation slides is included in Appendix IX.

Following the completion of the presentation, Mr. Diaz opened the floor to questions and comments that were of a general nature. Questions were asked regarding:

- Project Timeline - Mr. Diaz responded that the project was a 12-month project with about 10 months remaining in the schedule.
- Construction Start Date - Mr. Diaz responded that if all funding was in place design could begin in June 2008, for two years. He stated that it would be 5 years from the meeting before right-of-way would be acquired and construction would be underway if all funding was in place. Mr. Jim Stivender, Lake County Public Works, indicated that he felt that the construction was likely 10 or more years in the future due to the cost of construction, the number of projects needed in the area and the lack of funding in general.
- Project Funding - It was stated that the study is currently funded through impact fees from Lake County Public Works. It is likely that a portion of the roadway would be built by developers. Right-of-way dedication, as well as some construction, has already been included in some development orders.
- Study Limits - This study is for a roadway within the identified corridor. It does not address other City roads or other infrastructure.
- Status of paving Turkey Farm Road - Mr. Stivender noted that the developer is responsible for paving a portion of the roadway as they move forward to other phases of their project per their development order.

Mr. Diaz closed the presentation by reminding attendees to fill out a comment sheet and turn it in at the meeting or to mail it in to the HNTB office. Attendees were then provided an opportunity to ask questions of staff and continue their review of the visual materials throughout the room.

A total of 50 people were in attendance at the meeting. A majority of those in attendance reside and/or own businesses in the corridor. The attendees were interactive and attentive during the presentation. Many questions were answered during the informal sessions and contacts were made for future individual meetings to discuss individual concerns.

Six written comments were received during the meeting. No comments were received through the mail. A list of comments has been provided in Appendix VIII. Responses will be added to this summary after they have been mailed to the concerned party.

Comments received from attendees at the meeting, before and after the presentation, generally regarded:

- Concern for personal property
- Questions as to the future of the area
- Change of street names
- Traffic projections
- Safety Issues
- Desire/non-desire for improvements to the corridor
- Reduction of the environmental disturbance created by development and this type of project.

Alternatives Public Meeting

The Alternatives Public Meeting was held on February 28, 2008, by the City of Minneola, Florida. Newsletters with meeting notification information were mailed on February 8, 2008, to appropriate elected and appointed public officials, to appropriate regional and reviewing agencies and to property owners of record. Pursuant to Florida Statute 334.211, notifications were mailed to property owners of record whose property is located within 300 feet of each side of the centerline of the existing Hancock Road Extension and Citrus Grove Road corridor as well as to others in the vicinity of the extended project corridor. Approximately 1,340 newsletters were mailed out prior to the meeting. Additionally, other persons expressing interest in the project and those in attendance at the Public Kick-off Meeting were also notified. Two public notice display ads were published in the Orlando Sentinel - Lake Section on February 14 and 23, 2008. Flyers were hand delivered to residences located immediately adjacent to Citrus Grove Road and Hancock Road Extension on February 26, 2008. Copies of the newsletter, display ads and flyer can be found in Appendix X.

The Open House/Material Review period of the hearing began at 6:00 p.m. Members of the community began arriving at approximately 5:50 p.m. During this period, attendees could peruse the available boards and

documentation as well as ask questions of any staff member in attendance. Attendees were asked to sign-in at the entrance to the room and were provided handouts including a copy of the newsletter for those who may not have received one in the mail, a meeting handout providing project specific information and a summary of the alternatives, a business card with the address of the project's website and a meeting comment sheet. A copy of each handout is included in Appendix X.

The formal portion of the presentation began at 6:30 p.m. Mr. Luis Diaz, HNTB Project Manager, provided a brief description of each item available at the sign in table and urged attendees to provide comments via the comment sheet. Utilizing a PowerPoint presentation, Mr. Diaz provided project related information regarding the study process and timeline, the purpose and need, the public involvement efforts that have and will take place as part of the process, a summary of the comments received after the Kick-off Meeting, a description of how the alternative alignments are chosen, a description of each alternative and a comparison matrix documenting the evaluation factors considered during the alternatives review. A copy of the presentation slides is included in Appendix X.

