Appendix A

Polk Transit Vision 2032

Transit Development Plan Major Update for Citrus Connection



CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

December 2022

CitrusConnection
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Polk Transportation Planning Organization

Polk Transit Vision 2032: The Transit Development Plan (TDP) Major Update for Citrus Connection

Final Report

December 2022

Prepared for

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List of Acronyms

ADA	Americans with Disabilities Act
AADT	Annual Average Daily Traffic
ACES	Autonomous, Connected, Electric, Shared-Use
ACS	American Community Survey
APR	Annual Progress Report
APTA	American Public Transportation Association
BEBR	Bureau of Economics and Business Research
BLS	Bureau of Labor Statistics
BoCC	Board of County Commissioners
BRT	Bus Rapid Transit
CARES	Coronavirus Aid, Relief, and Economic Security Act
COA	Comprehensive Operational Analysis
CTPP	Census Transportation Planning Products
CTC	Community Transportation Coordinator
DOR	Department of Revenue
DTA	Density Threshold Assessment
FAC	Florida Administrative Code
FCTD	Florida Commission for the Transportation Disadvantaged
FDOT	Florida Department of Transportation
FSUTMS	Florida Standard Urban Transportation Model Structure
FTA	Federal Transit Administration
FTIS	Florida Transit Information System
FTP	Florida Transportation Plan
GTFS	General Transit Feed Specification
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
LAMTD	Lakeland Area Mass Transit District
LEP	Limited English Proficiency
LRTP	Long Range Transportation Plan
MOD	Mobility on Demand
MPO	Metropolitan Planning Organization
NTD	National Transit Database
PD&E	Project Development and Environment
PIP	Public Involvement Plan
PRC	Project Review Committee
PSA	Public Service Announcements
RAISE	Rebuilding American Infrastructure with Sustainability and Equity

List of Acronyms (continued)

RLOS	Roadway Level Of Service
SaaS	Software-as-a-Service
TAC	Technical Advisory Committee
TAM	Transit Asset Management
TAN	Transportation Advisory Network
TAZ	Traffic Analysis Zone
TBEST	Transit Boardings Estimation and Simulation Tool
TCAR	Transit Concept and Alternatives Review
TD	Transportation Disadvantaged
TD LCB	Transportation Disadvantaged Local Coordinating Board
TDP	Transit Development Plan
TDSP	Transportation Disadvantaged Service Plan
TNC	Transportation Network Company
TOD	Transit-Oriented Development
TOI	Transit Orientation Index
TPO	Transportation Planning Organization
TSP	Transit Signal Priority
UAP	Universal Access Partnership
USDOT	US Department of Transportation
VOMS	Vehicles operated in maximum service
WHAT	Winter Haven Area Transit

Section 1. Introduction

This effort was initiated by the Polk Transportation Planning Organization (TPO) in collaboration with the Lakeland Area Mass Transit District (LAMTD), which operates transit services as Citrus Connection, to prepare a Major Update of the Citrus Connection's 10-Year Transit Development Plan (TDP), also dubbed "Polk Transit Vision 2032."

This TDP represents Polk County's vision for public transportation from 2023 to 2032, functioning as the strategic guide for public transportation for the community. This major TDP update also allows the transit and planning agencies in Polk County to outline actions to be taken in the following year and set transit goals for subsequent years. As a strategic plan, the TDP will also identify needs in an unconstrained fashion and for which currently there is no funding. As a development plan for local transit services, the plan will be consistent with community goals, reflect the priorities that leadership have established, and integrate the various community characteristics and development patterns that influences decisions and growth within Polk County and its municipalities.

Preparing and submitting a TDP major update that complies with Florida Administrative Code (F.A.C.) Rule 14-73.001 (commonly called the TDP Rule) every five years is also required by the Florida Department of Transportation (FDOT) as a prerequisite to the receipt of State Block Grant funds. According to F.A.C. Rule 14-73.001 – Public Transportation, "The TDP shall be the applicant's planning, development and operational guidance document to be used in developing the Transportation Improvement Program and the Department's Five-year Work Program."

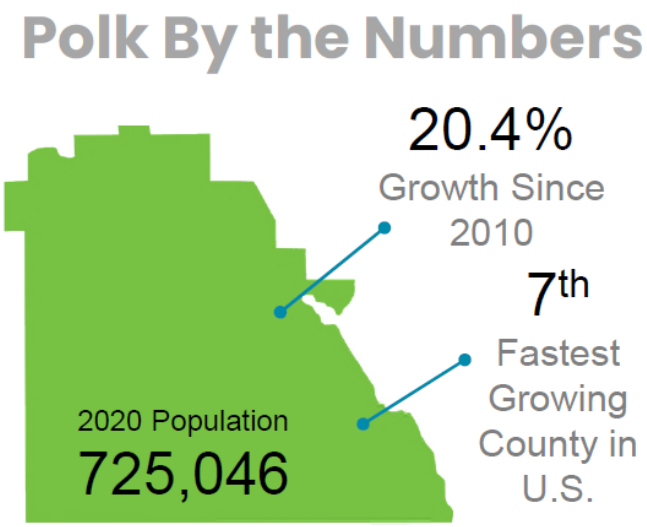
A major TDP update also allows transit agencies to outline actions to be taken in the following year and set goals for subsequent years. The most recent 10-year TDP major update for Citrus Connection was adopted in August 2017 for Fiscal Years (FY) 2017–2026. This current major update for FY 2023–2032 is due by November 10, 2022.

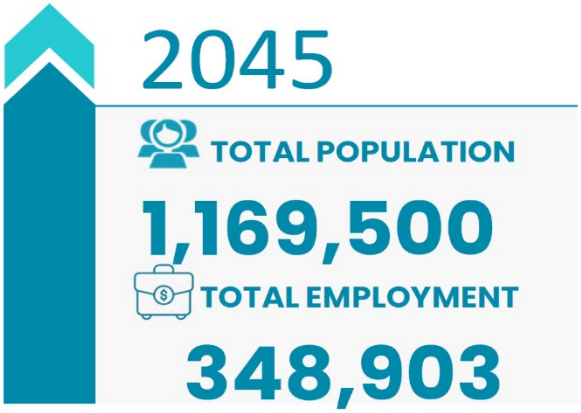
Objectives of This Plan

The main purpose of this effort is to update the TDP for Citrus Connection's fixed-route bus services, as currently required by State law for agencies receiving State Block Grant funding for transit. This TDP also is a 10-year plan for transit and

mobility needs, cost and revenue projections, and community transit goals, objectives, and policies. This Major Update supports a unified vision with realistic goals and recommendations that stakeholders, citizens, and decisionmakers can support and promote.

The plan also integrates and is responsive to the community factors and opportunities caused by rapid growth and development. Understanding and addressing the current trends and opportunities is of paramount importance at this time since, according to the 2020 US Census, Polk County had the seventh largest population increase from July 1, 2020 to July 1, 2021, of any County in the US. Polk County is also the fastest-growing County in Florida, numerically.





While Polk County is capitalizing on these opportunities to improve the quality of life for its residents and visitors, it is also focused on massive improvements in the County's Capital Improvement Program, and has many major road improvements scheduled over the next few years. These investments in the roadway infrastructure will provide significant relief to relieve congestion, and this should also help the public transit system function better, too. The County recognizes that the increases in population growth means it needs to invest in transit and other modes of transportation, in order to provide residents and visitors with different choices for their mobility needs. The County leadership clearly understand that the population growth will spur economic development and the jobs that come as a result must be accessible by additional modes, including transit. All of this is part of the need for a strategic vision for transit in Polk County.

TDP Requirements

FDOT requires that recipients of state Public Transit Block Grant funds prepare a major update of their TDP every five years to ensure that the provision of Citrus Connection's public transportation system in Polk County is consistent with the mobility needs of local communities. This is particularly important in this update cycle, due to the massive growth and development that is happening in Polk County at this time. Current TDP requirements were formally adopted by FDOT on February 20, 2007. Major requirements of the rule include the following:

- Major updates must be completed every 5 years, covering a 10-year planning horizon.
- A Public Involvement Plan must be developed and approved by FDOT or consistent with the approved Metropolitan Planning Organization (MPO) Public Involvement Plan.
- FDOT, the Regional Workforce Development Board, and the MPO must be advised of all public meetings at which the TDP is presented and discussed, and these entities must be given the opportunity to review and comment on the TDP during the development of the mission, goals, objectives, alternatives, and 10-year implementation program.
- Estimation of the community's demand for transit service (10-year annual projections) must use the planning tools provided by FDOT or a demand estimation technique approved by FDOT.

Polk Transit Vision 2032 – Process

The process and components of the Polk Transit Vision 2032: TDP Major Update for Citrus Connection is consistent with the process and flow recommended by FDOT's 2022 *TDP Handbook* for preparing TDPs in the state. As shown in Figure 1-1, this includes a series of separate yet interrelated tasks, including the existing transit service evaluation task summarized herein. All tasks coordinates and contribute to the full picture of the current operating environment and existing/ future transit needs in Polk County and its immediate region. With this coordinated and collaborative efforts, this TDP has not only attempted to truly reflect the needs of its community, but also to answer how the transit system will responds to meet those needs effectively.

TDP Checklist

This TDP Update meets the requirements for a TDP major update in accordance with Rule Chapter 14-73, F.A.C. Table 1-1 is a list of TDP requirements from Rule 14-73.001 and indicates whether or not the item was accomplished as part of the Citrus Connection TDP and its location within this 10-year plan.

Figure 1-1: Polk Transit Vision 2032 – Process



Table 1-1: Polk TDP Checklist

	Public Involvement Process	TDP Section
√	FDOT-approved TDP Public Involvement Plan (PIP)	4 & Appendix F
√	Opportunities for public involvement outlined in PIP	4 & Appendix F
√	Solicitation of comments from RWB	4
√	Notification to FDOT, RWB, and MPO about public meetings	4 & Appendix F
√	Provision of review opportunities to FDOT, RWB, and MPO	4
Situation Appraisal		
√	Plans and policy review	5
√	Socioeconomic trends	5
√	Land use	5
√	Organizational issues	5
√	Technology/innovation	5
√	Transit-friendly land use and urban design efforts	5
√	10-Year transit ridership projections	7
√	Farebox Recovery report	3 & Appendix E
Mission and Goals		
√	Mission and vision	6
√	Goals and objectives	6
Alternatives Development & Evaluation		
√	Documentation of development of transit alternatives	8
√	Documentation of evaluation of transit alternatives	8
Implementation Program		
√	10-year program of improvement strategies and policies	9
√	Maps indicating areas to be served and types and levels of service	9
√	10-year financial plan showing funding sources and expenditures of funds	9
√	Documentation of monitoring program to track performance	9 & Appendix H
√	Implementation plan with projects and/or services needed to meet the goals and objectives in the TDP	9
√	List of unfunded needs	9
Relationship to Other Plans		
√	Consistent with Florida Transportation Plan	5
√	Consistent with local government comprehensive plan	5
√	Consistent with regional transportation goals and objectives	5
Submission		
√	Adopted by LAMTD	
√	Submitted to FDOT	

Organization of This TDP

This report is organized into 10 major sections, including this **Introduction.**

Section 2 summarizes the **Baseline Conditions** for the defined study area. This includes a review of the physical description of the study area and a population profile including demographic and socioeconomic characteristics and trends, including employment, income distribution, race, educational attainment, and poverty levels. Additionally, travel behavior and commuting trends are reviewed, including transportation ownership, modes of commuting, regional commute flows, and journey-to-work characteristics. Land use trends, transportation disadvantaged, major developments, major transit trip generators and attractors, Annual Average Daily Traffic (AADT), major activity centers, tourism, and seasonal resident levels also are explored.

Section 3 summarizes the **Existing Transit Service Review** for Citrus Connection. An analysis of Citrus Connection data and information is presented to help understand demand for and supply of transit services. The trend and peer section examines historical data on service metrics for fixed-route service to better understand system-level performance over time and in comparison to other similar systems, and a performance trend analysis provides a detailed examination over time of operating data for Citrus Connection's fixed-route services. A peer agency review provides an opportunity for Citrus Connection to compare its system-wide effectiveness and efficiency indicators with selected peer transit systems to help to determine how well transit service is performing locally compared to similar transit agencies elsewhere.

Section 4 presents the **Public Involvement Summary**, including a summary review of the outreach efforts completed for the TDP and the associated findings. TDP outreach efforts were conducted in two phases and include stakeholder interviews, public input surveys, discussion groups workshops, grassroots outreach events, general public workshops, and presentations as well as use of online platforms and tools.

Section 5 provides the **Situation Appraisal**, which reviews the current planning and policy environment in the county to better understand transit needs. It begins with a plans and policy review, including an overview of what each plan or policy aims to address and highlights key implications for transit within Polk County. Strengths and weaknesses of the system and potential threats to the

provision of service in the county are identified, as are key opportunities for addressing the threats. In addition, insights are presented based on review of socioeconomic trends, travel behavior and trends, public involvement, land use assessments, organizational attributes and funding issues, and technologies impacting the provision of transit service. While the community goals, growth factors, and development patterns will be integrated throughout the plan sections, the section that will govern and guide how the major influencing factors for successful growth and guiding principles will be reflected in the Situation Appraisal. It will reflect the community profile and patterns of the community feeding into the plan and define the goals and implementation strategies to move ahead and meet the needs of Polk County.

Section 6 provides draft **Goals and Objectives** to serve as a policy guide for implementation of the TDP. Proposed revisions to the existing goals and objectives are presented to ensure consistency with the goals of the local community with respect to transportation.

Section 7 presents the **Transit Demand Assessment** summarizing the various demand and mobility needs assessments conducted as part of the TDP. Included is a market assessment that provides an examination of potential service gaps and latent demand using GIS-based analyses. A transit accessibility assessment also was conducted to provide an understanding of the reach of existing services within a set time window. Additionally, forecasted ridership estimates using the Transit Boardings Estimation and Simulation Tool (TBEST) are summarized.

Section 8 discusses the **Transit Needs Development**. Improvements were developed based on four factors, including community needs and vision, situation appraisal, goals and objectives, and transit demand analysis. The 10-year needs are summarized based on service improvement type and supporting capital needs. This section also includes the transit needs evaluation used to assess the identified improvements for the 10-year TDP. These results were then used to develop the 10-year TDP financial and implementation plans.

Section 9 summarizes the **10-Year Transit Plan** developed for Citrus Connection's bus transit service. The Plan shows the recommended service and capital/technology/policy improvements as well as the unfunded needs. It also includes a discussion of the revenue assumptions and capital and operating costs used. Thereafter, the 10-year phased implementation plan for the TDP is summarized. A set of service, capital/technology, and policy improvements are

programed for the 10-year period, and the improvements that may not be funded now but should be considered if additional funding becomes available are also listed.

Section 10 summarizes techniques and approaches to help facilitate **Plan Implementation and Coordination** after adoption of the TDP. This section identifies implementation strategies and ways to make use of the various relationships, tools, and outreach materials from the TDP process to continue to build support for the implementation of the 10-Year TDP.



Source: Polk TPO

Section 2. Baseline Conditions

A multitude of factors in an operating environment can impact the provision of public transit services at varying levels, so it is crucial to review and understand them. A review of socio-economic, geographic, regulatory, environmental, land use, developmental, and political factors were conducted to aid in developing a public transit service in Polk County that responds appropriately to its environment. This section analyzes and presents data on relevant baseline conditions to help gain an understanding of the environment in which the current transit routes are operating. Figure 2-1 shows the key components reviewed as part of this assessment.

Figure 2-1: Components of Baseline Conditions Assessment



A series of user-friendly maps, figures, and tables is used to illustrate these baseline conditions in the remainder of this section. Data from various local, state, and national sources were used, including but not limited to the U.S. Census, U.S. Bureau of Labor Statistics (BLS), U.S. Department of Transportation (USDOT), American Community Survey (ACS), Bureau of Economics and Business Research (BEBR) of the University of Florida, Polk TPO, and Citrus Connection. These data were supplemented by other data from local and regional agencies, as available.

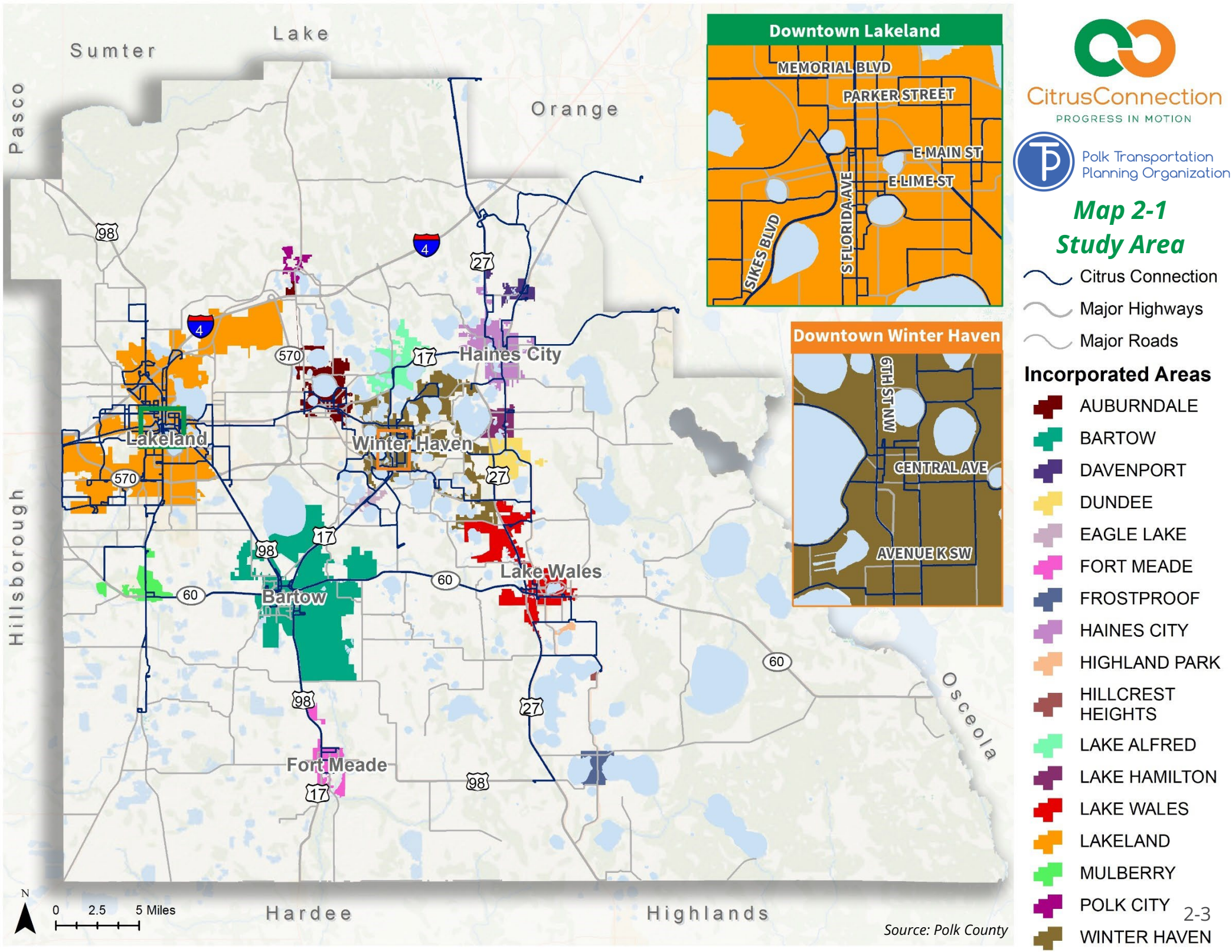
Study Area

Polk County is located in central Florida and has a land area of 2,011 square miles. Osceola County is located to the east; Orange, Lake, and Sumter counties are to the north; Pasco and Hillsborough counties are to the west; and Hardee and Highlands

counties are to the south. Polk is a county known for its nature preserves and includes 17 incorporated areas, with Bartow serving as the County seat. Other Polk County incorporated areas include Auburndale, Davenport, Dundee, Eagle Lake, Fort Meade, Frostproof, Haines City, Highland Park, Hillcrest Heights, Lake Alfred, Lake Hamilton, Lakeland, Lake Wales, Mulberry, Polk City, and Winter Haven. Six major highways intersect Polk County—I-4, US-98, US-27, US-17, SR-60, and Polk Parkway. Polk County is growing rapidly and attributes agriculture, the phosphate industry, and tourism as major contributors to its local economy. Map 2-1 provides a physical depiction of the boundaries of Polk County and its incorporated areas.



Source: Polk TPO



CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

Map 2-1
Study Area

- Citrus Connection
- Major Highways
- Major Roads

Incorporated Areas

- AUBURNDALE
- BARTOW
- DAVENPORT
- DUNDEE
- EAGLE LAKE
- FORT MEADE
- FROSTPROOF
- HAINES CITY
- HIGHLAND PARK
- HILLCREST HEIGHTS
- LAKE ALFRED
- LAKE HAMILTON
- LAKE WALES
- LAKELAND
- MULBERRY
- POLK CITY
- WINTER HAVEN

Source: Polk County

Population and Employment Profiles

Population Trends

Population information from the 2000 Census and the 2010 Census, supplemented with information from the 2015–2019 ACS 5-Year Estimates, were used to develop a population profile for Polk County. As shown in Table 2-1, the population of Polk County increased approximately 46 percent from 2000 to 2019, with 16.3 percent growth from 2010 to 2019. Similar trends were observed in employment and household growth. From 2000 to 2019, jobs grew approximately 23.4 percent, and the number of established households grew approximately 26 percent. The rate of population increased at a faster rate than households, suggesting that population density is increasing. Additionally, ACS data show that, from 2000 to 2010, 26 percent of those residents moved to Polk County from elsewhere.

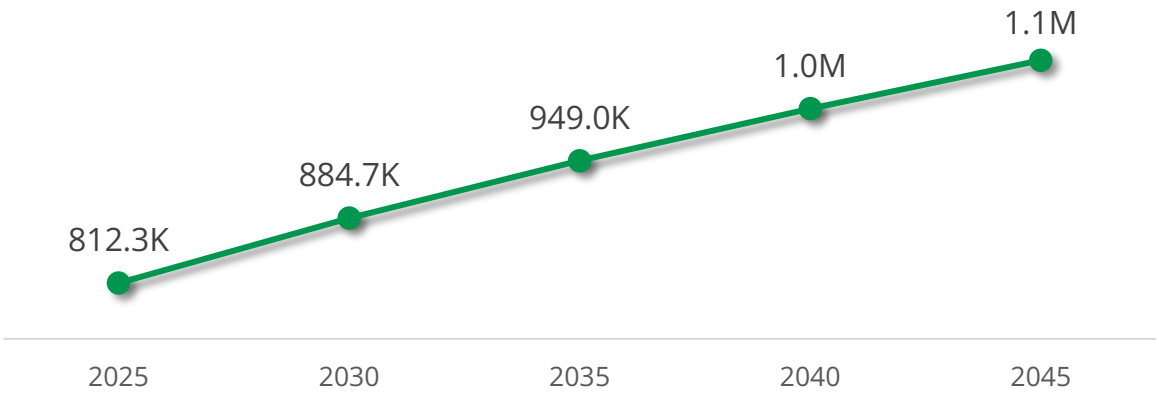
Table 2-1: Population & Employment Characteristics, Polk County, 2000–2019

Metric	2000	2010	2019	2000-2019 % Change	2010-2019 % Change
Population	471,192	590,073	686,218	45.6%	16.3%
Employment	231,202	247,262	285,305	23.4%	15.4%
Households	187,233	223,689	235,283	25.7%	5.2%

Sources: 2000 and 2010 Census, ACS 5-Year Estimates 2015–2019

The future population estimates prepared by BEBR indicate that Polk County's population is projected to grow approximately 14 percent by 2025 and 48 percent by 2045. Figure 2-2 shows the average of medium/high population projections for Polk County from 2025 to 2045.

Figure 2-2: Population Projections, Polk County, 2025–2045



Source: BEBR 2021 Florida Statistical Abstract

Cities and Municipalities in Polk County

A review of population trends also was conducted for the incorporated cities and municipalities in Polk County. Davenport experienced the most growth (154%), and Hillcrest Heights experienced a population decrease (-4%). The majority of other areas experienced a considerable amount of growth, with an average 24 percent increase. Table 2-2 provides population information for 2010 and 2019 and respective percent changes.

Table 2-2: Population, Incorporated Areas in Polk County, 2010–2019

Incorporated Area	2010	2019	2010–2019 % Change
Davenport	2,888	7,323	154%
Polk City	1,562	2,490	59%
Dundee	3,717	5,159	39%
Winter Haven	33,874	47,044	39%
Haines City	20,560	27,268	33%
Auburndale	13,507	17,120	27%
Lake Alfred	5,015	6,351	27%
Lake Hamilton	1,231	1,556	26%
Eagle Lake	2,255	2,785	24%
Bartow	17,298	20,757	20%
Highland Park	230	266	16%
Frostproof	2,992	3,454	15%
Lake Wales	14,225	16,386	15%
Lakeland	97,422	109,238	12%
Mulberry	3,817	4,100	7%
Fort Meade	5,626	5,833	4%
Hillcrest Heights	254	243	-4%

Source: BEBR, 2021 Florida Statistical Abstract

Existing and Future Population

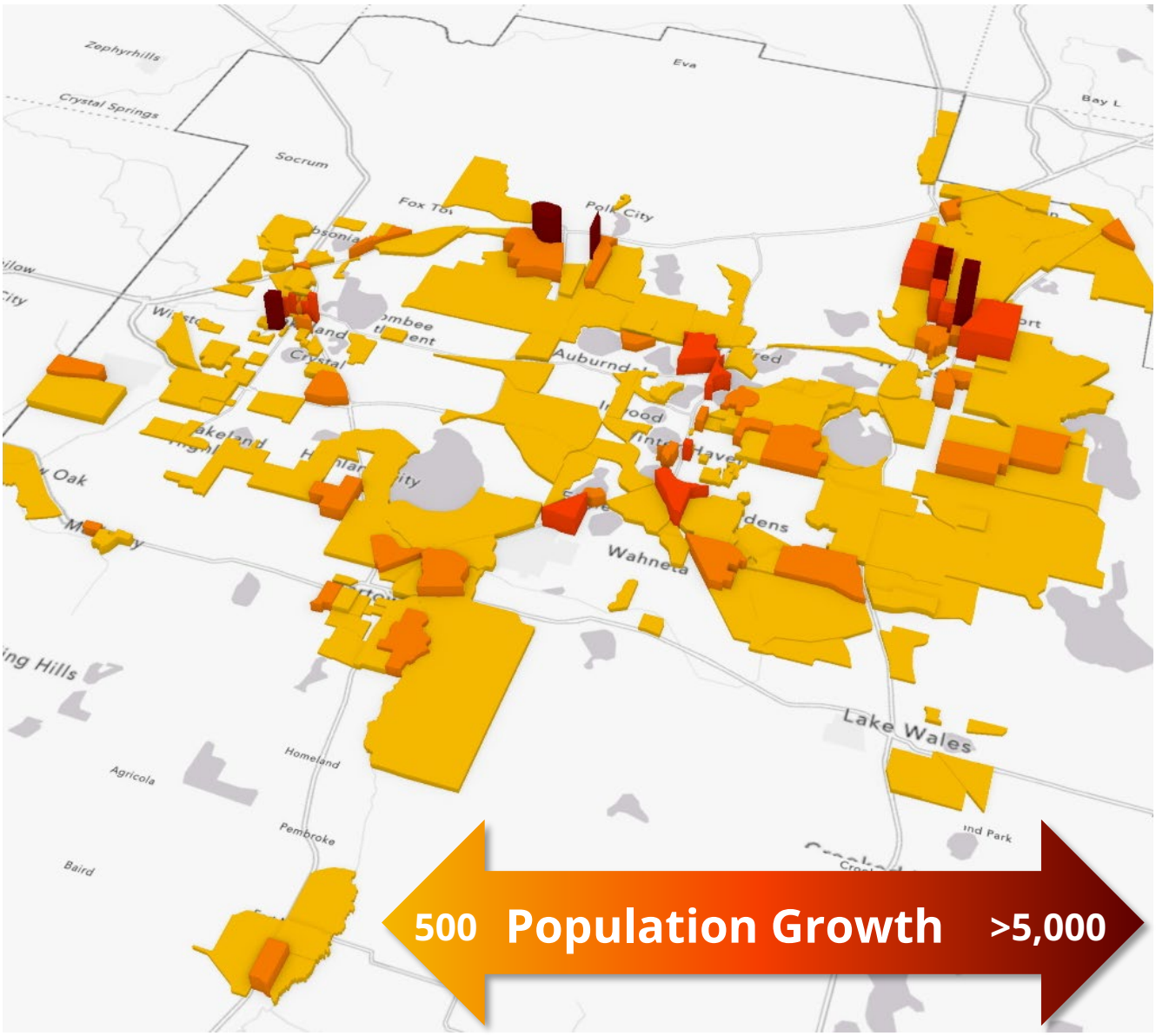
Map 2-2 shows the projected population densities for Polk County for 2023, prepared based on the socioeconomic data developed to support the Polk TPO 2045 Long Range Transportation Plan (LRTP).

As shown, higher population density (more than 4,000 people per square mile) is concentrated in incorporated areas, specifically downtown Lakeland, Bartow, and Winter Haven and along US-27 north of Haines City.

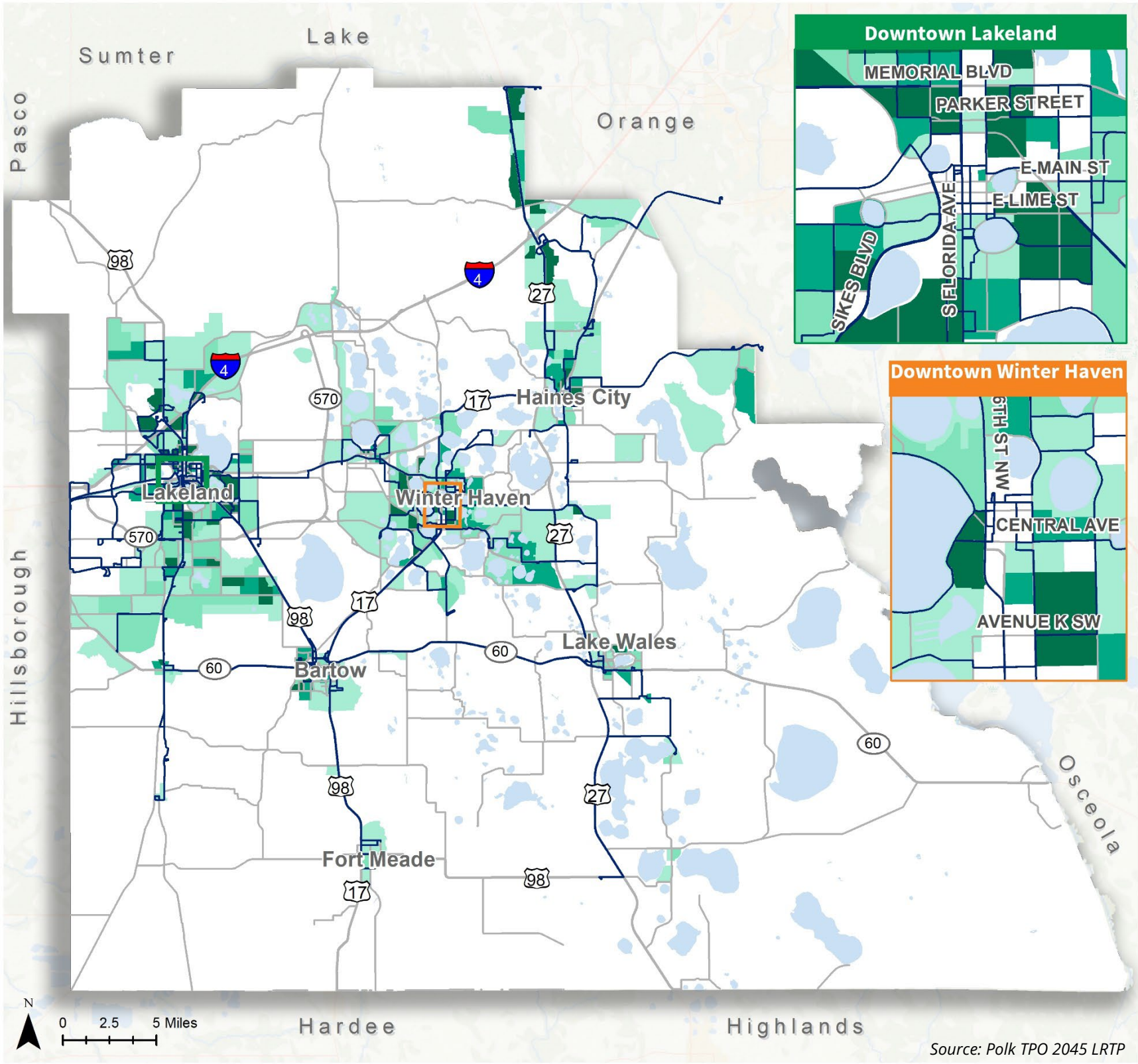
Map 2-3 shows the projected population densities for 2032, indicating that there will be more growth in already-established areas, specifically Lakeland, Lake Alfred, Eagle Lake, and Davenport. The key areas projected to experience the most growth are adjacent to major roadways such as US-17, US-27, US-92, US-98, and the Polk Parkway.

Figure 2-3 shows the geographic distribution of growth, indicating areas that will experience the most to least population growth in the next 10 years.

Figure 2-3: Population Growth by Traffic Analysis Zone (TAZ), 2023–2032



Source: Polk TPO 2045 LRTP



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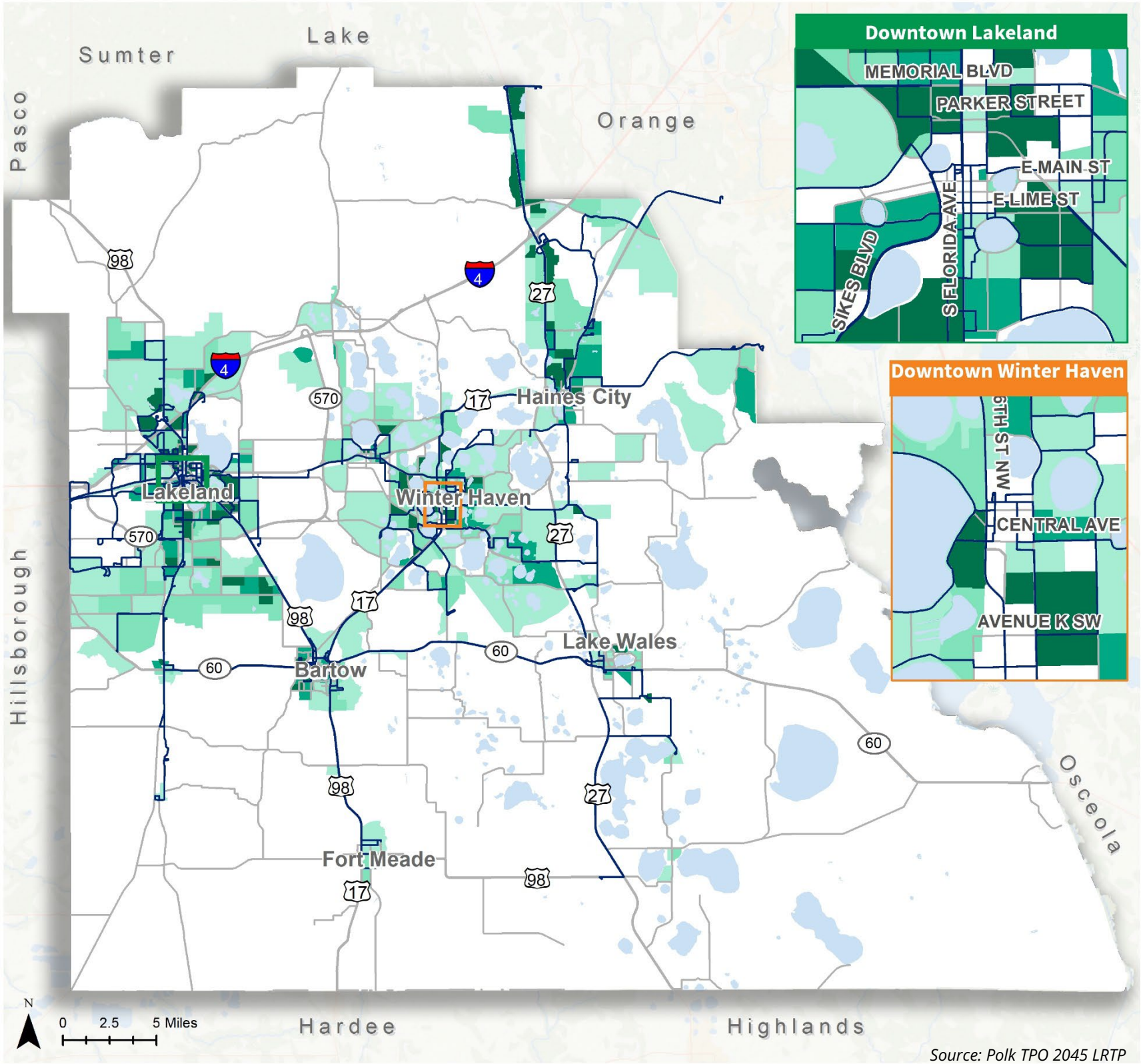
Map 2-2 2023 Population

Citrus Connection

2023 Population per Square Mile

- <1,000
- 1,000-2,000
- 2,001-3,000
- 3,001-4,000
- >4,000

Source: Polk TPO 2045 LRTP



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Map 2-3 2032 Population

Citrus Connection

2032 Population per Square Mile

- <1,000
- 1,000-2,000
- 2,001-3,000
- 3,001-4,000
- >4,000

Source: Polk TPO 2045 LRTP

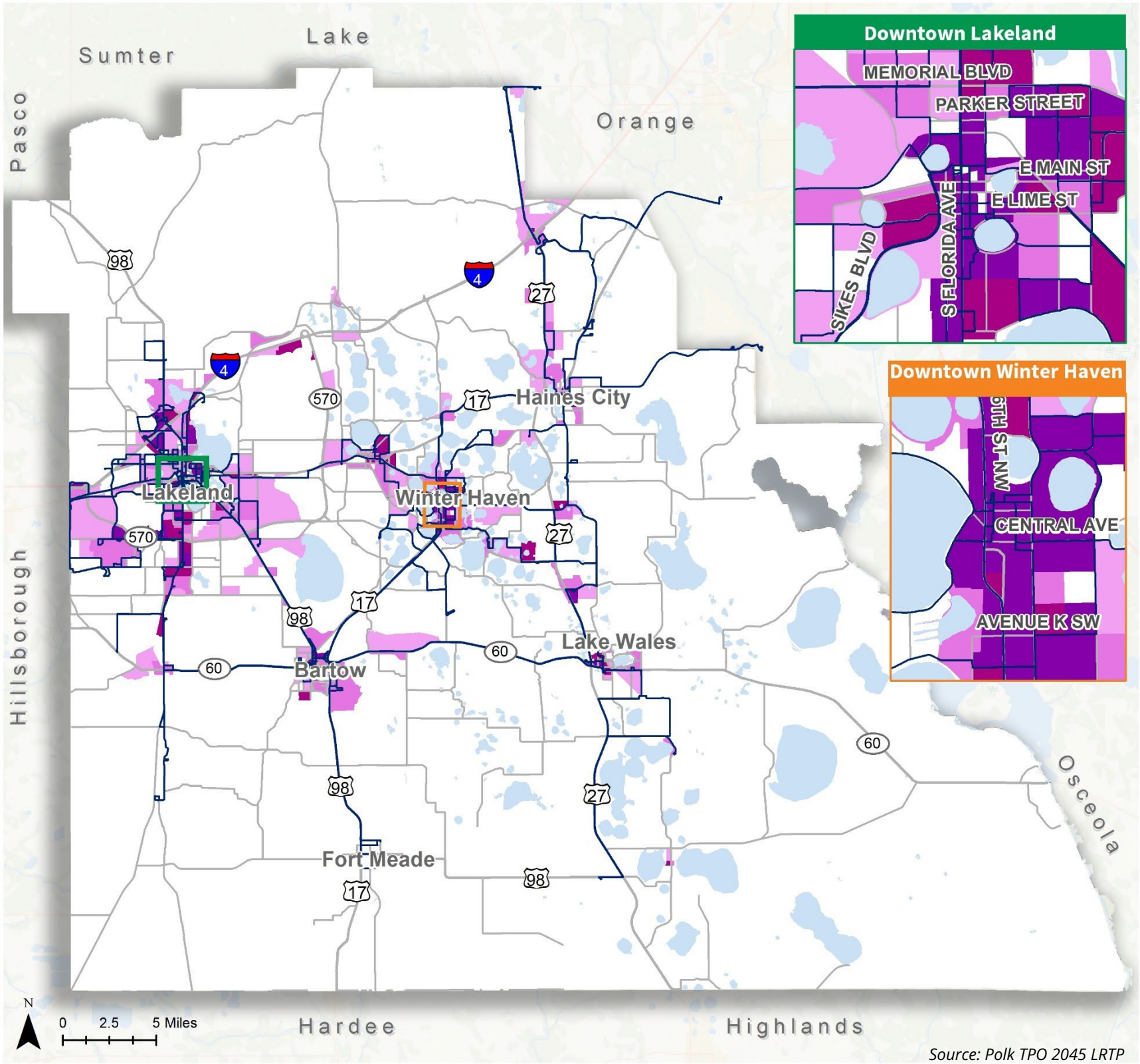
Existing and Future Employment

Availability of adequate transit services can ensure that workers have alternative modes to get to their job locations, thereby providing essential benefits to the local economy. Map 2-4 shows the projected employment densities for Polk County for 2023. These employment data are based on socioeconomic data developed to support the Polk TPO 2045 LRTP. In the TDP base year of 2023, jobs are concentrated in established areas such as Lakeland, Winter Haven, and Bartow, areas in which many employment campuses are located. In 2032, the projected employed population growth will be concentrated in established areas/along major corridors (Map 2-5). Figure 2-4 shows the job growth in Polk County in the next 10 years.

Figure 2-4: Employment Change by Traffic Analysis Zone (TAZ), 2023–2032



Source: Polk TPO 2045 LRTP



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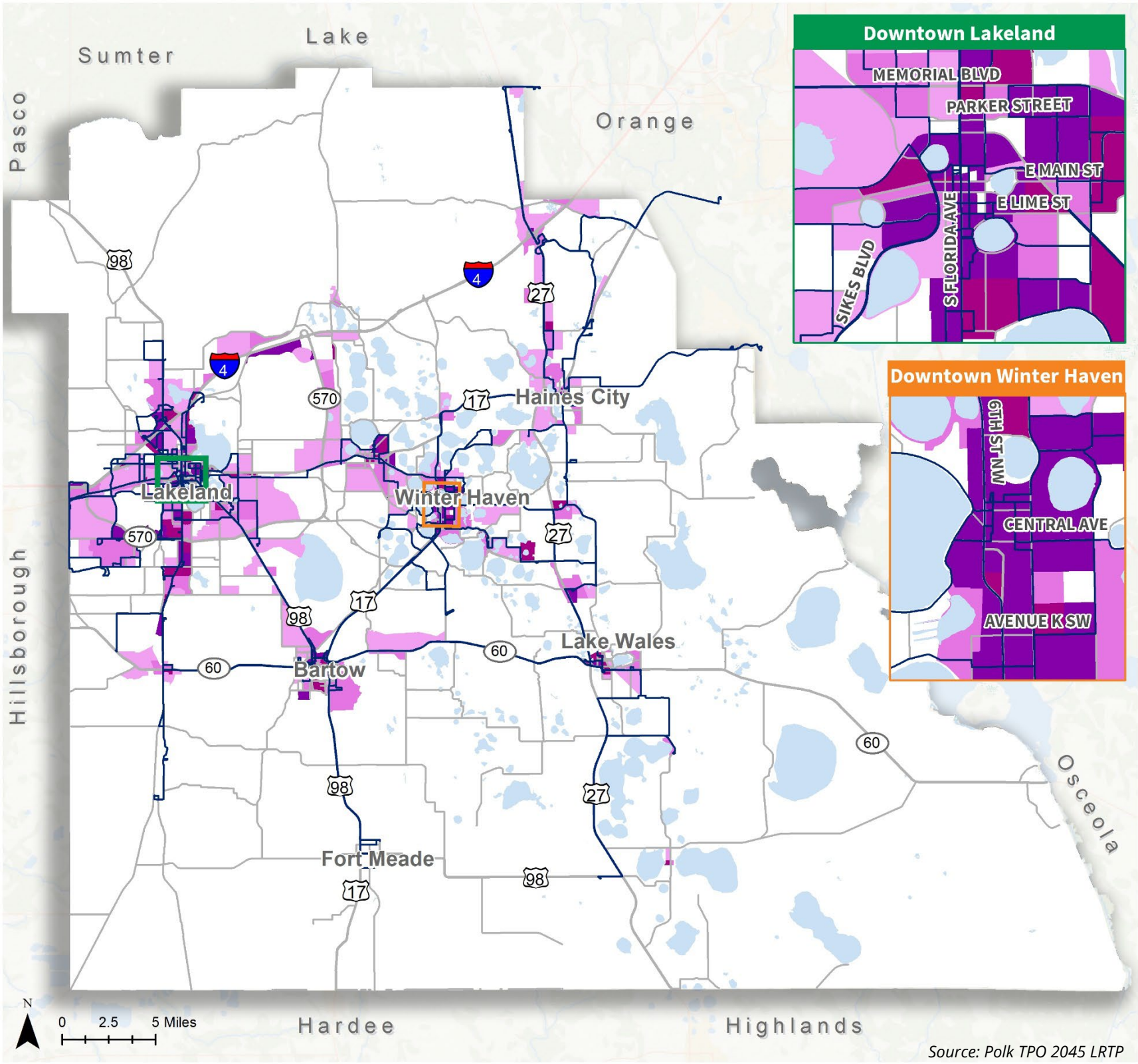
Map 2-4 2023 Employment

Citrus Connection

2023 Jobs per Square Mile

- <500
- 500-1,000
- 1,001-2,000
- 2,001-3,000
- >3,000

Source: Polk TPO 2045 LRTP



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Map 2-5 2032 Employment

Citrus Connection

2032 Jobs per Square Mile

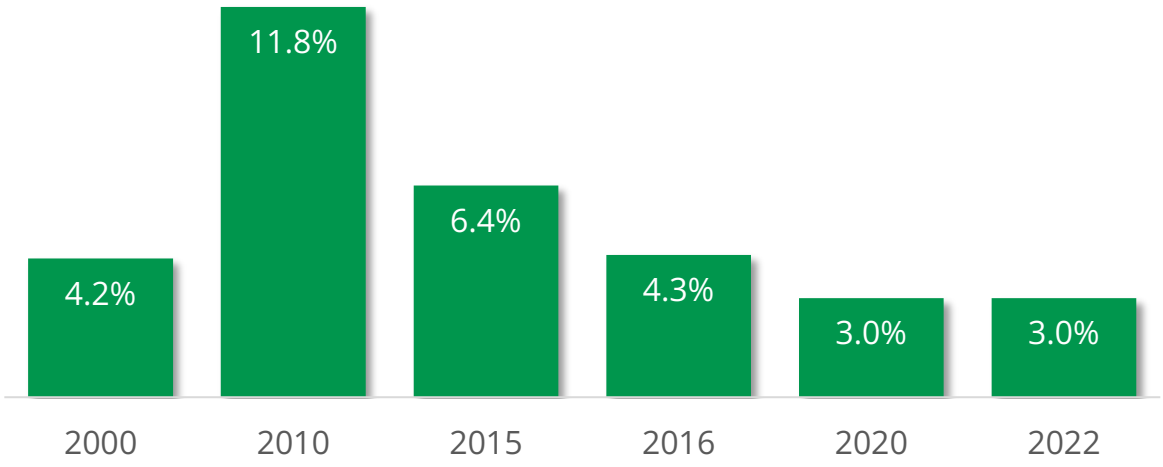
- <500
- 500-1,000
- 1,001-2,000
- 2,001-3,000
- >3,000

Source: Polk TPO 2045 LRTP

Unemployment Rates

The unemployment rate is an important economic indicator that can indicate drops in income, subsequently affecting household purchasing power for their transportation needs. According to the Bureau of Labor Statistics (BLS), in 2000 unemployment rates were 4.2 percent and increased 7.6 percent to 11.8 percent in 2010. This increase could be due to the 2008 recession. Since 2010, the unemployment rate has decreased. According to the Central Florida Development Council, approximately 3.0 percent of Polk County residents were unemployed as of May 2022 (Figure 2-5). This reflects an 8.8 percent decrease since 2010.