Following the completion of the presentation, Mr. Diaz opened the floor to questions and comments that were of a general nature. Questions were asked regarding:

- Project Timeline: Mr. Diaz responded that two lanes for part of the length of the road will be constructed by Founder's Ridge and the Reserve at Minneola. The four-laning is driven by development and requirements will be placed on future developers in the region. However, the economy is slowing down the housing market, so two lanes may be sufficient for some time into the future.
- Existing right of way on N. Grassy Lake Road is only an easement: Mr. Diaz indicated that we will investigate this concern and will show the right of way properly on the plans.
- Alignment within the Progress Energy easement: The alignment is not within the easement but does run adjacent to it and crosses under the lines to return to its original alignment.
- Connection to existing trail on Hancock Road: The trail will connect to the existing trail on N. Hancock Road.
- Overpass for Old 50 at the Collector Road: The intersection between the two roads will be at grade.
- Property Impacts, loss in property value, appraised value depreciation considerations: Mr. Diaz explained that when property is acquired, an appraisal is performed. If no property is required then there is no compensation.
- Noise evaluation: Mr. Diaz indicated that a noise evaluation will be performed for the preferred alignment.
- Evaluation of the compensation for a property being taken: Property being taken goes through the eminent domain process. Compensation is based on several appraisals and fair market value.
- Residential impacts versus Number considered relocations: Mr. Diaz explained that the impacts total the number of parcels of land that may be affected by right of way taking while the number of relocations is based on impact to the actual home, requiring relocation.

Mr. Diaz closed the presentation by reminding attendees to fill out a comment sheet and turn it in at the meeting or to mail it in to the HNTB office. Attendees were then provided an opportunity to ask questions of staff and continue their review of the visual materials throughout the room.

A total of 60 people were in attendance at the meeting. A majority of those in attendance reside and/or own businesses in the corridor. The attendees were interactive and attentive during the presentation. Many questions were answered during the informal sessions and contacts were made for future individual meetings to discuss individual concerns.

Twenty written comments were received during the meeting. One comment was received through the mail. One comment was received through email. A list of comments has been provided in Appendix IX. Responses will be added to this summary after they have been mailed to the concerned party.

Comments received from attendees at the meeting, before and after the presentation, generally regarded:

- Preference to Alternatives:
 - No-Build - 1
 - A - 4
 - B - 0
 - C - 11
 - D - 5
- Concern for personal property/Not wanting to lose home
- Noise wall for Country Ridge

- Speed bumps in Country Ridge
- Impacts to parcels on Turkey Farm Road
- No bike lanes - should use multi-use trail instead
- Close vicinity to a four lane road
- Requests for copies of plans
- Tie-in of South Avenue (outside this project's limits)
- Landscaping
- Wells in way of construction - does that require City water
- Include battery operated vehicles in traffic plan

Minneola City Council Briefing and Public Hearing

The Minneola City Council Briefing and Public Hearing for the Minneola Collector Road PD&E Study was held on August 21, 2008. Newsletters with meeting notification information were mailed on August 6, 2008, to appropriate elected and appointed public officials, to appropriate regional and reviewing agencies and to property owners of record. Pursuant to Florida Statute 334.211, notifications were mailed to property owners of record whose property is located within 300 feet of each side of the centerline of the existing Hancock Road Extension and Citrus Grove Road corridor as well as to others in the vicinity of the extended project corridor. Additionally, other interested persons were also notified as well as those that had attended the Public Kick-off Meeting or the Alternative Meeting for the project. A public notice display ad was published in the Orlando Sentinel - Lake Section. Additionally, property owners directly affected by the alternative alignments were notified about the Public Hearing via certified U.S. mail.

Following a brief presentation regarding the study process, the alternatives analyzed and the recommended alternative, the City Council discussed the project and received public comment.

- Brad Southerland, expressed concerns with the current congestion at the two schools, and if the local residents would be forced to use the new road, and if an alternative road for local residents would be in place.
- James Fox, explained that he was an owner of property in the effected area and stated his opposition to alignment D due to the need for 18 driveway cuts, and asked Council to consider Alignment C.
- Brenda Mason, urged the Council to consider the residential areas and not allow commercial property in the immediate area. She asked that and alternate route further east be used.
- Shannon Linke, stated she did not want commercial in the area of her home, and expressed concern with the crime that a commercial area could bring.
- Richard Gonzales, explained that in the past his company had worked on the area's road design, and offered to cooperate with the County regarding road placement where his property is located.
- Sherry Vickram, stated that she and her uncles were the owners of the two homes on the corner of Jim Hunt Rd. and asked the Council to find an alternate route that would not take their property.