Figure 2-5: Unemployment Rates, 2000–2022

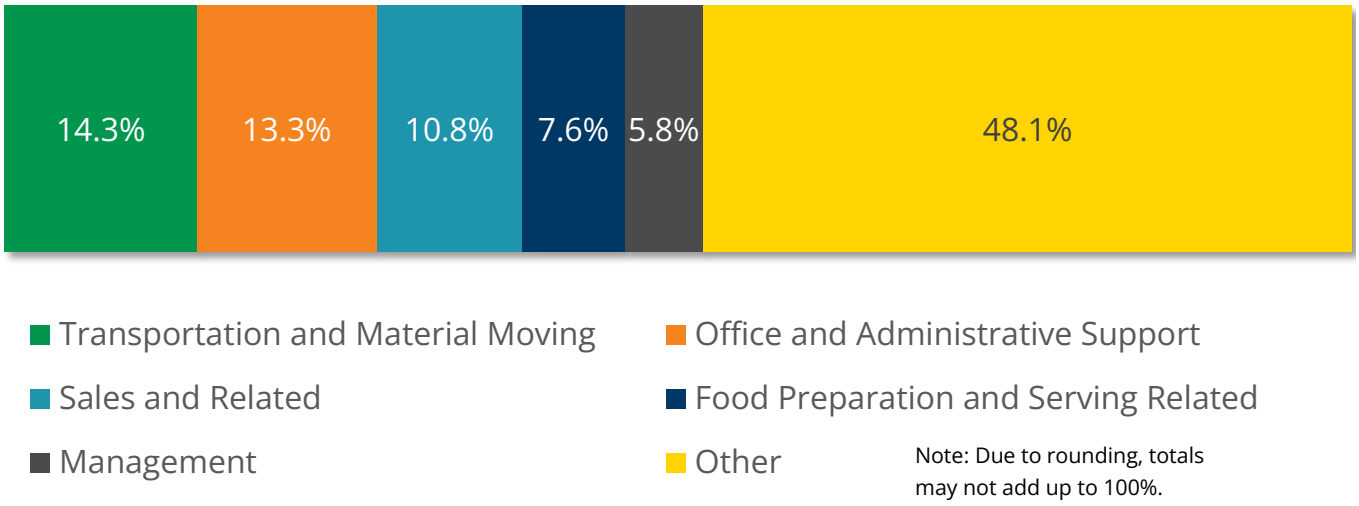


Source: Bureau of Labor Statistics (BLS) and Central Florida Development Council

Occupations

A review of the type of employment in Polk County was conducted using data from the Central Florida Development Council, with the economy broken down by occupation, as shown in Figure 2-6. The top occupations that make up approximately half of the jobs in Polk County are those in transportation and material moving (14.3%), office and administrative support (13.3%), sales and related (10.8%), food preparation and serving related (7.6%), and management (5.8%). Other occupations make up approximately 48.1 percent of the rest of the local economy.

Figure 2-6: Occupations, Polk County, 2019



Sources: Central Florida Development Council

Socio-Demographic Characteristics

Key demographics such as age, income distribution, racial and ethnic origin, persons who have limited English proficiency, education attainment, and auto-ownership were reviewed to better understand the communities Citrus Connection serves.

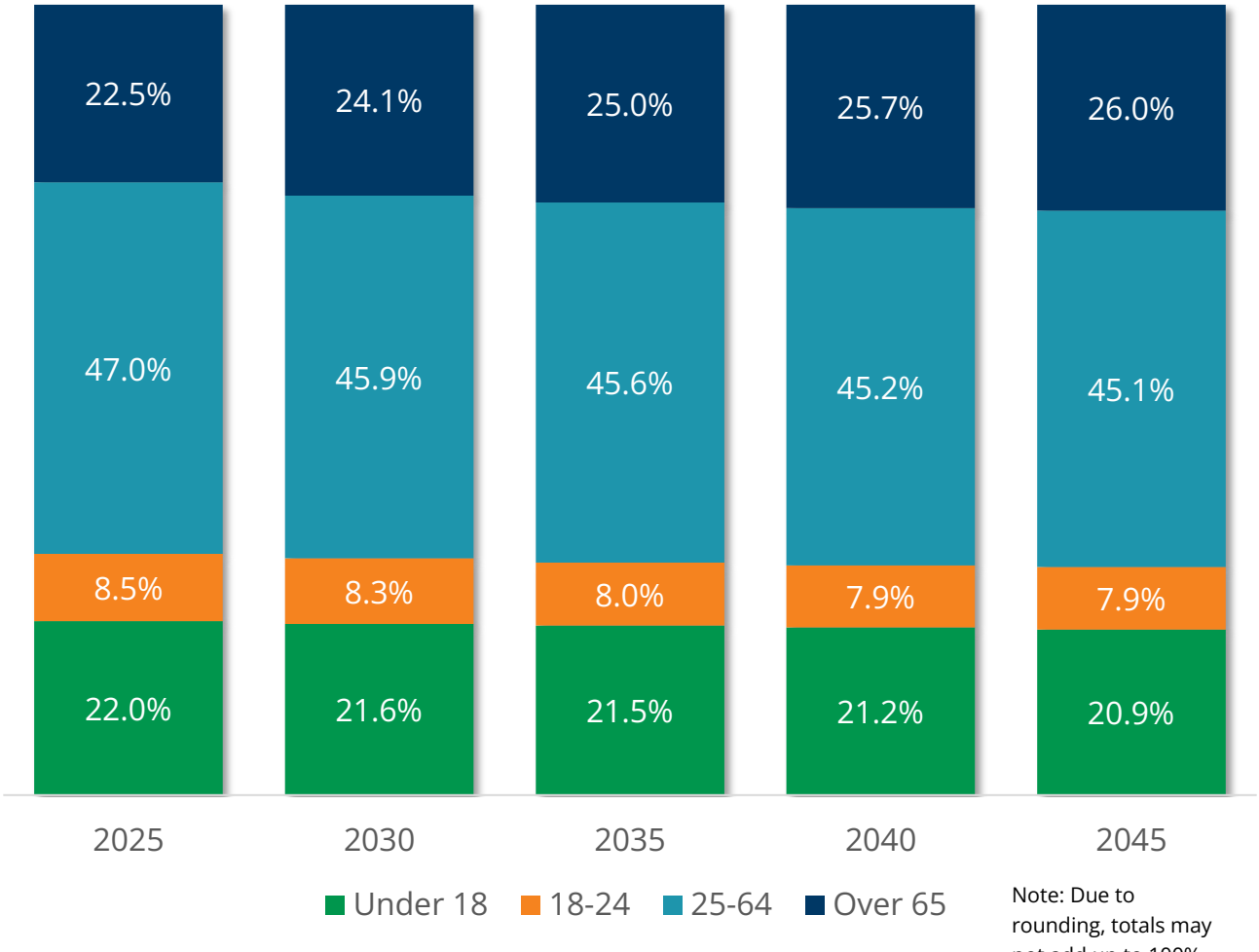
Age Distribution

Age is an important factor when planning for public transit. Teenagers and young adults, for example, may not have an automobile and, thus, a higher need for transit. Older adults are more likely to experience age- and health-related obstacles to driving and are more reliant on other ways to get around other than driving themselves, including using public transit. In Polk County, the share of residents age 65 and older is the only age group projected to increase, which has a direct impact on transit use, as the older adult segment of the population typically has a higher tendency to use transit than its cohorts.

Figure 2-7 shows the projected growth of the age 65 and older population from 2025 to 2045, from 22.5 to 26.0 percent. Although they make up the largest share of population, the 25–64 age group will decrease by approximately 2 percent, from 47.0 to 45.1 percent. The proportion of those under age 18 and the percentage of those ages 18–24 will decrease marginally.

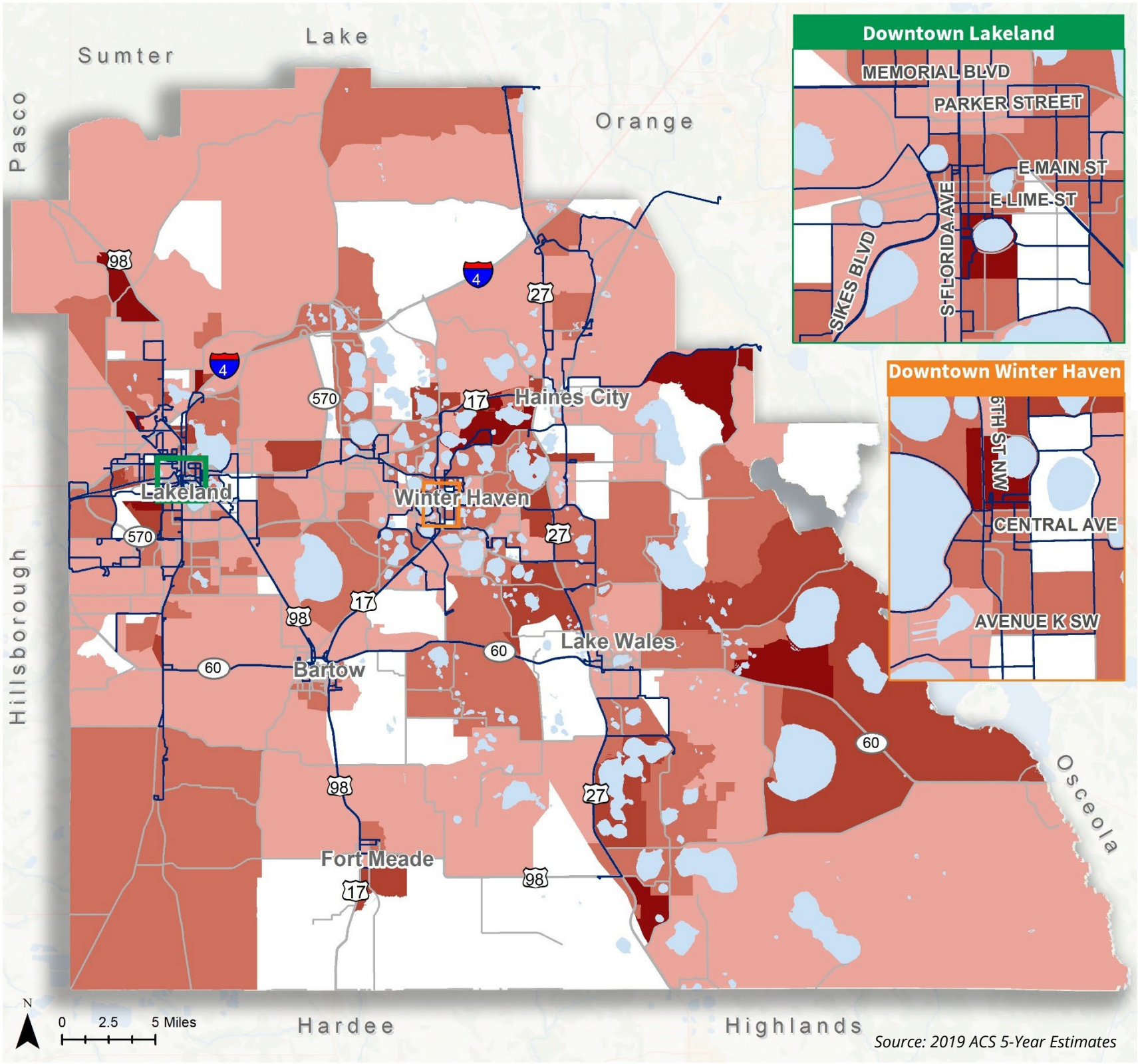
Map 2-6 shows the geographic distribution of older adults in Polk County. Areas with higher concentrations (over 60%) are found along US-98 north of Lakeland, in downtown Lakeland, south of US-17 near the Osceola County line in Haines City, north of SR-60 adjacent to Lake Wales, and near US-27 and US-98 in Frostproof.

Figure 2-7: Age Distribution, Polk County, 2025–2045



Note: Due to rounding, totals may not add up to 100%.

Source: BEBR 2021 Florida Statistical Abstract



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Map 2-6 Older Adults, 2019

Citrus Connection

Percent of Older Adults by Block Group

- <10%
- 10%-20%
- 21%-40%
- 41%-60%
- >60%

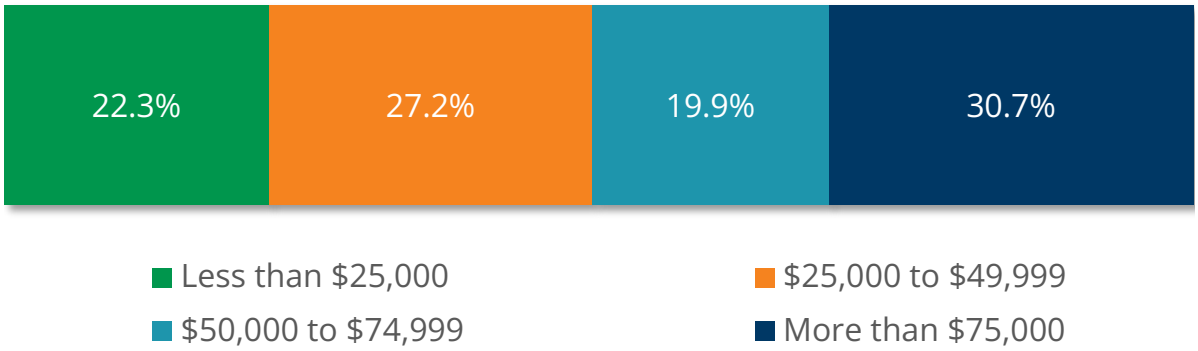
Source: 2019 ACS 5-Year Estimates


Source: Polk TPO

Income Distribution

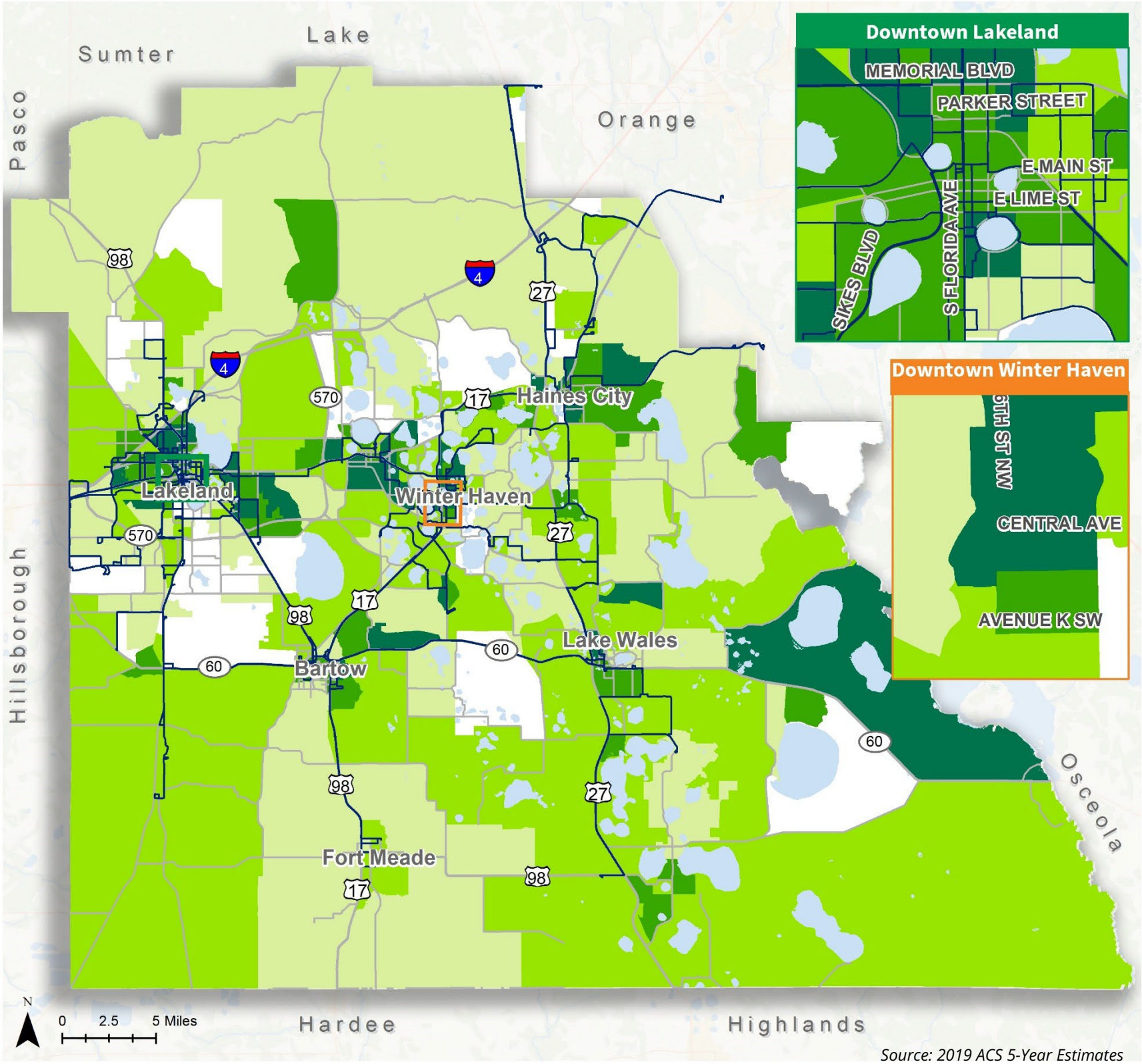
Earned annual income also can be a key indicator for determining public transit needs of an area, as low-income populations tend to use transit more than the higher-income earners. According to ACS 2015–2019 5-Year Estimates, approximately 22.3 percent of residents in Polk County earned less than $24,999 annually. Furthermore, approximately 30.7 percent of Polk County's households had an annual income of more than $75,000, and the median income of the 235,283 households is $50,584. Figure 2-8 shows the distribution of the annual household income range for Polk County for 2019, and Map 2-7 shows the areas in Polk County that have higher concentrations (40% or more) of households with incomes less than $25,000. These areas include areas near and in downtown Lakeland, between Thornhill Road to Lake Cannon in Auburndale, clusters east of US-17 in Winter Haven, clusters north of Johnson Avenue in Haines City, areas adjacent to US-27 in Lake Wales, and north of SR-60 bordering Osceola County. The majority of households that are considered low-income (make $25,000 or less) are adjacent to existing Citrus Connection routes.

Figure 2-8: Income Distribution, Polk County, 2019



Source: ACS 5-Year Estimates 2015–2019

Note: Due to rounding, totals may not add up to 100%.



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Map 2-7 Low-Income Households, 2019

Citrus Connection

Percent of Low-Income Households by Block Group

- <10%
- 10%-20%
- 21%-30%
- 31%-40%
- >40%

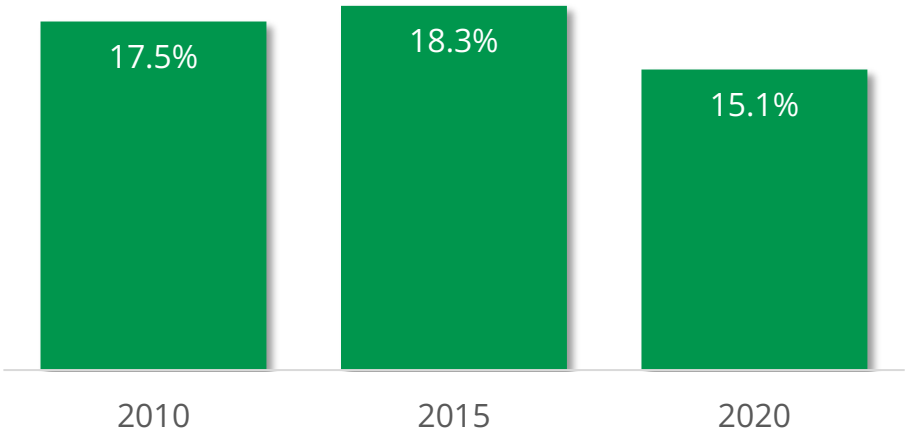
Source: 2019 ACS 5-Year Estimates

Poverty

Although Polk County as a whole is not considered to be a county in persistent poverty by USDOT, there are areas that are considered to be such. USDOT's RAISE (Rebuilding American Infrastructure with Sustainability and Equity) persistent poverty tool defines these areas as having greater than or equal to 20 percent of population living in poverty as measured by the ACS. It is important to note that this tool does not consider population density. These areas include incorporated areas such as Lakeland, Winter Haven, Lake Wales, Haines City, and Frostproof. The majority of areas considered to be in persistent poverty are served by Citrus Connection routes (Map 2-8).

The U.S. Census has a sliding poverty threshold dependent on size of the family unit—for example, an annual household income of under $26,300 for a family of four with two children in 2019. Figure 2-9 shows that there was an increase in poverty from 2010 to 2015 (0.8%) and a 3.2 percent decrease in poverty from 2015 to 2020.

Figure 2-9: Poverty, Polk County, 2010–2020



Sources: ACS Estimates 2010, 2015, and 2020

Minorities

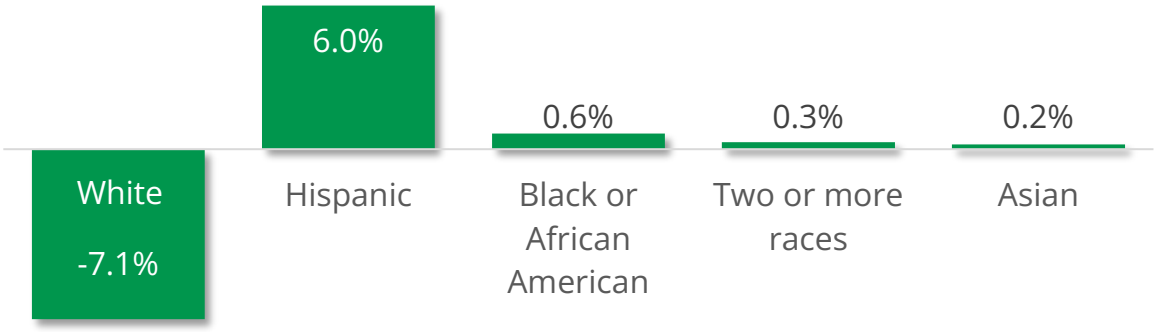
Table 2-3 shows that Polk County's population is trending to be more ethnically and racially diverse. From 2010 to 2019, the number of residents identifying as Hispanic/Latino increased to 22.5 percent, representing an approximate 6.0 percent net increase in the proportion of the overall county distribution. Similarly, the distribution percentage of Black or African American residents rose 0.6 percent, and those identifying as White decreased by 7.1 percent (Figure 2-10).

Table 2-3: Race and Ethnicity, Polk County, 2010–2019

Race/Ethnicity	2010	2019	Change
White	65.9%	58.9%	-7.1%
Hispanic	16.6%	22.5%	6.0%
Black Or African American	14.0%	14.7%	0.6%
Two Or More Races	1.2%	1.5%	0.3%
Asian	1.5%	1.7%	0.2%
Other	0.3%	0.3%	0.0%
American Indian And Alaska Native	0.3%	0.3%	0.0%
Native Hawaiian/Other Pacific Islander	0.0%	0.0%	0.0%

Sources: 2010 Census and ACS 5-Year Estimates 2015–2019

Figure 2-10: Changes in Race and Ethnicity, Polk County, 2010–2019



Sources: 2010 Census and ACS 5-Year Estimates 2015-2019

Map 2-9 shows the geographic distribution of persons who identify as an ethnic or racial minority in Polk County. Individuals identifying as minorities are clustered in downtown Lakeland north of Main Street, between US-17 and SR-60 in Bartow, east of US-17 to Lake Alfred Road in Winter Haven, and pockets of areas in Haines City between US-27 to Osceola County boundary.

Limited English Proficiency

Transit may also provide Polk County residents described as having Limited English Proficiency (LEP)[1] with additional means of travel options to services and jobs. Approximately 22 percent of households speak another language, and 4.0 percent of households in Polk County identify as LEP households. As previously noted, the

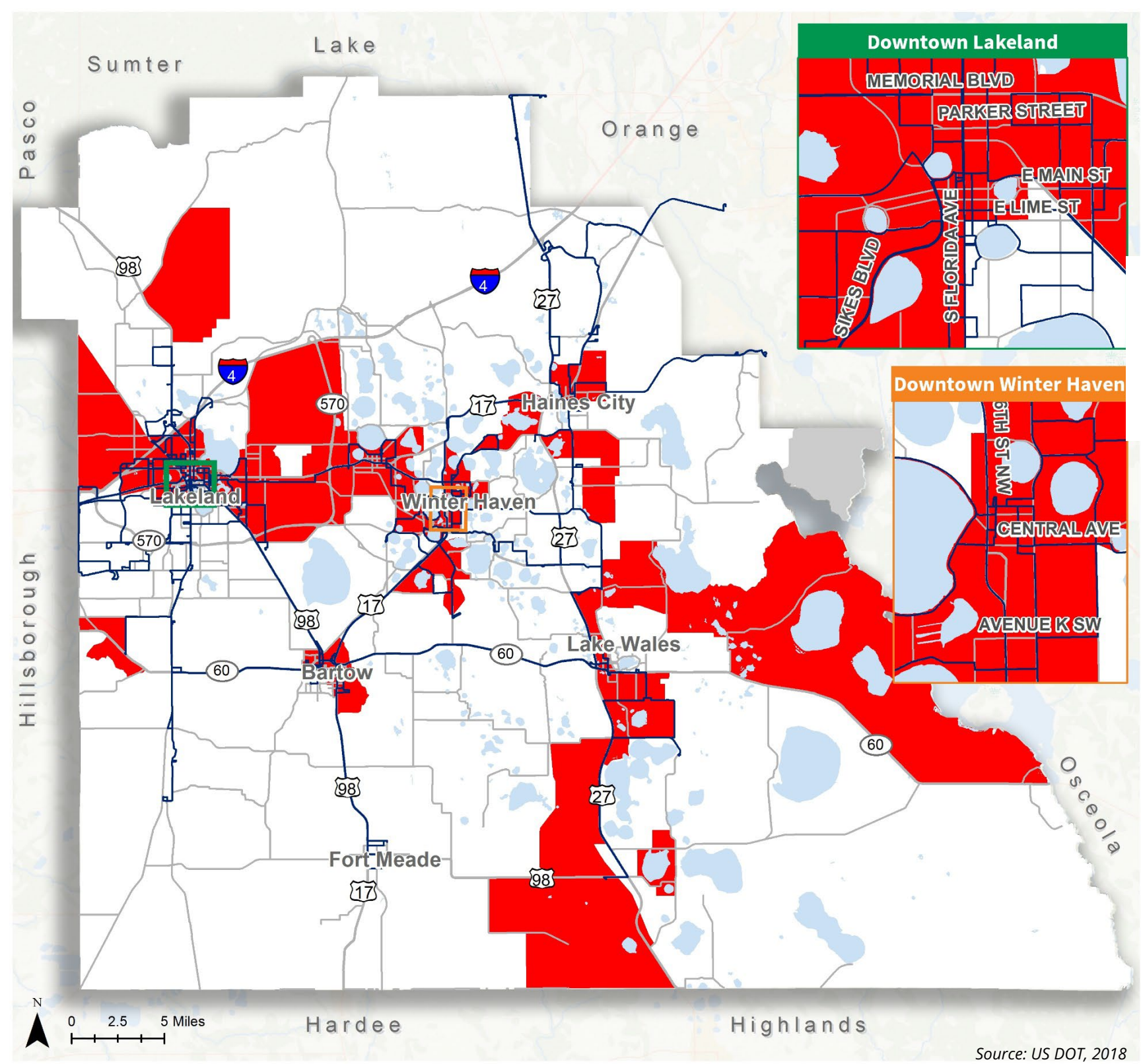
[1] According to the U.S. Census, Limited English proficient (LEP) individuals are defined as the population age 5 or older who self-identify as speaking English less than "very well." The total LEP population equals the sum of all individuals who speak a language other than English and speak English less than "very well."

number of Hispanic/Latino residents has increased by 6 percent, so it is reasonable that Spanish is the most popular non-English language; approximately 17 percent of households speak Spanish, with 3.3 percent considered LEP. According to ACS data, 47 percent of transit riders in Polk County speak another language, and 39 percent speak English "less than well." Table 2-4 shows an overview of households that speak other languages, and Map 2-10 shows the geographic distribution of LEP households. Higher concentrations of LEP households (more than 20%) are clustered in Haines City between US-17 and Lake Marion and between Gerber Dairy Road and Bomber Road south of Winter Haven. Most areas with high percentage of LEP households have access to existing transit services.

Table 2-4: Limited English Proficiency (LEP) Households, 2019

LANGUAGE SPOKEN AND HOUSEHOLD STATUS	PERCENT OF HOUSEHOLDS
English Only	181,554
Spanish:	**46,041**
Limited English-Speaking Household	9,759
Not A Limited English-Speaking Household	36,282
French, Haitian, Or Cajun:	**4,183**
Limited English-Speaking Household	1,050
Not A Limited English-Speaking Household	3,133
German Or Other West Germanic Languages:	**592**
Limited English-Speaking Household	-
Not A Limited English-Speaking Household	592
Russian, Polish, Or Other Slavic Languages:	**315**
Limited English-Speaking Household	-
Not A Limited English-Speaking Household	315
Other Indo-European Languages:	**1,587**
Limited English-Speaking Household	-
Not A Limited English-Speaking Household	1,587
Other:	**4,357**
Limited English-Speaking Household	844
Not A Limited English-Speaking Household	3,513

Source: ACS 5-Year Estimates 2015-2019



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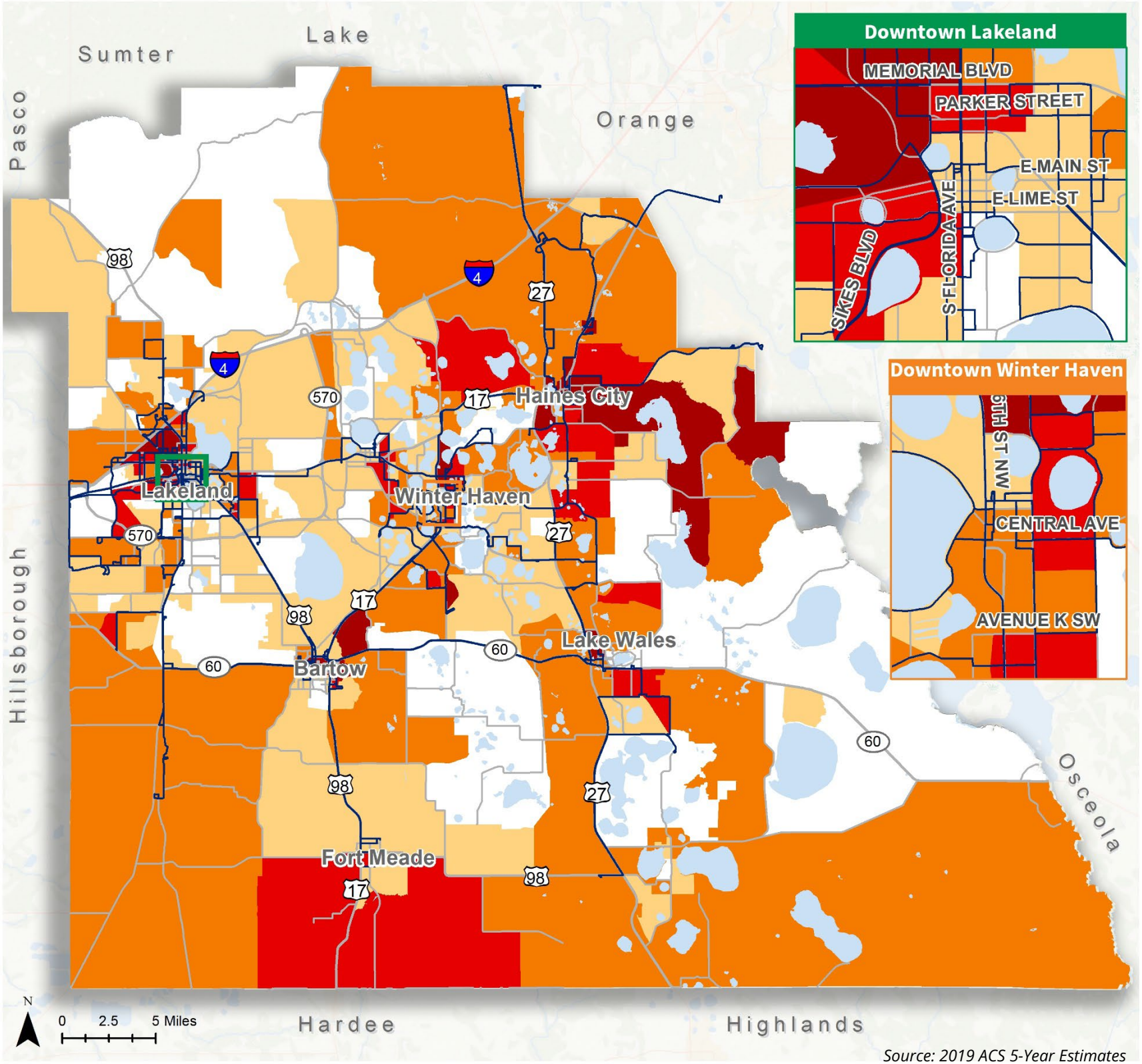
Map 2-8 Areas of Persistent Poverty, 2018

Citrus Connection

Area of Persistent Poverty?

- Yes
- No
- Not Identified

Source: US DOT, 2018



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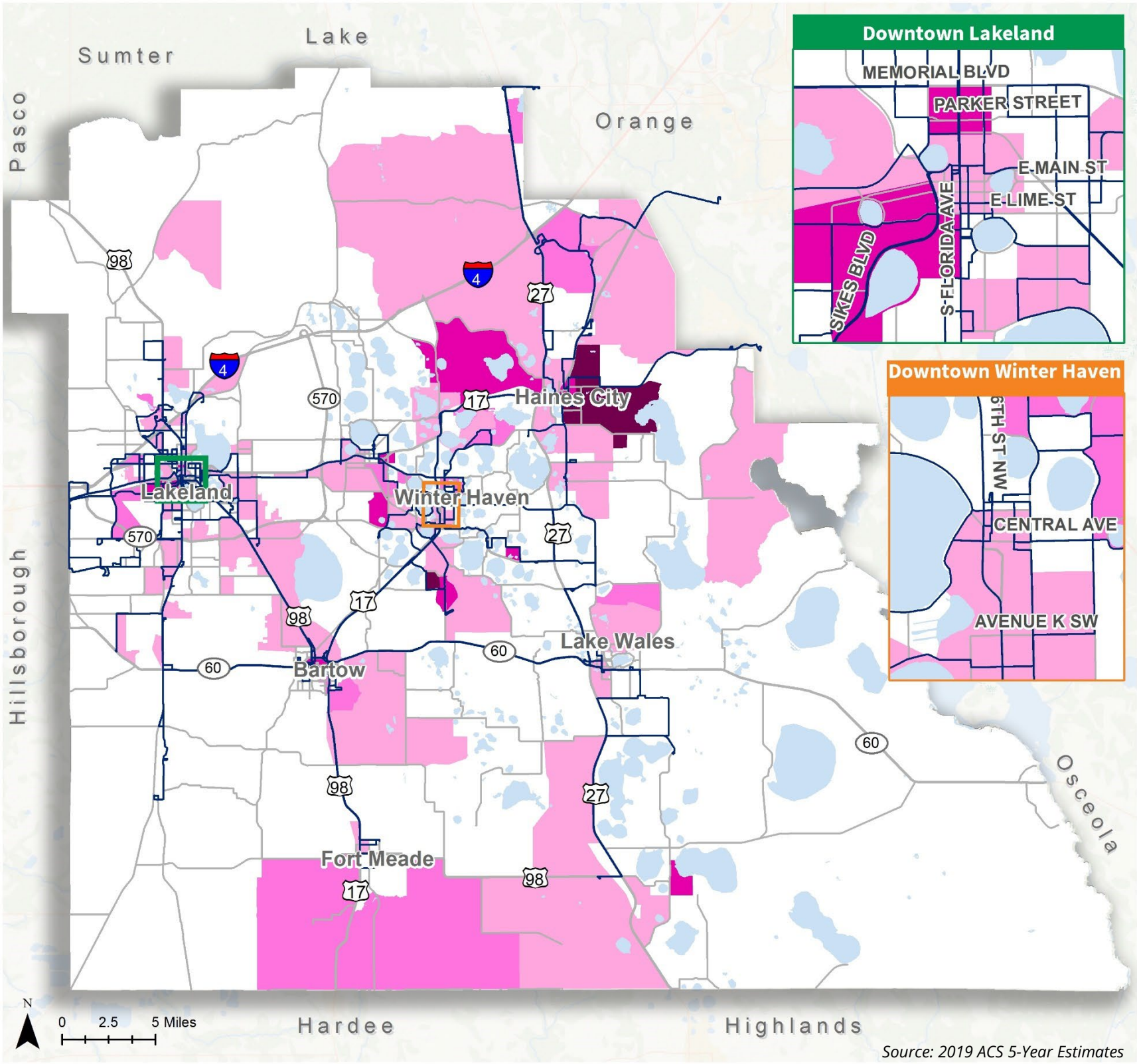
Map 2-9 Minorities, 2019

Citrus Connection

Percent of Minorities by Block Group

- <20%
- 21%-40%
- 41%-60%
- 61%-80%
- >80%

Source: 2019 ACS 5-Year Estimates



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Map 2-10 LEP Households, 2019

Citrus Connection

Percent of Limited English Proficiency by Block Group

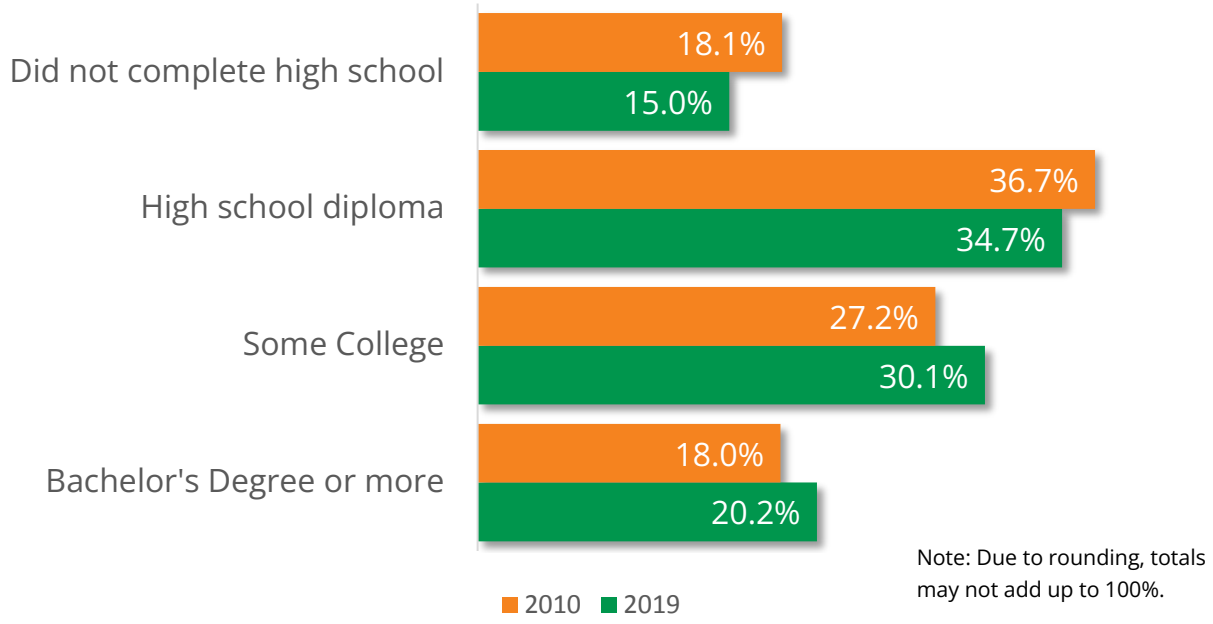
- <5%
- 5%-10%
- 11%-15%
- 16%-20%
- >20%

Source: 2019 ACS 5-Year Estimates

Education Attainment

Education level is an important factor in understanding an area's population make-up. The level of education has been shown to directly correlate with income, which may affect the tendency of a person using public transit. Polk County's education attainment has increased since 2010; the percentage of people who hold a bachelor's degree or higher increased by approximately 2 percent, from 18.0 percent in 2010 to 20.2 percent in 2019. Concurrently, the percentage of people who did not achieve a high school degree or the equivalent has fallen approximately 3 percent, from 18.1 percent in 2010 to 15.0 percent in 2019. Notably, there are higher education centers in Polk County, which could be a key catalyst for the increase in advanced degrees. Figure 2-11 shows the level of educational attainment that Polk County citizens have achieved according to the 2010 Census and 2019 ACS estimates.

Figure 2-11: Education Attainment, Polk County, 2010–2019



Sources: 2010 Census and ACS 5-Year Estimates 2015–2019

Vehicle Ownership and Availability

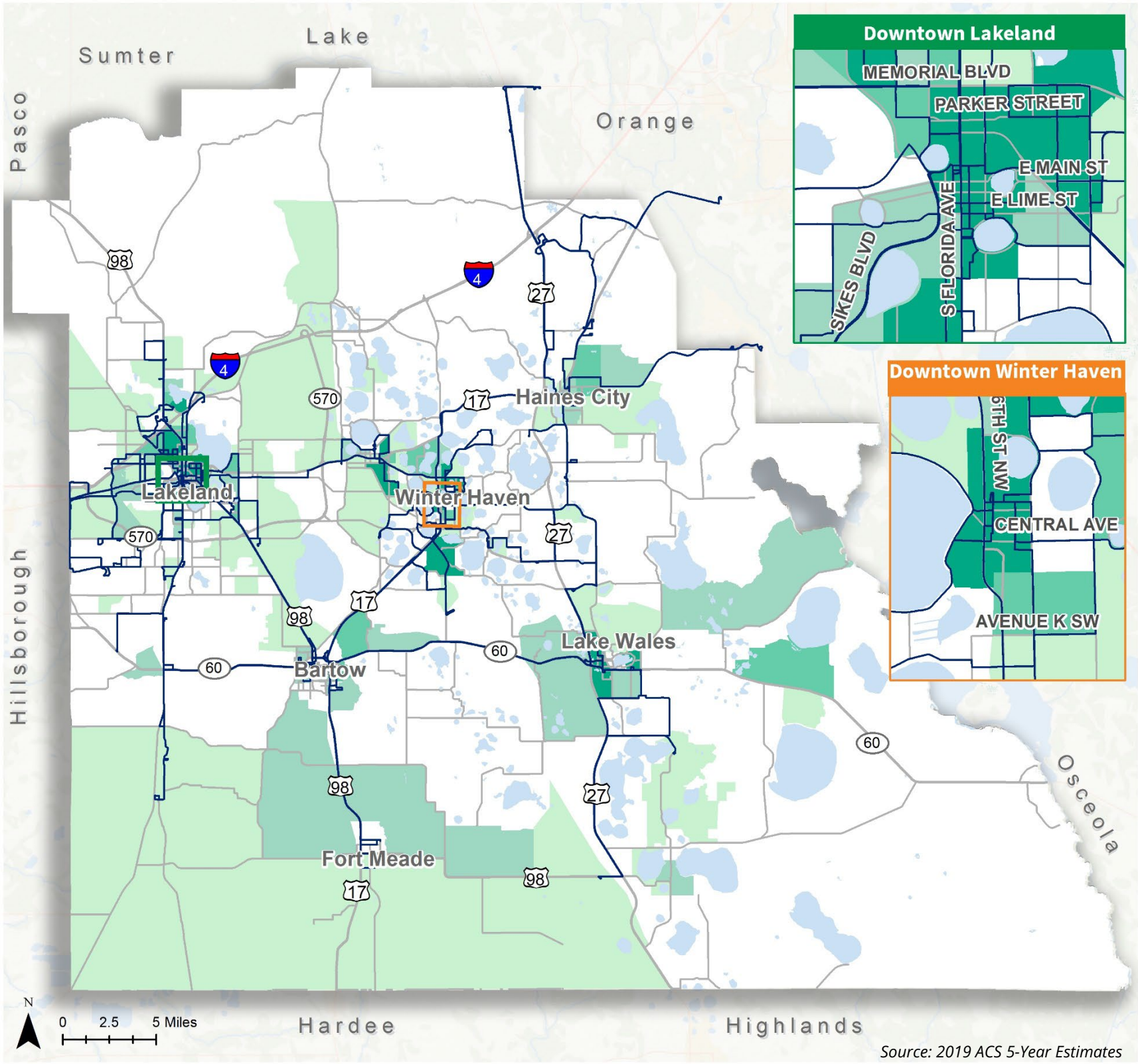
Owning a vehicle can be a significant financial burden, particularly for households already near or below the poverty line. Households that do not own a vehicle are referred to as "zero-vehicle households" and are more likely to be dependent on public transportation for work, education, recreation, and accessing other services. According to 2015–2019 ACS 5-Year Estimates, approximately 2.3 percent of

households in Polk County were considered zero-vehicle households. Those who indicated that they use transit reported a significantly higher rate of zero-vehicle households, at 27.9 percent. In Polk County, approximately 22.4 percent of households have one vehicle available, and approximately 75.3 percent have two or more vehicles available.

Map 2-11 shows the distribution of zero-vehicle households by Census Block Group in Polk County. Many areas of the county have varying percentages of zero-vehicle households, with the greatest concentration in and around downtown Lakeland area, specifically adjacent to Providence Road south of Griffin Road, east of US-98 near Lake Parker, along Florida Avenue from Memorial Boulevard to Ariana Street, along US-17 in Winter Haven, and in central Lake Wales adjacent to SR-60.



Source: Polk TPO



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Map 2-11 Zero-Vehicle Households, 2019

Citrus Connection

Percent of Zero Vehicle Households by Block Group

- <5%
- 5%-10%
- 11%-15%
- 16%-20%
- >20%

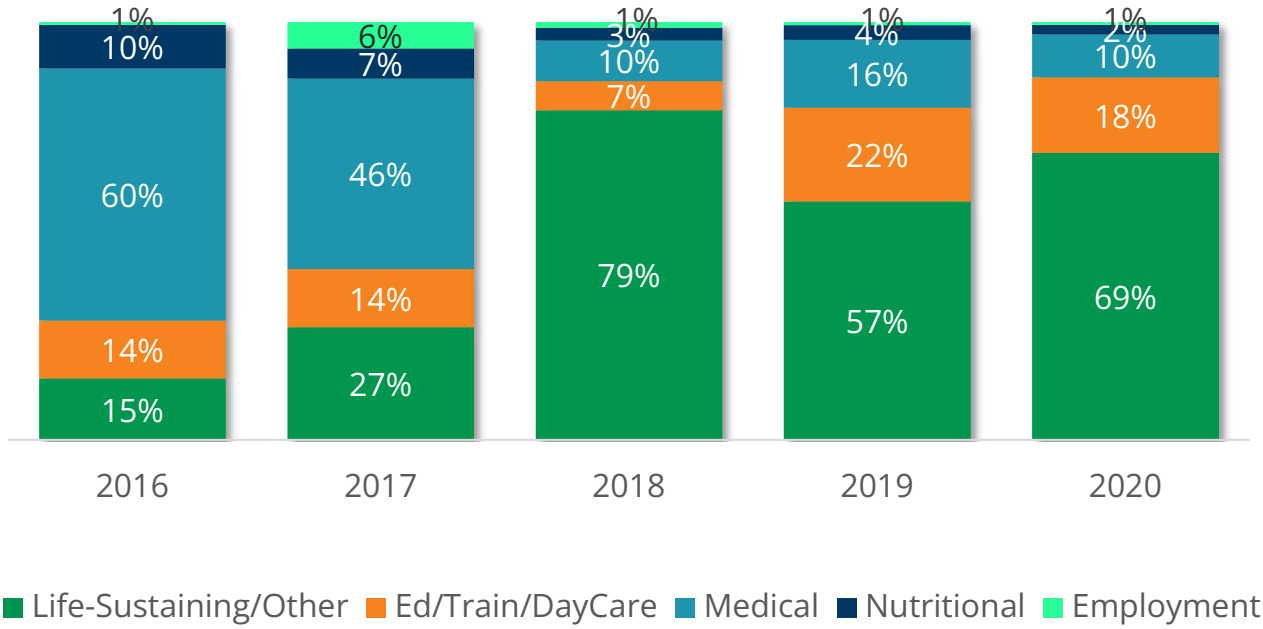
Source: 2019 ACS 5-Year Estimates

Transportation Disadvantaged Population

In addition to providing fixed-route services, Citrus Connection is the designated Community Transportation Coordinator (CTC) in Polk County, coordinating the important task of providing travel options to people who cannot use regular fixed-route bus services in the county. This service provides door-to-door service for individuals with disabilities, persons age 60 or older, or those who qualify as low-income from anywhere in Polk County under the Transportation Disadvantaged (TD) Program. To use TD services, individuals must submit an application and be approved.

As shown in Figure 2-12, TD service connects qualified individuals to lifeline trips such as medical, employment, educational, nutritional, or other life-sustaining trips. According to the 2020 Florida CTD Annual Operator Report, the top trip purpose reported in 2020 was life-sustaining/other (69.0%), which experienced an overall increase since 2016 (15.0%). Medical trips experienced a significant decrease, from 60.0% in 2016 to 10.0% in 2020. The pandemic occurred in 2020 and 2020 data are not normal. The noticeable redistribution in trips may be partially related to the reclassification of Medicaid to other providers and the reduction of funding made available to the CTC. More information on the trip purpose categories can be found in the Polk Transportation Disadvantaged Service Plan (TDSP) and in Appendix A.

Figure 2-12: Paratransit Trips by Purpose, Polk County, 2016–2020



Source: 2020 Florida CTD Annual Operator Report

Note: Due to rounding, totals may not add up to 100%.

Travel Behavior and Commuting Patterns


Source: Polk TPO

Data available on travel flows were analyzed to assess general travel behaviors and patterns in and around Polk County. By better understanding commuting behaviors and general travel patterns, Citrus Connection may plan its transit services more effectively. If offered as an attractive and viable option to the automobile, transit can become an effective mode to connect residents to economic opportunities, link to recreational/other activities, and reduce traffic in the county. This analysis attempts to understand current travel patterns and behavior, including the modes used to commute to work, popular commute times, and regional commuting patterns.

Journey-to-Work

Table 2-5 shows that the most popular commute choice for persons in Polk County continued to be driving alone (83.4%), an increase since 2010 from 80.7%. During that period, carpooling decreased from 11.7 percent to 9.4 percent, working from home increased from 3.1 to 4.0 percent, and bicycling increased marginally from 0.3 percent in 2010 to 0.4 percent in 2019. The proportion of commuters using public transit has not changed since 2010, and persons using other means and walking declined marginally, at -1.2% and -0.2%, respectively.

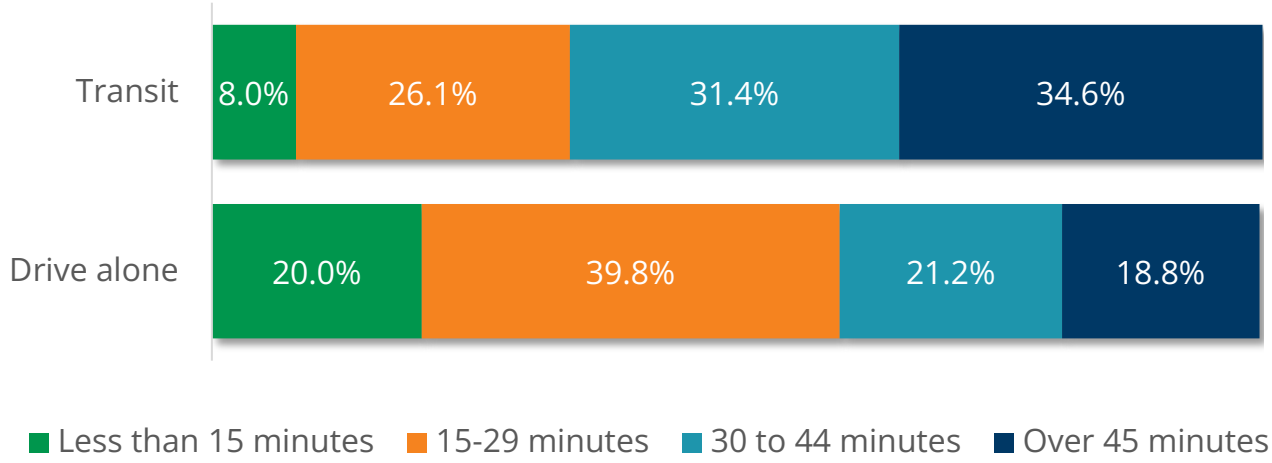
Table 2-5: Commuting Choices, Polk County, 2010–2019

Means of Transportation	2010	2019	% Change
Drive Alone	80.7%	83.4%	2.7%
Carpool	11.7%	9.4%	-2.3%
Work At Home	3.1%	4.0%	0.9%
Other	2.6%	1.4%	-1.2%
Walk	1.2%	1.0%	-0.2%
Transit	0.5%	0.5%	0.0%
Bicycle	0.3%	0.4%	0.1%

Sources: 2010 Census and ACS 5-Year Estimates 2015-2019

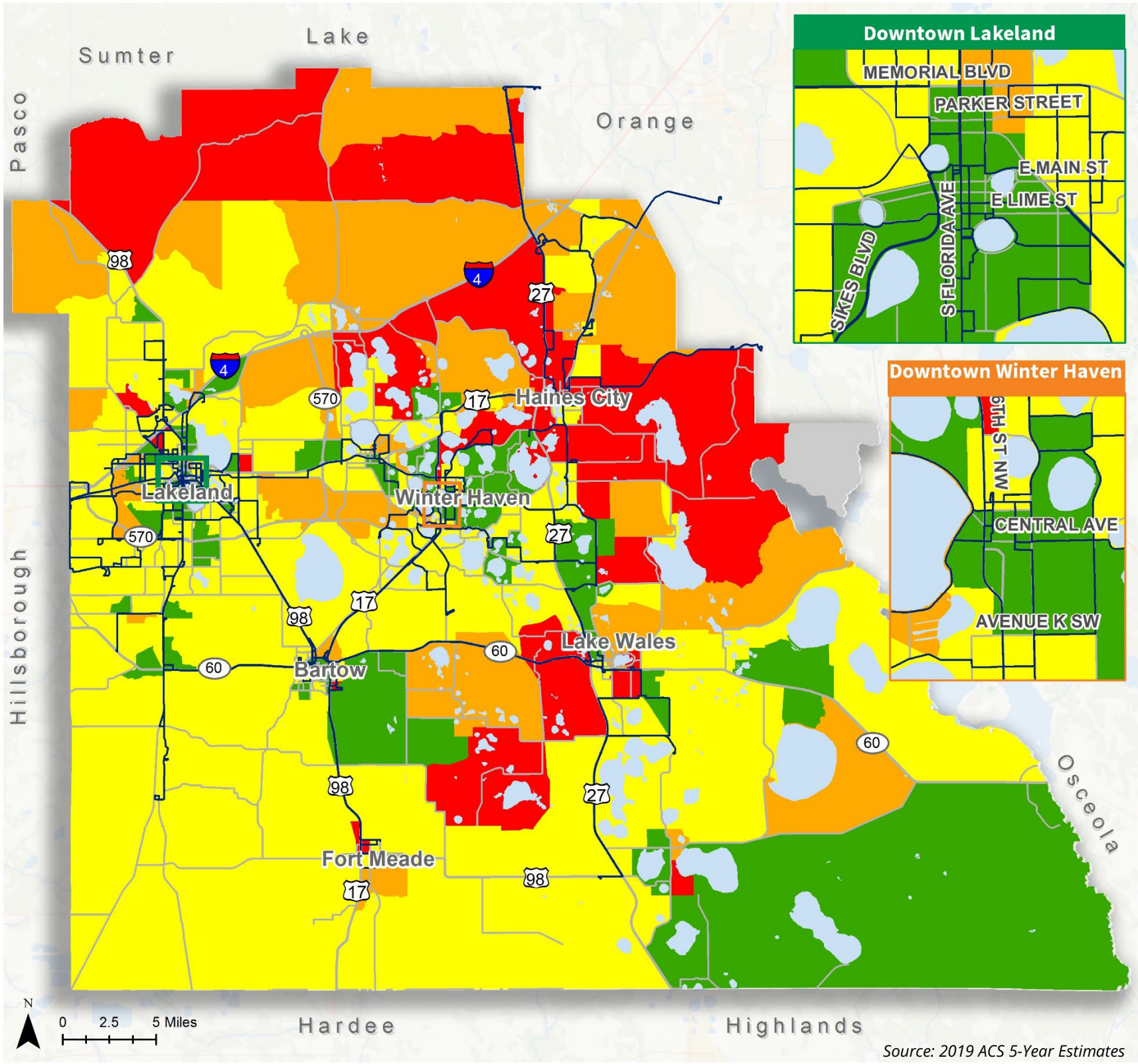
Insight into commute times in Polk County is important to understand how transit may be able to help the community's travel options. Examination of commute times shows that the majority (59.8%) of commuters who drove alone had a commute time of 30 minutes or less, and only 18.8 percent had a commute longer than 45 minutes (Figure 2-13). In comparison, the majority (66%) of transit users had a commute time of 30 minutes or more, with 34.6 percent having a trip longer than 45 minutes. Map 2-12 shows the commute to work by Block Group as reported by the ACS. Areas closer to incorporated areas, such as Lakeland, Winter Haven, and Bartow, report shorter commute times. The majority of Block Groups with longer commute times are closer to the northern county boundaries and in northeast Polk County areas.

Figure 2-13: Commute Length, 2019



Note: Due to rounding, totals may not add up to 100%.

Sources: ACS 5-Year Estimates 2015–2019



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Map 2-12 Commute Times, 2019

Citrus Connection

Most Common Commute Time (min.)

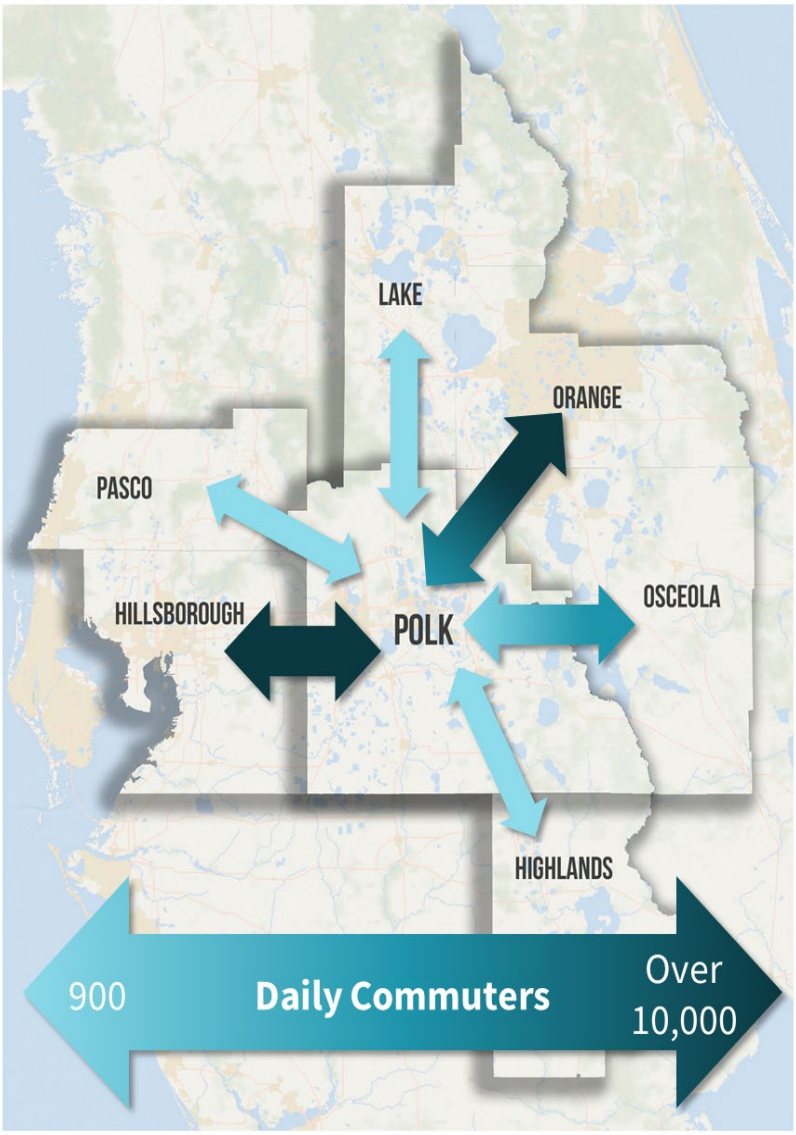
- No Data Available
- Less than 15
- 15 to 29
- 30 to 44
- More than 45

Source: 2019 ACS 5-Year Estimates

Commuting Inflows/Outflows

Review of commute patterns is important for evaluating existing services and the potential need to establish more regional connections. According to Census Transportation Planning Products (CTPP) 2012–2016 Estimates, over 179,000 Polk County residents leave the county every day to go to work. The largest combined total of inflows and outflows is with Hillsborough County, with 11,985 residents leaving Polk County daily for work in Hillsborough County and approximately 12,400 Hillsborough County residents commuting daily to Polk County (Figure 2-14) for work.

Figure 2-14: Inflows and Outflows, Polk County



The top outflow for Polk County residents is to work in Orange County, at 20,915. Table 2-6 shows that the three most significant commute trends in addition to Hillsborough and Orange counties are commuters traveling to and from Osceola County (8,725 and 3,315, respectively), to and from Highlands County (1,460 and 1,370, respectively), and to and from Pasco County (1,020 and 1,840, respectively).

Table 2-6: Commuting Inflows and Outflows, Polk County

County	Inflow	Outflow
Orange	2,500	20,915
Hillsborough	12,390	11,985
Osceola	3,315	8,725
Highlands	1,460	1,370
Pasco	1,840	1,020
Lake	1,340	980

Source: Census Transportation Planning Products (CTPP) 2012–2016 Estimates

Major Activity Centers and Trip Generators

Major trip attractors are places with an enhanced need for residents to travel to them either for employment, recreation, or shopping and may include medical facilities, recreational areas, educational establishments, major shopping centers, and government or business offices. A large number of these major trip attractors are scattered throughout Polk County; however, they are typically located close to major roadways. Additionally, locations such as public libraries, courthouses, schools, learning centers, and public parks were also reviewed as part of this analysis. As expected, the distribution of these facilities generally matches population and employment densities in the given areas. The rest of this section discusses these and other activity centers and current transit access to them.


Source: Polk County

Downtown Lakeland

A major hub of activity in Polk County is in downtown Lakeland, which includes Hollis Garden, Munn Park, and the historic Polk Theatre, attracting residents and visitors to the area. The area has a wide array of educational institutions, cultural attractions, museums, restaurants, and shops that support approximately 7,000 jobs. Every first Friday of the month, the Downtown area closes its streets to traffic to host a market, car show, and other family-friendly activities. Every Saturday, a

smaller area in Downtown north of Kentucky Avenue closes for the Downtown Farmers Curb Market. These activities attract approximately 5,000 people. The downtown Lakeland area currently has access to all west Polk County routes in addition to the Purple 12 route that connects Lakeland to Winter Haven.

Legoland

Legoland, a recreational and resort center, is located in Winter Haven and comprises a theme park, water park, and beach resort with the capacity to host over 10,000 visitors per day. It attracts tourists year-round and has contributed nearly $1 billion to the local economy. There are plans to expand the park by adding attractions to current theme parks and hotels and opening additional theme parks in 2022.

Currently, Citrus Connection Route 30 serves Legoland, which intersects with eight other routes at the nearby Winter Haven Terminal. Workers and visitors can access the theme park via nearby stops on Old Helena Road and Legoland Way. Additionally, Legoland as an employer participates in the Universal Access Partnership, which expands mobility options for employees by offering them a pass to ride any Citrus Connection route six days per week by showing an appropriate ID badge.

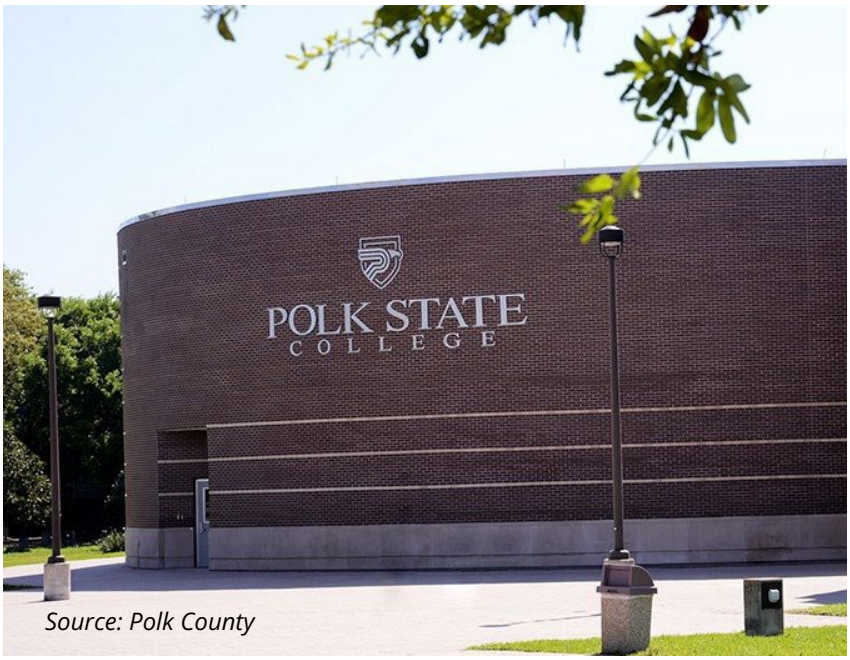
Bok Tower Gardens

Bok Tower is a historic landmark and attraction in Lake Wales located east of US-17. It currently has no transit connections. Throughout the year, the park, composed of gardens, historic structures, and other natural features that have attracted visitors since 1929, hosts many events open to the public, including concerts, walking tours, and exercise classes.



Source: Polk TPO

Polk State College



Source: Polk County

Polk State College, established in 1964, has campuses in Lakeland, Winter Haven, Bartow, and Lake Wales in addition to three charter high schools. All campuses serve over 20,000 students. Like Legoland, Polk State College also participates in the Universal Access Program, which provides access to the Citrus Connection network for all enrolled students. The majority of campuses are served by or adjacent to a Citrus Connection route.

Other Higher Education Centers

In addition to Polk State College, there are four technical schools and six universities located throughout Polk County. Florida Southern College and Florida Polytechnic University are both located in Lakeland, with approximate enrollment of 3,000 and 1,400, respectively. Florida Southern College is served by Citrus Connection.


Source: Google Earth

Spring Training

The Detroit Tigers baseball team uses Publix Field at Joker Marchant Stadium for its Spring Training. The stadium was built in 1966 and has the capacity to host 9,000 fans (Figure 2-15). The team has been traveling to Polk County since

1978, the longest consecutive Spring Training relationship a major league team has had with a municipality. There are plans to enhance the current stadium by adding shade for existing seats, additional air-conditioned seats, concession stands, restrooms, and restaurants. Currently, transit services operate to the stadium.

Major Employers

Polk County is home to large employment centers and headquarters. Major employer sectors include healthcare, retail, finance, and government, as shown in Table 2-7. The majority of these employers have multiple locations throughout Polk County, with Publix Supermarket headquarters located in Lakeland.

Lakeland Regional Medical Center, with campuses located in and around downtown Lakeland, is one of the top private sector employer in the county and also one of its primary healthcare centers. Publix is the top retail employer, and Polk County Schools is the top public sector employer.

Table 2-7: Major Employers

Employer	# of Employees	Sector
Publix Supermarkets	13,701	Retail
Polk County School Board	13,363	Government
Lakeland Regional Medical Center	5,888	Healthcare
Walmart	5,523	Retail
Amazon	5,000	Retail
Polk County Government	4,638	Government
Geico	3,700	Finance
City Of Lakeland	2,800	Government
Baycare	2,614	Healthcare
Advent Health	2,466	Healthcare

Source: Citrus Connection

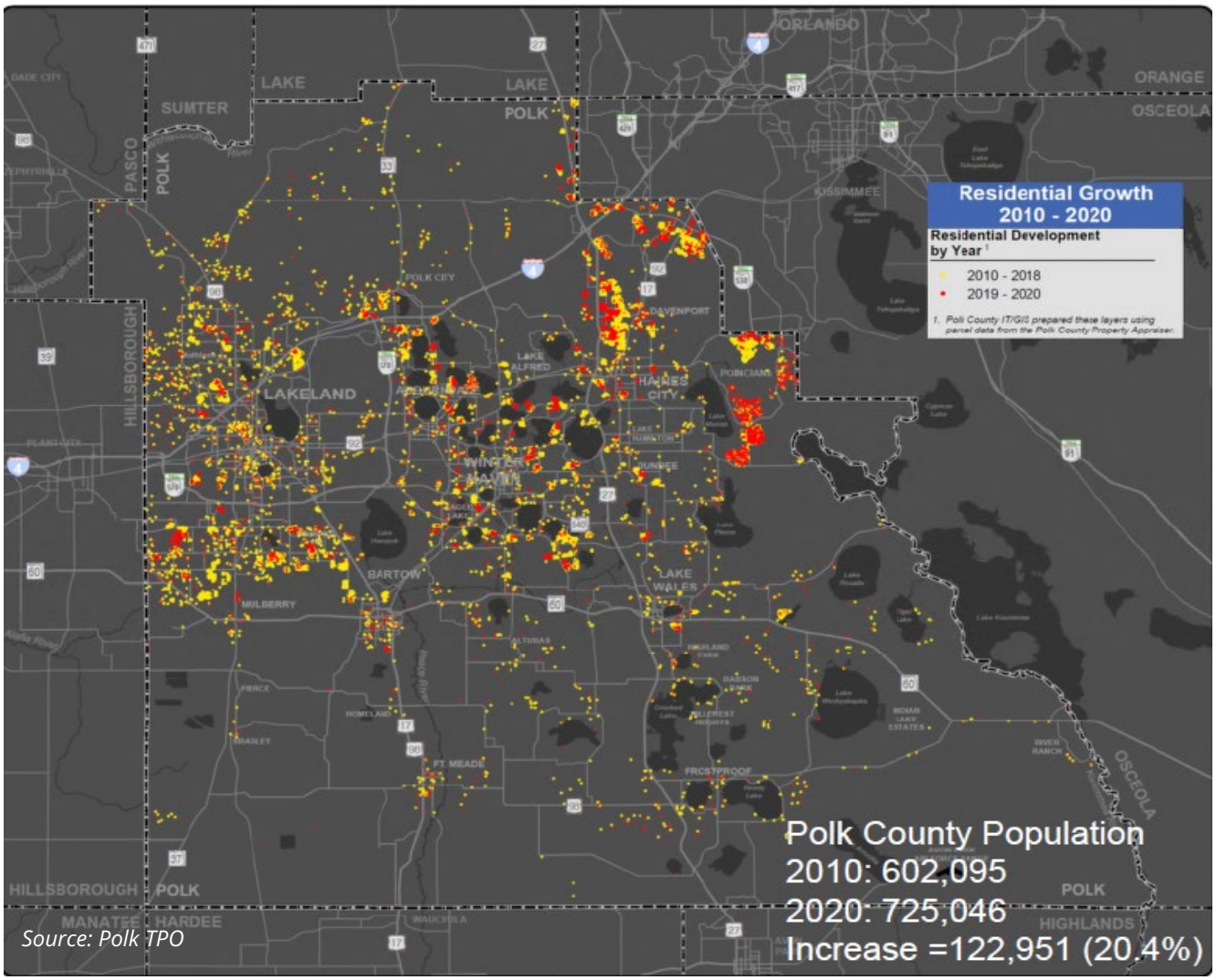
Proposed Developments

Polk County is growing rapidly; since 2015, there has been a 146 percent increase in the number of housing permits issued for new single-family homes. New developments can affect where and how transit should be operated in the service area in the future. As major employers or new developments often can be large transit trip generators (depending on the nature of the business or activity there), it

also is informative to determine where they are located in relation to existing fixed-route service.

As shown in Figure 2-15, there has been significant growth in residential developments in Polk County in recent years, particularly in Davenport, Haines City, and Poinciana areas. In addition, demand for housing in more established and denser areas such as Lakeland and Winter Haven also have increased.

Figure 2-15: Residential Development, Polk County, 2022



Source: Polk TPO



Affordable Housing

A combination of federal and local programs provides funding assistance for subsidized and affordable housing for populations including older adults, families, farmworkers, the homeless, and those who are low-income or have disabilities. Table 2-8 summarizes the 7,408 assisted units within 94 properties in Polk County by program funding source; their locations are illustrated in Map 2-13.

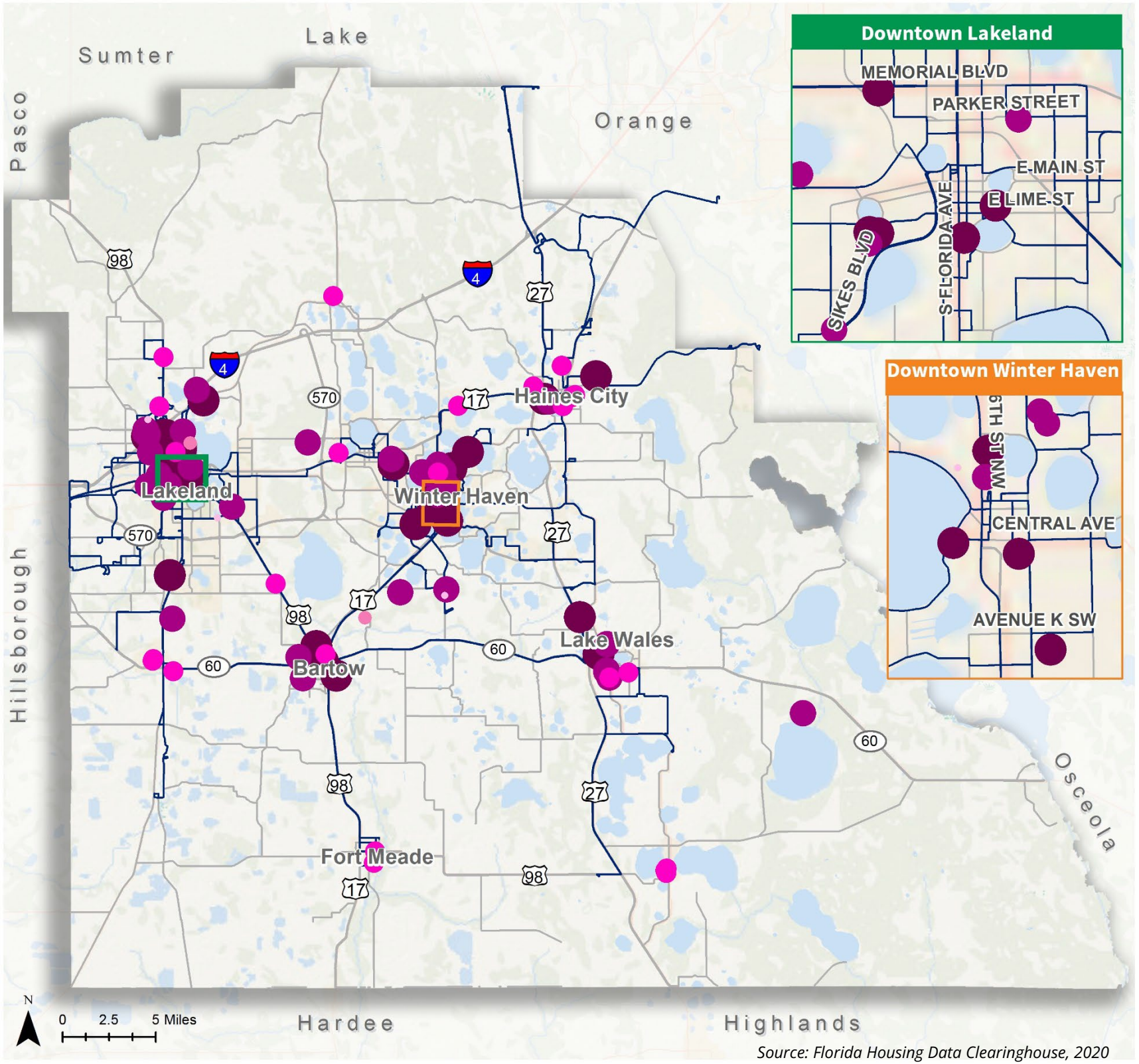
Most areas with affordable housing in Polk County are well-served by transit at this time, as the majority are adjacent to Citrus Connection routes. The properties not served are located southeast of Lake Wales, in Auburndale, and Polk City.

Table 2-8: Affordable Housing in Polk County by Funding Source, 2020

Funding Program	# of Properties	# of Assisted Housing Units	# of Total Housing Units
Florida Housing Finance Corp.	46	4,805	5,111
HUD Multifamily	20	1,580	1,927
USDA Rural Development	31	1,359	1,372
Local Housing Finance Authority	8	980	1,371
HUD Public Housing	13	998	1,139
Total	94	7,408	8,418

Notes: Many properties receive funding from more than one agency; properties and units may appear in more than one row.

Source: Florida Housing Data Clearinghouse



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Map 2-13 Affordable Housing, 2020

Citrus Connection

Number of Units

- 2-10
- 11-20
- 21-50
- 51-100
- >100

Source: Florida Housing Data Clearinghouse, 2020

Tourist/Seasonal Resident Population


Source: Polk TPO

With its location close to Orlando and with Legoland, tourism is one of the key industries in Polk County. Other destinations include Fantasy of Flight, state parks, a baseball stadium, and other attractions, most of which can benefit from transit connections to worker and visitors.

Tourists are an important group of riders to consider when identifying local and regional transportation needs. For example, tourists staying in Polk County will benefit if transit is a convenient way to get from their hotel to attractions in the county. Regional connections, such as to the Orlando or Tampa airport, would be helpful, as transit costs less than renting a car and is convenient for visitors who do not want to or cannot drive. Residents and tourists making day trips around the region will also benefit if transit is a convenient option, as opposed to driving, and the area will benefit if fewer cars are on the road.

ACS estimates that there are over 69,000 unoccupied (partially throughout the year) dwelling units in Polk County, suggesting that they may be occupied by seasonal residents.[2] According to the Polk County Comprehensive Plan, the estimate of annual seasonal resident population in 2020 is 33,072 people. The influx of tourists or seasonal residents to the county, particularly during peak season in winter months, places a high demand on County and Florida roadways, ultimately increasing traffic congestion levels. Transit options that are safe and convenient may help reduce peak season road congestion and strengthen the attractiveness of Polk County as a place to visit.

[2] The Polk County Comprehensive Plan refers to seasonal populations as tourists, short and long term visitors (seasonal residents), and migrant farm workers.

Traffic & Mobility Conditions


Source: Polk County

A review of the Annual Average Daily Traffic (AADT) on Polk County roadways was conducted based on the data available from FDOT. AADT, defined as the average volume of traffic on a section of roadway for a year, was included to assess congested roadways that may have opportunities to be better served by transit. Implementing transit on congested roadways may help decrease traffic, which can help reduce emissions and single-occupant vehicle miles.

The sections of roadways in Polk County that experience the most average annual traffic (more than 20,000 daily trips) include the following:

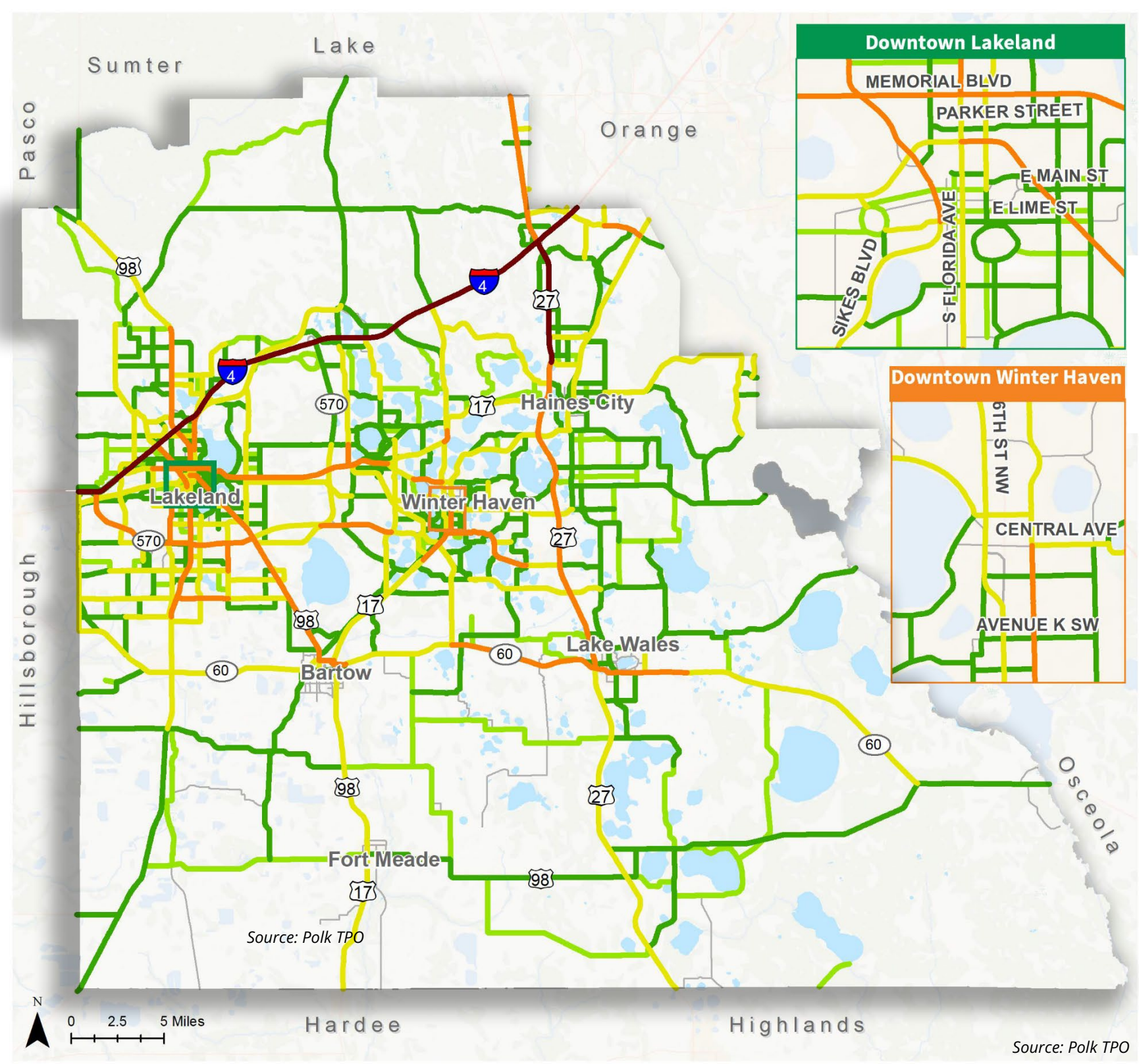
- I-4 throughout the county
- Major roadways in and around incorporated areas such as Lakeland, Winter Haven, Haines City, Bartow, and Lake Wales
- US-27 in the northern part of the county

Map 2-14 shows the major roadways that FDOT monitors symbolized by AADT counts.

To review the mobility conditions in addition to traffic conditions throughout Polk County, Neighborhood Mobility Audits were reviewed. These were conducted as part of the Livable Polk Initiative in partnership with the Polk TPO. Part of the Livable Polk Initiative is to recommend strategies to enhance walking, biking, and transit connections to lifeline trips such as jobs and essential services.

Neighborhood Mobility Audits are neighborhood-based, focusing on communities considered to be traditionally transportation-disadvantaged. These neighborhoods were determined by a review of low-income and minority Block Groups in Polk County and input from the Polk TPO Technical Advisory Committee (TAC). When conducting the audits, transportation investments to improve overall mobility access (pedestrian, bicycle, and transit access) were identified. A cumulative score of the walking, biking, and transit access and a gap/barriers analysis were used to create a Mobility Index. More information about the Neighborhood Mobility Audits can be accessed at https://polktpo.com/what-we-do/our-planning-documents/neighborhood-mobility-audits.

Table 2-9 shows the Mobility Index score by neighborhood, and Figure 2-16 shows their geographic location. Central Winter Haven has the highest score for Potential Access and the Mobility Index. This neighborhood also has the lowest Gap Index, whereas Wahneta has the highest Gap Index and the lowest Mobility Index. Central Winter Haven, Crystal Lake-Combee, East Haines City, and Inwood are considered to have the highest Mobility Index, and Frostproof, Mulberry, and Wahneta are considered to have the lowest Mobility Index. The Gap Index indicates the gaps in the multimodal network and may be adjacent to high-speed roads that are not pedestrian-friendly.



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Map 2-14 Annual Average Daily Traffic, 2021

Annual Average Daily Traffic

- <2,500
- 2,501 - 10,000
- 10,001 - 25,000
- 25,001 - 50,000
- >50,000

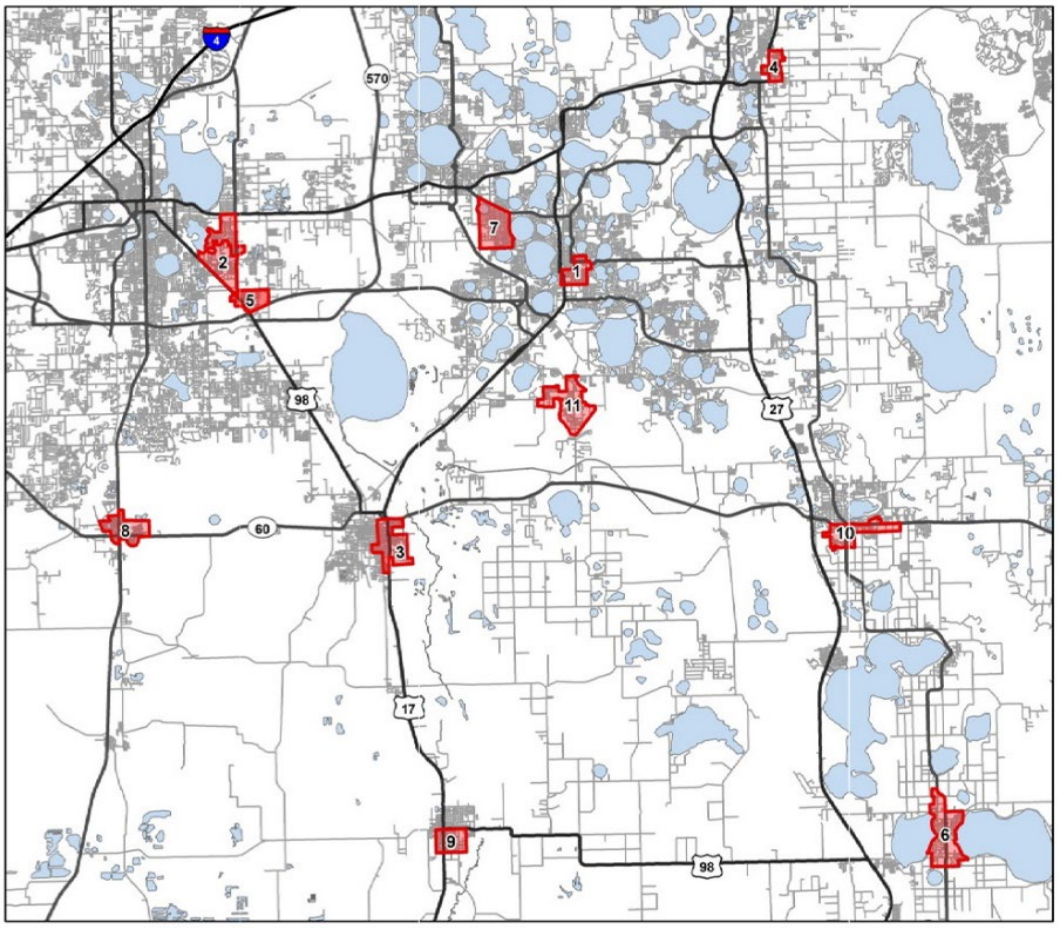
Source: Polk TPO

Table 2-9: Mobility Index Score by Neighborhood

	Neighborhood	Potential Access	Gap Index	Barriers Index	Mobility Index
1	Central Winter Haven	12.0	0.6	1.4	10.01
4	East Haines City	11.4	1.8	1	8.75
2	Crystal Lake-Combee	11.2	1.8	1.7	7.95
7	Inwood	9.9	1.9	1.3	7.27
9	South Fort Meade	8.9	1.5	1.5	6.68
3	East Bartow	8.7	1.3	2.1	6.24
5	Eaton Park	9.3	2.1	2.6	5.67
10	South Lake Wales	7.5	1.2	1.8	5.63
6	Frostproof	5.8	2	1.2	4.26
11	Wahneta	6.3	2.6	1.7	4.05
8	Mulberry	4.3	1.9	2.2	2.84

Source: Polk TPO Neighborhood Mobility Audit Executive Summary

Figure 2-16: Selected Neighborhood Mobility Audit Locations



Future Land Use

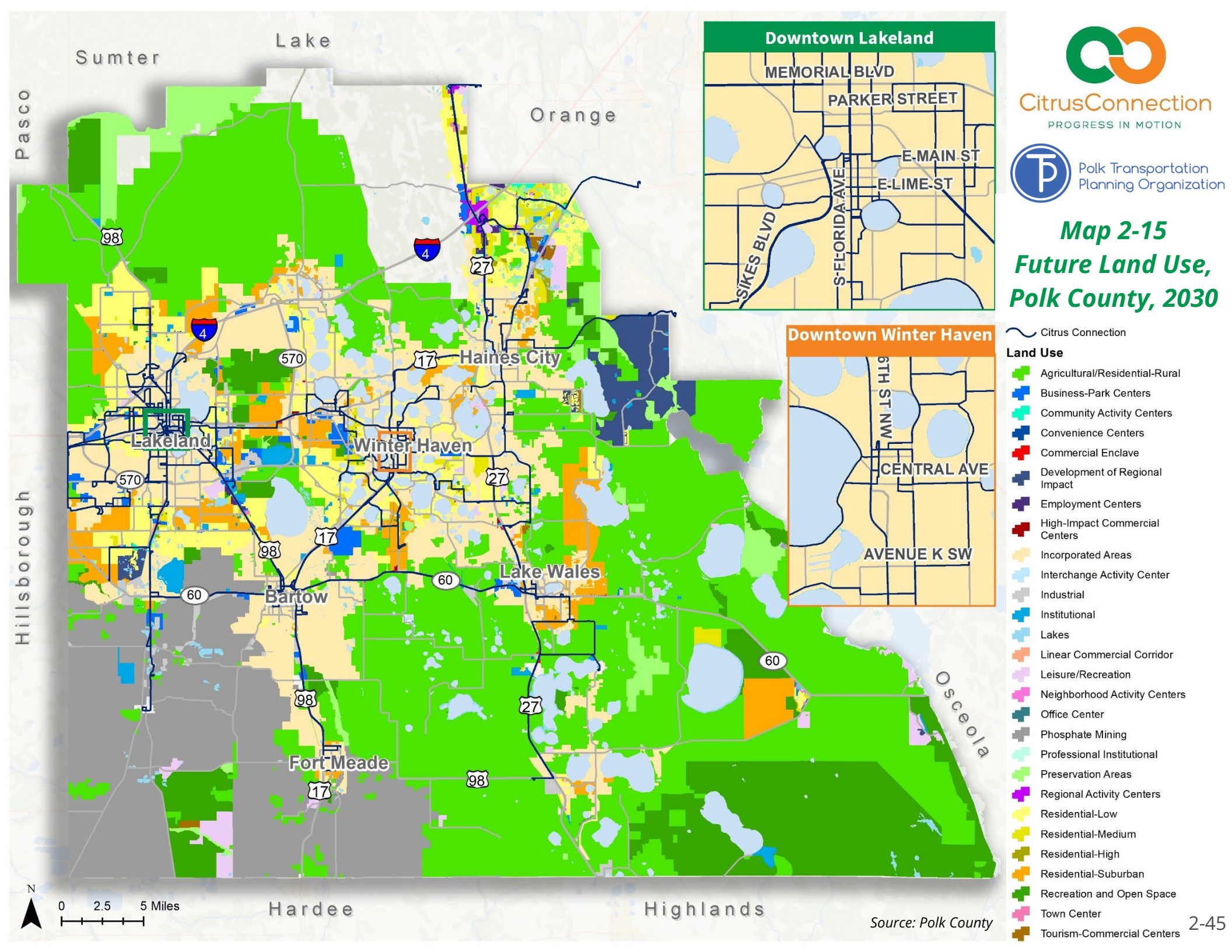
Reviewing and understanding future land use designations is important to understand growth and development patterns. Transit-supportive land uses such as high-density residential areas and employment centers may create more opportunities for transit to thrive. Identifying such land uses in Future Land Use Maps may provide valuable guidance on the direction for Polk County. Future Land Use Maps for Polk County, Lakeland, and Winter Haven, shown in Maps 2-15 through 2-17, were reviewed, and the following key trends were observed.

Polk County

According to the Future Land Use Map developed for 2030, the majority of the county is dedicated to environmentally-sensitive areas such as agriculture, conservation, recreation and open space, and preservation.

- A significant area is classified as Agriculture/Residential-Rural (green), Recreation and Open Space (dark green), or Phosphate Mining (gray), which are concentrated adjacent to each other and on the boundaries of the county.
- The majority of residential land uses are low-density (yellow), which consists of up to 5 dwelling units per acre. High Density Residential uses (gold) are also present in Polk County.
- The top land uses within the three-quarter mile buffer of existing Citrus Connection fixed-routes are Low-Density Residential (yellow), Agriculture/Residential-Rural (green), and Suburban Residential (orange).

While the map of Polk County may depict a large rural county with vast areas of green agricultural and rural lands, and gray industrial lands, there is a bigger story going on in Polk. Polk County is growing! Its population has grown from 729,233 in July 2020 to 753,520 in July 2021. Over the next few years, Polk County is also embarking on the most expensive infrastructure investment in its history. In addition, Polk was the only county (or one of the only counties) in the country to add population during COVID. The two main cities, both Lakeland and Winter Haven are booming. People are moving to Polk County and some of them are used to public transit in the places they have moved from.