Following the receipt of public comment, Mr. Sam Oppelaar, City Manager, noted that a motion was requested to approve the recommended alternative as presented. Following a brief discussion by the commission, a motion was made to approve Alternative C3 for improvements to the Minneola Collector Road corridor. The motion was seconded but did not pass. Numerous members of the public had, previous to the meeting, viewed the boards that were on display outside of the Council Chambers and asked questions of the Study Team. A record of the Public Hearing will be available from City of Minneola as part of the regular minutes of the City Council Meeting and can also be found in Appendix XI.

At the September 16, 2008 Minneola City Council meeting the Council again discussed the potential alignment for the recommended alternative for the Minneola Collector Road. Mr. Sam Oppelaar, City Manager pointed out to the Council that a resolution regarding a recommended alternative alignment was required, so that Lake County could move ahead with design plans for the southern segment of the road as required for the future High School to be located along the Hancock Road extension. . Following a brief discussion by the commission and public comment, a motion was made to approve Alternative C2 as the recommended alignment for the southern segment of the road. The motion was seconded and passed with a 3-2 vote. A record of the Public Hearing will be available from City of Minneola as part of the regular minutes of the City Council Meeting and can also be found in Appendix XI. A resolution

ratifying this recommendation was approved by the Minneola City Council on October 21, 2008 and was forwarded to the Lake County Board County Commissioners for final approval of the preferred alignment.

Lake County Board of County Commissioners Briefing

The Lake County Board of County Commissioners Briefing for the Minneola Collector Road PD&E project was held on November 18, 2008. Following a brief presentation regarding the study process, the alternatives analyzed and the recommended alternative, the Commission received public comment. Following the receipt of public comment, Mr. Jim Stivender, Lake County Public Works, noted that a motion was requested to approve the recommended alternative as presented and previously approved by the Minneola City Council. Following a brief discussion by the commission, a motion was made to approve the preferred alternative for the Minneola Collector Road (Hancock Road/Citrus Grove Road). The motion was seconded and was passed unanimously. A record of the presentation and subsequent discussion will be available from Lake County as part of the regular minutes of the Board of County Commissioners Meeting.

9.15. Drainage

9.15.1. Drainage Basins and Pond Alternatives

The roadway corridor can be divided into several drainage basins based on the vertical alignment of the proposed roadway. The location of the proposed pond determines the outfall condition. The pond alternative analysis involves selecting potential sites near the existing low points of the road, but considering the placement to make the best use of remaining portions of the parcel or future development or existing ponds within the basins. The ponds are analyzed as if they will be only retaining the runoff from the roadway and offsite area that cannot be bypassed.

To size the ponds, the depth was based on the preliminary geotechnical data. Actual geotechnical data may indicate that the ponds can be deepened or made shallower. The ponds are sized utilizing a 1 to 4 side slope and a 15-foot maintenance berm. The limits of the basin boundaries and the location of the potential ponds sites are shown on the concept drawings in Appendix II. Table 9-4 summarizes the drainage basin data.

Table 9-4: Drainage Basin Data

Basin	Basin Area -Road (ac)	Impervious Area - Road (ac)	Basin Area - Offsite (ac)	Impervious Area - Offsite (ac)	Pond Discharge Point	Existing Area Discharging to Existing Outfall (ac)	Required Retention Volume (ac-ft)	Pond Alternative	Pond Size (ac)
A	3.90	3.11	21.13	0.96	Grassy Lake	26.92	1.32	A	1.83
B	15.87	9.71	34.62	13.90	Grassy Lake	--	2.90	B	1.66
C	3.58	1.94	43.50	17.35	Camp Lake	47.04	13.45	C	2.29
D	7.61	3.56	2.60	0	NA	NA	4.39	D	2.51
E	8.43	4.60	230.55	61.03	NA	NA	29.00	E	16.07
F	2.34	1.57	20.08	1.42	NA	NA	2.60	F	1.57
G	5.20	3.75	2.72	0	NA	NA	6.39	G	1.54
H	6.07	4.02	9.45	1.16	NA	NA	7.28	H	1.27
I	3.21	1.98	6.03	0	NA	NA	3.54	I	1.26
J	3.17	1.97	73.97	16.50	Offsite abandoned railroad right of way to east	73.97	10.26	J	3.00

Basin A

Basin A lies between U.S. 27 (State Road 25) (Sta. 79+50) and a point (Sta. 109+00) approximately 3,000 feet east of U.S. 27. The stormwater management is designed to discharge only the

predevelopment condition runoff to the existing storm sewer system discharging to the pond. The contributing drainage basin consists of 3.90 acres of area within the road right of way and 21.13 acres of offsite area located on the north side of Citrus Grove Road. There is one pond alternative for this basin as described in the following section.

Basin A, Pond A

Proposed Pond A is located near the intersection of U.S. 27 and Citrus Grove Road, south of the existing Citrus Grove Road. The pond is in an undeveloped area. The pond site is in a low-lying area and contains highly permeable soil. This pond would store the difference between the pre-development and post-development 25-year/96-hour runoff with overflow to a depression south of the proposed Pond A and would then sheet flow to Grassy Lake. The groundwater was not encountered on the day the borings were drilled. Citrus Grove Road is approximately five feet lower than the ground at the pond site. However, there is sufficient storage depth available to utilize a dry retention pond. The estimated pond size for this basin is 1.97 acres.

Basin B

Basin 2 lies between a point (Sta. 109+00) approximately 2,300 feet east of the first curve of the existing Citrus Grove Road and a point 2,300 feet east of the first curve of the existing Citrus Grove Road (Sta. 164+40). The stormwater management pond would hold the entire storm event and outfall to Grassy Lake. Recovery will be accomplished via horizontal infiltration through the side slopes. The contributing drainage basin consists of 15.87 acres of area within the road right of way and 18.75 acres of offsite area located on the north side of Citrus Grove Road in the Founder's Ridge subdivision. There is one pond alternative for this basin as described in the following section.

Basin B, Pond B

Proposed Pond B is existing pond DRA-1 in the Founder's Ridge subdivision (SJRWMD permit # 4-069-108870-1) located in the western boundary of the subdivision and north of Citrus Grove Road. This pond was permitted to include the final build out of Citrus Grove Road to a four-lane divided road. The roadway runoff will be collected in a stormwater pipe system and conveyed to the existing pond. The contributing offsite area (single family home subdivision) will also be collected in a storm water pipe system or sheet flow directly into the existing wet pond. The groundwater is approximately 16.5 feet below the existing ground surface. The estimated Pond B size as shown in the permit is 1.66 acres.

Basin C

Basin C lies between a point 2,300 feet east of the first curve of the existing Citrus Grove Road (Sta. 164+40) and a point 1,100 feet east of the curve where the existing Citrus Grove Road becomes Hancock Road Extension (Sta. 177+27). This basin discharges to Camp Lake, north of Citrus Grove Road. The contributing drainage basin consists of 3.58 acres of area within the road right of way and 43.50 acres of offsite area located on the north side of Citrus Grove Road in the Founder's Ridge subdivision. There is one pond alternative for this basin as described in the following section.

Basin C, Pond C

Proposed Pond C is the existing pond DRA-9 in the Founder's Ridge subdivision (SJRWMD permit # 4-069-108870-1). This pond was permitted to include the final build out of Citrus Grove Road to a four-lane divided road. The roadway runoff will be collected in a stormwater pipe system and conveyed to the existing pond. The contributing offsite area (single family home subdivision) will also be collected in a stormwater pipe system or sheet flow directly into the existing dry retention pond. The pond will stage up and discharge through three 20-foot weirs to the north of the pond. The groundwater was not encountered on the day the borings were drilled. The estimated Pond C size as shown in the permit is 2.29 acres.

Basin D

Basin D lies between a point 1,100 feet east of the first curve of the existing Citrus Grove Road (Sta. 177+27) and a point 350 feet west of the curve where the existing Citrus Grove Road becomes the existing Hancock Road Extension (Sta. 177+27). This basin has no apparent outfall. The contributing drainage basin consists of 5.46 acres of area within the road right of way and 2.60 acres of offsite area located on the east side of Hancock Road Extension. There is one pond alternative for this basin as described in the following section.

Basin D, Pond D

Proposed Pond D is located west of the intersection of the realigned Citrus Grove Road and Hancock Road Extension. This dry pond will provide the total retention of the 25-year/96-hour storm event with no discharge. The roadway runoff and contributing offsite area will be collected in a stormwater pipe system and conveyed to the pond. The groundwater was not encountered on the day the borings were drilled. The estimated Pond D size is 2.15 acres.

Basin E

Basin E lies between a point 350 feet west of the curve where the existing Citrus Grove becomes the existing Hancock Road Extension (Sta. 297+20) and a point 900 feet north of Citrus Grove Road (Sta. 327+80). This basin has no apparent outfall. The contributing drainage basin consists of 8.43 acres of area within the road right of way and 230.55 acres of offsite area located on the west side of Hancock Road Extension in the Reserve at Minneola subdivision. There is one pond alternative for this basin as described in the following section.