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Map 2-15 Future Land Use, Polk County, 2030

Citrus Connection

Land Use

- Agricultural/Residential-Rural
- Business-Park Centers
- Community Activity Centers
- Convenience Centers
- Commercial Enclave
- Development of Regional Impact
- Employment Centers
- High-Impact Commercial Centers
- Incorporated Areas
- Interchange Activity Center
- Industrial
- Institutional
- Lakes
- Linear Commercial Corridor
- Leisure/Recreation
- Neighborhood Activity Centers
- Office Center
- Phosphate Mining
- Professional Institutional
- Preservation Areas
- Regional Activity Centers
- Residential-Low
- Residential-Medium
- Residential-High
- Residential-Suburban
- Recreation and Open Space
- Town Center
- Tourism-Commercial Centers

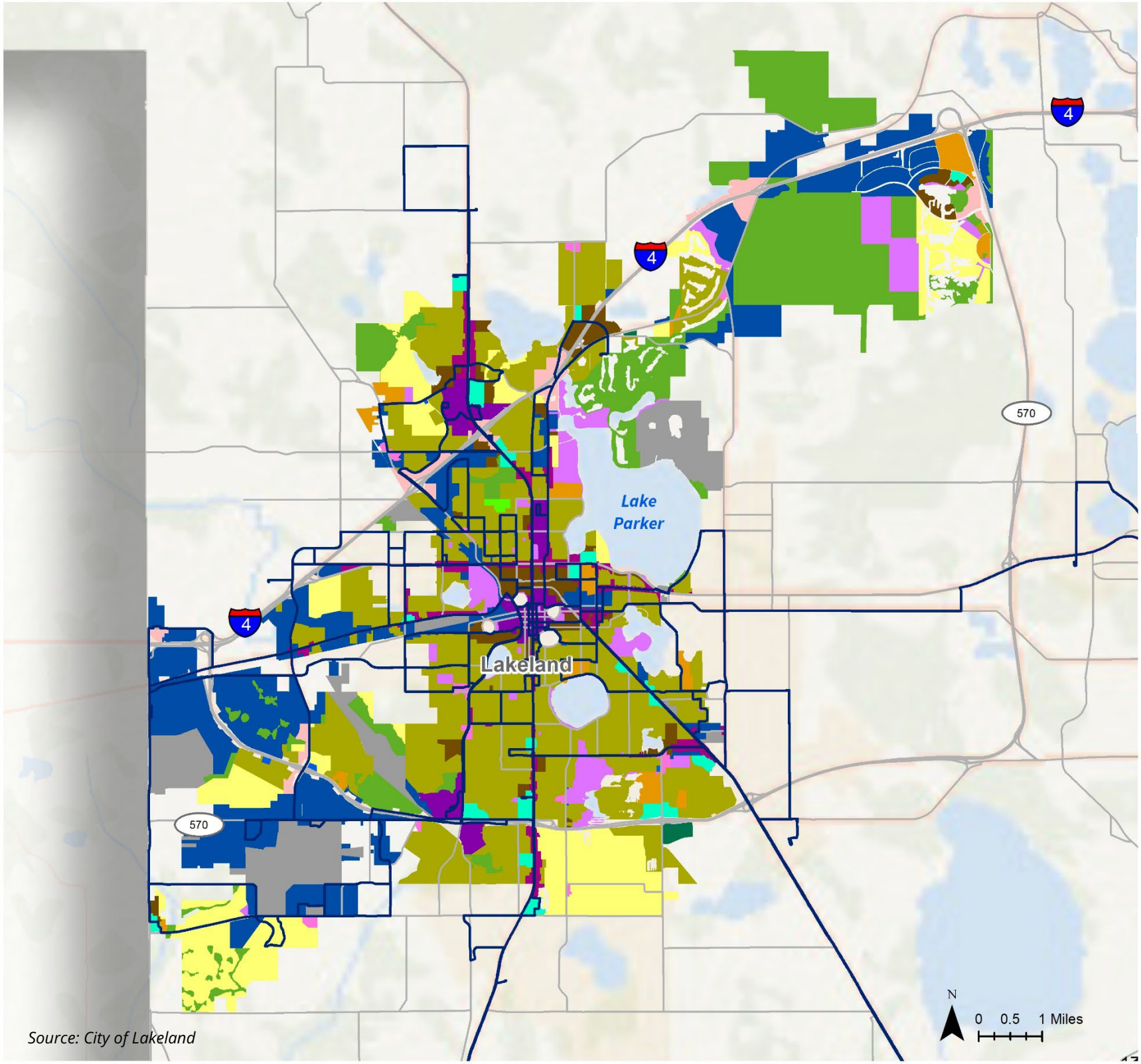
Source: Polk County


Source: Polk TPO

Lakeland

Lakeland currently has existing transit services and high-density employment centers in Polk County. Review of the Lakeland Future Land Use Map, developed for 2030, showed the following trends:

- The top land uses are Conservation (green), Business Park (blue), and Medium-Density Residential (gold).
- Low-Density Residential (yellow) is found on the periphery of the city and mostly found adjacent to Conservation(green) uses.
- High-Density Residential (brown) and Regional Activity Center (purple) land uses are found in and around downtown Lakeland.
- Industrial (gray) land uses are found in the southern parts of the city and north of Lake Parker.
- Current Citrus Connection routes are adjacent to Medium-Density Residential (gold) and Business Parks (blue).



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Polk Transportation Planning Organization

Map 2-16 Future Land Use, Lakeland, 2030

Citrus Connection

Land Use

- Business Park
- Community Activity Center
- Conservation
- Convenience Center
- Industrial
- Interchange Activity Center
- Mixed Commercial Corridor
- Neighborhood Activity Center
- Office Center
- Preservation
- Public and Institutional
- Recreation
- Regional Activity Center
- Residential Low
- Residential Medium
- Residential High

Source: City of Lakeland

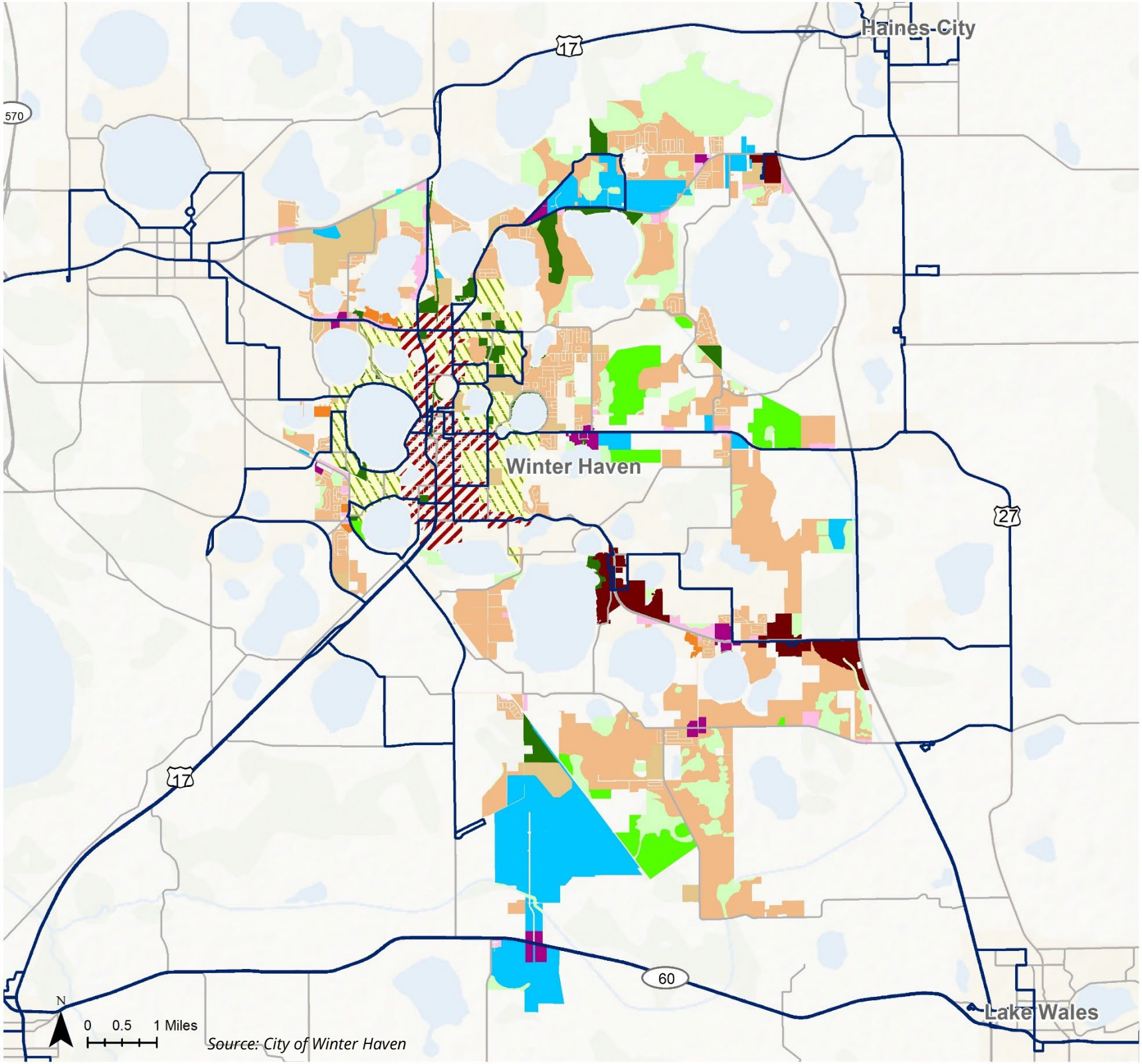
Winter Haven

Winter Haven has residential and employment centers in downtown. Furthermore, the downtown area has a transfer facility where the Citrus Connection east routes converge. Review of the Winter Haven Future Land Use Map, developed for 2025, showed the following trends:

- The top land uses are Residential Low Density (light orange), Conservation (green), and Industrial (blue).
- Low-Density Residential (light orange) is found scattered throughout the city but is concentrated in the northeast and southeast areas.
- Conservation (green) is found on the periphery of the city.
- Industrial (blue) land uses are found mainly in the southern parts of the city and north of Lucerne Park Road.
- The downtown and adjacent areas are Primary Activity Center (maroon stripes).
- Current Citrus Connection routes are adjacent to Primary Activity Center (maroon stripes) and Traditional Neighborhood Areas (green and yellow stripes).



Source: Polk TPO



CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

Map 2-17 Future Land Use, Winter Haven, 2025

- Citrus Connection
- Commerical
- Conservation
- Institutional
- Industrial
- Neighborhood Activity Center
- Recreation/Open Space
- Primary Activity Center
- Regional Activity Center
- Residential Estate
- Residential High Density
- Residential Low Density
- Traditional Neighborhood Area

Source: City of Winter Haven

Section 3. Existing Service Review

This section provides a snapshot of the current operating characteristics of the Citrus Connection, which provides fixed-route bus service for the general public and is the focus of this TDP, and paratransit service for those who are eligible. Presented is an overview of the current services and facilities provided by Citrus Connection. Information on other public transportation services in Polk County, as available and applicable, also is summarized to provide a comprehensive picture of services that may be available for the residents and visitors to the county.

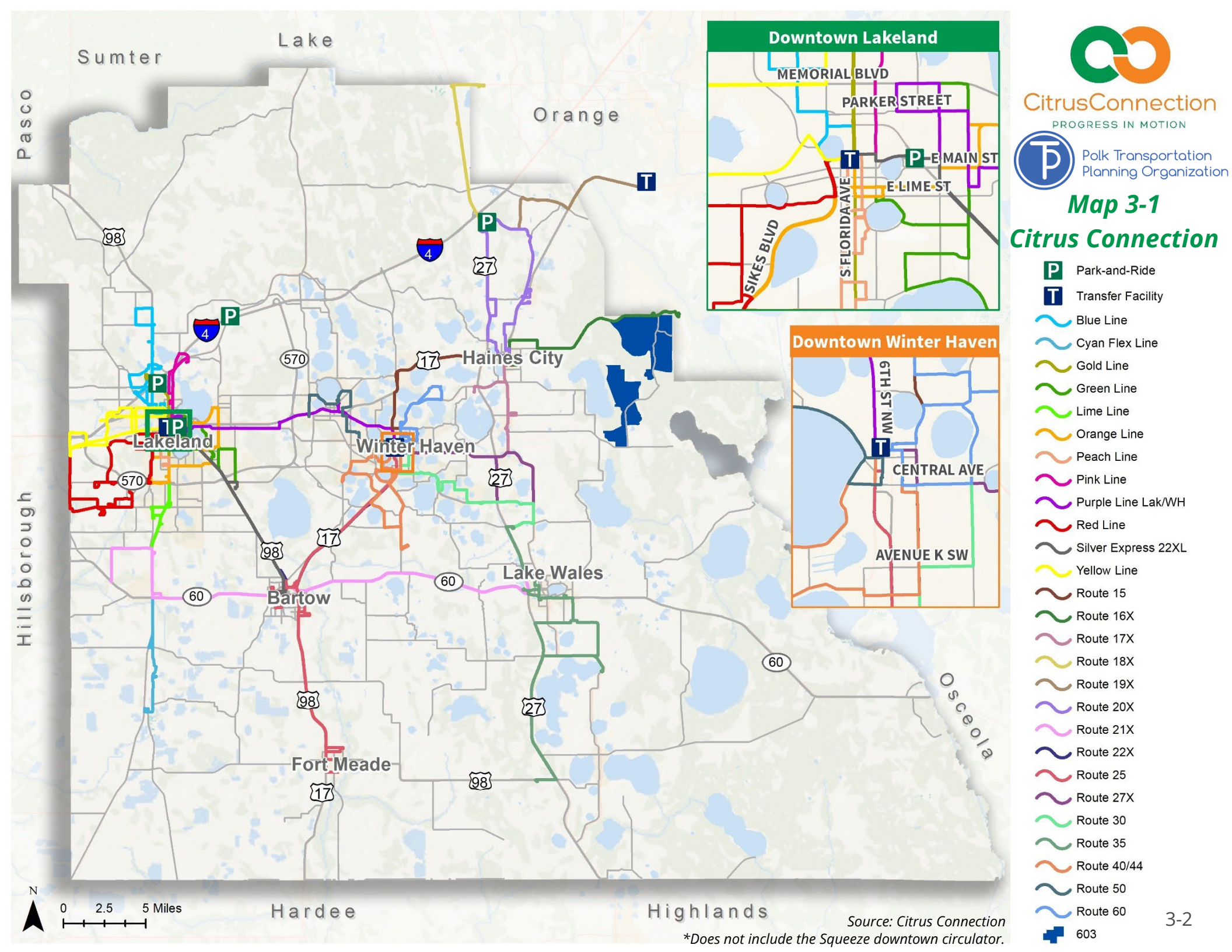
Fixed-Route Transit Services

Fixed-route public transit in Polk County is provided by the LAMTD, operating as Citrus Connection; this includes all public transportation in the county, including rural routes servicing Bartow and Fort Meade that were provided previously by Winter Haven Area Transit (WHAT). For many years, public transit in the county was provided by three agencies operating independently of each other, creating challenges for riders who wanted to use transit throughout the county. Since 2015, however, those services, personnel, and assets have been combined to operate under one name as Citrus Connection.

Current services are provided via 29 routes that enhance the ability of county residents to connect to economic opportunities, education centers, lifeline trips, and recreational areas throughout Polk County and regionally.

The majority of Citrus Connection's routes operate Monday through Saturday from 5:45 AM to approximately 7:00 PM, excluding major holidays. The earliest weekday service begins at approximately 5:45 AM on the majority of routes and ends at 8:03 PM with the Purple Line. Although most route frequencies are 90 minutes, some routes operate every 30 minutes and some over 2 hours. Route 30 (with 60-minute service on weekdays) is the only route operating on Saturday and Sunday with two-hour headways. The Purple Line, which connects Lakeland and Winter Haven, operates every 90 minutes Monday through Saturday from 5:45 AM to 8:03 PM on weekdays and from 7:15 AM to 4:08 PM on Saturdays.

Current services are shown in Map 3-1.



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Map 3-1
Citrus Connection

- Park-and-Ride
- Transfer Facility
- Blue Line
- Cyan Flex Line
- Gold Line
- Green Line
- Lime Line
- Orange Line
- Peach Line
- Pink Line
- Purple Line Lak/WH
- Red Line
- Silver Express 22XL
- Yellow Line
- Route 15
- Route 16X
- Route 17X
- Route 18X
- Route 19X
- Route 20X
- Route 21X
- Route 22X
- Route 25
- Route 27X
- Route 30
- Route 35
- Route 40/44
- Route 50
- Route 60
- 603

Source: Citrus Connection
**Does not include the Squeeze downtown circulator.*

Regional Connections

Currently, there are three routes that connect to adjacent transit networks provided by other public transit systems in the region. Route 18X connects to LYNX routes in Orange County, and 16X and 19X connect to the Poinciana Towne Center and Poinciana SunRail station in Osceola County, respectively. All regional connections operate on weekdays only. Both 16X and 18X operate every 90 minutes, and 16X runs from 6:25 AM to 7:45 PM and 18X from 5:45 AM to 7:06 PM. Route 19X provides 30-60-minute service from 5:45 AM to 7:10 PM.

Recent Service Improvements

In FYs 2018 and 2019, Citrus Connection launched an initiative to simplify and ultimately restructure the routes in Lakeland as part of *Re-Route 2020*. The goal was to enhance the system to be more user-friendly and expand service spans; *Re-Route 2020* did not eliminate any current service areas or current bus stops. New services were implemented in October 2019, and routes 10, 14, 15, 45, 46, 47, 58, and 61 were altered in addition to changing the names to colors. Ultimately, the service changes ensured that all routes connect at a major transfer facility, streamlined routes to require fewer transfers, and extended route service spans. In addition, the Peach Line was implemented to support the SR-37/S Florida Avenue Lane Repurposing by FDOT and the City of Lakeland.

On the east side of the Citrus Connection service area, Route 17X, which connects Lake Wales and Haines City, started service in October 2019, expanding the transit service area to include Lake Hamilton and Dundee. Also added was Route 19X, which connects to SunRail services at the Poinciana station from the Posner Park Park-and-Ride.

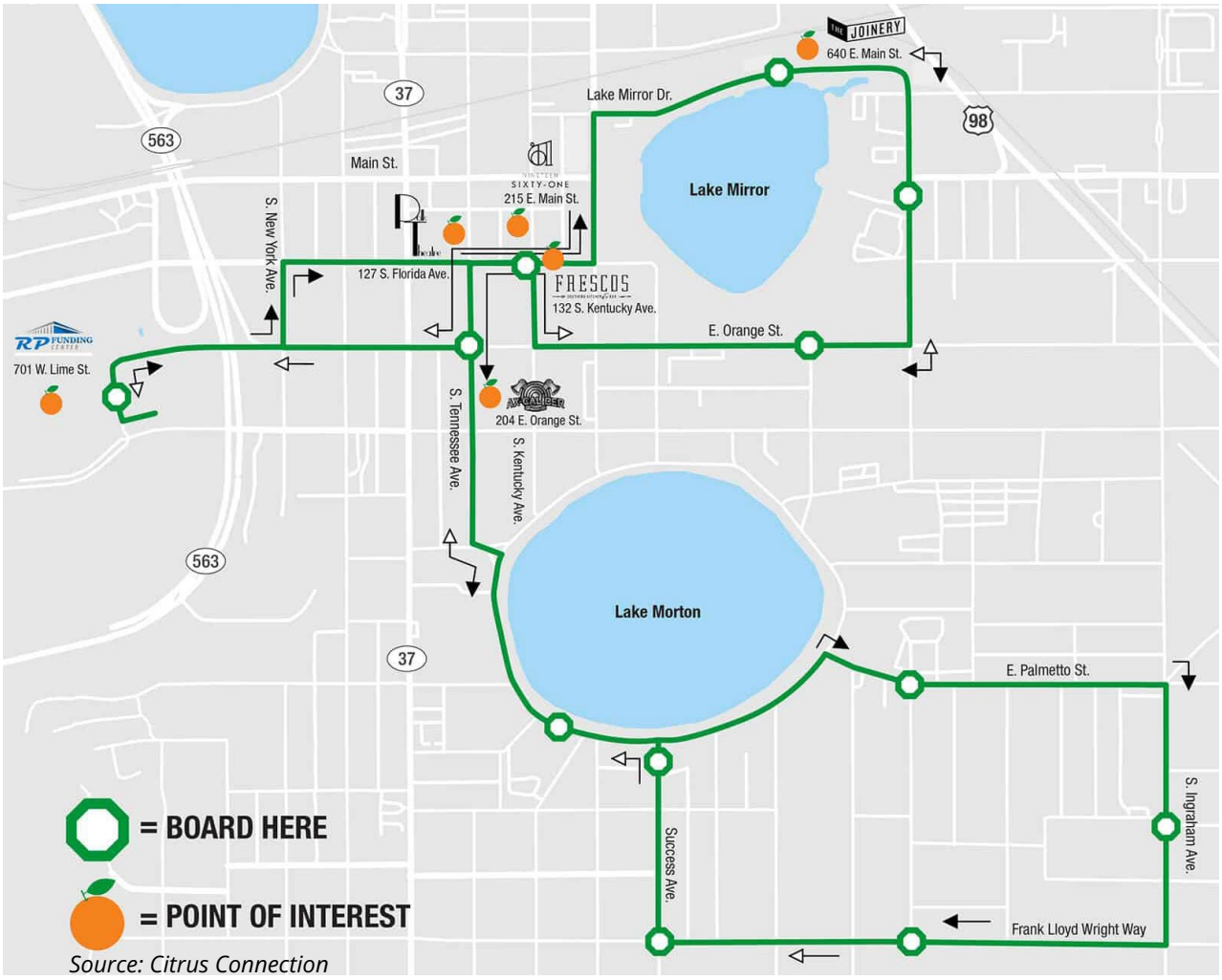
The Squeeze

A new federally-funded pilot circulator providing service in downtown Lakeland was launched in November 2021. Operating via open-air golfcarts, the route runs on Friday from 4:00 PM to 11:00 PM and Saturday from 8:00 AM to 3:00 PM and 4:00 AM to 11:00 PM with 12-minute headways. Named The Squeeze, it serves the Frank Lloyd Wright Visitor Center, the RP Funding Center, Florida Southern College, and other locations between Lime Street and



Ingraham Avenue from Main Street to Frank Lloyd Wright Way. As of May 2022, the service is free. Figure 3-1 shows where the service stops and attractions along the route.

Figure 3-1: Downtown Lakeland Circulator (The Squeeze)
Stops and Route Attractions



Source: Citrus Connection

Friday service from 4 pm until 11 pm. Saturday from 4 pm until 11 pm.
Service provided approximately every 12 minutes.
Servicio los viernes desde las 4 pm hasta las 11 pm. Servicio los sábados desde las 4 pm hasta las 11 pm.
Servicio prestado aproximadamente cada 12 minutos.

→ From SpringHill Suites to The Usonian House
Desde SpringHill Suites hacia Casa Usonian

→ From The Usonian House to SpringHill Suites
Desde Casa Usonian hacia SpringHill Suites

Paratransit Services

ADA Paratransit

In compliance with the Americans with Disabilities Act (ADA), Citrus Connection paratransit provides a call-ahead, door-to-door service for persons unable to use regular fixed-route bus service. A specialized fleet of small, wheelchair lift-equipped buses is currently available to older adults and people with disabilities throughout Polk County for a one-way fare of $2 per trip.

Transportation Disadvantaged Program

As noted, Citrus Connection is the CTC in Polk County and provides free or reduced-price bus passes to physically, mentally, emotionally, or economically disadvantaged individuals. According to the Polk TPO Transportation Disadvantaged Service Plan (TDSP), approximately 26.3 percent of the population could be considered TD based on their age, and approximately 42.6 percent could be transit-dependent. The TDSP acknowledges that the number of people who may access the TD program may increase for various reasons. Citrus Connection communicates by various modes, including phone, email, Facebook, to ensure that anyone can learn about their services and purchase bus passes.

Fixed-Route Transit Profile

A review of the current fixed-route network, ridership, fare structure, recent ridership trends, and inventory of transit facilities and vehicles is presented to provide a profile of Citrus Connection services. Table 3-1 shows the spans of operation on weekdays and weekends for all Citrus Connection routes. As shown, all current route frequencies are 30 minutes or greater. Morning service begins at 5:45 AM with 15 routes in both the east and west areas. During peak morning hours (6:00–9:00 AM), all routes are operating to provide riders connection to work and other destinations.

The only routes providing 30-minute headways are the Pink, Peach, and Gold lines in the western part of Polk County. The Peach Line begins service at 6:15 AM and ends operation at 7:00 PM, the longest service span among the routes with 30-minute headways. Most routes that have both weekday and Saturday service have 90-minute headways throughout their weekday and Saturday service span. Routes with frequencies of more than 90 minutes are routes 17X, 21X, 22XW, 27X, 35, and the Cyan Line, mainly in the eastern part of the service area. Compared to

weekdays, there is less service on Saturdays, with 19 routes operating at approximately 90-minute headways. All routes begin operation around 7:00 AM, except Route 603, which begins service at 6:10 AM. The majority of the routes that serve on weekends operate at a similar or less frequency as their weekday services. On Sunday, Route 30 operates from 8:15 AM to 3:00 PM every two hours.



Source: Citrus Connection

Table 3-1: Citrus Connection Operating Characteristics

Area	Line/Route	Weekday		Saturday		Sunday	
		*Frequency**	*Service Span*	*Frequency**	*Service Span*	*Frequency**	*Service Span*
WEST	Blue	60	5:45AM-7:45PM	150	7:15AM-2:29PM		
	Cyan	300	6:50AM-5:40PM				
	Gold	30	6:05AM-6:45PM	30	7:45AM-4:15PM		
	Green	45	5:45AM-6:35PM	90	7:15AM-3:35PM		
	Lime	60	7:50AM-6:08PM				
	Orange	45	5:45AM-6:23PM	90	7:15AM-3:23PM		
	Peach	30	6:15AM-7:00PM	30	7:45AM-4:30PM		
	Pink	30	6:15AM-5:56PM				
	Purple	90	5:45AM-8:03PM	90	7:15AM-4:08PM		
	Red	45	5:45AM-7:39PM				
	Silver	90	5:55AM-5:51PM				
	Squeeze	12	4:00PM-11:00PM	12	4:00PM-11:00PM		
	Yellow	45	5:45AM-7:31PM	90	7:15AM-3:30PM		
EAST	15	90	5:45AM-7:00PM	180	6:45AM-3:00PM		
	16X	90	6:25AM-7:45PM				
	17X	120	6:15AM-6:10PM	120	7:25AM-3:10PM		
	18X	90	5:45AM-7:06PM	90	7:15AM-4:06PM		
	19X	45	5:45AM-7:10PM				
	20X	90	5:45AM-7:05PM	90	7:15AM-4:05PM		
	21X	180	6:00AM-6:48PM	240	7:30AM-3:52PM		
	22XW	150	5:45AM-7:04PM	240	8:15AM-1:34PM		
	25	60	5:45AM-6:23PM				
	27X	300	6:00AM-7:05PM	-	10:40AM-11:50AM		
	30	60	6:15AM-7:00PM	120	7:15AM-4:00PM	120	8:15AM-3:00PM
	35	120	6:15AM-7:05PM	120	7:15AM-4:05PM		
	40/44	90	5:45AM-7:02PM	180	6:45AM-3:02PM		
	50	90	5:45AM-7:00PM	240	8:15AM-1:30PM		
	60	60	6:15AM-7:04PM				
	603	-	6:10AM-6:10PM	-	6:10AM-6:10PM		

*in minutes

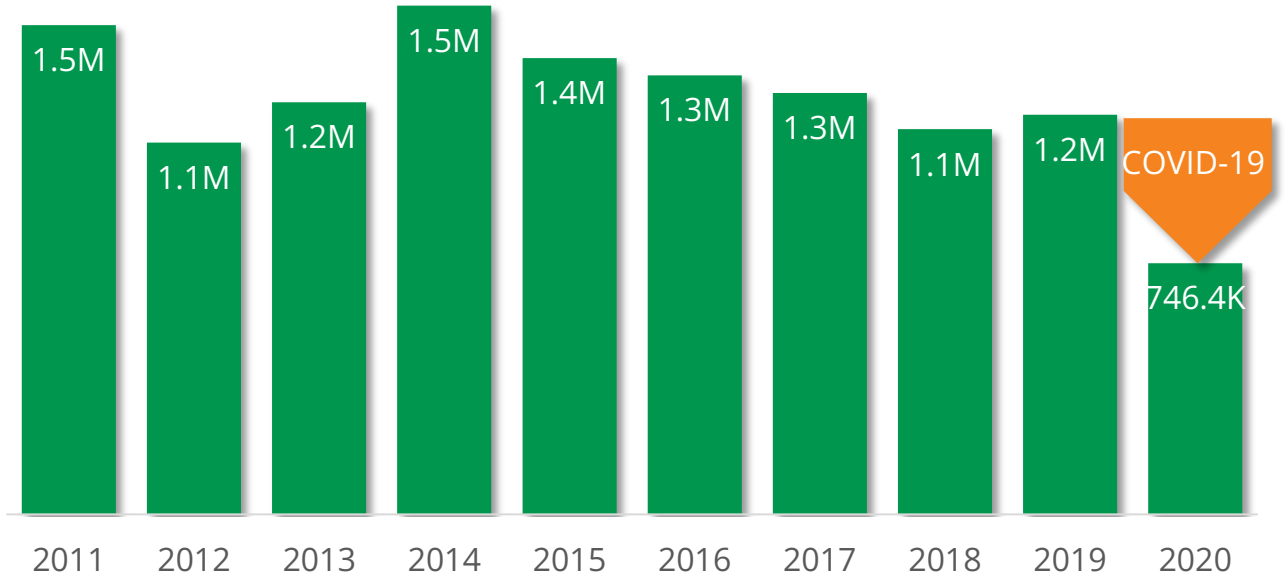
Citrus Connection Ridership Trends

Figure 3-2 summarizes ridership trends on Citrus Connection from 2011 to 2020, based on data gathered from Florida Transit Information System (FTIS), which includes validated National Transit Database (NTD) data from the Federal Transit Administration (FTA).

From 2011–2013, Citrus Connection ridership decreased from 1.5 million passenger trips in 2011 to 1.2 million in 2013. Subsequently, ridership increased by 23 percent in 2014 back to 1.5 million passenger trips. Since 2014, passenger trips have experienced a general declining trend, although in 2019 ridership increased from the previous year.

When the COVID-19 pandemic began in March 2020, ridership was greatly impacted due to public health and safety concerns that dramatically changed general travel behavior. According to an American Public Transportation Association (APTA) January 2021 study on the impact of COVID-19 on public transit, national ridership dropped to 65 percent below pre-pandemic levels from June through December 2020. Citrus Connection's ridership decreased by only approximately 37 percent, showing that the service is relied upon and a part of the fabric of the community.

Figure 3-2: Citrus Connection Ridership, 2011–2020

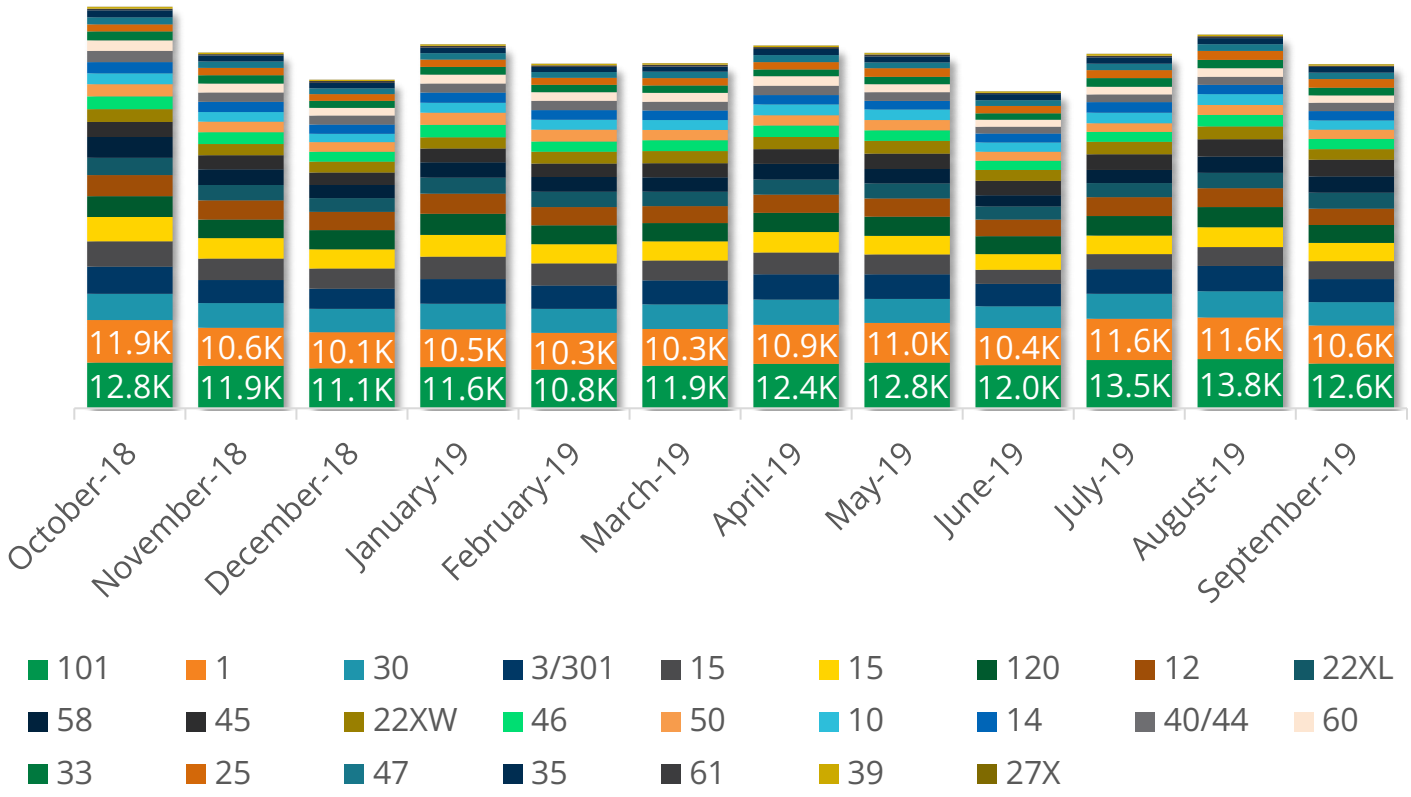


Note: Bar heights may not be even due to rounding.

Source: Florida Transit Information System (FTIS)

Figure 3-3 shows the ridership by route for each month in FY 2019. As shown, Route 101 has the highest ridership, providing over 147,000 trips in 2019, which makes up over 12 percent of Citrus Connection's total fixed-route ridership. The route with next-highest ridership demand is Route 1, serving over 129,000 trips during the same time.

Figure 3-3: Citrus Connection Ridership by Route by Month for FY19



Note: Ridership by route for 2019 is shown, as 2020 data were severely impacted by the COVID -19 pandemic and did not reflect a typical year for transit.

Source: Citrus Connection

COVID-19 Impact

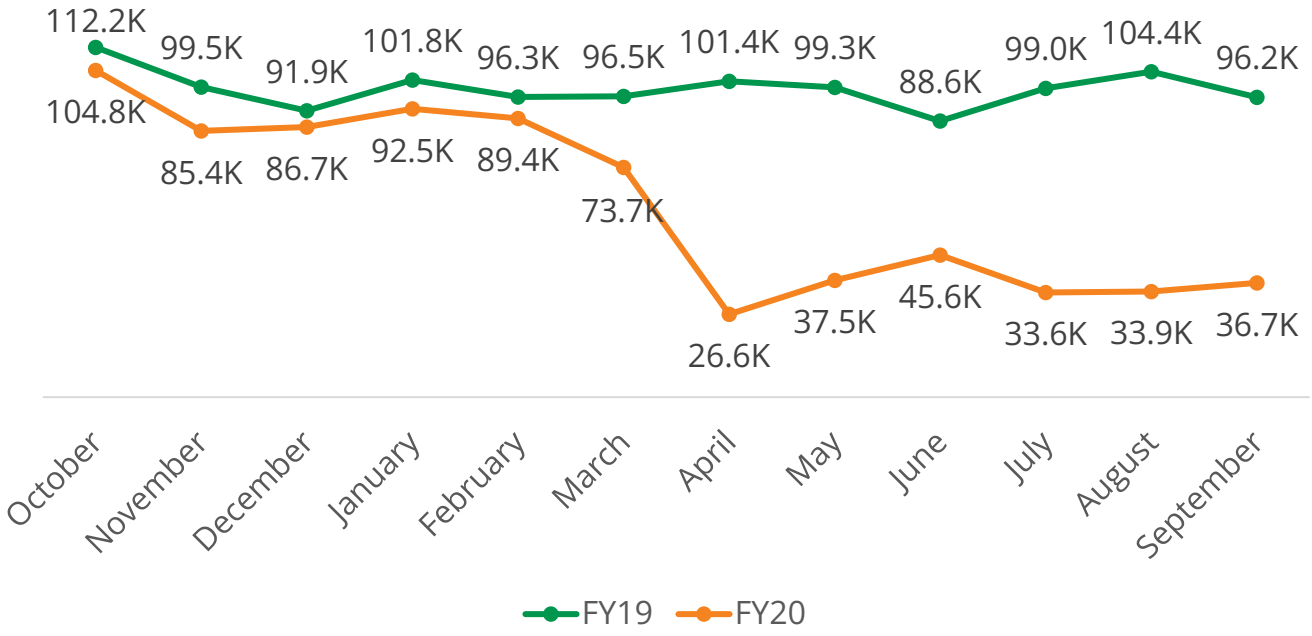
Like many agencies, Citrus Connection had to adjust to meet the challenges of the COVID-19 pandemic that began in 2020 and impacted the provision on public transportation in Polk County. Although a segment of the workforce began telecommuting, Citrus Connection continued to operate so essential workers could commute to and from work. However, at times, Citrus Connection had to reduce service hours as a response to declining ridership and availability of bus operators. For those who continued to rely on public transit, Citrus Connection kept vehicles

and facilities sanitized and seats blocked off for social distancing and distributed face masks to riders to reduce the spread of COVID-19, ensure a safe ride, and comply with federal mandates.

The reduction in the number of seats available on all transit services had a direct impact on ridership, which fell to its lowest level in April 2020, coinciding with the 30-day statewide stay-at-home order—fixed route passenger trips declined 177 percent from March to April.

As of July 2022, the pandemic continues, but the most significant ridership impacts were recorded from April to September 2020. As shown in Figure 3-4, during this time, average ridership was approximately 36,000 riders per month, compared to approximately 98,000 riders per month recorded in FY19.

Figure 3-4: Citrus Connection Ridership, FY19–20



Source: Citrus Connection

Bus Stop Infrastructure

Bus stops play an important role with any transit system, providing riders with a safe and designated place to catch a bus and a way for the transit agency to promote its services. Enhanced bus stops, such as those with a shelter or bench, provide a place to sit, protection from weather, and a feeling of safety and security.

There are more than 1,100 bus stops throughout Polk County at this time. As the scale and extent of the capital facilities can directly affect ridership, amenities were

analyzed to identify the facilities currently supporting Citrus Connection services. Table 3-2 shows the percentage of bus stops in Polk County that have certain infrastructure/amenities; some bus stops have more than one. As shown, 36 percent of stops currently have benches, 18 percent have trash cans, and 12 percent have shelters. Less than 10 percent of shelters have a bike rack (9%) or lighting (7%).

Of the 12 percent of bus stops that have shelters, the majority (85%) are in incorporated areas (cities and municipalities) and half are in Lakeland. In total, 98 percent of bus stops with shelters also have benches.

Table 3-2: Bus Stop Amenities, Polk County

Amenity	% Of Stops
Bench	36%
Trash Can	18%
Shelter	12%
Bike Rack	9%
Lighting	7%

Source: Citrus Connection

Existing Passenger Transfer Facilities

This section provides a review of transit facilities and other infrastructure currently available in the Citrus Connection service area. Citrus Connection connects to these facilities to accommodate the provision of its fixed-route bus throughout Polk County. Details of these key facilities are also provided.

Currently, there are two transfer facilities, located in Lakeland and Winter Haven. All routes in the respective areas converge to allow riders to transfer to access other various areas of the Citrus Connection service area. Information on each of these facilities is summarized below.

Winter Haven Terminal

Citrus Connection's east transfer hub is the Winter Haven Transit Terminal located at 555 Avenue E NW in downtown Winter Haven (Figure 3-5). The terminal allows for transfers to the 16 Citrus Connection routes in the west and the Purple/12 route that connects Winter Haven to Lakeland and also connects to Greyhound buses. It has shelters, benches, picnic tables, bicycle racks, and trash cans.

Figure 3-5: Winter Haven Transit Terminal



Lakeland Terminal

The Lakeland Downtown Terminal (Figure 3-6) is located in downtown Lakeland at 200 N Florida Avenue and currently provides connections for the west bus routes. This location serves all west routes – Green, Orange, Red, Yellow, Blue, Cyan, Pink, Peach, Gold, Lime, and Silver. It also connects the Purple/12 route, which connects riders to/with Winter Haven and the east routes. The terminal has shelters, benches, trash cans, and designated areas at which users can lock and store bicycles.

Figure 3-6: Lakeland Downtown Terminal



Future Lakeland Intermodal Center

Citrus Connection and the Polk TPO completed a feasibility study for a multimodal center in downtown Lakeland, as shown in the rendering in Figure 3-7. The selected site is west of the current Downtown Terminal, near the RP Funding Center. The project includes a parking garage with 580 spaces, bus parking, restrooms, administrative space, ticket booths, vending machines, security cameras, and solar panels. In addition to improving the conditions for waiting and transferring passengers, it could facilitate the proposed extension of the SunRail and Brightline services to Lakeland.

Figure 3-7: Proposed Downtown Lakeland Intermodal Facility Rendering



SunRail Poinciana Station

Although not located in Polk County or operated by LAMTD, the Poinciana Station (Figure 3-8) is considered to be a key part of Polk's transit network. SunRail, the Central Florida regional commuter rail service, connects Polk County to the Orlando area with this station, which is located just outside of Polk County at 5025 S Rail Avenue in neighboring Osceola County. Route 19X provides service to the station from the Posner Park Park-and-Ride. The station features shelters, bicycle racks, benches, displays, and a park-and-ride lot links Citrus Connection with LYNX routes.

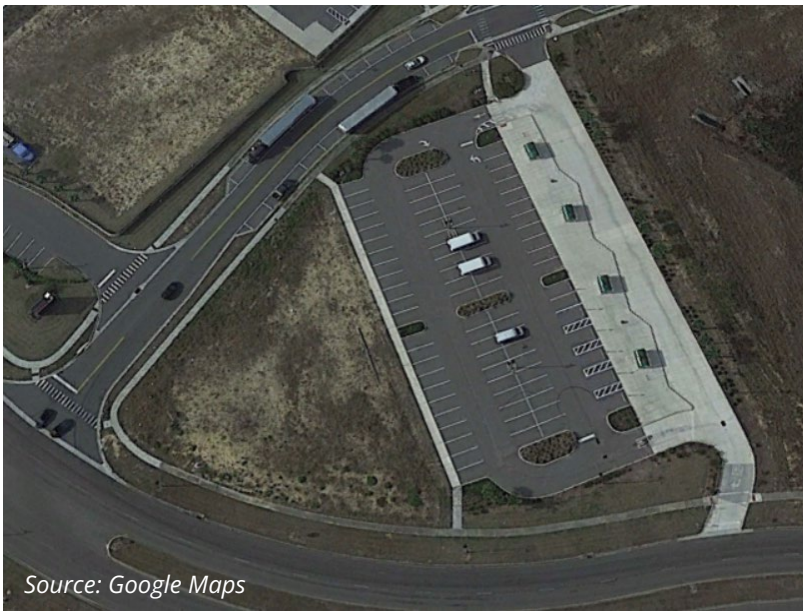
Figure 3-8: SunRail-Poinciana Station



Park-and-Ride Facilities

Currently, there are four park-and-ride facilities in Polk County, with three that serve the east and west area Citrus Connection routes.

Figure 3-9: Posner Park Park-and-Ride



Source: Google Maps

Posner Park Park-and-Ride

The Posner Park Park-and-Ride facility is located in Davenport adjacent to the Posner Village shopping center at the corner of I-4 and US-27 (Figure 3-9). The facility features four shelters with benches and bicycle racks. It also helps riders connect to the US-27 corridor, the SunRail station, and LYNX via routes 18X, 19X, and 20X. Service to and from the location began on September 8, 2020.

Gow B. Fields Park-and-Ride

The Gow B. Fields Park-and-Ride facility on north US-98 adjacent to I-4 was completed in June 2017. It has three shelters with benches and connects the Blue and Gold routes.

Rose Street Park-and-Ride

The Rose Street Park-and-Ride facility is free at any time and connects the Purple and Silver routes in Lakeland. It features covered benches, bike racks, and a bus bay.

State Park-and-Ride

The park-and-ride facility adjacent to I-4 and SR-33 in Lakeland currently is not served by Citrus Connection. It has 26 parking spots, of which 4 are reserved wheelchair-accessible parking spots.

Other Transit Facilities

Administrative and Transit Vehicle Maintenance

Citrus Connection's Administrative and Vehicle Maintenance Facility, located at 1212 George Jenkins Boulevard in Lakeland, is home to administration/ maintenance, a fueling station, and vehicle washing facilities. It is accessible by the Yellow route. With the addition of a multimodal center in Lakeland, the Regional Mobility Call Center currently located in Bartow could be moved so all administrative staff will be in one location.

Future East County Facility

Although there is an existing maintenance facility in the western part of the service area, there is a need for a maintenance facility in eastern Polk County to assist eastside services. This facility would require approximately 2.6-3 acres of land depending on amenities. The site would host charging and alternative fuel infrastructure, passenger facilities and other amenities in addition to maintenance-related functions.

Transit Vehicle Inventory

Citrus Connection's fleet consists of 47 active vehicles. The average age of the fleet is approximately seven years, and a majority of the vehicles (75%) are still within their useful life, based on guidance from FTA. All buses are equipped with bike racks and touchless tap card payment options.

A bus replacement plan was adopted in FY 2017 that resulted in Citrus Connection acquiring two new paratransit vehicles. It is expected that an additional nine buses will be acquired as replacements through the Coronavirus Aid, Relief, and Economic Security (CARES) Act funding. Appendix B provides more detail on the current fleet inventory.

Current Fare Structure

The current regular one-way adult cash fare for Citrus Connection service is $1.50. Several other fare options are included in the current Citrus Connection fare structure, including daily, weekly, and monthly passes, as shown in Table 3-3. Several discounted fare options also are available, including for students, individuals with disabilities, persons who use Medicare, and older adults (age 65 and older). Children under age 7 who are accompanied by an adult ride for free. To

receive a discounted fare, riders must show proof of eligibility or an applicable Citrus Connection ID.

Currently, transit passes can be purchased via phone, online, mobile app, mail, or at the following locations:

- Regional Mobility Call Center – 1290 Golfview Avenue, 2nd Floor, Bartow
- Winter Haven Transit Terminal – 555 Avenue E NW, Winter Haven
- Lakeland Bus Terminal – 200 N Florida Avenue, Lakeland
- Citrus Connection Office – 1212 George Jenkins Boulevard, Lakeland

Table 3-3: Citrus Connection Fare Structure

Fare Category	Adult	Student	Older Adult	Disabled
One-Way	$1.50	$1.25	$0.75	$0.75
Day Pass	$3.00	$2.50	$1.50	$1.50
Weekly	$12.00	-	$9.00	$9.00
Monthly	$47.00	-	$31.50	$31.50

Source: Citrus Connection

In October 2017, Citrus Connection introduced touchless tap card payment options. In addition to providing additional convenience for passengers, it allows Citrus Connection to track ridership by stop. The tap card readers were installed in all fixed-route and paratransit buses, and smartcard ticket sales stations were installed in four stations. Paper passes were no longer valid after November 2017.

In FY 2019/2020, mobile fare payment also became available for passengers. Riders using the mobile ticketing app can pay for tickets using credit card, debit card, Apple Pay, or Masterpass. Riders activate the tickets on their phone and show them to the driver to board.

Hours of the Bus Pass Sales windows at the Lakeland and Winter Haven terminals were expanded in FY 2017/2018 to Monday through Friday from 8:30 AM to 5:30 PM.

Universal Access Partnership (UAP) Program

With the UAP program, Citrus Connection gives the option to businesses, colleges, schools, and organizations to pay a low fixed rate to allow all employees or students to ride Citrus Connection for six days per week free of charge. There are no restrictions on the number of trips, purpose, or time. Currently, there are approximately 12 partnerships in place, including Southeastern University, Polk

State College, Pace Center for Girls, Polk County Schools, Peace River Center, and Legoland. LAMTD also has a partnership with the Polk County Board of County Commissioners to subsidize transportation for veterans through this program.

Other Transit Providers

A review of other private and public agencies that offer public transportation services in Polk County for the public and specific client groups also was conducted. These providers serve the general public and/or specific client groups such as persons with disabilities, older adults, and/or people needing medical care. This inventory of transportation providers is provided in Appendix C.

In addition to collecting basic information, private providers were contacted to obtain types of services, restrictions of clients, boundaries of service area, hours of operations, and any information on facilities. This information was requested in a survey format to facilitate the data collection process. In total, 20 private providers were contacted via email; a copy of the survey instrument used is included in Appendix C.

The following are some of the transportation options available that were not included in the provider inventory because of the scale and/or nature of their respective services:

- **Greyhound** is a national transit service provider and connects riders from a stop in Auburndale to many other destinations throughout the U.S. This stop does not sell tickets; they must be purchased at another terminal or online.
- **Megabus** is a private transit service provider that offers service from the Gow B. Fields Park-and-Ride in Lakeland to destinations on both coasts in Florida such as Hollywood, Miami, Orlando, or Tampa. Buses are equipped with Wi-Fi.
- **Amtrak** is a national rail and bus company that provides service from Lakeland and Winter Haven to many locations throughout the U.S. Both Lakeland and Winter Haven receive rail service.