Basin E, Pond E

Proposed Pond E is the existing Pond 10 in the Reserve at Minneola Subdivision (SJRWMD permit # 4-069-92447-1). This pond was permitted to include the final build out of Hancock Road Extension to a four-lane divided road but did not include the sidewalk, trail and one bike lane. The roadway runoff will be collected in a storm water pipe system and conveyed to the existing pond. The contributing offsite area (single family home subdivision) will also be collected in a stormwater pipe system or sheet flow directly into the existing dry retention pond. The pond will provide total retention of the entire 25-year/96-hour storm event. The groundwater was not encountered on the day the borings were drilled. The estimated Pond E size as shown in the permit is 16.07 acres.

Basin F

Basin F lies between a point 900 feet north of Citrus Grove Road (Sta. 327+80) and a point where Citrus Grove Road and Hancock Road Extension intersect (Sta. 336+80). This basin has no apparent outfall. The contributing drainage basin consists of 2.34 acres of area within the road right of way and 20.08 acres of offsite area located on the west side of Hancock Road Extension in the Reserve at Minneola subdivision. There is one pond alternative for this basin as described in the following section.

Basin F, Pond F

Proposed Pond F is the existing Pond 30 in the Reserve at Minneola Subdivision (SJRWMD permit # 4-069-92447-1). This pond was permitted to include the final build out of Hancock Road Extension to a four lane divided road but did not include the sidewalk, trail and one bike lane. The roadway runoff will be collected in a stormwater pipe system and conveyed to the existing pond. The contributing offsite area (single family home subdivision) will also be collected in a stormwater pipe system or sheet flow directly into the existing dry retention pond. The pond will provide total retention of the entire 25-year/96-hour storm event. The groundwater was not encountered on the day the borings were drilled. The estimated Pond F size as shown in the permit is 1.57 acres.

Basin G

Basin G lies between a point where Citrus Grove Road and Hancock Road Extension intersect (Sta. 336+80) and a point 1,900 feet south of the Citrus Grove Road and Hancock Road Extension intersection (Sta. 355+40). This basin has no apparent outfall. The contributing drainage basin consists of 5.20 acres of area within the road right of way and 2.72 acres of offsite area located on the east side of Hancock Road Extension. There is one pond alternative for this basin as described in the following section.

Basin G, Pond G

Proposed Pond G is located northwest of the intersection of Hancock Road Extension and the Progress Energy easement. This dry pond will provide the total retention of the 25-year/96-hour storm event with no discharge. The roadway runoff and contributing offsite area will be collected in a stormwater pipe system and conveyed to the pond. The groundwater was not encountered on the day the borings were drilled. The estimated Pond G size is 1.54 acres.

Basin H

Basin H lies between a point 1,900 feet south of the Citrus Grove Road and Hancock Road Extension intersection (Sta. 355+40) and a point 1,300 feet north of the Old Highway 50 and North Hancock Road intersection (Sta. 377+50). This basin has no apparent outfall. The contributing drainage basin consists of 6.07 acres of area within the road right of way and 9.45 acres of offsite area located on the west side of Hancock Road Extension in the Black West Subdivision. There is one pond alternative for this basin as described in the following section.

Basin H, Pond H

Proposed Pond H is located northeast of the intersection of Hancock Road Extension and the Progress Energy easement. This dry pond will provide the total retention of the 25-year/96-hour storm event with no discharge. The roadway runoff and contributing offsite area will be collected in a stormwater pipe system and conveyed to the pond. The groundwater was not encountered on the day the borings were drilled. The estimated Pond H size is 1.27 acres.

Basin I

Basin I lies between a point 1,300 feet north of the Old Highway 50 and North Hancock Road intersection (Sta. 377+50) and a point 500 feet north of the Old Highway 50 and North Hancock Road intersection (Sta. 385+00). This basin has no apparent outfall. The contributing drainage basin consists of 3.21 acres of area within the road right of way and 6.03 acres of offsite area located on the east side of Hancock Road Extension in the Black West subdivision. There is one pond alternative for this basin as described in the following section.

Basin I, Pond I

Proposed Pond I is located west of Hancock Road Extension and north of the new Old Highway 50 connector. This dry pond will provide the total retention of the 25-year/96-hour storm event with no discharge. The roadway runoff and contributing offsite area will be collected in a stormwater pipe system and conveyed to the pond. The groundwater was not encountered on the day the borings were drilled. The estimated Pond I size is 1.26 acres.

Basin J

Basin J lies between a point 500 feet north of the Old Highway 50 and North Hancock Road intersection (Sta. 385+00) and a point 630 feet south of the Old Highway 50 and North Hancock Road intersection (Sta. 396+50). This basin has no apparent outfall. The contributing drainage basin consists of 3.17 acres of area within the road right of way and 73.97 acres of offsite area located on the west side of North Hancock Road in the Skyridge Valley subdivision. There is one pond alternative for this basin as described in the following section.

Basin J, Pond J

Proposed Pond J is the existing pond WRA-"A" in the Skyridge Valley Subdivision (SJRWMD permit # 4-069-0356A-ERP). This pond was permitted to include the final build out of Hancock Road Extension to a four-lane divided road but did not include the sidewalk, trail and one bike lane. The roadway runoff will be collected in a stormwater pipe system and conveyed to the existing pond. The contributing offsite area (single family home subdivision) will also be collected in a stormwater pipe system or sheet flow directly into the existing dry retention pond. The groundwater was not encountered on the day the holes were drilled. The estimated Pond J size as shown in the permit is 3.00 acres.

9.15.2. Drainage Design Criteria

The stormwater management system will be designed to conform to the SJRWMD criteria and applicable Lake County and City of Minneola stormwater design criteria. The entire project corridor lies within the SJRWMD Ocklawaha River Hydrologic Basin.

Systems within the Ocklawaha River Hydrologic Basin shall meet applicable discharge criteria for 10-year and 25-year frequency storms. Onsite storage and outlet capacity should be designed for the 25-year storm and refined as necessary for the 10-year storm event.

The majority of soils in the Minneola Collector Road project area consist of excessively drained to moderately well-drained soils. A complete soil survey and geotechnical investigation should be completed in the design phase to determine the actual soil conditions. The type of soil present in the corridor is suitable for dry retention or detention ponds.

The proposed ponds analyzed for this project are all considered online ponds, such that the storm sewer system will discharge directly into a single pond. Off-line systems would involve the separation of water quality treatment storage from the flood attenuation storage. This type of system is not always practical because it requires a greater amount of land than a single pond. The proposed ponds for this project are designed based on the drainage characteristics of each drainage basin. Some of the ponds discharge to Grassy Lake, Camp Lake, existing retention ponds in Founder's Ridge subdivision, the Reserve at Minneola subdivision and Skyridge Valley subdivision and others have no outfall. The type of outfall can significantly affect the size of a pond. For dry retention ponds, the water quality treatment is based on retention of one-half inch of runoff over the project area or 1.25 inches of runoff over the impervious area plus 0.5 inches of runoff over the entire project area for on-line treatment, whichever is greater. The water quality treatment volume would have to be recovered in 72 hours. It is anticipated that all recovery will occur through natural percolation into the soil. For wet detention ponds, the water quality treatment is based on retention of one inch of runoff over the project area or 2.50 inches of runoff over the impervious, whichever is greater. The water quality treatment volume would have to be recovered in 24 to 30 hours.

The ponds that discharge to the existing lakes are designed to attenuate the 25-year/96-hour storm event runoff volume. Any runoff above the required attenuation volume would discharge to the lake over a weir or through an outfall structure and pipe.

The ponds that would have no outfall to a downstream water body or depression are considered landlocked. The pond must be sized to retain the entire runoff from the 25-year/96-hour storm event and recover the total volume within 14 days and the water quality volume within 72 hours.

For the ponds that lie within a basin with a positive outfall, the water quality treatment volume requirements are the same as described above. However, the attenuation volume is based on the difference between the pre-development and post-development 25-year/24-hour discharge rate. These ponds have an outfall structure with a weir set at the stage of the required water quality volume. The weir is sized to control the discharge rate to the pre-development condition.

9.16. Access Management

The conceptual design encompassed access management standards, which generally conform to FDOT Access Class 5 criteria. Input was gathered from property owners along the corridor at the general public meetings and at several individual meetings. Based on the input received at these meetings and coordination with the city and the county, a four-lane typical section has been developed.

9.17. Landscaping and Aesthetics

The City of Minneola and Lake County will provide guidance on aesthetic considerations such as landscaping and irrigation during the final design phase of this project. The typical section for the improvements provides a border area and median, which may be used for landscaping. All landscaping improvements will be developed in conformance with the design criteria for maintaining a clear zone and unobstructed line of clear sight for an urban arterial.