Transit Performance Review

A review of important performance indicators for Citrus Connection's fixed-route service was conducted to assess how efficiently it supplies its transit service and how effectively those services meet the needs of the area.

This section includes a performance trend analysis conducted for Citrus Connection using validated NTD data for the last five years. Various performance measures were used to present the data that relate to overall system performance.

A trend analysis is one aspect of transit performance evaluation; when combined with a peer transit system comparison, the combined analysis can provide a starting point for understanding Citrus Connection's performance over time and among agencies with similar characteristics. A peer review analysis also was conducted to compare Citrus Connection's performance at a given point in time with other transit systems. For that comparison, systems with operating characteristics similar to those of Citrus Connection were selected. The performance indicators included in this analysis help evaluate and benchmark the effectiveness and efficiency of Citrus Connection services.

Performance Trend Analysis

To conduct the trend analysis, data were retrieved from the FTIS, a comprehensive data repository of historical and the most recent validated NTD data for transit agencies in the US.

Performance Indicators and Measures

To assess how efficiently Citrus Connection supplies its fixed-route transit service and how effectively those services meet the needs of the area, the trend analysis used key performance indicators and three types of measures:

- **General Indicators** are the quantity of service supply, passenger and fare revenue generation, and resource input.
- **Effectiveness Measures** are the extent to which the service is effectively provided.
- **Efficiency Measures** are the extent to which cost efficiency is achieved.

The trend analysis is organized by type of measure or indicator and includes statistics, figures, and tables to illustrate Citrus Connection's performance over the past five years. This analysis includes statistics that summarize selected system performance indicators, effectiveness measures, and efficiency measures for the five-year period. Summary findings of the trend analysis are presented in Table 3-4; Appendix D provides a complete and more detailed summary of the trend analysis.

Table 3-4: Trend Analysis, 2016–2020

Indicator/ Measure	2016	2017	2018	2019	2020	% Change 2016–19*
General Indicators						
Passenger Trips	1,304,808	1,252,509	1,144,300	1,187,030	746,381	**-9.0%**
Revenue Miles	1,372,618	1,378,277	1,457,881	1,465,800	1,369,071	**6.8%**
Revenue Hours	89,104	90,759	92,634	89,311	86,118	**0.2%**
Total Operating Expense	$9,805,544	$8,855,838	$9,191,384	$9,563,218	$9,455,665	**-2.5%**
Vehicles Operated In Max. Service	30	32	32	30	34	**0.0%**
Effectiveness Measures						
Revenue Miles Per Revenue Hr	15.40	15.19	15.74	16.41	15.90	**6.5%**
Passenger Trips Per Revenue Hr	14.64	13.80	12.35	13.29	8.67	**-9.2%**
Passenger Trips Per Revenue Mi	0.95	0.91	0.78	0.81	0.55	**-14.8%**
Average Age Of Fleet (In Yrs)	8.70	6.78	7.87	8.31	6.87	**-4.5%**
Number Of Vehicle System Failures	374	275	216	285	153	**-23.8%**
Efficiency Measures						
Operating Exp. Per Passenger Trip	$7.51	$7.07	$8.03	$8.06	$12.67	**7.2%**
Operating Exp. Per Revenue Mi	$7.14	$6.43	$6.30	$6.52	$6.91	**-8.7%**
Operating Exp. Per Revenue Hr	$110.05	$97.58	$99.22	$107.08	$109.80	**-2.7%**
Farebox Recovery	18.8%	22.1%	13.1%	11.9%	5.6%	**-37.0%**
Average Fare	$1.41	$1.56	$1.05	$0.96	$0.71	**-32.4%**

* Change in performance was calculated for 2016–2019, as 2020 data were severely impacted by the COVID -19 pandemic and did not reflect a typical year for transit.

Source: Florida Transit Information System (FTIS)

Trend Analysis Summary

- **General Indicators** –Passenger trips, calculated for 2016–2019 as 2020 data showed a severe impact by the COVID-19 pandemic, decreased by approximately nine percent, a somewhat lower decrease than other trends observed in transit ridership regionally and nationally in this time period, although within the last year ridership increased (3.7%). There was a marginal increase in revenue hours (0.2%) and a larger increase revenue miles (6.8%), which is consistent with longer routes implemented. Total operating expense decreased (-2.5%) overall but increased within the last year (4.0%), in line with the increase in passenger trips.
- **Effectiveness Measures** – Passenger trips per revenue hour decreased by 9.2 percent, and passenger trips per revenue mile decreased by 14.8 percent. This is consistent with the overall decrease in passenger trips. The number of vehicle system failures decreased (-23.8%), which can be attributed to the average age of the fleet decreasing (-4.5%). This suggests that Citrus Connection is improving the quality of the experience for its riders.
- **Efficiency Measures** – The farebox recovery rate decreased (-37.0%) and the average fare also decreased (-32.4%), which could be attributed to the decrease in passenger trips and more passengers using weekly or monthly passes. As the only increase in efficiency measures, operating expense per passenger trip (7.2%), suggests that there is room for more efficiency. Operating expense per revenue mile decreased (-8.7%) and operating expense per revenue hour also decreased (-2.7%), indicating that operating cost decreased at a faster rate than the other metrics.

Farebox Recovery

An additional requirement for TDPs, added by the Florida Legislature in 2007 when it adopted House Bill 985, was a closer look at a transit agency's farebox recovery ratio so agencies can address "potential enhancements to productivity and performance which would have the effect of increasing farebox recovery ratio." FDOT subsequently issued guidance requiring that TDP Major Updates provide a summary report on the farebox recovery ratio. In addition to the summary of the most recent farebox recovery trend for Citrus Connection in this section, a farebox recovery analysis and a set of recommendations to improve farebox recovery were developed and are included in Appendix E.

Agency Peer Review Analysis

A peer system review was conducted to assess how Citrus Connection compares to comparable transit agencies. The FTIS data repository that includes transit data for agencies nationwide was used to obtain the necessary validated NTD data to complete the analysis. Due to the pandemic's effects on all agencies and their measures/indicators throughout FY 2020, the agency peer review analysis was conducted for FY 2019.

Using the same measures used for the systemwide trend analysis, a peer system review analysis was conducted to compare Citrus Connection's fixed-route performance characteristics to a selected group of transit agency peers.

The selection process for the peer agency systems is described, followed by summary results of the peer review analysis using the same three categories used previously—General Indicators, Effectiveness Measures, and Efficiency Measures.

Peer System Selection Methodology

The fixed-route peer system selection was conducted using FY 2019 NTD data available from FTIS. The nine standard variables used to score the pool of possible agency peers include the following:

- Located in southeastern U.S. (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia)
- Passenger trips
- Revenue miles
- Revenue hours
- Service area population
- Service area population density
- Total operating expense
- Average speed (revenue miles/revenue hours)
- Vehicles operated in maximum service (VOMS)

The peers were first selected based on geographic location. Fixed-route systems operating in these states, all of which have operating conditions more similar to Florida than other areas of the country, were added to the pool of possible peers and were analyzed again based on the eight remaining criteria described previously.

As part of the methodology, a potential peer received 1.0 points when one of the eight criteria was within 1 standard deviation of Citrus Connection's performance value and 0.5 points for each criterion that fell within 2 standard deviations of Citrus Connection's value.

Table 3-5 presents the final set of peers selected using the methodology summarized above. These peers were then used for the peer system review analysis summarized in the remainder of this section. Table 3-6 shows the results of the peer review analysis. Appendix D provides a complete and more detailed summary of the peer analysis.

Table 3-5: Selected Peer Systems for Citrus Connection

Agency Name	Location
Gwinnett County Board Of Commissioners (GCT)	Lawrenceville, GA
City Of Fayetteville (FAST)	Fayetteville, NC
Escambia County (ECAT)	Pensacola, FL
Potomac And Rappahannock Transportation Commission (PRTC)	Woodbridge, VA
Cape Fear Public Transportation Authority (Wave Transit)	Wilmington, NC
Manatee County (MCAT)	Bradenton, FL

Table 3-6: Citrus Connection Peer Analysis Summary

Indicator/Measure	Citrus Connection % From Peer Mean
General Indicators	
Passenger Trips	-3.9%
Revenue Miles	9.7%
Revenue Hours	-1.8%
Total Operating Expense	-3.3%
Vehicles Operated In Maximum Service	11.1%
Effectiveness Measures	
Passenger Trips Per Revenue Mile	-12.6%
Passenger Trips Per Revenue Hour	-1.8%
Efficiency Measures	
Operating Expense Per Passenger Trip	-6.3%
Operating Expense Per Revenue Mile	-13.4%
Operating Expense Per Revenue Hour	-4.0%
Farebox Recovery (%)	-12.0%
Average Fare	-3.3%

Source: Florida Transit Information System (FTIS)

Peer Review Analysis Summary

- **General Indicators** – Citrus Connection placed below the peer mean in passenger trips (-3.9%), revenue hours (-1.8%), and total operating expense (-3.3%) but above the peer mean in revenue miles (9.7%) and vehicles operated during maximum service (11.1%). This suggests that Citrus Connection is providing a shorter service span than its peers, resulting in fewer passenger trips and lower operating expense. Although Citrus Connection is providing shorter service spans, it is providing more vehicles and access to longer trips to its passengers.
- **Effectiveness Measures** – Scoring below the peer mean in passenger trips per revenue mile (-12.6%) and passenger trips per revenue hour (-1.8%) suggests that Citrus Connection riders do not use the service as much as its peers' riders. A larger deviance from the peer mean in passenger trips per revenue mile suggests that riders may be taking shorter trips.
- **Efficiency Measures** – Citrus Connection placed below the peer mean in all efficiency measures. Scoring below the peer mean in farebox recovery (-12.0%) and average fare (-3.3%) suggests that Citrus Connection's fares do not cover as much operating cost as its peers. Citrus Connection is more cost efficient than its peers in providing service, as operating expense per passenger trip (-6.3%), operating expense per revenue mile (-13.4%), and operating expense per revenue hour (-4.0%) placed below the peer mean.



Source: Polk TPO

Section 4. Public Involvement Summary

Conducting public outreach serves the important role of engaging the community and subsequently incorporating their vision and direction into the TDP planning process. This section summarizes the public involvement activities undertaken as part of this TDP and their findings.

Public Involvement Plan

One of the first tasks prior to initiating public outreach activities for the Polk TDP was to prepare a Public Involvement Plan (PIP) that describes activities planned to be undertaken during the development of this TDP. Activities included in the Polk TDP PIP provided numerous opportunities for involvement by the general public and representatives of local agencies and organizations. The PIP was prepared and submitted for FDOT review and approval prior to implementing the outreach activities. A copy of the PIP is provided in Appendix F.

The TPO also developed the brand for the TDP as *Polk Transit Vision 2032: The Transit Development Plan (TDP) Major Update for Citrus Connection* to emphasize the importance of this planning process and to help identify this TDP process from other ongoing planning studies and initiatives in Polk County and the region.

COVID-19 Impact on Outreach

As noted, the COVID-19 pandemic significantly impacted the services provided by Citrus Connection in Polk County. It also impacted many in-person outreach efforts planned in the PIP due to social-distancing requirements and other safety precautions in place at that time. Although the Polk TPO anticipated holding all outreach events in person, some outreach activities, including most discussion groups, stakeholder interviews, and the first public workshop, were conducted virtually via Internet-based meeting platforms and/or telephone due to pandemic-related social distancing practices.

Some outreach events were conducted in person when some restrictions were lifted, but materials were still also offered in a virtual format to expand the reach of the events and to allow any member of the public who still wished to join virtually. An array of available avenues and software/hardware platforms was used to ensure

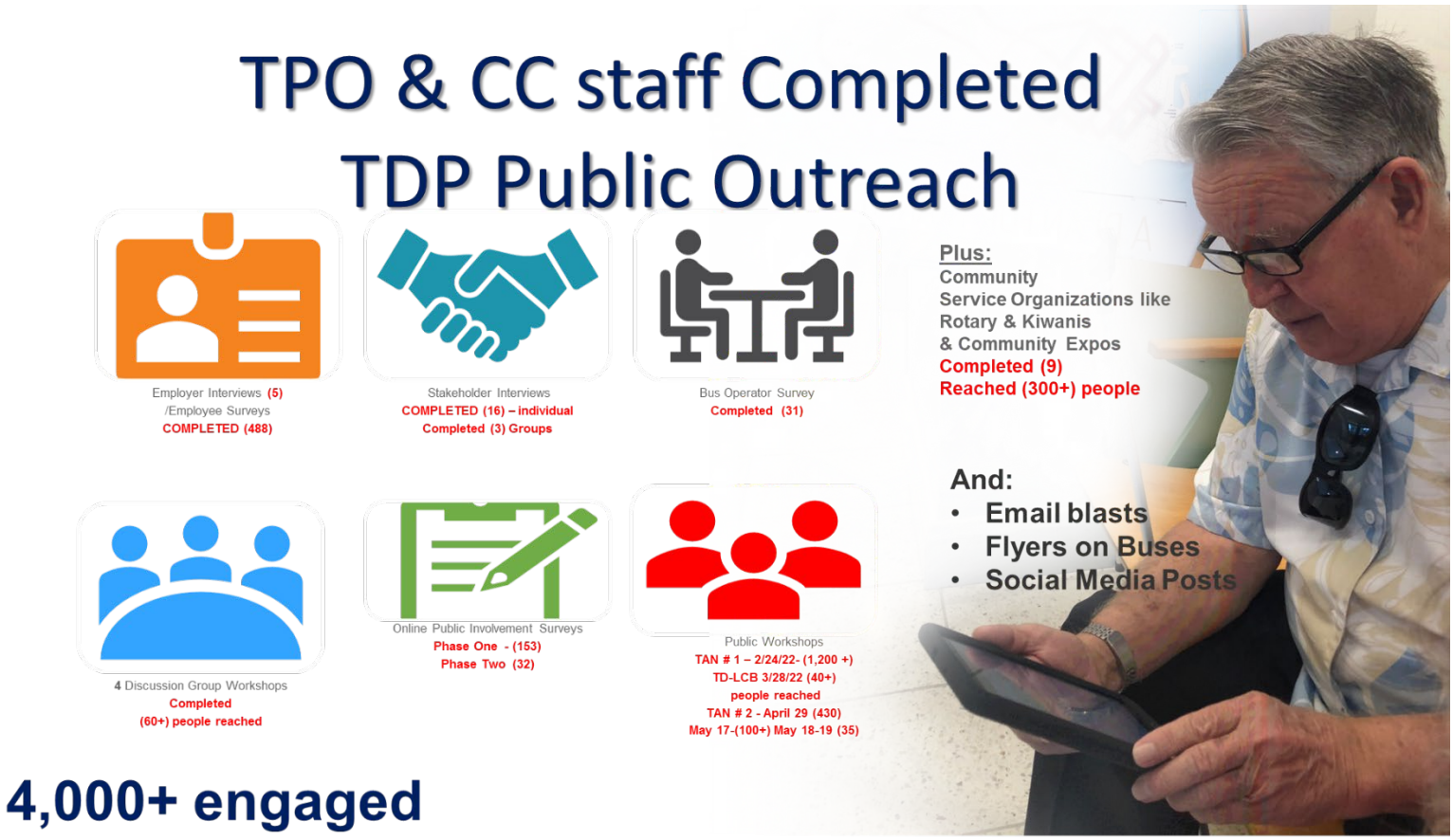
safe, easy, and equitable methods for reaching the public and obtaining their feedback.

Summary of Public Involvement Activities

The public involvement activities for the TDP major update were selected to ensure that adequate opportunities would be available for Citrus Connection riders, community stakeholders, and the general public to actively participate in the plan development process.

Figure 4-1 shows a summary of overall outreach efforts for the 10-year TDP. Thereafter, each outreach activity is summarized, including key findings from each.

Figure 4-1: TDP Public Involvement Summary



Project Review Committee Meetings

As project coordination is critical for a well-developed TDP, a Project Review Committee (PRC) was established by the TPO for necessary oversight and quality control throughout the TDP. The PRC included representatives from Citrus Connection, FDOT District 1, Polk TPO, and CareerSource Polk, the workforce development board for Polk County. Key coordination activities completed include the following:

- **Project Kick-off Meeting** – On November 8, 2021, a virtual meeting was held with the PRC to discuss TDP goals and objectives, review project tasks and deliverables, discuss public involvement strategies, examine coordination with other local and regional planning efforts, and discuss the project schedule.
- **Progress Meetings** – Multiple PRC meetings were held from November 2021 to May 2022, and other meetings were held to review and discuss the TDP progress and obtain input and direction form the PRC. These meetings, which included discussions about key findings from data analyses and public outreach, were followed by a discussion to help identify 10-Year TDP needs.
- **Coordination Calls & Emails** – The project team also coordinated with PRC members often to update them on the TDP and share material through phone calls and emails throughout the project timeline.

Stakeholder Interviews

Understanding local conditions is an important part of the TDP and should include knowledge of the perceptions and attitudes of community decision-makers and leaders towards transit and its role in the community. Stakeholders selected included members from Polk County government and 17 municipalities and from several other Boards. To obtain this information, 68 stakeholders were contacted for their choice of in-person, video call, or telephone interviews.

All interviews followed a similar format using an interview script developed with a list of questions and discussion topics. The questionnaire used to guide the stakeholder interviews is provided in Appendix F. A summary of stakeholder input and direction is summarized in the following sections.

Transit Today

In general, all stakeholders responded positively to Citrus Connection, expressing support for its role in the community.

- **Awareness** – Respondents indicated that Citrus Connection's role was important as a support service for the community but that there is a lack of awareness of the benefits that Citrus Connection provides and where it provides service. It was noted that the whole county should have a marketing and education campaign. Overall, respondents felt that a significant portion of people in the community knew about Citrus Connection but still may not know of all its services; many respondents noted that "people who use it, know about it."
- **Perception** – Although it was agreed that there was a lack of the awareness of transit's benefits, all respondents had positive comments about Citrus Connection's role and perception in the community. Some respondents felt that the community viewed Polk as a service for those who do not have access to a car. Although Citrus Connection is committed to serving everyone in the community, it is still not seen as a service for people who have a choice between driving and riding transit. Additionally, due to lack of education about the transit services, people worried about the convenience and dependability of Citrus Connection. Many stakeholders mentioned that they had traveled to other cities with robust transit systems and found them easy to use and that they had had good experiences traveling this way.
- **Accessible information** – Respondents who knew about the existing MyStop app felt it is a great tool that helps riders anticipate their bus arriving and helps with trip planning, but it was mentioned by most that the resource may not be well-known. Additionally, there was concern that those without access to smartphones or the Internet would not know how to access the system and that there should be printed information pamphlets available. Some respondents also suggested including Citrus Connection information in local publications and circulars from social service agencies.
- **Responsiveness** – Most respondents commented positively on the reputation of Citrus Connection regarding its responsiveness to the community's transit needs over the years, particularly in responding to community disasters or hurricane evacuations. Since the onset of the COVID-

19 pandemic, respondents felt that Citrus Connection had done an outstanding job responding by distributing masks and hand sanitizer.

- **Funding** – Overall, respondents felt funding was a barrier to expanding or enhancing services, improving frequency, and attracting "choice" riders. All believed that funding should be viewed as a community investment, and some believed that local funding for transit was insufficient at current levels. As the TDP process began, a County Commissioner floated the idea of a county-wide referendum on a penny sales tax for a set amount of time to support a defined list of transit projects.

Where Do We Want to Go?

- **Focus on core service and corridors** – There was consensus on the need for service to start earlier in the day and end later in the evening and for more frequent bus service, at least in the areas or corridors that have shown the need for it. The stakeholders expressed their appreciation for the services currently provided and would like to see more enhanced service with buses arriving at stops more frequently, which would lead to lower wait times and better total travel times that can be appealing to anyone, not just current riders.
- **Local collaboration and communication** – Respondents suggested greater collaboration and participation among municipal and County planning committees, community groups, and development agencies and developers, citing the importance to educate decision-makers on the benefits of transit. Additionally, respondents agreed that Citrus Connection should be more involved in the planning/development approval process, which would create a more cohesive community.
- **On-demand transit in less populated areas** – Implementing app-based MOD services in low-density areas/zones also was discussed. Some respondents thought that Citrus Connection should explore partnering with TNCs such as Uber/Lyft and similar providers to provide first/last-mile services.
- **Impacts of continued growth** – All respondents felt population increases and continued residential and commercial development in Polk County and the surrounding areas would continue to create congestion, which would impact the quality of life and drive a need for more transit services. It was

expressed that some of the higher-density developments and those that cater to older adults may need more services. Also identified was the need to coordinate transit capital needs with land development code requirements. Although it is already in place, stakeholders agreed that, depending on the type and size of the development, there could be a mechanism that requires developers to pay their fair share on transit bus stop infrastructure, thereby helping to increase transit access.

- **Funding** – Consensus was that more funding is needed; however, increasing property taxes may not be welcomed in the community, as there is an unwillingness to implement a penny sales tax, even for a fixed amount of time. Some stakeholders discussed the previous effort to increase the sales tax and lamented that it was a missed opportunity to enhance transit services. It was said that the support may not be there any longer. Some stakeholders suggested that municipalities that would like to have more transit access should contribute to the "Municipal Contribution Agreements," which Citrus Connection has in place with many municipalities. Most people interviewed felt that the existing fares are low or reasonable; stakeholders did not encourage fare increases, as it could discourage people from using the service and would be unhelpful to current riders.
- **Improved marketing and education** – All respondents commented on the need to develop more ways to market the service and educate the public on the many benefits of using the service. Although Citrus Connection currently engages the community and educates residents on the services available to them, stakeholders agreed that this program should be expanded, as it is important to let people know that Citrus Connection covers more than just the Lakeland area. A respondent commented on the opportunity to create a theme or catchphrase that is visible on buses, as those are most seen by the public. It was mentioned that buses and vans need to have a cohesive paint scheme and to eliminate use of wraps on WHAT and PCTS vehicles. Notable is that during development of this Major Update, the price of gas increased to above $4.00 per gallon and Citrus Connection ran a special marketing campaign to encourage transit use.
- **Improved infrastructure** – Stakeholders commented that accessible and enhanced bus stops would be great marketing tools for Citrus Connection, as it is difficult to see a bus stop pole and uncomfortable for older adults and

people with disabilities to wait at stops without benches. Some stakeholders noted that the new bus stops signs in the west, installed after *Re-Route 2020*, were hard to see. Also, it is difficult to reach the bus stops without nearby sidewalks, and some stops are adjacent to busy roadways. It was also noted that there was a need for more information about the availability of park-and-ride facilities and about them being an effective way to connect employers and outlying communities. Stakeholders suggested Citrus Connection should partner with local high schools or other higher education centers to use their facilities as park-and-ride locations. Additionally, some stakeholders suggested bus pull-outs to increase safety measures for passenger boarding and traffic safety.

How Do We Get There?

- **More frequent service** – Stakeholders identified improving frequency to help increase ridership as a key improvement for Citrus Connection for the next 10 years. Not only would this attract more discretionary riders, it would improve service for current users on popular routes. It was emphasized that increased frequency on existing routes is more important than adding new routes or service types.
- **Direct connections** – The idea of direct connections using smaller vehicles was discussed by some stakeholders. Some also felt there was an opportunity to tailor services to show local character and goals and that residents may use the service more if it directly connects them to local destinations such as Tampa International Airport, Orlando International Airport, and Disney World attractions.
- **More service and service span expansion** – All respondents agreed that there was a need to provide more service, including increased night, Saturday, and Sunday service.
- **New premium service types** – Some respondents agreed that there is a need for premium services such as Bus Rapid Transit (BRT) and rail, perhaps on US-98 from Lakeland to Bartow and along the US-27 corridor from the north County line to Sebring, and these should be a future goal for transit. An extension of SunRail from Poinciana was suggested, as was a Brightline stop along the I-4 corridor when it is extended to Tampa.

- **Special events** – Most agreed that using buses for special events is a good way to promote transit. Stakeholders felt that Citrus Connection should participate in and assist more with responding to special events to address congestion and parking, increase attendance, and connect popular destinations.
- **Enhanced infrastructure and technology** – Several respondents believed Citrus Connection should research investing in alternative fuel buses and autonomous vehicles when their fleet needs replacement.
- **Regional transit** – There was consensus on the need to be proactive and facilitate more connections regionally, especially by connecting with SunRail.

Changes and Vision

- **Need for community support** – Stakeholders indicated that Citrus Connection should continue to build support for transit, engaging decision-makers and the development community to accommodate future transit services. It was repeatedly noted how helpful and vital Citrus Connection can be when there is a major storm approaching to connect people to shelters.
- **Technology** – It was suggested that Citrus Connection should work to embrace more technology advancements with deployments of autonomous and connected vehicles. Stakeholders indicated that this would help make the service more efficient and potentially attract more riders.
- **Ongoing COVID-19 pandemic response** – All respondents agreed that Citrus Connection was doing a great job keeping the community safe while providing service and should continue to enforce social distancing, mask-wearing, and sanitization efforts.

Employer Interviews

Incorporating feedback and input on public transportation options available to local employers and their employees was a key component of the TDP public involvement effort. Employers were asked to participate to better understand their corporate commuting policies and employee habits, with particular attention paid to their use of transit. Efforts were made to contact the top 10 employers for interviews. In addition, Citrus Connection and FDOT District 1 also participated. TPO staff conducted interviews with the following:

- Polk County School Board
- Lakeland Regional Healthcare
- Citrus Connection
- Polk County Board of County Commissioners
- Advent Health

Key highlights of the employer interviews are summarized below. The guide used for employer interviews is provided in Appendix F.

Employer Interview Highlights

- There was a positive perception of Citrus Connection.
- Most employers had more than one location.
- All employers reported approximately 40–1,500 daily visitors who arrive mostly using a mode other than transit.
- Most employers agreed that Citrus Connection hours are limited and do not match with employee hours.
- Some employers mentioned that when hiring non-U.S. workers, many do not arrive with transportation.
- Some employers had limited knowledge or awareness of stops near them or routes that serve them and agreed there was a need for more routes. Other improvements mentioned were increased frequency, increased access to schools, and expanded hours.
- Most employers said there was high employee interest in alternative transportation modes, with some suggesting rideshare options or walking.
- If employers had not heard about UAP or commuter assistance programs, they were interested in more information.
- Most employers said they did not have enough on-site parking; a small number of their employees work from home.

Discussion Group Workshops

Another outreach activity conducted was discussion group workshops in which smaller groups representing key focus areas for transit were invited to discuss transit-related topics. These discussion group workshops served as a virtual roundtable in which all participants took part in assessing existing services and

determining future transit needs using questions to motivate and inspire conversation about the transit development process. Potential participants were contacted via email and phone to invite them to the discussions.

The smaller group framework with guided discussions increased participant interest and engagement on key topics important for Citrus Connection. Due to COVID-19 restrictions, some were held virtually or in a hybrid format. Materials and guides to engage discussion groups are provided in Appendix F.

Bus Rider Discussion Group

The bus rider discussion group was conducted at the Lakeland Bus Terminal, at which all west routes converge, on January 20, 2022, from 8:00–10:30 AM. Passengers were engaged by TPO staff to obtain comments and/or fill out surveys. The following is a summary of the input received.

Transit Today

- **Awareness** – Respondents stated that there was some awareness in the community and that awareness of transit, particularly Citrus Connection, has somewhat increased in recent years. Participants mentioned that there is potential for more public awareness and that Citrus Connection could set up a booth at festivals in the community to increase awareness of the service.
- **Perception of Citrus Connection** – When participants were asked about their perception of Citrus Connection's role in the community, participants indicated that the current service spans are incongruent with worker schedules. Participants agreed the service needs to run earlier and later, preferably 24/7. Other participants stated that there is a need for more service on Sundays.
- **Communication** – Participants noted that Citrus Connection was responsive to their needs and asked how their needs are communicated to the agency. It was mentioned that supervisors at terminals help distribute information, bus route maps, and some access Citrus Connection's website. Most passengers engaged had access to a cell phone or computers.
- **Information on transit** – Although participants believed that information on transit is readily available, they mentioned that bus stop signs on poles are not visible enough and need more information on which routes stop there. Also, times on bus stop signs need to be placed on the poles.

Where We Want to Go

- **Needed improvements** – Participants indicated improvements needed to include faster service, more frequent service, expanded service spans, more buses, more routes to other destinations, more comfortable waiting benches, additional infrastructure at bus stops, better design at the Lakeland Transfer Facility, more shade at bus stops, vending machines, lockers at bus stops, and Wi-Fi at terminals. Additionally, some participants mentioned safety issues at major transfer facilities, additional pedestrian access to stops, more bike lanes, additional connections to common locations (such as Bartow, Haines City, Poinciana, Mulberry, and Winter Haven), and accurate posted schedules. One participant mentioned that the bus leaves too early.
- **Need for faster connection to SunRail** – Participants stated that there is a need for faster connections to the SunRail station in Poinciana and for direct connections between Lakeland and Orlando.
- **Underserved and unserved areas** – Participants believed that there were areas not served or underserved by transit, including Bartow, Haines City, Winter Haven, and Mulberry.

How We Get There

- **Premium transit** – Participants agreed that there is a need for premium transit in the county for Lakeland to Bartow, Haines City, and Frostproof and for premium transit to Orlando/Kissimmee, Tampa, and Mulberry. Participants did not believe there is a need for premium transit on Florida Avenue in Lakeland.
- **Regional transportation and park and ride** – Participants believed there is a need for more regional transportation to connect Polk County with surrounding areas such as Tampa, Orlando, and Kissimmee. Participants also identified that more park-and-ride facilities are needed in Bartow, near malls, and near hospitals.
- **Vision for transit** – For the future, some participants mentioned that they would like additional amenities at terminals such as places to eat and better buses. Some also mentioned that they are not charging passengers enough.

Business & Education Discussion Group

Polk TPO invited 23 people to attend a virtual group discussion for representatives from business, education, and workforce development organizations to gauge their input on existing and future public transportation needs. The discussion was held in Polk County on March 1, 2022, from 10:00–11:30 AM.

Representatives from the following organizations participated:

- Northeast Polk Chamber of Commerce
- Central Florida Development Council
- Lakeland Symphony/Polk Arts Alliance
- Volunteers in Service to the Elderly (VISTE)
- IFAS Extension
- Citrus Connection

After a presentation on transit needs and vision, attendees participated in a guided discussion. Input received and needs identified from workshop attendees include the following.

Transit Today

- **Citrus Connection services are needed** – Overall, participants perceived Citrus Connection as an important community service that has become a convenient way for many people to get to and from shopping destinations and work. It was also noted that Citrus Connection has a great reputation and that no complaints had been heard about the service for many years.
- **Awareness and responsiveness** – Although Citrus Connection has a good reputation in the community, participants said that the awareness is somewhat low. One participant mentioned that many employers were aware of a nearby bus stop but not how many of their employees use it. Additionally, many people in the community are unaware of ridership demographics and profiles. There was consensus among participants about how Citrus Connection is innovative, fiscally-responsible, and creative and involves various stakeholders. Participants agreed that it was very important for the community and appreciated Citrus Connection's responsiveness to community needs.
- **Accessibility** – Participants appreciated the efforts Citrus Connection has made to remain innovative. However, one issue was that although the bus

app is important, it is not very straightforward for older adults or those who are not technologically savvy. Another issue that was discussed is how difficult it may be for potential riders to get to the bus stops and use the transit service.

Where We Want to Go

- **Increased service supply** – Participants believed that the County should be actively discouraging sprawl, encouraging affordable housing, and making logical land use/zoning decisions. Many agreed that Citrus Connection should extend service hours, which could also serve as a worker retention strategy and a way to diversify the types of employment option for residents.
- **Regional connectivity** – Participants were supportive of MOD, and some mentioned how fixed routes are perceived as unproductive. Participants requested information regarding how Citrus Connection perceived Uber and Lyft and whether a partnership would be viable in the future.

How We Get There

- **Enhanced infrastructure** – Participants agreed that they would like to see more shaded shelters at some stops and suggested having themed shelters that align with the community or the individuals who would be using the stop i.e., medical theme, recreation theme, etc.
- **Supporting communities** – Participants acknowledged that transit advantages include creating relief for parking and congestion, which is especially important because many have seen and/or anticipate tremendous growth in northeast Polk County. One participant commented on how bordering counties are viewing this growth and development as an opportunity for worker housing for Orange and Volusia counties. Participants were aware of the increased need for local transit due to this growth and believe that better transit could be a way of keeping Polk County's talent in Polk County.
- **Funding** – Participants inquired about the potential for a sales tax referendum to be reconsidered and a gauge on the status of support by local officials. Participants see the need and value of supporting and investing in transit and mentioned that when funding is cut for other essential community services, there is typically pushback that follows, but that does

not seem to occur for transit. Some participants believe that the fare is too high and unaffordable for fixed routes and paratransit.

- **Marketing and education** – The participants also provided their ideas to increase awareness and better educate the community on available transit services. New or enhanced branding at stops was suggested. Participants agreed that there should be schedules posted at shelters and made available at key locations in addition to information available on a phone app for equitable access.

Health, Social Services, and Housing Agency Discussion Group

The discussion with health, social services, and housing agency representatives was also held on March 2, 2022, and included representatives from the following agencies:

- GiveWell Community Foundation
- School Board of Polk County
- Lakeland Regional Health
- Focus Group Florida Realty

Input from the group via a guided discussion was categorized into key areas of focus and is summarized below.

Transit Today

- **Critical need in the community** – Participants perceived Citrus Connection as a critical need in the community that provides transportation services in a large county with many rural and underserved areas. They view Citrus Connection as a lifeline for those that are most vulnerable in the communities to access healthcare service.
- **Perception** – Participants mentioned that people are aware of the services offered by Citrus Connection when they need to use them but that a crisis typically takes place beforehand. There is a stigma associated with transit in Polk County, and people are not current on updates to transit routes and stops.
- **Awareness** – Participants agreed that there was awareness of the service in the community, but there could be more done to ensure that people know specific information about the services and what is available near them. They indicated that many in the community do not know where bus stops are

located or where routes run. Participants believe there is a need to better educate and inform the community about services available.

- **User-friendly and easily accessible transit information** – Participants expressed that those who have never used public transit may find the route maps and scheduling intimidating and feel apprehensive to try transit as a result. All participants agreed that there needs to be more awareness about travel training and the bus tracking app that shows real-time information about fixed-route services. Furthermore, participants would like more outreach to social services, including marketing materials.

Where We Want to Go

- **Adding more service and emphasis on technological solutions** – Discussion around future needs revolved around the need for more service supply and easier access to information and documents. Travel training will be needed to educate the public on how to plan their routes on the fixed-route system and potentially how to use MOD to connect individuals from their homes to a fixed-route stop. Participants voiced their frustration with the increased growth and development in the county being funded but that transit to reach those areas is underfunded.
- **Funding** – Participants agreed that a bigger investment in transit in the county is needed but did not feel that it was a priority for all Polk County residents at this time. They agreed that although a sales tax would be the best path for more funding, it likely would not be supported by the majority of residents. One prevailing comment about the tax referendum was that many people did not support the referendum because they did not see the need for it.
- **More outreach and marketing** – Throughout the discussion, many agency representatives echoed that although Citrus Connection offers great services, many people find using it frustrating. Citrus Connection has great information but no good venue to distribute it. By connecting with social services, healthcare agencies, and other community partners during outreach, Citrus Connection could use these organizations to spread the word and hand out marketing materials so their clients know about the benefits and why they should use the service.

How We Get There

- **More service coverage** – Participants believed that there is a need for better scheduling so there is more time between pick-up and drop-off. They also noted a need for extended service times and for increased routes. Some participants mentioned diversifying fare media options and possibly incorporating annual passes for individuals.
- **More frequent service and rail** – Rail was viewed positively by these participants, who noted that if Citrus Connection provided rail as an option, people would use the service, but that first /last mile issues would need to be addressed.
- **New transit markets** – Participants mentioned that Citrus Connection has the potential to capture new riders from new residents but that, ultimately, more education is needed, as more people will need to know about stops in their areas, new stops and routes being implemented, fare prices, and programs offered. The transit system will need to be a viability for people to want to ride it as opposed to driving.

Planner Discussion Group

Polk TPO invited 31 people who were transportation, land-use, regional, and school planners to attend a discussion on March 3, 2022. Representatives from the following organizations participated:

- City of Winter Haven
- Polk County, Roads & Drainage Department
- Polk County Public Schools
- Central Florida Regional Planning Council
- City of Davenport
- Polk County Department of Land Development
- Central Florida Regional Planning Council
- Citrus Connection
- FDOT

Input from the group via guided discussion was categorized into key focus areas, as summarized below.

Transit Today

- **Critical need in the community** – Participants perceived Citrus Connection as a vital need in the community and mentioned how transit is essential for many, especially those who are economically-disadvantaged and may have no alternative for accessing services. However, participants felt that the community at large views Citrus Connection as a service used primarily by those that do not have access to a vehicle. They also agreed that the service needs more local support and more routes to entice ridership.
- **Awareness** – Participants agreed that there was awareness in the community but there seems to be a divide in opinions between local elected officials and the community. They indicated that many people in the community who may have moved from other states are aware of the public transit system but some patrons, both transplants and locals, desire increased routes.
- **User-friendly and easily-accessible transit information** – There was discussion praising the success of Citrus Connection's use of social media as a way to disperse information. Participants mentioned that when they make land-use decisions, they designate transit as a primary consideration. Many participants agreed that there is a need for County partnerships during the development process.

Where We Want to Go

- **Adding more service and emphasis on technological solutions** – There were discussions around acquiring right-of-way that would support small cities within the county. Participants mentioned one of the goals for the County in terms of transit is to add a transit center overlay, urban and rural routes, and better headways. Future needs revolved around the need for more service supply and implementing technology-based solutions such as MOD. Although better regular bus service was seen as the better option in denser areas, MOD was seen by the group as a better solution for other areas due to its efficiency and, as it may be curb-to-curb, a more convenient option mimicking the conveniences of paratransit services. Participants also noted that regional routes that are city-to-city within the county but also connectors to nearby cities outside Polk County, such as Orlando, would be a good and viable option.

- **More service coverage** – Participants agreed that there was more service supply needed in general but thought coverage around the county was most important. New residents that move from areas with robust transit have trouble transitioning to living in areas that do not have access to transit services. Although it was agreed that Citrus Connection does a good job serving the county, the group agreed that the service should focus on new developments, especially multi-family. Specific areas that need better service are the east-west Polk County connections; the north-south connections are adequate. It was agreed that Citrus Connection's services should always be evolving to match resident's needs.

How We Get There

- **Funding** – Participants agreed that there needs to be a bigger investment in transit in the county but did not feel that it was a priority for all Polk County residents at this time. They agreed that although a sales tax would be the best path for more funding and would allow tourists to help pay for services, it would probably not be supported by the majority of residents. However, due to the growth of Polk County and the problems associated with such growth, there may be a momentum towards a willingness to support a sales tax referendum in the near future.
- **More outreach and marketing** – Participants agreed that although Citrus Connection offers great services, its marketing could be more effective, and it will need to define objectives clearly. This includes deciding whether Citrus Connection desires to attract more transit-dependent riders or increase their choice rider percentage. Employers, employees, the economy, and the resiliency of the community all benefit when communities invest in transit.
- **Increased regional connections** – Regional connections mentioned that are needed include connections to Orlando/Orange County and Seminole County. Additionally, participants said that more connections to SunRail would give residents better access to recreational opportunities and is seen positively by job seekers as more practical than using buses and subsequently needing to transfer.

Phase I Public Workshops

Public Workshop #1: Virtual Community Forum

The first general public workshop was hosted on February 24, 2022, at 10:30 AM to identify transit needs and assess existing perceptions in the community. The key focus was to gain an understanding of participant views about using Citrus Connection and identifying what Polk County can do going forward to make transit a more viable travel alternative. This workshop was held virtually after input from PRC members and discussions with Polk County/Citrus Connection staff on the appropriate format and platform to engage the public during the ongoing COVID-19 pandemic.

Prior to the workshop, notices/flyers in English and Spanish announcing it were distributed using websites, social media, and email.

Prior to the live workshop, Polk County recorded Polk TPO and Citrus Connection staff interviewing each other while also showing a presentation, and footage of Citrus Connection facilities was added. On the day it aired, Polk TPO and Citrus Connection staff introduced the pre-recorded material live, then aired the recorded session. The workshop was streamed live to the Polk County Government's Facebook page and to PGTV. After the pre-recorded material, Polk TPO and Citrus Connection staff went live to respond to questions. It is confirmed there were at least 1,200 views on Facebook. For those who could not attend the live workshop, the entire recording was posted on the County's YouTube account, where it has been viewed over 100 times.

Public Workshop #2: Polk Transportation Disadvantaged Local Coordinating Board

Polk TPO staff held a second public workshop in conjunction with a regularly scheduled meeting of the Polk Transportation Disadvantaged Local Coordinating Board (TD LCB) on March 28, 2022. The Polk TD LCB is composed of representatives of constituents who use public transit. The workshop was conducted using a hybrid format; the meeting was live-streamed on PGTV and on a virtual public platform. The in-person meeting was held in a large room that provided sufficient physical room for participants to comfortably social-distance themselves. Of the 300 people invited, 20 people attended in-person and 20 people attended on the virtual platform.

The Polk TPO notified the public by posting legal ads in the local newspaper, and the meeting date was posted on the TPO's website, emails were sent out to the Board and interested parties announcing the event, and staff sent reminders to all participants. For TDP purposes, notices/flyers announcing the event were distributed using websites, social media, and email prior to the workshop. The agenda was distributed prior to the Board meeting and included a copy of the presentation and questions that would be asked.

After a presentation about Citrus Connection and the TDP, TPO staff asked Board members to engage in a discussion on their perceptions of transit services in the county and what is needed in the future. The discussion followed the TDP stakeholder interview guide; materials for this workshop are provided in Appendix F. Following are highlights from the workshop:

- **Awareness** – TD LCB members believed the biggest barrier to accessing community services is transportation. Additionally, participants believed that Citrus Connection needs to conduct more education and outreach about the different programs and that they do not have adequate support or an adequate supply of navigators. Some members stated that there was a need for more "boots on the ground," more information, and increased services for students, adults, and transit patrons with disabilities. Some participants inquired about marketing of the TD program and asked who the target community for marketing efforts was.
- **Strengths** – Participants noted that ridership shows that the service is working for the people who know about it and those who need it. In Lakeland, the LCB is seeing more participation by younger adults. Also, participants stated that riders feel confident about getting to medical appointments; one participant mentioned that transit does a great job getting people to shelters.
- **Weaknesses** – An issue mentioned was the difficulty that older adults face to get to bus stops to go to the grocery store or pharmacy or other essential places. Another weakness is the perception of door-to-door transit, as there is a mindset that it is only for persons with disabilities. When Elderpoint shut down, people did not want to share their financial information with Citrus Connection to sign up for TD service. An LCB member noted that Citrus Connection has a marketing team who speak to different groups; the

pandemic initially stopped the marketing and outreach team but it is now back to continuing its outreach efforts. One tool the Marketing Department is using is virtual platforms for events such as the Transit Summit. The Marketing Department plans to go into the community a few times each month to do outreach with stakeholders. Another item mentioned by CTC representatives is that paratransit must mirror the hours of service of fixed routes. The CTC does what it can for TD and ADA with the available funds they have; as funds grow, so will the system.

- **Additional service areas** – Participants mentioned new destinations that will need new connections, including the new VA Center and Downtown Lakeland. The new VA Center will have a clinic that provides primary care, mental health, lab, and some specialty services. It is anticipated to serve Polk County residents and to attract others from surrounding areas.
- **Additional service types** – In Downtown Lakeland, it was suggested that trollies or shuttles could be used to alleviate congestion. Rail, specifically SunRail, was mentioned as a service that could potentially alleviate traffic congestion. Although rail was seen as a positive, drawbacks such as time to build, funding to build and operate, and coordination were mentioned.
- **Environmentally-friendly services** – Transit should continue to help in reducing congestion and improve the environment. Participants agree that it helps by reducing car emissions.
- **New ridership markets** – Participants learned about the agreement Citrus Connection has to provide rides to high school students and agreed with expanding the program to middle schoolers as well.
- **Funding** – Participants agreed that if people knew the benefits of transit, they would support a tax for the services. Overall, it was acknowledged that more funding is needed, although participants indicated that fares should remain the same and that there should be special fares for veterans.
- **Marketing** – Participants believe that there is a need to enhance marketing efforts, specifically to older adult, minority, and/or low-income populations. It was acknowledged that different demographics may receive the message differently.

Phase I Surveys

Bus Operator Survey

Bus operators are essential to transit operations and are often on the frontlines interacting with transit patrons while also collaborating with administration. This places drivers in a particularly unique position to provide useful feedback based on experiences that have been reported to them by riders as well as their personal experiences as operators. Materials for the bus operator survey are provided in Appendix F.

Citrus Connection drivers were asked to select three of their top concerns from a list of top complaints riders may have voiced to operators. The top concerns reported were the following:

- Need for more frequent service
- Bus is late
- Buses do not go where they want

Other concerns that were indicated include:

- Bus stop is not clean
- Need for more bus shelters and benches
- Bus schedule too hard to understand
- Need for better sidewalk connections to bus stops
- Bus is not comfortable
- Fare is too high
- Safety/security concerns at bus stops and onboard

Additionally, respondents had the opportunity to write comments suggesting ways to improve Citrus Connection's transit service. Respondents indicated that there was a need for connections to other cities, particularly Tampa, Orlando, and Bartow. One respondent specified a need for express service to Tampa.

Respondents also mentioned the need for later bus service, extended to 8:00 PM through 12:00 AM.

When asked about what could be improved, respondents indicated that buses are not dependable, routes are too long, some areas are in need of stops, and there is a need for additional lighting at bus stops so drivers can see passengers.

Themes from driver survey responses include the following:

- **Undependable services** – Buses are not dependable and sometimes leaves passengers stranded. This was not unique to the fixed-route bus fleet but also to paratransit; drivers mentioned that it is occasionally late because of lack of drivers. As a result, drivers have noticed that those who use transit to get to work never use it to get back. Overall, it was agreed that there needs to be more service that connects to more places. It also was suggested to communicate better and more effectively with Citrus Connection riders.
- **Need for later service** – Some drivers reported that later service was needed by those who work late, and later hours are should be implemented for the Lakeland terminal.
- **Increased frequency** – Drivers suggested improving the quality of service, as there is a need for increased frequency during peak hours and more connection points at more places between routes.
- **Quality of the fleet and stop infrastructure** – Common complaints were that the buses break down, as they are old and have many issues such as AC problems, a fare collection system that is broken for extended periods of time, and the need for ADA-compliant platforms to be placed along popular routes.
- **Driver shortage and driver pay** – Drivers expressed their dissatisfaction with low driver pay and that there is a need for Citrus Connection to pay drivers more, as drivers noted that it was difficult to survive on just one paycheck from Citrus Connection, noting that other companies, both entry-level and those that require a Class B license, pay more. The consensus was that the Citrus Connection pay is not competitive, so many drivers are looking elsewhere to companies that pay a competitive wage, a factor that is contributing to the driver shortage.

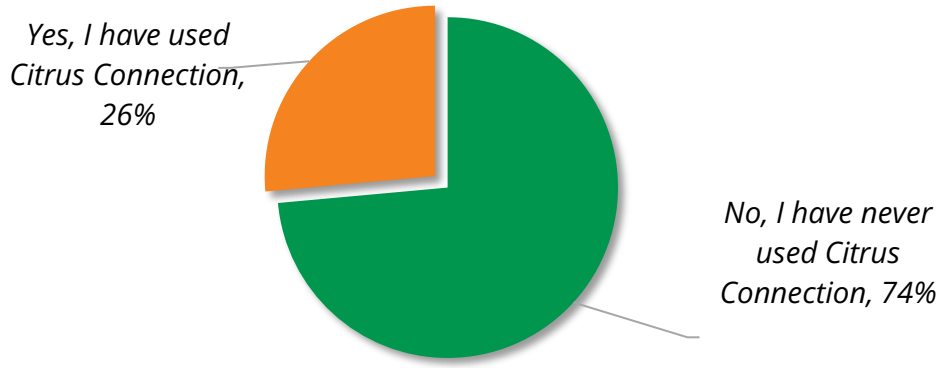
Public Input Survey

An online public input survey was conducted from February to March 2022, and was made available via social media, email, and the Polk TPO/Polk County websites. Due to social distancing requirements, promotion for this TDP survey were made via online platforms, email, and posted flyers. The survey was provided in English and Spanish and garnered 150 survey responses in English and 3 in Spanish. The survey instrument is included in Appendix F. Questions included in the survey helped gather opinions about travel behaviors and community transit needs and to obtain socio-demographic information of survey respondents.

Survey Findings Summary

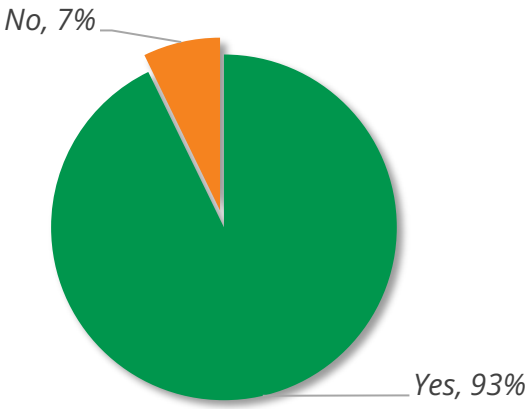
To accurately evaluate survey results, it is important to gauge the amount of awareness and consumption of transit services in Polk County. Figure 4-2 shows that only 26 percent had used Citrus Connection, but that although most respondents had not used the service, a majority (93%) agreed that there was a need for additional or improved transit services in Polk County (Figure 4-3).

Figure 4-2: Have you or a member of your household used Citrus Connection?



Note: Due to rounding, totals may not add up to 100%.

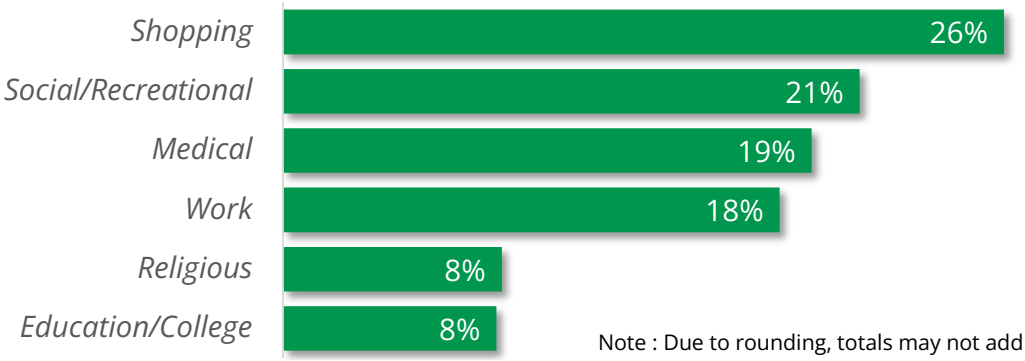
Figure 4-3: Do you think there is a need for additional or improved transit services in Polk County?



Note: Due to rounding, totals may not add up to 100%.

To assess whether service is meeting current or potential rider needs, respondents were asked to indicate where they go or where they would go if they were to use Citrus Connection services. As shown in Figure 4-4, the most popular answers selected were shopping (26%) and recreation (21%), followed by medical (19%), work (18%), social/religious purposes (8%) and education/college (8%).

Figure 4-4: If you use Citrus Connection services now or decide to use them in the future, where would you go using it?



Note : Due to rounding, totals may not add up to 100%.

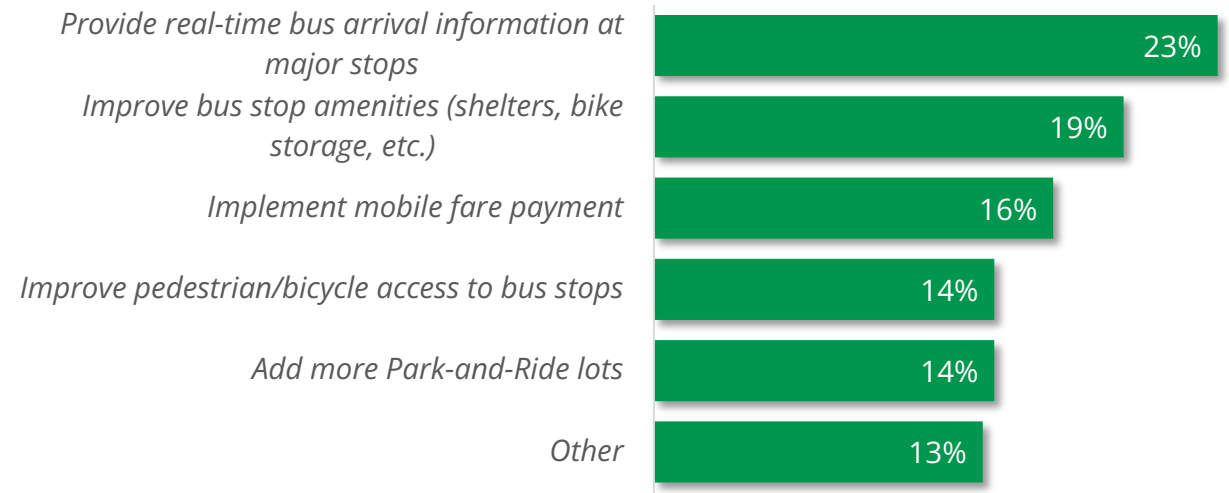
Note 2: Shopping-includes the necessities like food, medicine, but, could also mean the social/recreational activity of shopping. And, the Social/Recreational activity includes trips from Polk to the major airports in either Tampa or Orlando, or to go to Disney Parks.

The provision of user-friendly public transit enhancements is important for making service accessible and convenient to riders in Polk County. Infrastructure and technology improvements will help create a better experience for existing riders and may help make Citrus Connection an attractive transportation option for those

who do not currently use the service. As shown in Figure 4-5, the most popular improvement was real-time bus arrival information at bus stops (23%). Other popular options selected were improvements to bus stop amenities (19%) and mobile fare payment options (16%). Additional support was shown for improved bicycle and pedestrian access (14%) and for park-and-ride facilities (14%).

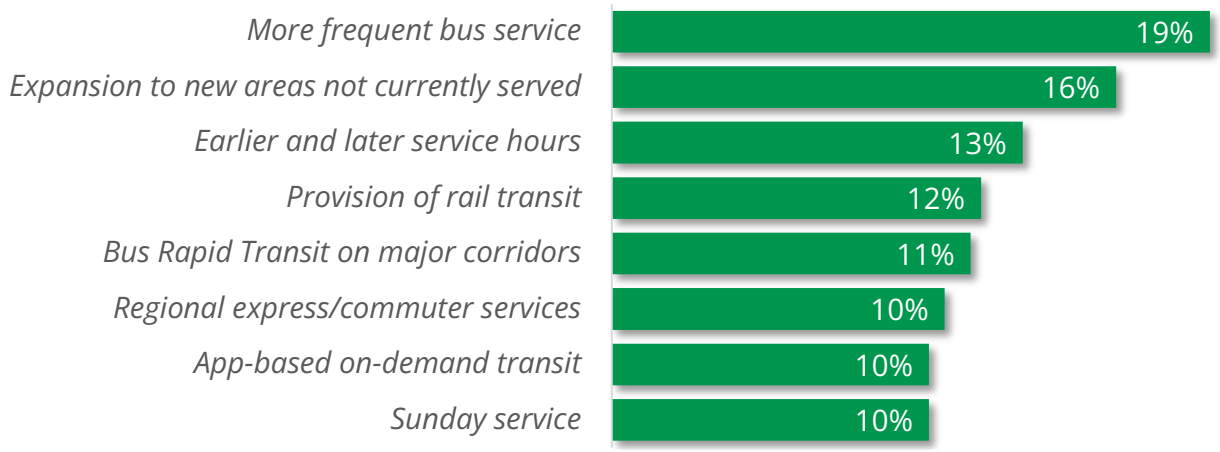
Respondents were asked to select the improvements that Polk County should prioritize over the next 10 years. Figure 4-6 shows the top three selected improvements were more frequent bus service (19%), expanded service into new areas (16%), and more early/late service (13%), indicating that respondents would like more service supply. Premium options such as provision of rail transit (12%) and BRT services on major corridors (11%) also received attention. Regional express transit, application-based MOD, and Sunday service equally garnered the least amount of support (10% each).

Figure 4-5: What transit infrastructure/technology improvements should the County consider supporting in the next 10 years?



Note: Due to rounding, totals may not add up to 100%.

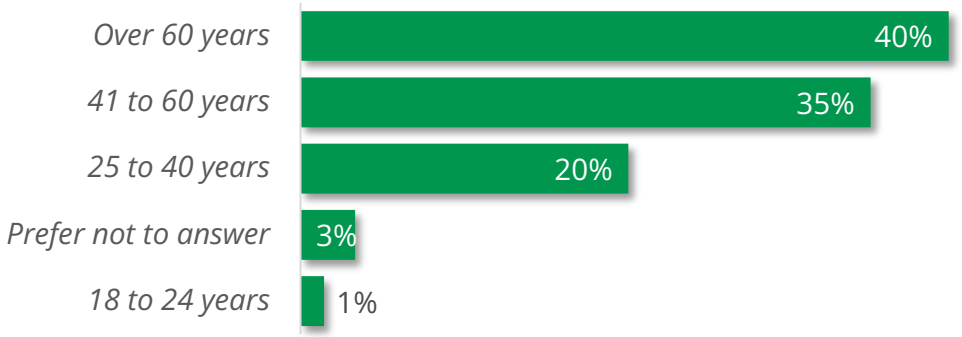
Figure 4-6: What should Polk County consider as priority public transit improvements over the next 10 years?



Note: Due to rounding, totals may not add up to 100%.

When asked about their age, just under half (40%) indicated that they were age 60 and older, approximately 35 percent said ages 41-60, and 20 percent said ages 25–40. The remainder were ages 18–24 (1%) or declined to answer (3%), as shown in Figure 4-7.

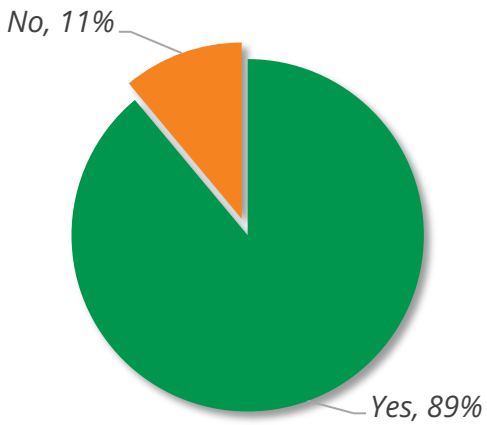
Figure 4-7: Age



Note: Due to rounding, totals may not add up to 100%.

Respondents were asked about access to a personal vehicle, as those without access to a personal vehicle may rely on transit services more due to limited mobility options. Figure 4-8 shows that the majority of respondents (89%) indicated that they have access to a vehicle; 11 percent said they did not.

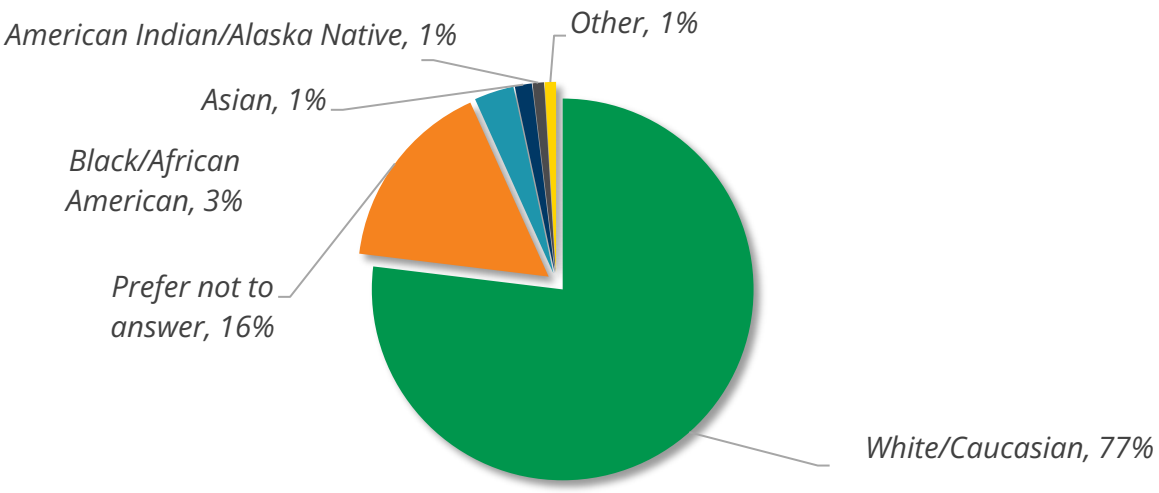
Figure 4-8: Vehicle Access



Note: Due to rounding, totals may not add up to 100%.

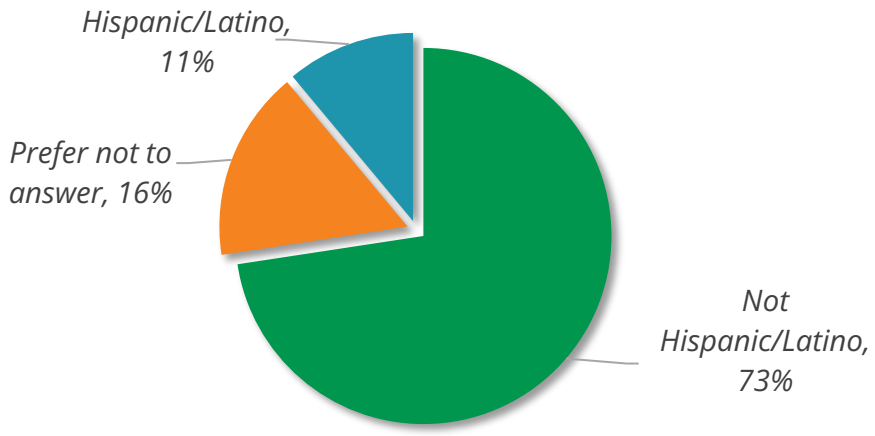
Survey respondents were asked about their race and ethnicity, as in Figure 4-9, which shows that approximately 77 percent of respondents identified as White. The remaining respondents indicated that they were either Black (3%), Other (1%), Asian (1%), or American Indian/Alaska Native (1%). The majority (73%) identified as Non-Hispanic, and 11 percent identified as Hispanic/Latino, as shown in Figure 4-10. Approximately 16 percent of respondents declined to indicate their identified race or ethnic origin.

Figure 4-9: Race



Note: Due to rounding, totals may not add up to 100%.

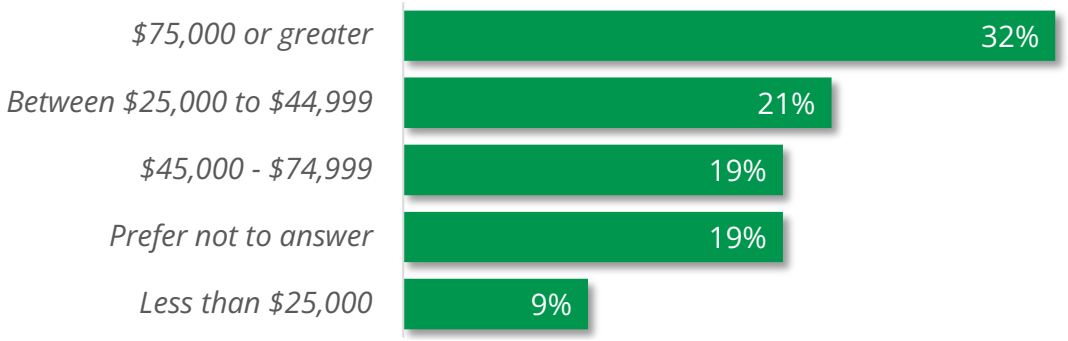
Figure 4-10: Ethnic Origin



Note: Due to rounding, totals may not add up to 100%.

As shown in Figure 4-11, approximately 32 percent of survey respondents indicated their annual household income level as $75,000 or greater. Other responses were $25,000–44,999 (21%), $45,000–74,999 (19%), and 9 percent indicated under $25,000.

Figure 4-11: Annual Household Income



Note: Due to rounding, totals may not add up to 100%.

Employee Survey

In February 2022, an employee survey was released to identified employers to gauge their awareness, commuting needs, and inclination towards transit. The survey was distributed to the following organizations:

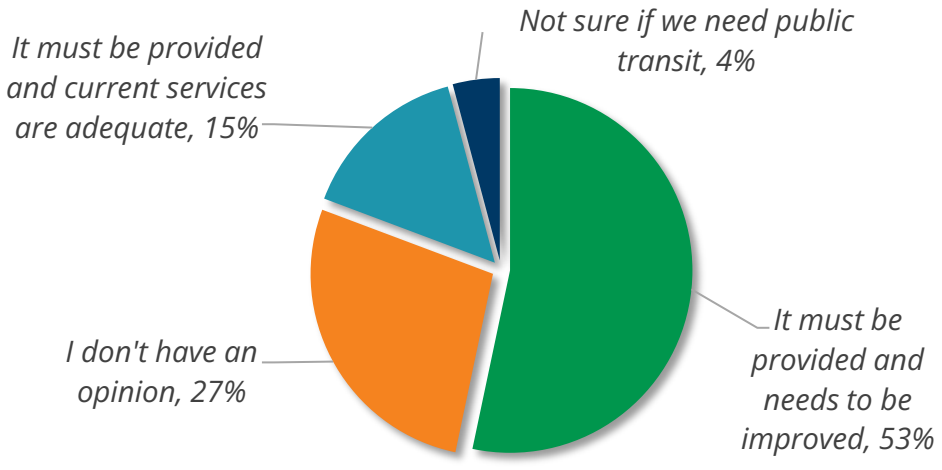
- Polk County School Board
- Lakeland Regional Hospital
- Citrus Connection
- Polk Board of County Commissioners
- The City of Lakeland
- FDOT District 1
- Advent Health

The employee survey instrument is provided in Appendix F.

Survey Findings Summary

Survey respondents were asked about their perception of transit services in Polk County. As shown in Figure 4-12, the majority answered that transit services must be provided and needs to improve (53%). Other respondents had no opinion of Polk County transit services (27%), and others felt that although transit services must be provided, the services are adequate as they are (15%). The remaining respondents indicated they were unsure if public transit was needed in Polk County (4%).

Figure 4-12: How do you view public transit services in Polk County?

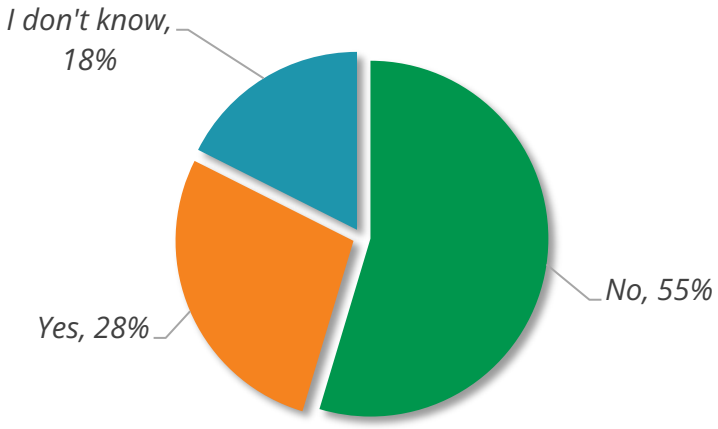


Note: Due to rounding, totals may not add up to 100%.

Respondents were asked about the distance of bus stops from their home, and if there was a bus stop within reasonable walking distance from where they live. It is important to gauge respondent accessibility to bus stops, as access to service may affect their propensity to use Citrus Connection.

Figure 4-13 shows that 55 percent of respondents indicated there was no bus stop within walking distance, and 28 percent indicated there was a bus stop available within walk distance. The remaining participants were unsure if there was a bus stop withing walking distance of their home (18%).

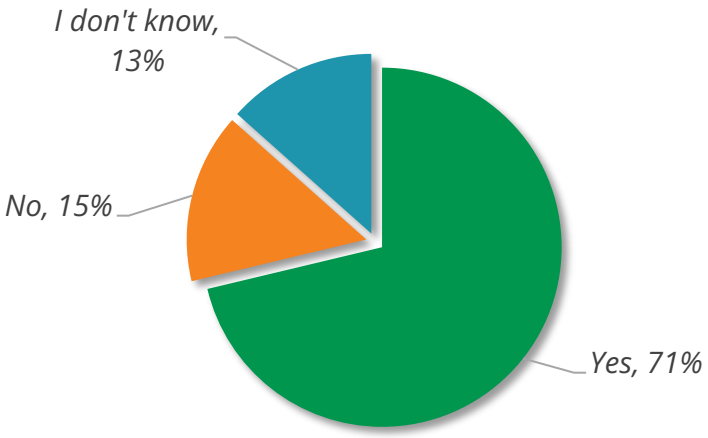
Figure 4-13: Is there a bus stop within walking distance of where you live?



Note: Due to rounding, totals may not add up to 100%.

Respondents were asked about the distance of bus stops from their workplace and if there was a bus stop within reasonable walking distance from where they work. As shown in Figure 4-14, the majority of participants indicated there was a bus stop within walking distance from their workplace (71%), and 15 percent indicated there were not. The remaining respondents were unsure if there was a bus stop within walking distance of their workplace (13%)

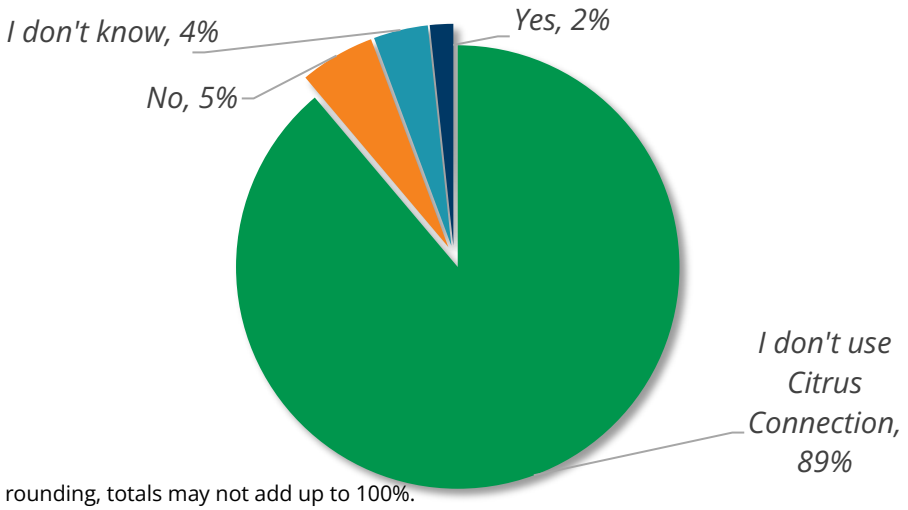
Figure 4-14: Is there bus stop within walking distance of your workplace?



Note: Due to rounding, totals may not add up to 100%.

To gain better understanding of respondent ridership and needs, respondents were asked if they use Citrus Connection for transportation. To identify demand from existing riders within Polk County, if they did use Citrus Connection, they were asked to indicate if the routes available fit their travel needs. Most (89%) indicated they did not use Citrus Connection services (Figure 4-15); approximately 5 percent used Citrus Connection but were unsure if the routes met their travel needs, 4 percent used Citrus Connection and felt the services did not meet their travel needs, and the remaining 2 percent indicated that they used Citrus Connection and felt as though the services do meet their travel needs.

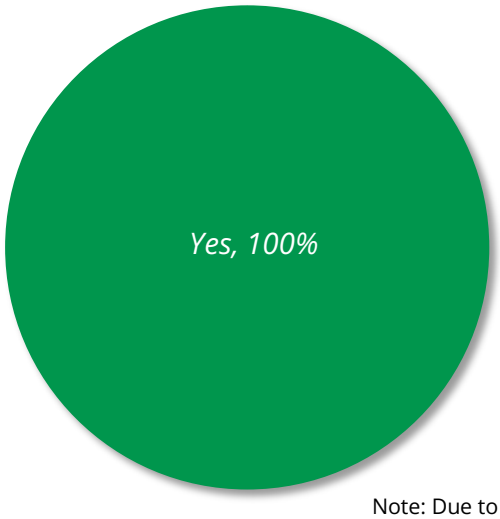
Figure 4-15: If you already use Citrus Connection, do the routes fit your travel needs?



Note: Due to rounding, totals may not add up to 100%.

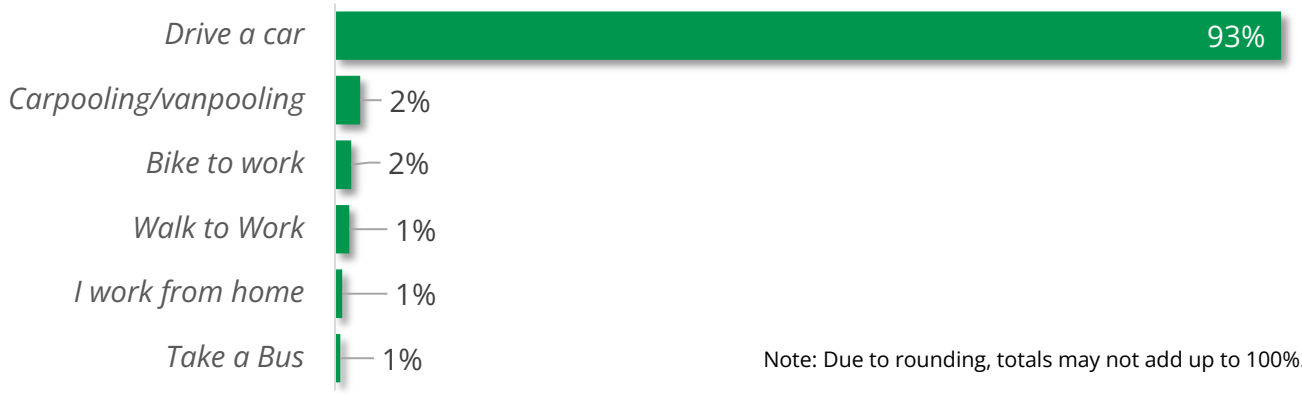
To gain a clearer understanding of respondent travel patterns to work, they were asked about access to a personal vehicle and to select the forms of transportation they use most often. All indicated that they had access to a vehicle (Figure 4-16), and 93 percent responded that they used it as their most common commute option. Carpool/vanpooling and biking to work were the second most popular (2% each), and taking the bus and walking to work each had 1 percent of responses, and 1 percent said they worked from home, as shown in Figure 4-17.

Figure 4-16: Do you have a vehicle you can use for your commute to/from work?



Note: Due to rounding, totals may not add up to 100%.

Figure 4-17: Which form(s)of transportation do you use most often to commute to work?

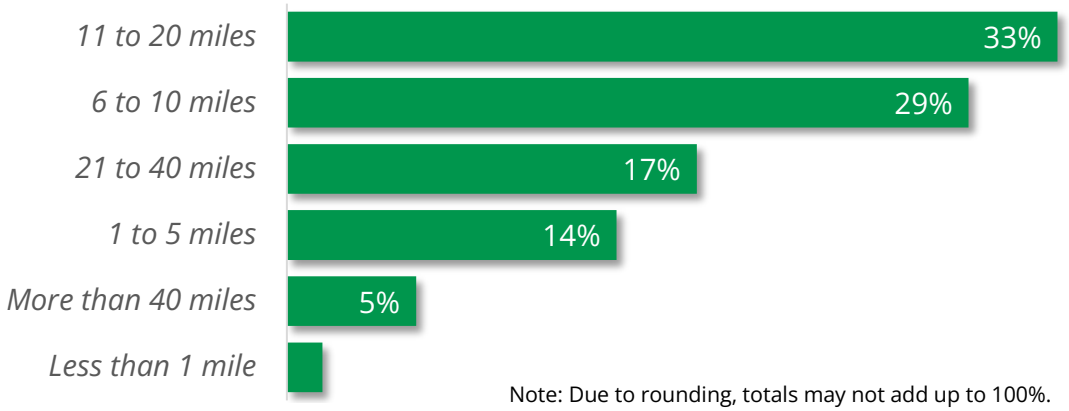


Note: Due to rounding, totals may not add up to 100%.

The distance of a work commute can hinder the use of alternative transportation methods. Respondents were asked to report the normal distance of their commute

to work. As shown in Figure 4-18, 11–20-mile commutes were the most common among participants (33%); other commute lengths were 6–10 miles (29%), 21–40 miles (17%), 1–5 miles (14%), more than 40 miles (5%) and less than 1 mile (2%).

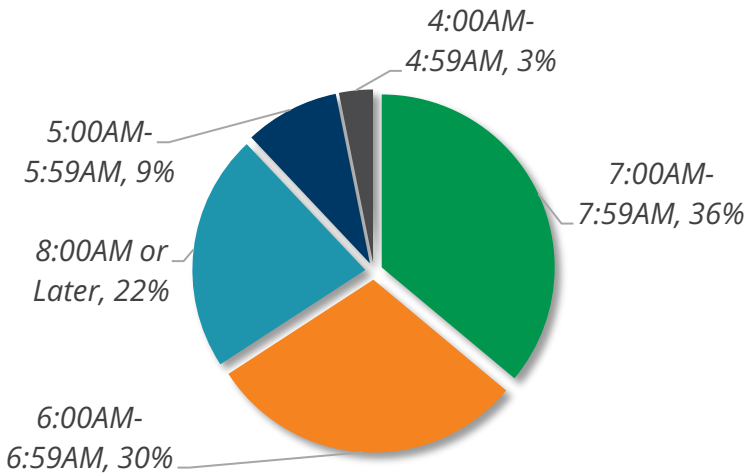
Figure 4-18: What is the distance your normally commute to work?



Note: Due to rounding, totals may not add up to 100%.

The time someone leaves for work impacts what services are available to them, what traffic levels they will experience on their journey, and how long their commute will take. Approximately 36 percent of respondents left for work at 7:00–8:00AM, 30 percent at 6:00–7:00 AM, 22 percent at 8:00 AM or later, 9 percent at 5:00–6:00 AM, and 4 percent at 4:00–5:00 AM (Figure 4-19).

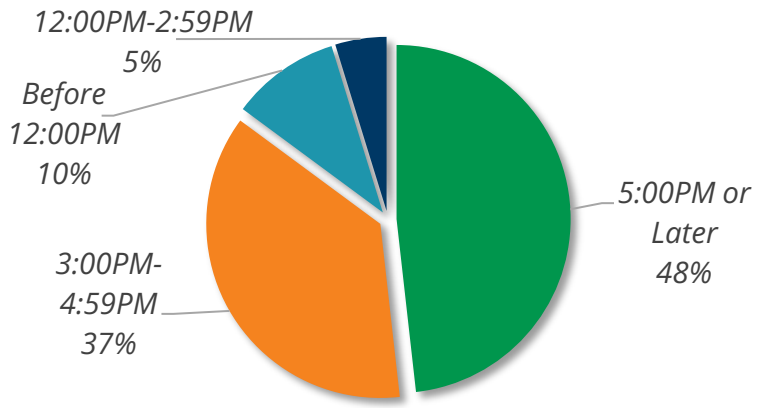
Figure 4-19: At what time do you normally leave home for work?



Note: Due to rounding, totals may not add up to 100%.

Similarly, the time someone leaves work can impact their commute. According to Figure 4-20, 48 percent of left work at 5:00 PM or later, 37 at 3:00–4:59 PM, 10 percent before 12:00 PM, and 5 percent at 12:00–2:59 PM.

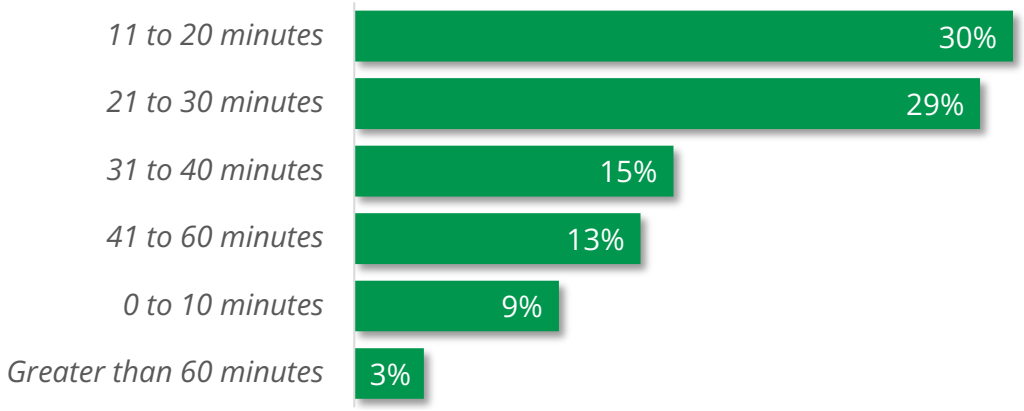
Figure 4-20: At what time do you normally leave work?



Note: Due to rounding, totals may not add up to 100%.

Respondents were asked how long it took, on average, to commute and from work. Approximately 30 percent of respondents indicated 11–20 minutes to commute, 29 percent said 21–30 minutes, 15 percent said 31–40 minutes, 9 percent said less than 10 minutes, and 3 percent said more than 60 minutes (Figure 4-21).

Figure 4-21: What is the average time it takes to commute to/from work?



Note: Due to rounding, totals may not add up to 100%.

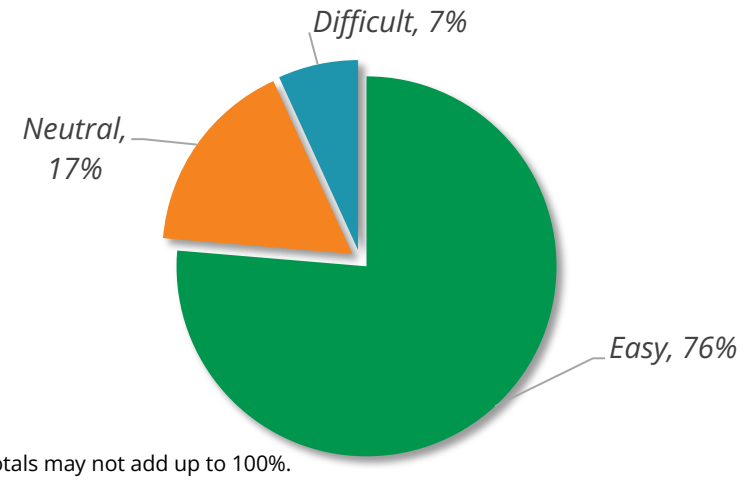
Respondents were asked about the challenge of parking that may come with commuting with a personal vehicle. Overall, 76 percent said parking was easy to find in their work location, 17 percent felt neutral about their parking situation, and the remaining 7 percent said it was difficult finding parking at work (Figure 4-22).

Respondents were asked to identify the greatest challenges in their current commutes (Figure 4-23). The largest share of responses indicated that the costs of gas, tolls, and car ownership was their greatest transportation challenge (30%);

additional common challenges were difficult routes and traffic (18%), distance and duration of commute (11%), and the absence of a bus stop near home (10%).

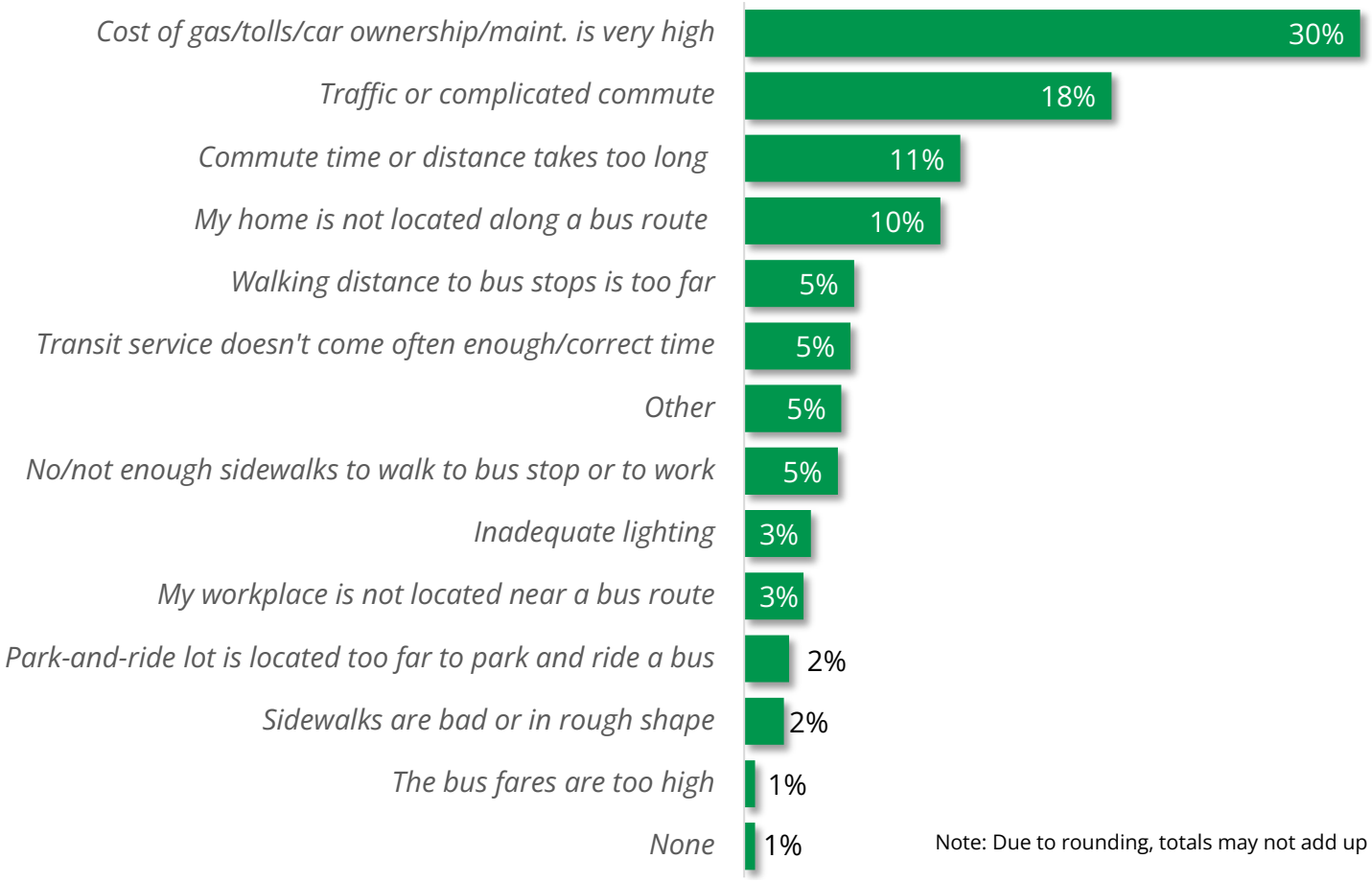
Other transportation challenges included walking distances to bus stops from participants homes (5%), infrequent transit services (5%), absence or lack of sidewalks to transit services (5%), inadequate lighting (3%), absence or distance to bus stops from place of work (3%), distances to park-and-ride facilities (2%), undesirable sidewalk conditions (2%), and the cost of bus fares being too high (2%). Only 1 percent indicated they faced no challenges in their current work commute.

Figure 4-22: How difficult is it to find a parking spot at your work location?



Note: Due to rounding, totals may not add up to 100%.

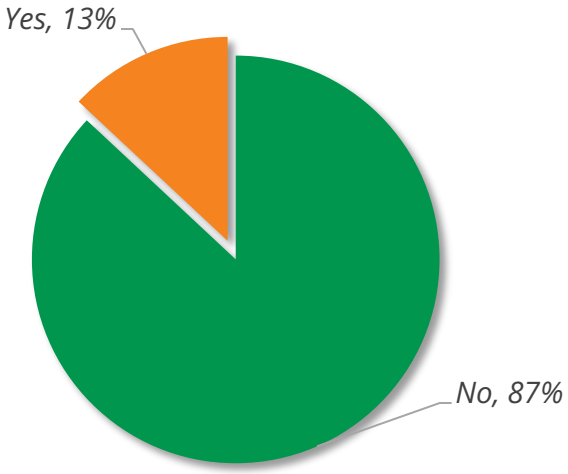
Figure 4-23: What are the greatest challenges or issues with your current commute?



Note: Due to rounding, totals may not add up to 100%.

Respondents were asked to indicate if they have ever needed to turn down a job opportunity or change jobs because transportation was too challenging. Approximately 87 percent said it had not influenced their employment opportunity, and 17 percent indicated that it did have effect (Figure 4-24).

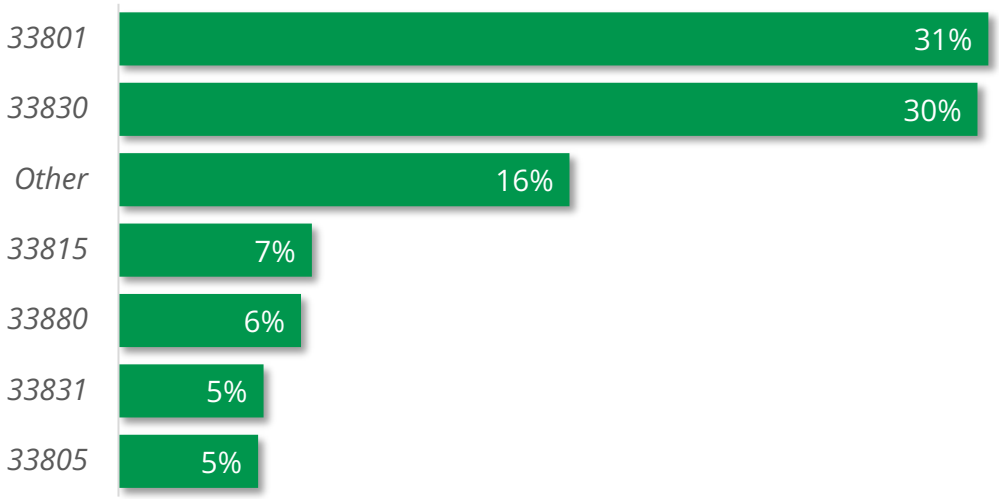
Figure 4-24: Have you ever had to turn down or change jobs because transportation to and from work was too difficult or because of these issues?



Note: Due to rounding, totals may not add up to 100%.

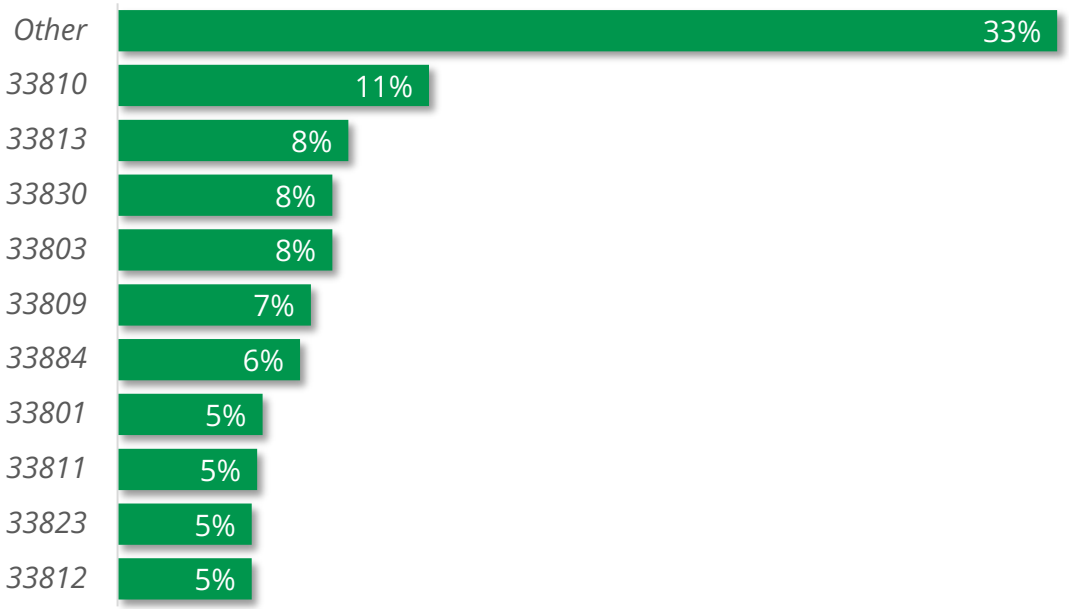
To understand more about where the needs of respondents may be specifically located, respondents were asked to provide their work and home ZIP codes, as shown in Figures 4-25 and Figure 4-26.

Figure 4-25: What is your work ZIP code?



Note: Due to rounding, totals may not add up to 100%.

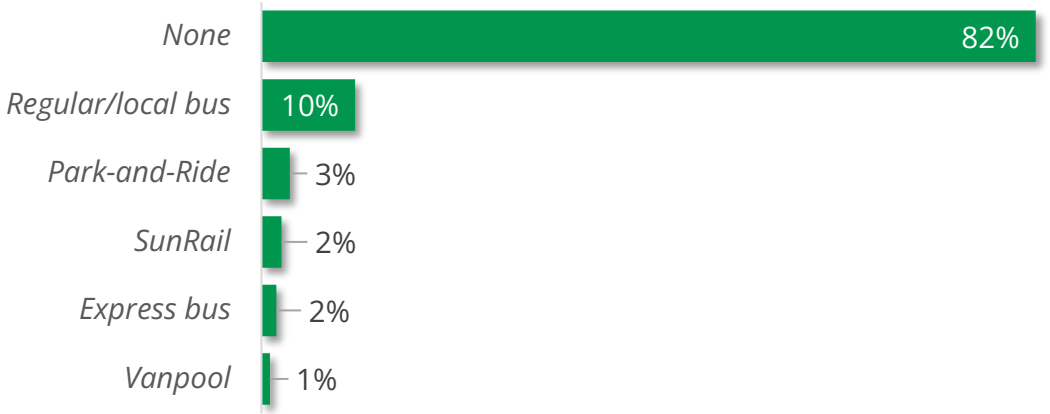
Figure 4-26: What is your home ZIP code?



Note: Due to rounding, totals may not add up to 100%.

To gauge the types of transit services participants8 had previously used for their work commute, they were asked which, if any, alternative transit services they had used. As shown in Figure 4-27, 82 percent of respondents had not previously used any of the listed services, 10 percent rode a regular or city bus for their work commute, 3 percent had used park-and-rides, 2 percent had used SunRail and Express bus services, and 1 percent had used vanpooling.

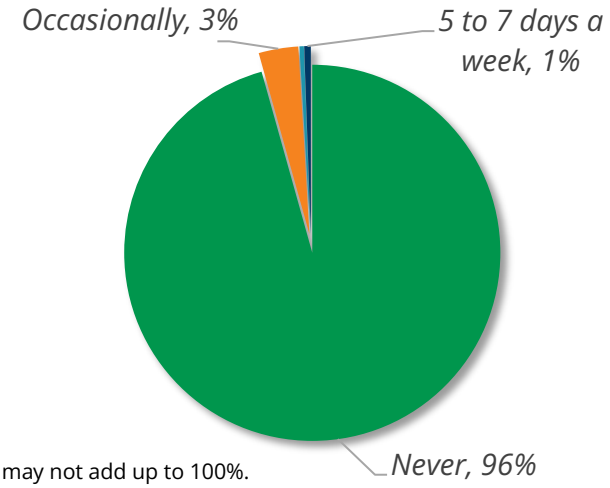
Figure 4-27: Have you ever used any of the following transit services for your commute?



Note: Due to rounding, totals may not add up to 100%.

To understand the number of Citrus Connection riders using the service for their work commute, the survey asked how often participants ride Citrus Connection for any portion of their work commute (Figure 4-28). The majority of respondents said they did not use Citrus Connection for their work commute (96%), and 3 percent indicated that they did so occasionally; only 1 percent indicated that they typically use Citrus Connection for their commute 5–7 days per week (1%).

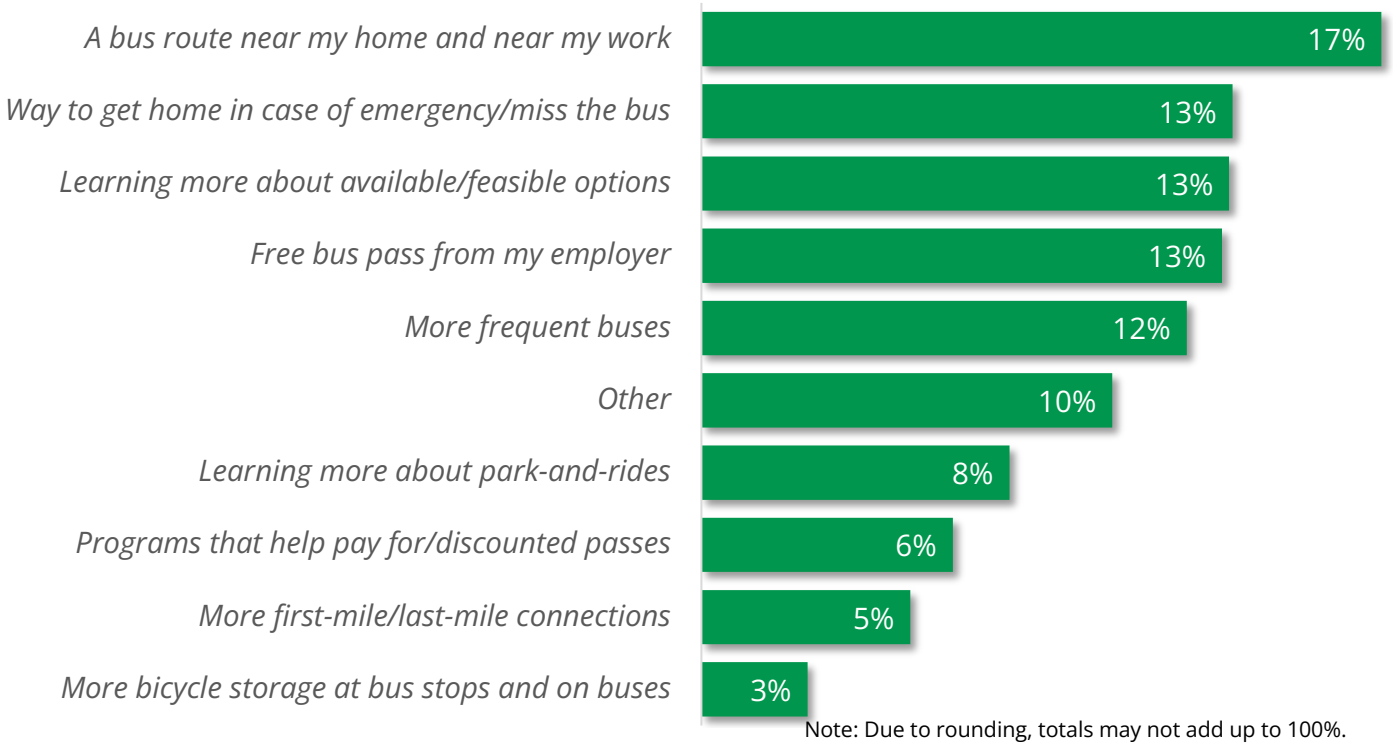
Figure 4-28: How often do you use Citrus Connection for all or part of your work commute?



Note: Due to rounding, totals may not add up to 100%.

Respondents were asked what enhancements or improvements could be made to existing public transit services that could encourage new or more frequent usage. The most popular enhancements indicated included the addition of bus routes near home and work locations (17%), a way to travel home in case of an emergency (13%), more education about bus stop location (13%), paid bus fares from employers (13%), and more frequent bus services (12%). Other less common choices were increased park-and-ride information (8%), additional fare assistance programs (6%), more first/last mile connections to bus stops (5%), and increased bicycle storage at bus stops (3%), as shown in Figure 4-29.

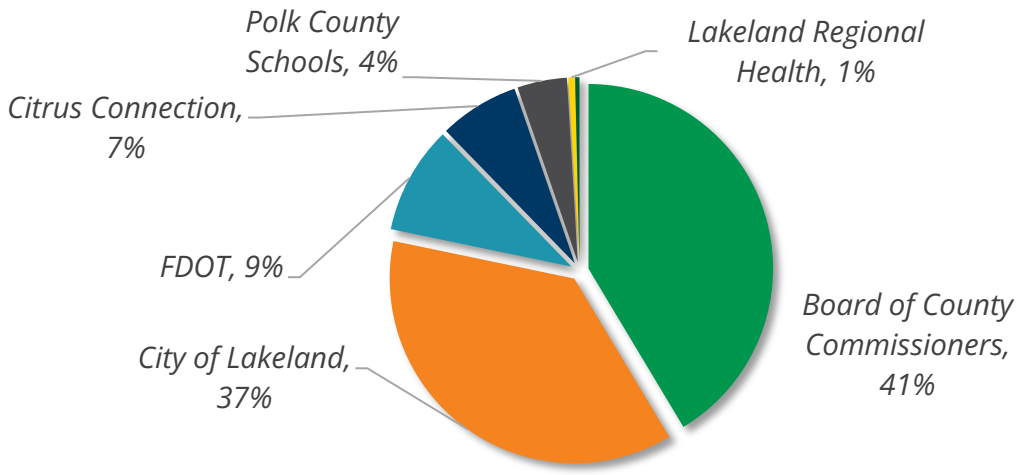
Figure 4-29: What improvements or assistance could encourage you to use transit as an option to get to and/or from work?



Note: Due to rounding, totals may not add up to 100%.

Respondents were asked to identify their employer, as shown in Figure 4-30. Approximately 41 percent report being employed by the Board of County Commissioners, 37 percent by the City of Lakeland, 9 percent by FDOT, 7 percent by Citrus Connection, 4 percent by Polk County Public Schools, and 1 percent by Lakeland Regional Health.

Figure 4-30: Employer



Note: Due to rounding, totals may not add up to 100%.

Phase II Public Workshops

In Spring 2022, the need to rely upon virtual outreach strategies was reassessed with staff, and it was deemed possible to conduct the second set of public workshops in person in addition to virtual efforts. On April 29, 2022, a virtual public workshop on Polk TPO's Transportation Advisory Network (TAN) was held with Citrus Connection. A shorter presentation with no script was used, and the public was updated on the work done on the TDP to date, the upcoming public Needs Plan survey, and the locations of the three remaining public events. The public workshop was pre-recorded then live streamed on Polk County Government Facebook page and PGTV. Workshop materials are provided in Appendix F.

On May 18, an in-person workshop at Citrus Connection's Board Room in Lakeland was conducted. During the meeting, poster boards with the current map, proposed map, needs assessment tools, and how to take the needs survey were displayed.

On May 19, an in-person workshop was held at the Winter Haven Bus Terminal at which staff used poster boards displaying the current map, proposed map, needs assessment tools, and how to take the needs survey.

Approximately 30 people attended these workshops and public comments received focused on concerns about current and future services.

Transit Priorities Survey

From May to June 2022, a second TDP survey was made available online to the general public to provide their input on the recommended transit priorities and alternatives. The survey was promoted on virtual platforms such as the Citrus Connection and Polk TPO websites, emails to stakeholders, and on social media. Additionally, it also was made available at two in-person public workshops and one community summit.

In total, 32 surveys were completed; a copy of the survey instrument is provided in Appendix F. Several questions were asked on the survey to determine support for potential service alternatives and capital improvements. Respondents were asked to indicate their agreement on an improvement from "disagree" to "strongly agree." The survey was presented with multiple display boards at the in-person workshops.

To accurately evaluate survey results, it is important to gauge the amount of awareness and consumption of transit services in the area. When respondents were asked if they or a member of their household used Citrus Connection, approximately 59 percent said they had used it, and 41 percent indicated that they had not (Figure 4-31).

Figure 4-31: Have you or member of your household used Citrus Connection?



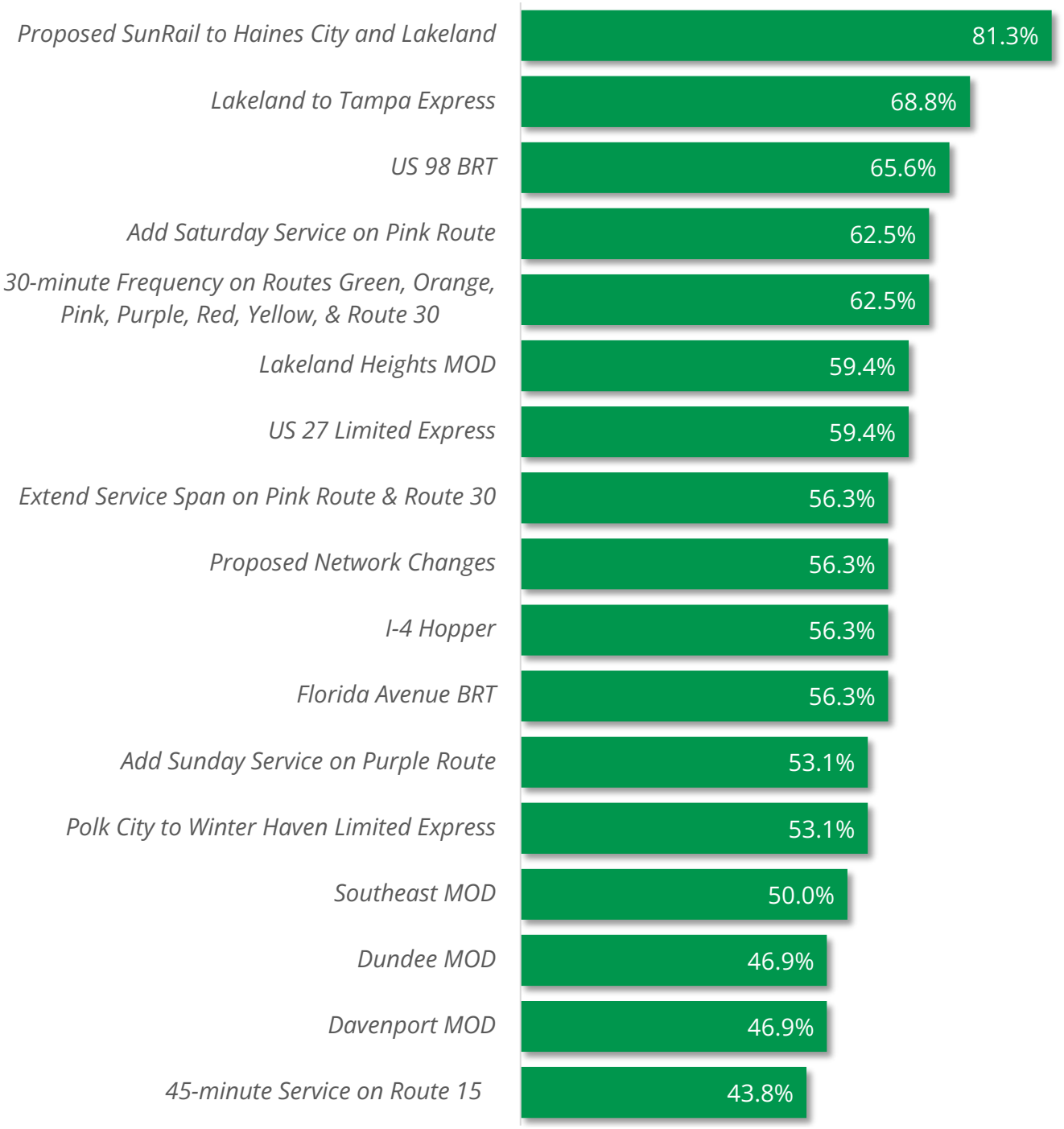
Note: Due to rounding, totals may not add up to 100%.

To rank the improvements, the percent of respondents who indicated they "strongly agree" with a service improvement was calculated. The top three most popular improvement strategies selected were the proposed SunRail to Haines City and Lakeland, Lakeland to Tampa Express, and the US-98 BRT (Figure 4-32). Transit

strategies that were regional connectors received the most support, as did premium transit options such as BRT and express routes.

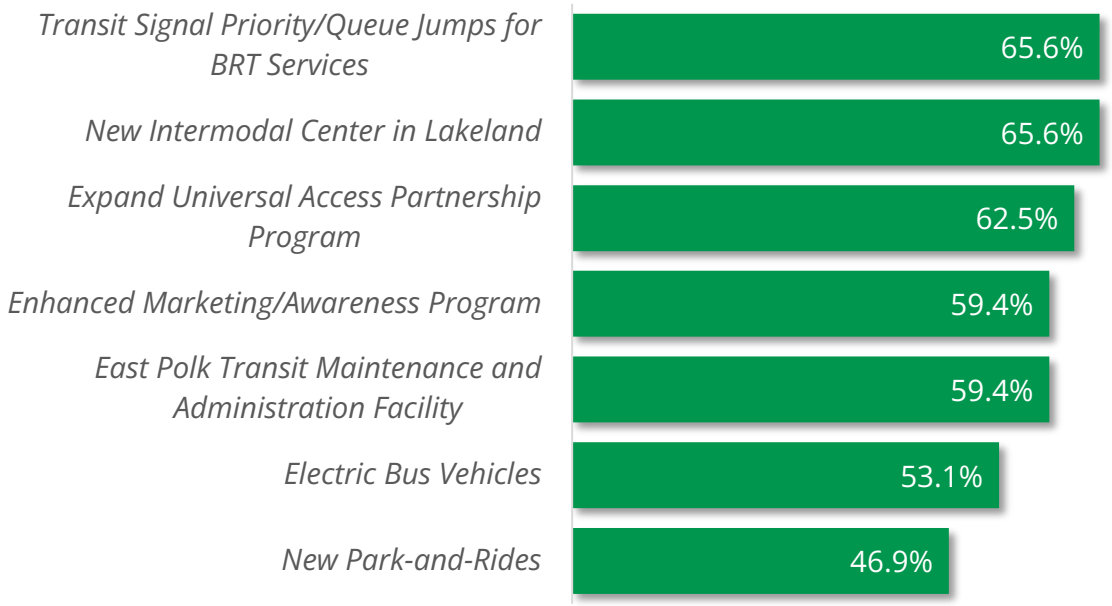
When asked also to prioritize capital improvements, Transit Signal Priority/Queue Jumps, the new intermodal center, and expanding the UAP program were the top three selections indicated. Other improvements such as enhancing marketing/awareness, the East Polk transit maintenance and administration facility, electric buses, and new park-and-rides were also received positively. Figure 4-33 shows the improvements ranked by favorability.

Figure 4-32: Transit Priorities Survey – Service Improvements Ranked by Favorability



Note: Due to rounding, totals may not add up to 100%.

Figure 4-33: Transit Priorities Survey – Capital Improvements Ranked by Favorability



Note: Due to rounding, totals may not add up to 100%.

Grassroots Outreach Events

In addition to the planned events, Citrus Connection, along with Polk County staff, participated in multiple other events. Polk TPO staff made presentations at community service organizations such Rotary and Kiwanis to provide information about the Polk TPO, Citrus Connection, and the TDP Process. Table 4-1 shows a summary of the outreach efforts.

Table 4-1: Presentations to Community Groups

Group	Date	#
Rath Senior Connections Center – (Lakeland Presbyterian Church)	Jan 11, 2022	10+
Polk TAC	Jan 27, 2022	20+
Polk Vision Food Insecurity Team	Jan 27, 2022	15+
HOA	Jan 2022	30
Polk Vision Operating Board	Feb 7, 2022	15
LAMTD Board	Feb 9, 2022	15
Polk TPO Board	Feb 10, 2022	20
Haines City Rotary Club – Lake Eva Event Center	Feb 23, 2022	15
Auburndale Rotary	Mar 1, 2022	15
LAMTD meeting	Mar 9, 2022	15
Kiwanis (Breakfast) in Lakeland	Mar 10, 2022	15
TPO booth with Land Use Planning at Career Fair	Mar 10, 2022	25
Community Senior Adult Health & Resource Fair	Mar 11, 2022	100+
Lakeland Rotary	Mar 22, 2022	50
Bartow Rotary	Mar 23, 2022	25
Citrus Connection Table at Lakeland “First Friday”	Feb-Mar 2022	100+
Citrus Connection / LAMTD Board Annual Retreat	Apr 26, 2022	20
Food Insecurity Summit – Bartow	May 17, 2022	100+
Total		**600+**

Hispanic Population Outreach Efforts

Polk TPO staff developed short public service announcements (PSAs) for “Que Pasa Polk,” and Polk TPO staff prepared a Virtual Community Forum/Take Our Survey flyer in English and Spanish. The public survey, the PSA, and applicable flyers were provided in Spanish and sent to all contacts. Polk TPO staff reached out to the

Puerto Rico Hispanic Chamber of Commerce and local Catholic churches with services in Spanish and asked them to distribute the surveys.

Websites/Email/Social Media Outreach

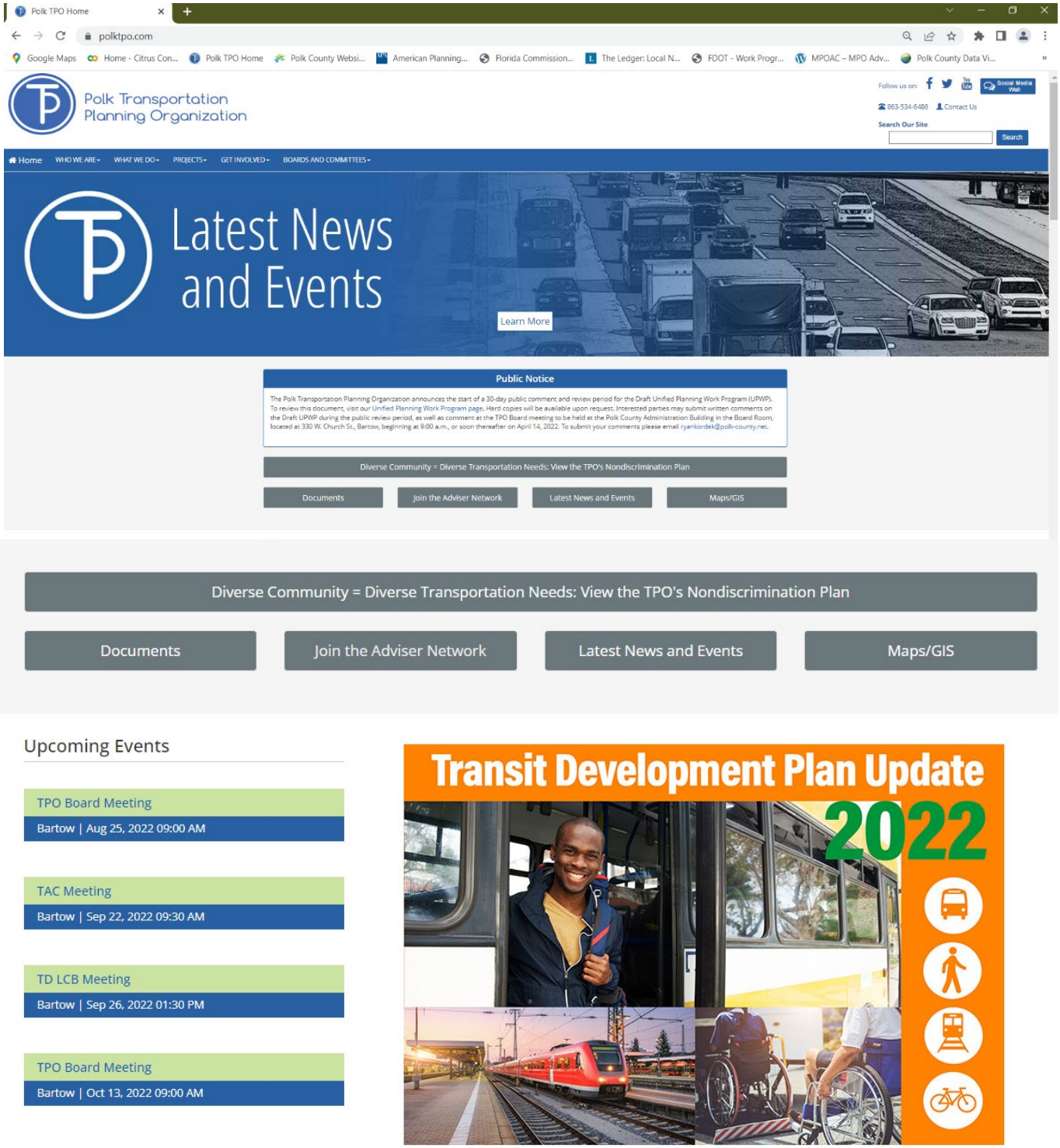
Several additional outreach methods were used to educate and inform the public of the TDP process and findings. The Citrus Connection and Polk TPO websites include information and links for those seeking information on the current stage of the study, process, surveys, and how to provide input or obtain more information. Emails were sent to stakeholders/riders/members of the general public to engage the community and seek opinions, ideas, and relevant information. Emails and reminders also were sent to promote upcoming workshops and provide links to complete the TDP survey. Available social media channels were used to inform and educate the public about TDP efforts and encourage participation in upcoming public workshops and to take the survey. The Polk TPO Facebook and Twitter pages also were used to encourage citizens to take the survey and attend the latest public workshops.

Websites

Citrus Connection operates and maintains a website that provides information on its transit services, which includes route information, fares, a bus locator tool, and other relevant information. The TDP is mentioned on the website.

The Polk TPO has a website to educate the public about its plans and projects. The TPO set up a website for the TDP; throughout the TDP public involvement process, the website included a page dedicated to keeping the public updated on the latest TDP outreach events and updates (Figure 4-34). Following both sets of public workshops, a recording of the presentation was posted on the Polk TPO website for the public to review to engage those that could not attend.

Figure 4-34: Polk TPO Website



Email

The Polk TPO sent out multiple emails and calendar invites to an email list of 300–400 people with information on the project surveys, upcoming workshops, save-the-date flyers, and follow-up flyers about the TDP to engage and encourage public participation. Project stakeholders and members from social service/health, business/economic, the Polk TPO Board and committees, and bus rider discussion groups were informed and regularly reminded about the events using email. Each transmitted email also encouraged those receiving it to forward it to redistribute the information.

Polk TPO's Transportation Advisory Network

The Polk TPO uses a Transportation Advisory Network (TAN) in place of the Polk TPO's Citizen Advisory Committee platform for the TPO. TPO staff select topics on a quarterly basis and conduct a forum to discuss the topic in detail. During the course of the TDP Major Update, the TPO made use of TAN and community forum processes on the following dates:

- September 2021 –Transit Summit (shared event with Citrus Connection),
- February 24, 2022 – "The Future of Public Transportation"
- April 29, 2022 – Virtual Community Forum, Polk TPO TAN event

The TAN listserv is managed by Polk County Communications and contains over 380 email contacts. The Communications Department sends out several "e-blasts" to this group for these events.

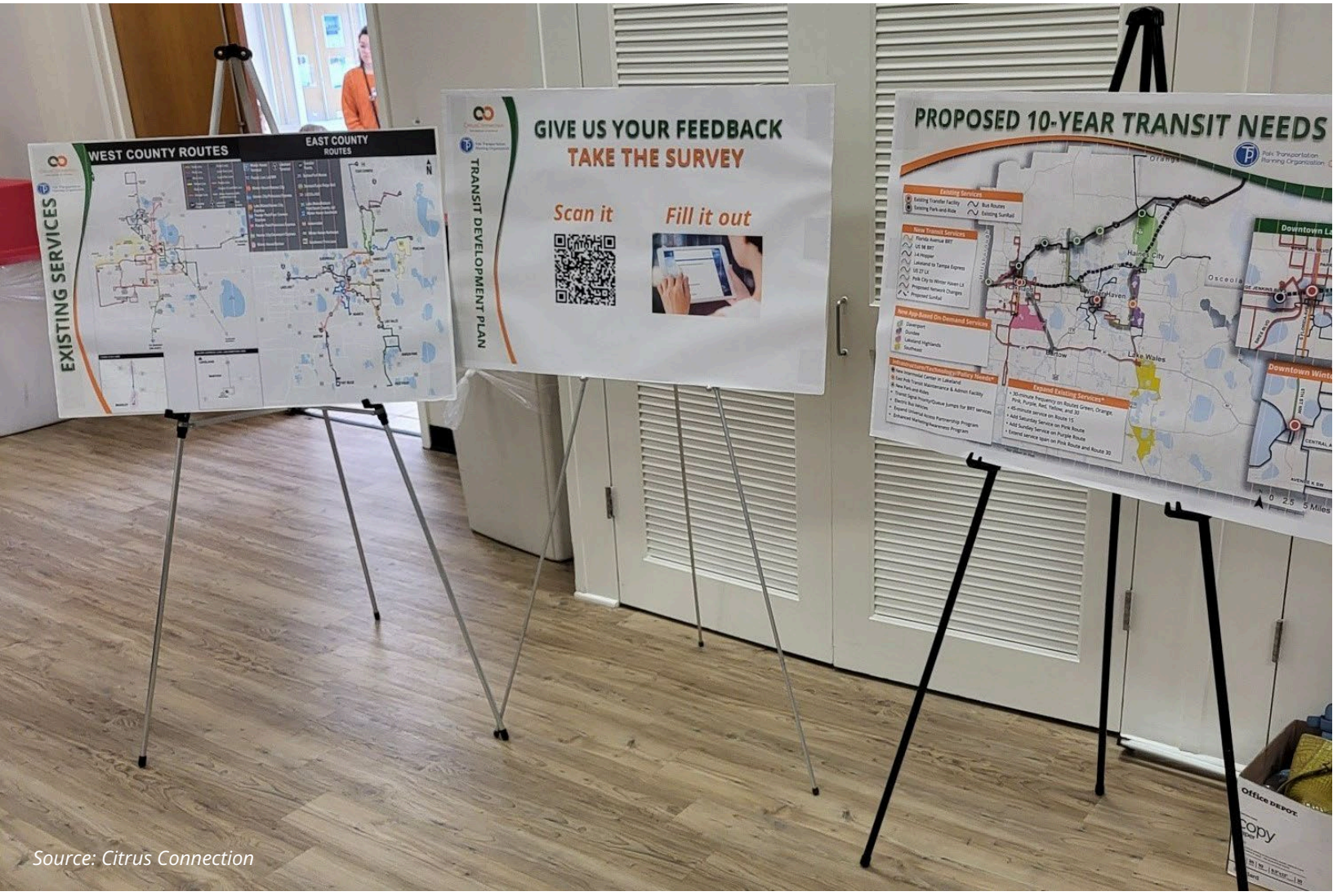
Polk Vision

Polk TPO staff work closely with Polk Vision for technical assistance with email lists and efforts to contact the major employers. The TPO provided flyers to Polk Vision, which distributed the information to its partners. Polk Vision provided the TPO with opportunities to make presentations about the TDP to its various boards and committees, including the Polk Vision Operating Board, the Polk Vision Infrastructure Team, and the Polk Vision Food Security Team, which held the Polk Hunger Summit on May 17, 2022.

Social Media

The Polk TPO has a Facebook page, as do Polk County Government and Citrus Connection. The TDP project team, in coordination with Polk TPO staff, used the

County and Polk TPO social media accounts, including Facebook, to promote the TDP and share information on outreach events. With multiple Facebook posts on the Polk TPO page as well as via other community/city channels, social media was used as a platform to allow the general public to engage in the process, especially during the ongoing pandemic.



Source: Citrus Connection

Section 5. Situation Appraisal

In addition to being a key requirement, conducting a Situation Appraisal that analyzes the factors within and external to a transit system helps a transit agency examine the strengths and weaknesses of the system, existing/potential challenges, and opportunities for the provision of its services. A review of the effects of land use, urban design efforts, socioeconomic trends, organizational issues, state and local transportation plans, other governmental actions and policies, and technology/innovation will allow the agency to determine how these issues impact the current provision of transit service and how the future of the transit system may be affected by any challenges that exist.

In addition, a review of Federal, State/regional, and local plans was conducted to develop an assessment of the planning environment for Citrus Connection. This assessment serves as a supplement for the formulation/update of the future goals and objectives for transit in Polk County. Figure 5-1 shows the topics included in the appraisal to help develop an understanding of the transit operating environment.

Figure 5-1: Situation Appraisal Overview



Plans and Policies Review

Many agencies and organizations conduct studies to produce plans and policies for addressing local and regional transportation issues and intermodalism that may impact Citrus Connection services. Various Federal and State plans and regulations also may impact the provision of transit services. This plans and policy review helps facilitate an understanding and supports the pursuit of existing goals while pursuing its own goal of creating a viable and accessible transit system.

Relevant transportation planning and programming documents are summarized, with an emphasis on issues having implications for Citrus Connection. Additionally, selected plans produced for the key municipalities within Polk County were reviewed to summarize and call attention to community goals, objectives, and policies that may have implications for current and future transit services.

The following plans and studies were reviewed to understand current transit policies and plans with potential implications for Citrus Connection:

- Momentum 2045 Long Range Transportation Plan
- Seminole Tribe of Florida Transit Study
- MyRide Transit Development Plan (2017–2026)
- Polk County Transportation Disadvantaged Service Plan
- Polk County Comprehensive Plan
- City of Bartow Comprehensive Plan
- City of Lakeland Comprehensive Plan
- City of Winter Haven Comprehensive Plan
- ACES Emerging Technology Study
- SunRail Extension Study
- Polk TPO Strategic Plan
- Polk TDP- 2021 Annual Progress Report (APR)
- Lakeland Area Alternatives Analysis- US 98 Bus Rapid Transit Feasibility Study
- Lakeland Intermodal Study
- East Polk Transit Maintenance Facility Siting Analysis
- Feasibility of Premium Transit
- Access to Transit
- State of Florida Transportation Disadvantaged 5-Year/20-Year Plan
- FDOT Complete Streets Implementation Update: Handbook and Design Manual

- Florida Transportation Plan (FTP)
- Bipartisan Infrastructure Bill
- Implications to Public Transportation of Emerging Technologies

These transportation planning and programming documents are summarized in Tables 5-1 and 5-2 by their geographic applicability, responsible agency, overview of the plan/program, and key considerations for the Situation Appraisal.



Table 5-1: Local Plans

Plan Title	Geographic Applicability	Most Recent Update	Responsible Agency	Plan/Program Overview	Key Considerations/Implications For TDP
Momentum 2045 Long Range Transportation Plan	Polk County	2021	Polk TPO	Represents Long Range Transportation Plan for Polk County through planning horizon year of 2045. Characterizes current and future transportation needs and highlights multimodal recommendations to address these needs.	Discusses and addresses congestion, an evolving road network, transit, coordination, and the possibility for increased transit demand. The identified transit needs include the following: • Anticipated projects including constructing a park-and-ride lot on N US-98, implementing "smart card" payment systems, and operating new buses. • Increase frequency, hours of service, and days of service on routes Gold, Pink, Green, Purple, Orange, Blue, Silver, Yellow, 22XW, 30, 40/44, and 50. • Add Haines City/Eagle Ridge Mall, Lakeland/Florida Polytechnic, Auburndale/Florida Polytechnic fixed-routes and Lakeland/Bartow, Lakeland/Winter Haven, Lakeland/SunRail, Lakeland/TIA, Lakeland/MCO express routes. • Add circulators in Mulberry, Bartow, Lake Wales, North Lakeland, and Haines City. • Add call-and-ride service in Fort Meade, Frostproof, Ridge, Poinciana, Davenport, and Winter Haven.
Seminole Tribe Of Florida Transit Study	Seminole Tribe of Florida	2021	Seminole Tribe of Florida	Transit plan for Seminole Tribe of Florida and its decision-makers to make informed and accurate changes to improve quality of transportation services for tribal members, employees, guests, and visitors.	Identifies unmet transportation needs and demand with specific focus on older adults, persons with disabilities, and low-income individuals who are dependent on transportation. Additionally, promotes funded FDOT initiatives such as commuter assistance programs. Service needs include: • Connection between Plant City and Lakeland through coordination of Citrus Connection. • Express bus service connecting Lakeland to Tampa, bringing connectivity to Seminole Hard Rock Casino and surrounding areas.
My Ride Transit Development Plan (2017–2026)	Polk County	2017	Polk TPO	Serves as strategic guide for public transportation in Polk County over next 10 years.	Includes documentation of area's conditions and demographic characteristics and overall 10-year TDP that provides guidance. Priorities for next 10 years focus on: • Improving service on routes 12, 14, 15, 22XL, 30, 32/33, 58, 60, 1/101, 3/301, and 427 with extended weekday hours, weekend services, and existing service headways. • Implementing new routes that expand service coverage to county activity centers, Poinciana SunRail Station, and other priority locations with no existing service.
Polk County Transportation Disadvantaged Service Plan	Polk County	2021	Polk TPO	Polk TPO staff worked closely with Citrus Connection staff to create a TDSP that includes development plan, service plan, quality assurance component, and rate structure component.	Document goals are to: • Enhance availability of transportation services to meet mobility needs of transportation disadvantaged persons. • Provide transportation disadvantaged services in cost-effective and efficient manner. • Improve public awareness of Transportation Disadvantaged Program. • Provide transportation services in a safe and reliable manner. • Ensure program accountability by collecting and reporting system and provider data in an accurate and timely manner.

Table 5-1: Local Plans (continued)

Plan Title	Geographic Applicability	Most Recent Update	Responsible Agency	Plan/Program Overview	Key Considerations/Implications For TDP
Polk County Comprehensive Plan	Polk County	2009	Polk County	Section of Polk County's comprehensive plan places emphasis on development of alternate modes of transportation and integration of these modes with highway travel as part of a multimodal transportation system.	Helps achieve overall goal of providing a safe, efficient, and financially feasible transportation system that is multi-modal, responsive to community needs, consistent with land use policies, environmentally sound, and promotes economic opportunity. In addition, transit core areas and hubs have been established and allows Local Development Code to foster better development and developer contributions to transit infrastructure and operations. Plan also: • Identifies needs for new fixed-route service connecting Winter Haven and Polk City via Berkeley Road. • Proposed SunRail feeder route from Poinciana to Winter Haven Terminal. • Recognizes improvements needed along key transit routes, with most prominent service improvements being increased frequency and weekend service to Lakeland/Winter Haven route and Florida Avenue route.
City Of Bartow Comprehensive Plan	Bartow	2013	City of Bartow	Section of Bartow's 2030 Comprehensive Plan outlines current and planned transportation features in Bartow.	Establishes mobility and multimodal goals in agreement with County's goals and plans. Supports and promotes transit by: • Providing safe and efficient multimodal system. • Goal of 60-minute service throughout city. • Implementing transit-supportive land use policies such as mixed-use developments and higher residential densities within ¼ mile to existing and planned transit routes. • Encouraging large employers to develop commuter assistance programs. • Coordinating with County to expand transit services. • Supporting and implementing plans for park-and-rides and encourage sheltered stops.
City Of Lakeland Comprehensive Plan	Lakeland	2021	City of Lakeland	Focuses on transit-related goals and visions; emphasis placed onto public transit, bicycle, and pedestrian transit modes and land use coordination.	Supports regional connectivity in transportation, connecting regional transit systems, and multi-modal transit options. Establishes roadway level of service (RLOS) and directs attention to minimizing impacts of highly-constrained corridors. Identifies several constrained corridors including Edgewood Drive, South Florida Avenue, North Florida Avenue, and Cleveland Heights Boulevard. Establishes goals to improve headways along designated transit routes, hoping to obtain 30-minute or less headways during peak times within anticipated areas. Goals described are consistent with County's goals.
City Of Winter Haven Comprehensive Plan	Winter Haven	2011	City of Winter Haven	Establishes goals, improvements, and objectives for transportation- related plans and developments.	Establishes cooperation with Polk County TPO to integrate strategies to improve RLOS in Winter Haven. Includes coordination of mass transit plans alongside TPO and in line with FDOT 5-Year Work Program and establishes goal to create fixed-route transit service along four new routes by 2025, including Cypress Gardens Road and CR-653. Plan and its goals are consistent with County's goals and policies.

Table 5-1: Local Plans (continued)

Plan Title	Geographic Applicability	Most Recent Update	Responsible Agency	Plan/Program Overview	Key Considerations/Implications For TDP
ACES Study Of Emerging Technology	Polk County	2020	Polk TPO	Focuses on usefulness of ACES (autonomous, connected, electric, shared-use) technologies throughout transit landscape in Polk County.	Contributes long range transportation scenarios for consideration when planning for future transportation advancements such as autonomous vehicles, including roadway infrastructure and surrounding land uses. Suggests actions to aid in preparedness for emerging ACES technology, such as supportive planning for automated vehicles in likely first-adopter areas and pilot studies to identify impacts on existing transportation elements. Coordination between transit agencies and local governments should partner to develop guidelines for placement and developments of electric vehicle charging stations. Suggests designating corridors for use in implementing or enhancing future technologies.
SunRail Extension Study	CSX Corridor from Lakeland to Poinciana/ Orlando	2015	Polk TPO	Evaluates feasibility of SunRail into Polk County and related alternatives, site considerations, ridership analysis, and financial/ institutional considerations. Provides action steps to prioritize transit investments for Polk County LRTP.	Establishes potential Polk County SunRail station locations in Lakeland, Auburndale, Haines City. Presents and analyzes feasibility of different locations by geographic limitations, spatial benefits, or otherwise relevant factors in placement decision. Relevant action steps include: • Connect to Poinciana SunRail station by bus. • Undertake Project Development and Environment (PD&E) study for preliminary station locations. • Initiate discussions with Central Florida Commuter Rail Commission and FDOT. • Identify permanent station locations with park-and-rides and transit-oriented development (TOD) opportunities.
Polk TPO Strategic Plan	Polk County	2020	Polk TPO	Applies developed strategies and action plans surrounding safety, livability, mobility, economic, and sustainability focuses as established in LRTP.	Establishes strategy to provide transportation infrastructure that supports mobility, vitality, and job creation in area alongside potential application of 20-minute city planning methods to increase these elements further. Identifies areas to monitor and assess feasibility of enhancements and developments, such as intercity public transit options, additional maintenance facilities (East Polk County), implementation of premium transit corridors, and high ridership corridors/stops for enhanced facilities and transit resources.
Polk TDP 2021 Annual Progress Report	Polk County	2021	Polk TPO	Presents observed progress-related goals, objectives, and strategies established in 2017 TDP. Identifies areas where progress not being made and provides applicable re-evaluations for major changes needing to be made or resolved.	Confirms implementation of several new service routes at outlined in TDP and use of new intelligent transportation systems projects being newly used through Citrus Connection. States success of consolidation of 8 LAMTD routes into 5 routes through *Re-Route 2020*. Provides updated mobility objectives regarding provision of intercity and local travel, including successful new intercity connections between Mulberry, Bartow, Lake Wales, and Bradley Junction, as step towards goal of providing fixed-route transit service to all municipalities in Polk County. States need for service between Polk City and Winter Haven and connections between park-and rides.

Table 5-1: Local Plans (continued)

Plan Title	Geographic Applicability	Most Recent Update	Responsible Agency	Plan/Program Overview	Key Considerations/Implications For TDP
Lakeland Area Alternatives Analysis- US 98 Bus Rapid Transit Feasibility Study	City of Lakeland	2021	FDOT	Evaluates the feasibility of BRT services implemented along the corridor of US. 98 connecting North and South Lakeland areas. Provides detailed recommendations and improvements needed to support the successful construction of this service and its related infrastructure.	Proposes near-, medium-, and long-term options for accomplishing the best transit scenario by the year 2045. Increasing frequency, implementing components such as TSP, pedestrian and bicycle improvements, branded BRT stations, and a dedicated BRT lane north of Griffin Road are needed to complete the best scenario. The study defines increments of 10-year intervals to outline significant investments needed for success in creating BRT services. This process requires actions relating to land development, external investment, policy changes, and funding availability. Required infrastructure for the project prompts attention in local, regional, and state level planning documents to ensure the vision for BRT services and dedicated transit lanes aligns with surrounding developments. Connections between future high speed rail developments and the proposed BRT advancements should also be considered to provide the maximum usability of services and result in the most possible relief of increasing traffic congestion in the area.
Lakeland Intermodal Study	City of Lakeland	2020	FDOT	Conducted throughout 2019, outlines the vision supporting a proposed intermodal center and its functional components. The envisioned intermodal center accommodates Amtrak, local bus services, park and ride facilities, and future developments such as BRT and high-speed rail connections.	Considerations for future land use must be evaluated and prioritized for implementing the intermodal center. The study presents the proposed site locations for the construction of the intermodal center in Lakeland and each sites specific attributes in relation to its potential usage. To ensure success in this potential development, future advancements must be considered in relation to the placement and connectivity of the intermodal center that this study supports. Site location is highly dependent on the potential for TOD potential and redevelopment opportunities, additional investments in transit services is also required to provide the level of service needed to justify the consolidated location converging multiple mass transportation options. Downtown West option B (near the RP Funding Center between Lemon and Main Streets) was selected as the best choice. Citrus Connection and the City of Lakeland passed resolutions to show their support.
East Polk Transit Maintenance Facility Siting Analysis	East Polk County	2021	Polk TPO	Outlines the area of growth in the eastern territory of Polk County, emphasizing the need for additional transit services in the area. Construction of a satellite maintenance facility is needed to accommodate the increased transit services. This analysis defines the necessary criteria for site selection and presents initial sites for consideration.	The 13 candidate sites yielded from this analysis provide insight to the development needs that will be required to support expanding transit facilities into eastern Polk County. Access, proximity, adjacent land use, site buildability, expansion potential, and acquisition were considered. Following an official site selection, further developments can be considered to meet the growing needs and additional capabilities of transit services in the area.

Table 5-1: Local Plans (continued)

Plan Title	Geographic Applicability	Most Recent Update	Responsible Agency	Plan/Program Overview	Key Considerations/Implications For TDP
Feasibility Of Premium Transit	Polk County	2021	Polk TPO	Proposes advanced transit services with increased frequency and predictable service. Implementing premium services aim to compete with single occupancy vehicle ridership in the region. The study evaluates ridership trends throughout Polk County and establishes necessary components for potential premium transit services.	The report outlines transit demand factors throughout Polk County alongside projections through the year 2045. Attention to areas of growth within the next two decades and the means of expanding transit services is vital to successful implementation. Candidate corridors provide potential areas for consideration in premium transit services, while the recommended corridors include Lakeland to Lake Wales, Lakeland to Mulberry, and Lakeland to SunRail corridors. Prioritization of potential service routes its established regarding transit needs is outlined in the report and suggests implementation strategies and scenarios. Operation and capital cost estimates are detailed for further consideration of the proposed services.
Access To Transit	Polk County	2021	Polk TPO	Identifies opportunities for enhanced access to the highest ridership transit stops. Evaluates and proposes schematic improvements for bus stops including improved bus stop placement and enhanced infrastructure.	The included transit stop review summary provides a comprehensive analysis of the top 100 active bus stops throughout the region. The review of the active bus stops includes observations of the current status of each bus stop as well as the opportunities suggested for increasing accessibility to each bus stop. Considerations to be made for bus stop access include elements such as sidewalk widening, increased lighting, improved crosswalks, additional shelters at bus stops and other potential solutions to existing deficiencies. Additionally, potential funding sources are outlined to support the improvements identified throughout the report.

Table 5-2: State and Federal Plans

Plan Title	Geographic Applicability	Most Recent Update	Responsible Agency	Plan/Program Overview	Key Considerations/Implications For TDP
State Of Florida Transportation Disadvantaged 5-Year/20-Year Plan	Florida	2007	Florida Commission for the Transportation Disadvantaged (FCTD)	Purpose is to accomplish cost-effective, efficient, unduplicated, and cohesive transportation disadvantaged services within its service area.	Develop and field-test model community transportation system for persons who are transportation disadvantaged; create strategy for FCTD to support development of universal transportation system.
FDOT Complete Streets Implementation Update: Handbook And Design Manual	Florida	2018	FDOT	Developed as way to create alternative transportation systems to facilitate Complete Streets focused design.	Plan includes: • Revising guidance, standards, manuals, policies, and other documents. • Updating how decision-making is processed. • Modifying evaluation of performance. • Managing communication between agencies. • Updating training and education in agencies.
Florida Transportation Plan	Florida	2020	FDOT	Florida's long-range transportation plan, as required by State and Federal law.	Supports development of state, regional, and local transit services through series of related goals and objectives, emphasizing new and innovative approaches by all modes to meet needs today and in future. Most recent update emphasizes: • Safety and security for Florida's residents, visitors, and businesses. • Resilient and quality infrastructure. • Connected, efficient, and reliable mobility for people and freight. • Transportation choices that improve equity and accessibility. • Transportation solutions that strengthen Florida's economy. • Mobility solutions that enhance Florida's communities. • Transportation systems that enhance Florida's environment.
Bipartisan Infrastructure Bill	National	2021	117th US Congress	Provides funding for nation's surface transportation infrastructure, including transit systems and rail transportation network. Maintains strong commitment to safety.	Legislation will advance public transportation through safety, modernization, climate, and equity. • Includes $33.5 billion for transit capital and operating assistance in urbanized areas and $4.6 billion to support rural transit systems. • Funds dedicated to repairing and upgrading existing infrastructure, increasing accessibility, expanding service areas, upgrading buses to zero-emissions models. • Increases funding to meet transportation needs for older adults and people with disabilities. • Provides $12 billion in partnership grants for intercity rail service.
Implications To Public Transportation Of Emerging Technologies	National	2016	Research Report	National Center for Transit Research	White paper that explores possible consequences for public transportation as result of introduction of new technologies such as autonomous vehicles, connected vehicles, and other innovations that impact efficiency, cost-effectiveness, and overall demand for transportation.

Situation Appraisal

A required component of the TDP Major Update includes a Situation Appraisal of the environment in which the transit agency operates. A review and analysis of the aforementioned baseline conditions along with other pertinent topics will allow Citrus Connection to determine how the issues impact its current service. This section also explores how the future of the transit system may be affected by projected opportunities and increasing the number of alternative transportation options. Issues, trends, and implications are summarized for each of the major elements in the remainder of this section.

Socioeconomic Trends



Changing demographic and socioeconomic conditions within the community can affect the existing transit market. It is important to understand the trends and markets that could be affected by or may benefit from transit services when assessing the impact of the growth in population and the evolution of its key demographic characteristics that result from that growth. Key findings from the assessment of socioeconomic trends are summarized as follows:

- According to 2021 BEBR estimates, Polk County's population is projected to grow approximately 14 percent by 2025 to approximately 812,300 residents and 48 percent by 2045 to over 1.1 million residents.
- According to the U.S. Census, Polk County grew by approximately 25,000 residents between July 2020 and July 2021.
- According to 2021 BEBR estimates, Lakeland remains the most populous city, and Davenport experienced the most growth since 2010, an increase of 154 percent of residents. The majority of other incorporated areas experienced a considerable amount of growth, with an average 24 percent increase.
- Existing jobs are concentrated in established areas such as Lakeland, Winter Haven, and Bartow. The projected employed population growth will be concentrated in Lakeland, Haines City, and along I-4 near Polk City.
- The top industries that make up approximately half of the jobs in Polk County are those in education, health care, and social assistance (19.0%), retail (14.8%), and arts, entertainment, and food services (14.4%).
- By 2045, the age cohort of age 65 and older is expected to be 26.0 percent.

- From 2000 to 2010, there was an 8.1 percent increase in households considered to be in poverty; from 2010 to 2019, there was a marginal decrease (-1.7%).
- Of all Polk County households, approximately 2.3 percent were considered zero-vehicle households. Approximately 27.9 percent of households that indicated that they used transit were zero-vehicle households.

Implications

Polk County will continue to grow rapidly in population and jobs, creating more demand for alternative modes of transportation such as transit. Furthermore, diversity in growth will require not only more transit but more transit options to fill needs, including fixed-route, Mobility on Demand (MOD), and vanpool. Key considerations for Polk County should include maintaining mobility and independence for traditional populations and considering new enhanced services to attract new and discretionary riders that are in the service areas but do not use Citrus Connection. Data also show that traditional transit markets, which typically include older adults and low-income populations, will continue to be a major influence and part of Citrus Connection's core ridership. Therefore, it is important to retain and grow this ridership by providing reliable, safe, and efficient service for these markets and use any opportunity to enhance the services.

With Polk County continuing to grow in employment, with top industries including retail and food services in established areas, an overarching goal is for transit to become a more viable option to access jobs. It will be critical for Citrus Connection to provide service that is appealing to commuters accessing areas of concentrated economic opportunity. Citrus Connection's success will depend on the ability to improve services and develop more mobility options to attract new markets while also serving its current rider base.



Travel Behavior/Patterns

It is important to understand existing and projected travel behaviors to determine the possible impacts or benefits affecting transit. Several key findings based on the data analyzed include the following:

- According to ACS 2020 5-Year Estimates, the most popular commute choice for persons in Polk County is driving alone (83.4%), which has increased

marginally since 2010 (2.7%). The segment of people taking transit to work (0.5%) has stabilized since 2010.

- The majority of commuters who drove alone, 59.8 percent, had a commute time of 30 minutes or less.
- According to Census Transportation Planning Products (CTPP) 2012–2016 Estimates, the most popular external employment destination is Orange County; over 20,000 residents commute from Polk County every day.
- The largest combined total of inflows and outflows is with Hillsborough County. Roughly the same number of commuters—approximately 12,000—leave Polk County to commute to Hillsborough County and leave Hillsborough County to commute to Polk County.

Implications

Although the long-term effects of the COVID-19 pandemic on commuting are still not clear, the call for employees to return to the office may increase the need for alternative transportation options. Those who will resume commuting may be more willing to try Citrus Connection, as it will give them the freedom to participate in leisure activities during their commute.

ACS data indicate that a larger percentage of people are driving in 2020 compared to 2010, although the number of transit riders has remained the same. Citrus Connection should pursue premium service improvements that will help attract more commuters and capture a larger share of daily travel using transit. Providing modes such as BRT and express bus service can significantly help due to the perceptions of convenience and speed. Furthermore, if services are provided on non-limited access facilities, Transit Signal Priority (TSP) and Queue Jump treatments will be necessary, at least at major intersections. Additionally, current frequencies on popular and productive routes could be improved to attract commuters/new riders and improve the experience for current riders. Increasing frequency may also generate more demand and increase awareness in the community, as buses are “moving billboards” for transit service.

Citrus Connection should also consider connecting with HART (Hillsborough Area Regional Transit), which would provide commuters with an option to and from their jobs while also allowing access to the counties surrounding Hillsborough. With an equal number of commuters driving from Hillsborough County to Polk County to

work, such a connection could have economic benefits, and the route could also provide access to an additional major international airport.



Land Use

Effective land use planning can significantly support public transit with strategies that reshape land use to increase mobility and quality of life for its residents, creating an efficient, effective, and balanced intermodal and multimodal transportation system. Transit-supportive land uses typically include greater density of development, features to support ease of access to and from transit, and features that give priority to modes that are alternatives to auto travel. The following are trends observed:

- According to Polk County, residential areas make up approximately 10 percent of unincorporated Polk County, with the majority of residential land uses zoned as Low Density Residential, which consists of up to five dwelling units per acre.
- High-Density Residential land uses, at 15 dwelling units per acre, are not as prevalent as residential uses in unincorporated Polk County and are found adjacent to major roadways. Existing Citrus Connection fixed-routes service the majority of parcels that are classified as such.
- In Lakeland, the most population-dense city, the top land uses are Conservation, Business Parks, and Medium-Density Residential.
- Transit-supportive land uses in Lakeland, including High-Density Residential and Regional Activity Centers, are found in and around downtown Lakeland.
- Winter Haven's top land uses are Low-Density Residential, Conservation, and Industrial.

Implications

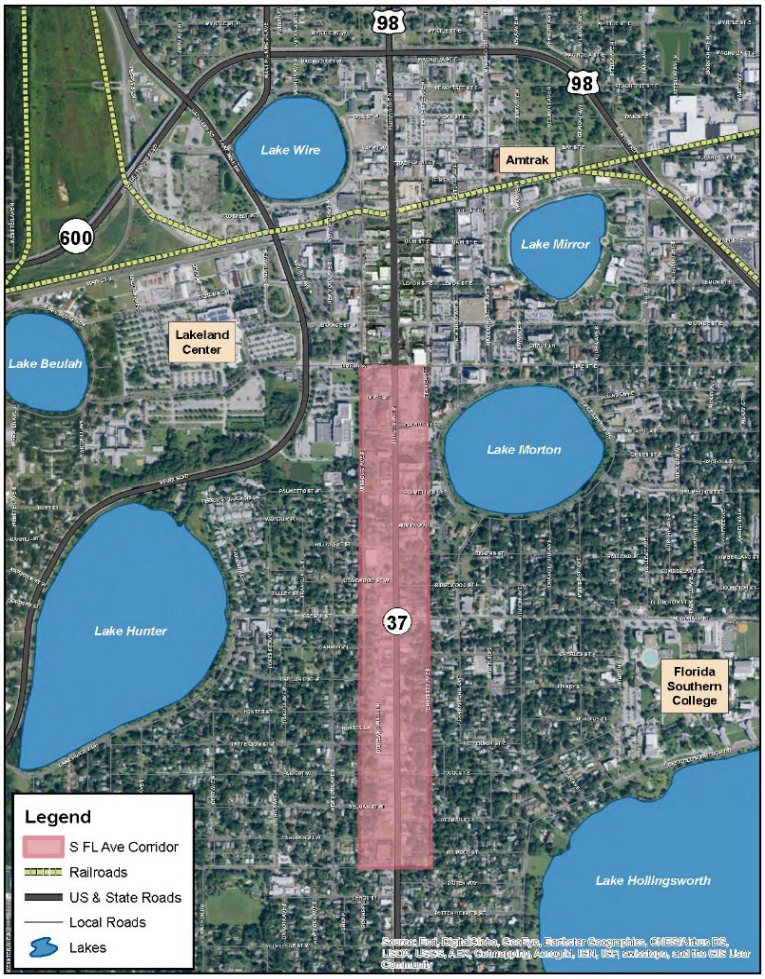
Citrus Connection should continue to support changes to County and municipal comprehensive plans that would result in additional density and/or transit-supportive development adjacent to established higher-density/intensity areas or in developing nodes. Citrus Connection should strive to improve transit access for proposed developments and high growth areas, such as Four Corners, and areas with affordable housing. Citrus Connection should also participate (secure a seat at the table) in key land use decisions that may assist its growth within the county.

Increasing accessibility to transit and to major attractions can bolster economic development efforts, considering that transit is an engine of economic development and incentive for real estate investment, and also should provide benefits for developers such as reduced parking needs, a multimodal pedestrian-friendly environment, and support for a greater mix of land uses.

Transit-Friendly Urban Design Efforts

Current and future urban design efforts in Polk County that support transit were reviewed; one example is the South Florida Road Diet Project. In April 2020, construction was started on the South Florida Avenue Lane Repurposing as a traffic calming effort. The project also aimed to rectify substandard ADA infrastructure and narrow sidewalks among other hazards.

Figure 5-2: South Florida Road Diet Project Limits



As shown in Figure 5-2, South Florida Avenue (SR-37), from Lime Street to Ariana Street (1.4 miles), was changed in October 2020 from five lanes to three and had concrete barriers installed to protect pedestrians. The three lanes include one travel lane in each direction and a turn lane in the middle. In addition to reduction of lanes, a dedicated transit route for the area was included as an amenity; the Peach route provides service between Southgate Plaza and the downtown Lakeland Transfer Facility and does not stop on

Florida Avenue between Lime Street and Ariana Street but provides access to surrounding areas.

Additionally, past road purposing projects implemented—MLK Avenue and Parker Street—have been successful in decreasing traffic crashes.

Implications

Historically, land-use patterns and choices have favored the automobile in Florida and its cities. However, sustained growth in city centers and established areas has led to more considerations for pedestrians and more Complete Streets efforts.

Citrus Connection should continue to take advantage of these efforts and support similar changes in other municipalities in Polk County. It is important that Citrus Connection have the opportunity to influence and ensure that similar projects are implemented appropriately and in a way that does not negatively impact transit services. Transit stops should be considered in the plans, and pedestrian access should be a priority.

Additionally, identifying and advocating for specific local land-use regulations, parking minimums, parking exemptions, TOD, and mixed-use developments can bolster transit performance when implemented while promoting Citrus Connection within the community. The local comprehensive plans and development codes are favorable and should be levied to continue the development of premium transit options. As a best practice, Citrus Connection should foster and develop a process outside the TDP to have staff regularly involved with those reviewing and approving development.



Technology/Innovation

Currently, Citrus Connection offers many technologically-advanced amenities to passengers, including My-Stop mobile with Avail, a real-time bus information mobile app. This app is used with other transit agencies throughout the world, making it helpful for visitors who already have it on their smartphones. Additionally, riders can use a short text feature to text 321123 with the current stop number and in minutes they will be texted back the next two times that a bus will be driving past that point. Citrus Connection routes and bus stops are also available on Google Trip Planner, with which riders can input their preferred arrival or departure time and have the application advise them when to leave and what route to use.

Citrus Connection is currently upgrading its computer and server storage. The current farebox system is past its useful life and frequently does not work, which slows down patrons boarding the bus, ultimately affecting Citrus Connection's efficiency.

Other technological and innovative trends that Citrus Connection should explore include the following:

- **Alternative fuels** – Purchasing and maintaining alternative fuel vehicles can be aided by federal funding for public transit systems in addition to being environmentally friendly. Citrus Connection seeks to replace diesel vehicles with alternative fuel vehicles when they are passed their FTA useful life benchmark.
- **TSP/Queue Jumps** – Using these technologies along major corridors known for having congestion hot spots could help reduce bus run time delays. In partnership with the City of Lakeland, Citrus Connection plans to implement these technologies with west side routes.
- **Updated software** –Citrus Connection uses older software that does not interface well with the current Intelligent Transportation Systems (ITS) system. Upgrading software will assist the agency with booking trips more efficiently and create a better user experience for riders.
- **Updated hardware** –Much of the Citrus Connection's hardware relies on older technology, including Mobile Data Terminals for the ITS system, routers for buses, and emergency backup systems in the event of natural disasters.
- **Security Systems** – As the agency has expanded in size and service area, its security systems are strained and have experienced vandalism. Security for riders, operators, and staff is paramount, and Citrus Connection should consider upgrading its safety management system.

Implications

Citrus Connection continually seeks to upgrade its vehicles and other technologies as needed to ensure that riders have a high-quality experience. With the new touchless fare payment system, real-time bus locator app, and other technologies on all buses, discretionary riders may be more inclined to use the services. Furthermore, investing in alternative fuels when diesel buses are past their FTA useful life will help set the standard and be on the cutting edge of technology.

Upgraded vehicles in combination with other new amenities will increase the quality of the rider experience while also attracting new riders.

Implementing app-based MOD in the near future for first /last-mile services in the next 10 years should be explored to improve the attractiveness of transit and to make use of several new federal grants that have become available to support new technologies in transit. Citrus Connection should continue to coordinate with the City of Lakeland on bus preferential treatments such as TSP, which could be coordinated with lane features such as Queue Jumps that will assist buses to maintain on-time performance.



Organizational Issues and Capacity

An assessment of Citrus Connection's organizational structure was conducted to ensure that staffing levels are sufficient to support current service levels and proposed enhancements to the transit network. The organizational assessment includes several elements including input and observances received through staff interviews and key discussion groups; a general review of current trends or conditions impacting staffing; a general review and assessment of the current staffing structure and impact of the consolidation process of WHAT and PCPT with LAMTD; and a review of staffing levels by major employment category as identified per NTD reporting requirements. The review includes a comparison of Citrus Connection staffing levels to those of previously identified peer agencies.

Staff and Discussion Group Input

During interviews with staff individually and jointly as well as during discussions with key groups, observances about staffing levels and input on staff needs were received. This input was vetted through the TDP Review Committee and provides some guidance towards staffing needs and potential recommendations. Primarily, this input identified the need for a more additional support for planning department at Citrus Connection that would help implementing new and restructured services and for the long-term growth of the system. It was specifically noted that current planning staff function much more like grant and program managers, without meaningful opportunity to do actual system planning, resulting on relying on contracted planning support with inadequate budget resources to accomplish appropriately.

However, the agency has recognized this weakness and is seeking to address the situation by standing up a formal planning department that is adequately funded. The functions of grants management, in recognition of the importance for the agency to remain adequately funded, has been broken out into a separate role in finance and still remains working close with planning.

Current Trends

Citrus Connection currently has 188 employees, an increase from pre-COVID-19 pandemic levels in 2019 due to expanded services. However, this is a somewhat skewed number; since the beginning of the pandemic, Citrus Connection operations experienced a shortage of about 10 drivers per day as a result of 20 drivers resigning or retiring and is currently managing a 15 percent shortage of drivers overall. National trends during the pandemic are similar, with drivers retiring early or resigning to stay home or take other jobs. Recruiting new drivers has been hindered by higher-paying jobs in the region for newly-licensed drivers. Citrus Connection recently approved higher salaries for drivers to better compete and retain them, which will take effect October 1, 2022.

Adding to the transit challenges in Polk County is rapid population growth. From July 2020 through July 2021, Polk was the fastest growing county in Florida and seventh in the country, with the addition of 24,000 new residents. These trends in growth are continuing and are fostering explosive development, job growth, and transportation needs. Together, due to the impacts of the pandemic and growth in the county, Citrus Connection Is experiencing a consistent staff shortage and will need to continue extraordinary steps to hire and retain an adequate number of drivers for current services and expanded services in the future.

Organizational Structure

Citrus Connection operates as an independent authority through designation as a Special Assessment District in the Lakeland area and county-wide services under interlocal agreement with the Polk County Board of County Commissioners. The Citrus Connection Governing Board comprises three City of Lakeland Commissioners and two Polk County Commissioners. The staff organizational hierarchy for Citrus Connection is headed by an Executive Director; next level reporting structures are in the functional areas of Chief Financial Officer (CFO), overseeing Finance/Accounting/IT/CSR operations; Revenue Services Director, providing direction to all transit operations; Human Resources & Risk Director, supporting all HR functions and post-accident liability; External Affairs Director,

supporting community development and marketing and government relations; Safety & Security and Training Director, with accountability for accident investigations and training; Maintenance Director, responsible for all vehicle maintenance and grounds; and Call Center Director, overseeing dispatch and incoming transportation calls.

It should be noted that many transit agencies in Citrus Connection's peer size group do not report all data, including three selected peers that do not report employee levels. Therefore, a comparison was completed using data from only the three remaining peers. Citrus Connection serves as the CTC for Polk County and has engaged a larger staff in support of the process to manage and perform CTC duties. Additionally, as Citrus Connection previously was three separate agencies that were consolidated and combined into the one system, it is required to perform a number of additional administrative duties for fiscal management, tracking and reporting, and enhanced accountability.

Citrus Connection is an independent authority, whereas all its peers are organizationally housed/managed as part of a larger governmental entity, a County department. Many functions conducted by peer County departments are conducted internally by Citrus Connection, resulting in several additional administrative duties. Appendix G shows the organizational structure of Citrus Connection, including the sub-hierarchy of functional areas. Of note is that most independent transit authorities have fully-functioning planning sections and conduct and/or lead the majority of transit planning needed to sustain, improve, develop, and grow their services; Citrus Connection does not.

National Staffing Practices and/or Key Peer Experiences

A peer review was performed to compare Citrus Connection's staffing levels with similar-size transit agencies. Due to the pandemic, staffing data for all agencies were obtained from the 2019 NTD database, the most recent data released by FTA without pandemic-related reductions and impacts. The peer review compared the number of full-time-equivalent (FTE) operations and maintenance employees staffed by each agency in addition to transit service statistics such as revenue hours and revenue miles. For the peer review, administrative employees were not compared for the reasons noted. Because of the variability in system size among the transit agencies, FTE data for each employee category were normalized using operations staff by revenue hour and maintenance staff by revenue mile.

Table 5-3 shows the performance statistics and staffing levels for Citrus Connection and its three peer transit agencies, including averages and standard deviations for each variable. Table 5-4 compares Citrus Connection staffing levels in each staff category to the peer system averages. Citrus Connection operates with fewer staff compared to its peer averages across both the Operations and Maintenance staff categories. Table 5-5 shows the number of staff that Citrus Connection would employ if its FTE was equivalent to the peer agency FTE per operational characteristics. From this calculation, Citrus Connection operates with slightly fewer operations employees and 16 fewer maintenance employees than if it was operating at the peer agency average FTE per operational characteristics.

Table 5-3: Citrus Connection Staffing Level Peer Review

Transit Agency	Revenue Hours	Revenue Miles	Operating Employees FTEs	Maintenance Employees FTEs
Citrus Conn	89,311	1,465,800	71.71	14.61
ECAT	109,214	1,683,088	78.03	18.06
FAST	95,679	1,289,753	84	65.43
MCAT	96,147	1,394,373	83.38	8.29
Average	100,347	1,455,738	82	31
Standard Deviation	7,683	203,721	3	31

Table 5-4: Citrus Connection Staffing vs. Peer System Staffing

Employee Category	Employee FTES	Operational Characteristics		FTE Per Operational Characteristic	
Citrus Connection					
Operating	72	89,311	revenue hrs	8.03	10,000 revenue hrs
Maint.	15	1,465,800	revenue mi	1.00	100,000 revenue mi
Peer System Average					
Operating	82	100,347	revenue hrs	8.14	10,000 revenue hrs
Maint.	31	1,455,738	revenue mi	2.10	100,000 revenue mi

Table 5-5: Citrus Connection Staff Shortfall and Surplus

Employee Category	Citrus Connection Current Employee FTEs	Projected Citrus Connection FTEs Based On Peer System Average	Citrus Connection Shortfall/Surplus vs. Peer System Average
Operating	71.71	72.66	-0.95
Maintenance	14.61	30.84	-16.23

Implications

The organizational assessment shows that Citrus Connection has fewer employees across the Operations and Maintenance staffing categories than its peer agencies of similar size. The Maintenance category shows the largest shortfall compared to the peer system average, indicating a need to more than double the number of employees to reach the peer average. The Maintenance results may indicate that Citrus Connection operates more efficiently than its peer agencies or with a newer or better-maintained inventory, but it may also suggest that the agency is understaffed, with the greatest need among Maintenance staff. However, overall, the performance of maintenance duties have been acceptable in the past and may become more of a realized need as the system expands.

The Operations staffing level is slightly lower than that of the peers, indicating a consistency among peers on drivers; however, the impact of the pandemic created a 15 percent shortfall in drivers, a national trend and concern. With planned growth and service expansions, it will be critical to continue the extraordinary strategies already begun and continue additional efforts to hire drivers.

Although Citrus Connection has many more Administrative employees than its peers, all have legitimate functions that other peer transit agencies do not. Additional assessment based on observances including both internal and external concerns recognize the lack of a planning section and need for planning support. Considering most peers rely on extended County departments, planning is an administrative area from which Citrus Connection could benefit by adding staff dedicated to the agency's true planning needs. The agency should consider matching its planning section staff level to other independent agencies, factored for varying sizes. For Administrative staffing levels, additional analysis may be needed, primarily to determine if there are alternative means to accomplish the same efforts or if some functions could be shared with other entities.

Regional Coordination

Regional coordination and planning are effective for transit priorities and goals when adjacent entities and their plans consider future needs. Citrus Connection currently has regional connections to the east by bus to SunRail and to Orange and Osceola counties, which connect to the larger LYNX network. SunRail provides opportunities for riders to connect to Volusia County, and LYNX provides links to local routes. There are no existing connections to any transit services to the west of Polk County.

On April 14, 2022, the Polk TPO approved a resolution to support the extension of SunRail services into Polk County and a request to FDOT to prepare a Transit Concept and Alternatives Review (TCAR). Additionally, municipalities have approved resolutions to support SunRail services extending into Polk County. On January 20, 2022, Haines City Commissioners approved a resolution of support for a rail stop for SunRail services; part of this approved resolution is an economic goal to foster an environment that attracts economic opportunity and sustains economic viability. Lake Wales approved a resolution on March 15, 2022, citing the improvement of transportation options, economic growth, and cost-effective and eco-friendly transportation options. Subsequently, FDOT initiated the TCAR project for the extension of SunRail, with the project to be completed in mid-2023.

Whereas regional coordination on SunRail is ongoing, discussions on Brightline, another regional rail service, also have come into focus with its upcoming connection to Orlando from Miami. However, currently, no stations are being discussed for Polk County for the future Orlando-Tampa extension of Brightline service.

No transit connections to Tampa are currently available for Polk County residents . Such a connection would give Citrus Connection riders a seamless regional connection to major population and employment hubs to the west of Polk County. Similarly, no northward connection to Lake County is available.

Implications

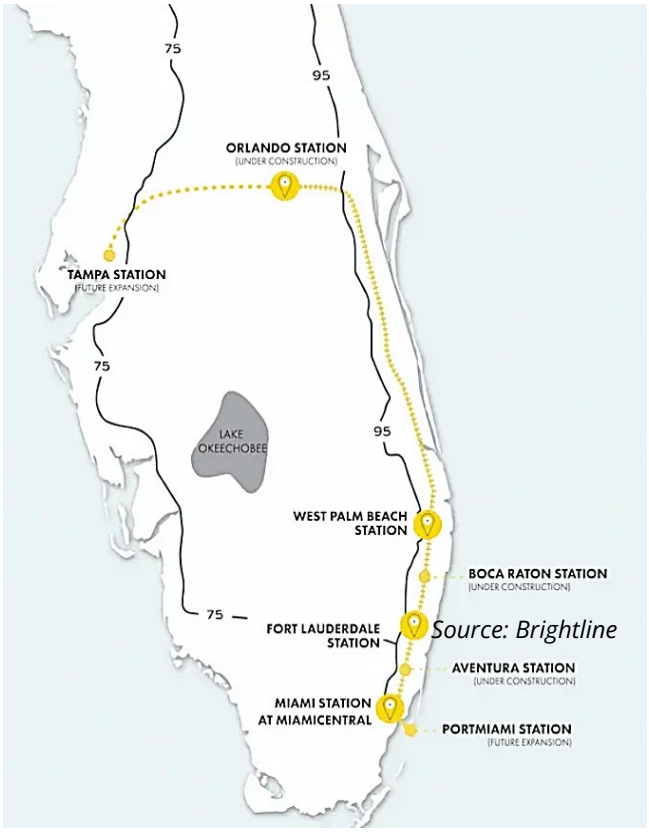
With connections to the LYNX network and SunRail, Citrus Connection has been proactive in the regionalism discussion and should continue to play a key role as a partner in developing an effective and well-connected regional network. Current data and growth projections indicate a potential future need for connecting with

HART. Citrus Connection should continue its relationship and coordination with LYNX and maintain communication with HART and SunRail.

Although SunRail has not yet been extended into Polk County, Citrus Connection should prepare for the additional demand that will be generated when the rail service is extended. Haines City is expected to be the first stop in Polk County and is supportive of the service. It is anticipated that SunRail service eventually will be extended to Lakeland, and multiple local connections may be warranted to bring riders from park-and-rides and other major transfer facilities. Citrus Connection should be prepared and supportive of all SunRail connections to Polk County.

Regional transit connections to HART in Hillsborough County to the west and LakeXpress in Lake County to the north also should be considered in the next 10 years. Although not as high as to the Orlando area, daily regional travel flows to Hillsborough County may indicate a need for a commuter type service to Tampa. LakeXpress is considering an express route to the Four Corners area in the near future, and close regional coordination with Lake County may help to ensure that those plans connect with current Citrus Connection services.

Figure 5-3: Existing/Proposed Brightline Rail Network



Source: Brightline

Although a Brightline station in Polk County is not currently planned, the County should continue to ensure that any Brightline plans complement plans for transit locally. In the absence of a Brightline station in Polk County, there may be added demand for regional connections to Orlando and Tampa, providing another reason for better regional connections from Polk County.

Section 6. Goals and Objectives

This section summarizes the guiding mission and vision as well as the goals, objectives, and policies developed for public transit services in Polk County for the next 10 years. Goals and objectives are an integral part of any transportation plan, as they provide the policy direction to achieve the community's vision.

Citrus Connection's Vision

"Effectively connecting people with their world through expanded, environmentally-friendly service with full support of the communities we serve."

Citrus Connection's Mission

"We strive to be a superior provider of transportation services that contribute to the economic growth and quality of life for the communities we serve."

Citrus Connection's Core Values

- Safe and reliable transportation should be available to all people regardless of their age, ability, or social status.
- Transportation is part of the fabric of our community. Transportation projects and services should support vibrant communities and our vision for the future.
- The best plans come from community collaboration. Leveraged resources go farther.

Goals, Objectives, and Policies

G1	**Goal 1: Maintain a public transportation system to provide safe travel for all users that supports livable communities and economic activity.**
1.1	***Objective: Provide safe and secure travel conditions on public transportation.***
1.1.1	Policy: Maintain zero traffic-related fatalities on the public transportation system annually.
1.1.2	Policy: Annually reduce injuries and accidents/incidents on the public transportation system by achieving fewer than one accident per 100,000 miles of revenue service.

1.2	***Objective: Provide equitable mobility options for all persons, regardless of age, income, race, or abilities.***
1.2.1	Policy: Provide and maintain an overall average Transit Connectivity Index score (as developed by the Polk TPO's Neighborhood Mobility Audits) of 175 for Polk County Census Block Groups.
1.2.2	Policy: Provide service to areas in which 75% of residents are older adults (age 65+), with high or moderate access to fixed-route transit services based on the Transit Connectivity Index.
1.2.3	Policy: Support requirements for new development that place emphasis on the provision of Complete Streets, connectivity, and access to transit.
1.2.4	Policy: Support initiatives for TOD and MOD throughout Polk County.
1.2.5	Policy: Participate in the development of community strategies to support aging in place and older adult mobility.
1.3	***Objective: Provide public transportation options for intercity and local travel.***
1.3.1	Policy: Document current public transportation options for intercity travel and identify opportunities for intercity and regional connections including feeder bus service to SunRail stations.
1.3.2	Policy: Evaluate public transportation options for new or enhanced intercity travel.
1.4	***Objective: Implement services that encourage economic development and support job creation and job retention.***
1.4.1	Policy: Connect transit services to major employment hubs and activity centers, identified and prioritized by LAMTD Board.
G2	**Goal 2: Increase transit ridership to improve cost efficiency.**
2.1	***Objective: Provide quality service for all Citrus Connection riders.***
2.1.1	Policy: Achieve an "on-time" performance rating of 90% at the route and system levels, annually.
2.1.2	Policy: Maintain a spare ratio of 20% for fixed-route service, annually.
2.2	***Objective: Make the best use of existing resources and implement a performance monitoring system to provide cost-efficient services and be a good steward of public resources.***
2.2.1	Policy: Achieve and maintain ridership of 10 passengers per hour on fixed routes in operation less than 5 years.
2.3	***Objective: Provide transportation infrastructure and services that support economic vitality and job creation.***

2.3.1	Policy: Review local development codes and coordinate to enhance the ability to fund and develop new transit alternatives in growing areas.
2.3.2	Policy: Meet at least annually with appropriate County departments and municipal jurisdictions to identify strategies that will encourage and foster the development community to provide/build transit-supportive development.
2.4	***Objective: Use new technologies, such as TSP and queue jumps, and employ creative thinking to generate access to mobility options and value for the community.***
2.4.1	Policy: Explore and investigate new technology-based on-demand transit service and shared mobility options.
G3	**Goal 3: Reduce environmental impacts, encourage sustainability, and support resilient infrastructure.**
3.1	***Objective: Evaluate the feasibility of converting at least part of the transit fleet to alternative fuel vehicles as the existing stock reaches useful life maximums.***
3.1.1	Policy: Implement green initiatives where appropriate, considering the potential to transition to alternative fuel vehicles for economic and environmental benefits and reducing carbon emissions and reliance on fossil fuels.
3.1.2	Policy: Evaluate all assets for risks, gaps, or vulnerabilities.
3.1.3	Policy: Evaluate fleet age and condition annually and evaluate the feasibility of replacing aging vehicles with alternative fuel vehicles.
3.1.4	Policy: Support infrastructure that provides diverse transportation options that ensure accessibility to mobility options and support evacuation needs.
3.2	***Objective: Investigate opportunities to encourage and promote biking and walking as alternative and viable modes and help with first/last mile connections to bus stops.***
3.2.1	Policy: Install bike racks at highly-used bus stops to encourage alternative transportation to bus stops
G4	**Goal 4: Pursue coordination activities with regional agencies and neighboring counties**
4.1	***Objective: Ensure coordination with local and regional agencies for the future provision of bus and rail transit, including SunRail and Brightline.***
4.1.1	Policy: Meet at least annually with transit staff in neighboring counties, including HART, LYNX, and Lake County to better understand existing and future transit services and to identify coordination requirements associated with public transit services and planning efforts across County lines.

4.1.2	Policy: Coordinate with SunRail and Brightline on connections to regional rail services
4.2	***Objective: Promote, facilitate, and provide regional connectivity from Citrus Connection transfer hubs and Polk County employment hubs and activity centers to other regionally-significant transportation hubs.***
4.2.1	Policy: Conduct internal meetings to determine travel demand to and from regionally-significant locations and transfer hubs.
4.2.2	Policy: Meet as appropriate with staff from relevant municipalities to discuss the role of transit in their respective comprehensive plans.
G5	**Goal 5: Increase awareness of service through education, marketing, and outreach.**
5.1	***Objective: Provide information and training about transit services and infrastructure to prospective passengers, community partners, and staff.***
5.1.1	Policy: Initiate and partner with programs to educate the community on the need for and value of public transportation through community forums, transit summits, public meetings, and regular updates to local government and other stakeholders.
5.1.2	Policy: Provide transit user travel training and an in-house train-the-trainer program.
5.1.3	Policy: Ensure that transit staff are trained on consistent procedures and messaging.



Section 7. Transit Demand Assessment

An assessment of transit demand was conducted using a set of tools and methodologies to gain an understanding of existing and future travel needs locally and regionally for Citrus Connection's service area. These types of latent demand assessments are a key component of TDPs and yield the building blocks for determining the transit needs for the community when their results are combined with findings from the other efforts in the TDP, such as the baseline conditions assessment, public outreach, and relevant plan reviews.

This section summarizes the demand and mobility needs assessment conducted as part of the Citrus Connection 10-year TDP.

Transit Markets

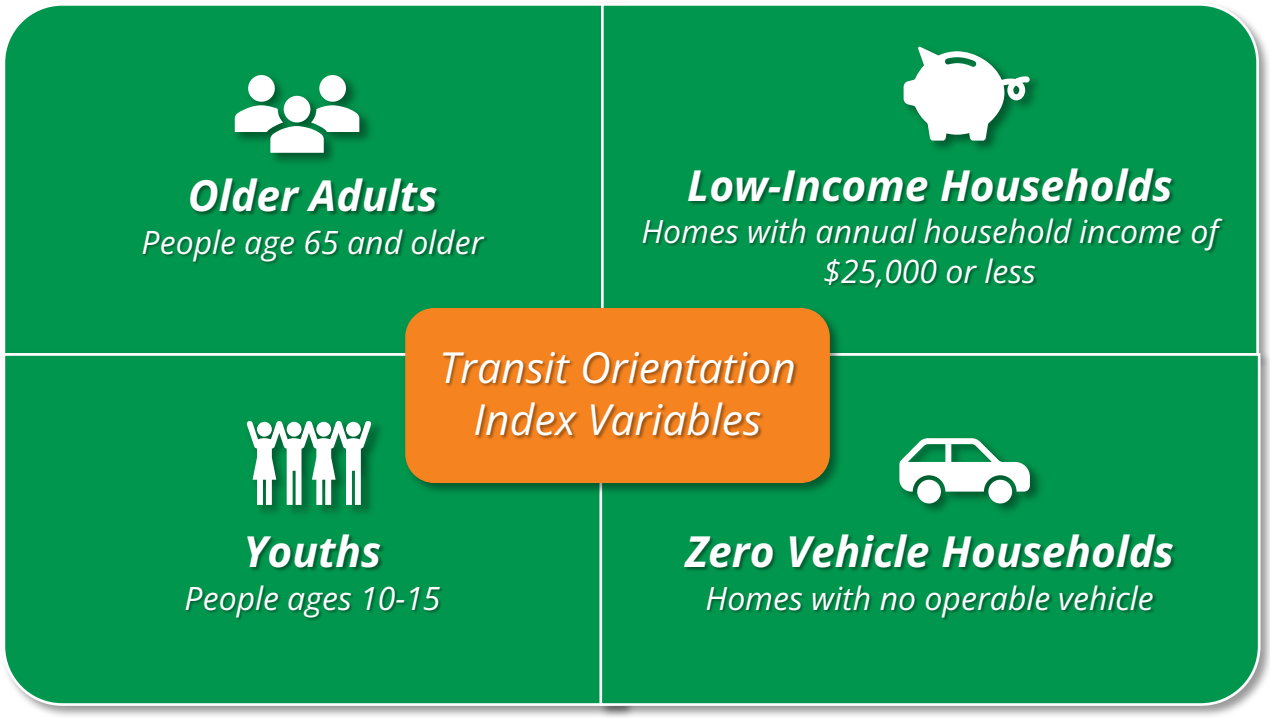
Two demand estimation tools that use GIS as a platform were used to analyze core transit markets using existing and projected population and employment data. Demand from specific transit markets in Polk County was carefully analyzed to identify the potential need for public transit services.

The Transit Orientation Index (TOI) measures the traditional rider markets, the levels of transit dependency within a particular geographical area to help assess existing transit coverage in comparison to areas with populations that have a propensity for transit use (older adults, youths, low-income/no vehicle households). The Density Threshold Assessment (DTA) supplements these findings by illustrating the relationship between the discretionary market, persons living in higher-density areas who can drive and have access to a vehicle but may be a potential transit rider because of their willingness to use alternative modes for travel and the use of transit as a commuting alternative and high-density employment areas. The core transit markets investigated and the corresponding market assessment tool used to measure each are described below.

Traditional Rider Markets

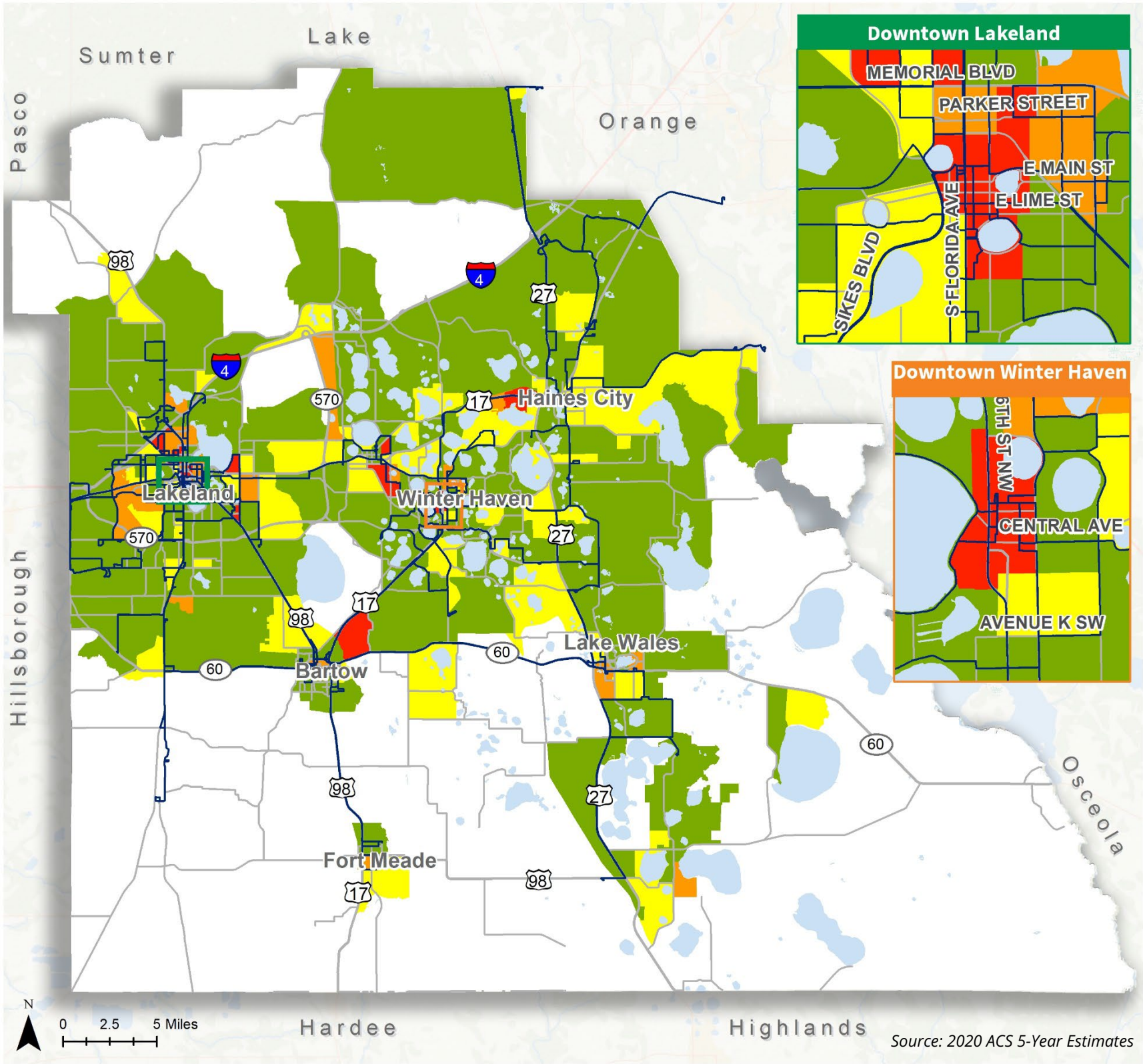
A traditional rider market refers to population segments that historically have had a higher propensity to use transit or are dependent on public transit for their transportation needs. This market was analyzed using the TOI methodology described previously. Variables used to determine traditional transit users are shown in Figure 7-1.

Figure 7-1: Transit Orientation Index Variables



For some individuals, the ability to drive is greatly diminished with age, such that they must rely on others for their transportation needs. Likewise, younger persons not yet of driving age but who need to travel to school or employment or for leisure may rely more on public transportation until they reach driving age. For lower-income households, which may have no private vehicle or more drivers than available vehicles, transportation costs are particularly burdensome, as they tend to spend a greater portion of income on transportation-related expenses than higher-income households; therefore, these households typically have a higher reliance on public transportation for their mobility needs.

The TOI was developed to assist in identifying areas of the county where these traditional rider markets exist. To create the TOI for this analysis, demographic data from the 2020 ACS with 5-Year Estimates (2015–2019) were analyzed at the block group level for the demographic and economic variables. Using data for these characteristics and developing a composite ranking for each census block group, each area was ranked as “Very High,” “High,” “Medium,” or “Low” in their respective levels of transit orientation (Map 7-1). The block groups that were identified as “Very Low” have less than 100 persons per square mile. Table 7-1 shows the results of the TOI analysis.


Sumter
Lake
Orange
Pasco
Hillsborough
Polk
Hardee
Highlands
Osceola
Lakeland
Winter Haven
Haines City
Bartow
Lake Wales
Fort Meade
98
4
27
570
17
60
N
0
2.5
5 Miles
Downtown Lakeland
MEMORIAL BLVD
PARKER STREET
E MAIN ST
E LIME ST
S FLORIDA AVE
SIKES BLVD
Downtown Winter Haven
6TH ST NW
CENTRAL AVE
AVENUE K SW
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Map 7-1: Transit Orientation Index, 2020
Citrus Connection
Transit Orientation Index
Very Low*
Low
Medium
High
Very High
*Less than 100 persons per square mile.
Source: 2020 ACS 5-Year Estimates

Table 7-1: TOI Findings

Medium	High	Very High
Large area between Lake Wales and Winter Haven between Mountain Lake Cutoff Road and Cypress Garden Boulevard along Peace Creek	In downtown Lakeland, areas north of Bartow Road to areas north of Memorial Boulevard	Areas of downtown Lakeland, along South Florida Avenue, and south of Memorial Boulevard
East of Haines City near Osceola County	Webster Park (north and south)	Combee Settlement east of Lake Parker in Lakeland
East of Winter Haven, north and south of CR-542	Along US-98 from I-4 to Lakeland Hills Boulevard	Along Kathleen Road and I-4 to Providence Road
North of Bartow on both sides of US-98	From Drane Field Road north to I-4	Southeast parts of Lakeland into Eaton Park
West of SR-37 along SR-60 in Mulberry	North of downtown Winter Haven along 1st Street/Lucerne Park Road	Along US-17 in downtown Winter Haven
The central portion of Fort Meade along US-17 south of 9th Street	Between Lake Alfred Road and SR-544	Near Auburndale, concentrated between SR-655 and Havendale Boulevard
	In the more northern parts of Auburndale towards I-4 along SR-570	Area north of Bartow between US-17 and SR-60
	Area north of Hunt Brothers Road along SR-60 in Lake Wales	
	The central portion of Fort Meade along US-17 north of 9th Street	

Discretionary Markets

The discretionary market consists of potential riders residing in higher-density areas of Polk County that may choose to use transit as a commuting or transportation alternative. An analysis was conducted using industry-standard density thresholds, from the DTA methodology as discussed below, to identify areas in Polk County that exhibit transit-supportive residential and employee density levels today as well as in the future. Socioeconomic data for Polk County, including dwelling unit and employment data based on information developed for the Polk TPO 2045 LRTP, were used to develop the DTA for 2023 and 2032.

Based on industry standards and research, three density thresholds were used to determine if an area contains sufficient density to sustain some level of fixed-route transit operations. The levels of investment are shown in Figure 7-2.

Figure 7-2: Levels of Investment

Minimum	*Reflects minimum dwelling unit or employment densities to consider basic fixed-route transit services (i.e., local fixed-route bus service).*
High	*Reflects very high dwelling unit or employment densities that may be able to support more significant levels of transit investment than areas meeting the minimum or high-density thresholds.*
Very High	*Reflects increased dwelling unit or employment densities that may be able to support higher levels of transit investment (i.e., more frequent service, longer service span, etc.) than areas meeting only the minimum density threshold.*

Table 7-2 presents the dwelling unit and employment density thresholds associated with each level of transit investment described above, and Figure 7-3 shows a visual of the dwelling units and employment densities associated with the respective thresholds.

Table 7-2: Transit Service Density Thresholds

Level Of Transit Investment	Dwelling Unit Density Threshold[1]	Employment Density Threshold[2]
Minimum Investment	4.5–5 Dwelling Units/Acre	4 Employees/Acre
High Investment	6–7 Dwelling Units/Acre	5–6 Employees/Acre
Very High Investment	≥8 Dwelling Units/Acre	≥7 Employees/Acre

[1] TRB, National Research Council, TCRP Report 16, Volume 1 (1996), "Transit and Land Use Form," November 2002, MTC Resolution 3434 TOD Policy for Regional Transit Expansion Projects.
[2] Based on review of research on relationship between transit technology and employment densities.

Figure 7-3: Transit Service Density Thresholds



Minimum
4.5–5 dwelling units
and/or
4 employees per acre

High
6–7 dwelling units
and/or
5–6 employees per acre

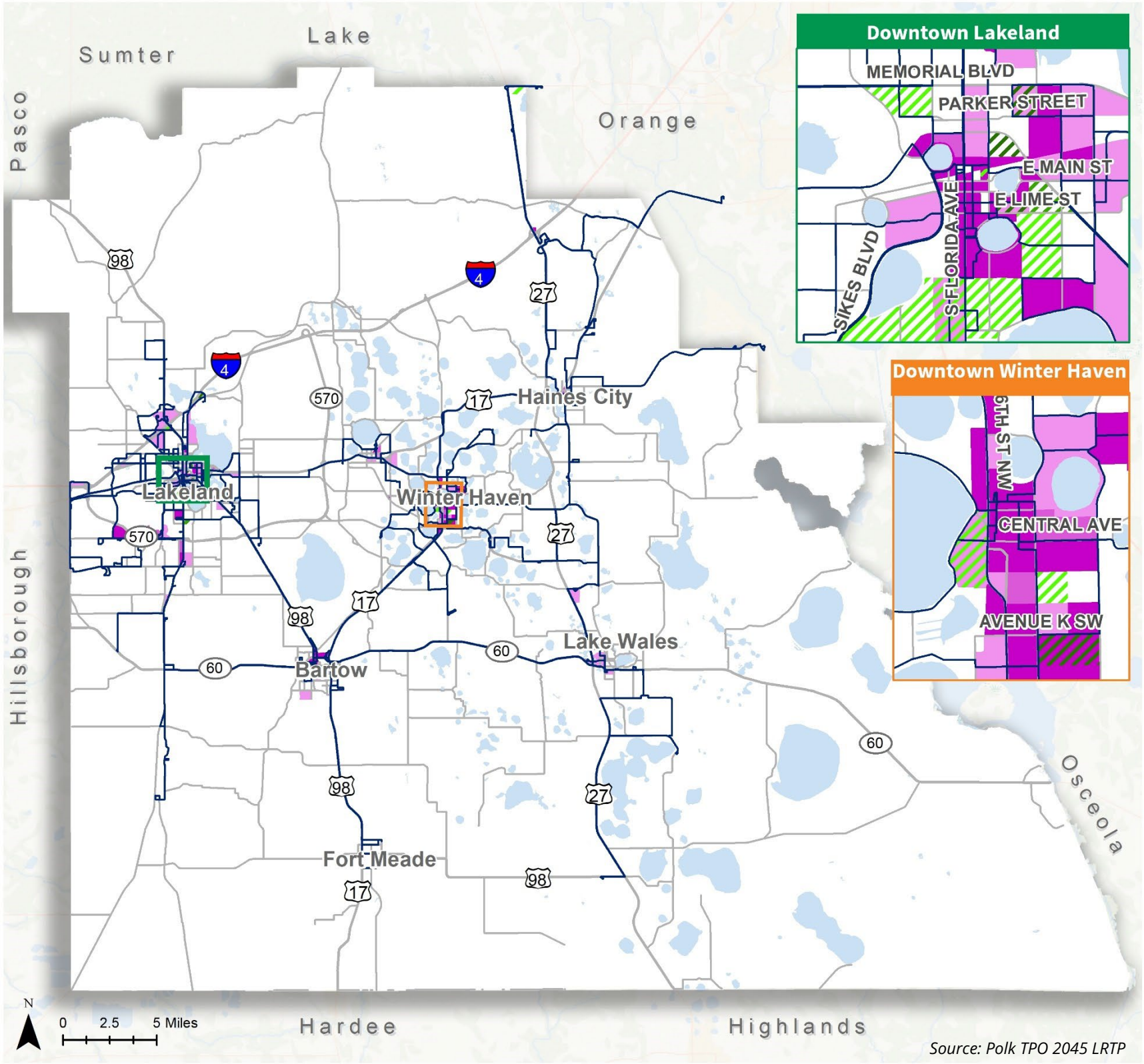
Very High
8 or more dwelling units
and/or
7 employees per acre

Table 7-3 shows the results of the DTA analysis. Maps 7-2 and 7-3 illustrate the results of the 2023 and 2032 DTA analyses conducted for Polk County, identifying areas that support different levels of transit investment in those time frames based on existing and future dwelling unit and employment densities. These maps also include an overlay of the existing Citrus Connection route network to gauge how well the current transit network covers the areas that are considered supportive of at least a minimum level of transit investment. The results of these analyses were used in the assessment of transit needs and demand.

Based on the 2032 DTA analysis, all areas meeting the "very high" threshold for employment and/or dwelling units will remain. A notable addition to the "very high" threshold is the area along I-4 near Florida Polytechnic University, which is projected to change from "minimum" to "very high" for employment density based on the 2032 DTA.

Table 7-3: DTA Findings

DTA	Minimum	High	Very High
Employment	In Lakeland, areas are primarily west of Lakeland Hills Blvd along I-4 directly south of SR-570 east of Florida Ave	In downtown Lakeland, west of Florida Ave and south of George Jenkins Blvd	Area west of Lakeland Linder International Airport to South County Line Road
	In areas of downtown Lakeland along Bartow Rd	East of Interlachen Pkwy, south of Memorial Blvd	In southwest Lakeland, near Lake Hollingsworth
	Along SR-60 corridor throughout Lake Wales	Along Polk Pkwy between Florida Ave and Beaker Blvd/ railroad tracks	Concentrated in downtown Lakeland, primarily south of Memorial Blvd, and east of Florida Ave by Florida Southern College campus
		North of Main St between Crown Ave and Van Fleet Dr in Bartow	Along US-98 in northern parts of Bartow, north of Main St
		Between Stadium Rd and Bridgers Ave in Auburndale	From Fairfax Dr to 11th St NE, near Polk State College campus
		North of Central Ave, east of 6th St in Winter Haven	Along US-17 corridor from Cypress Garden Blvd to Avenue T
Dwelling Units	In Winter Haven between Lake Howard and 6th St	In Lakeland along US-98 between Main St and Lime St	In downtown Lakeland between Memorial Blvd and East Lime St
	Areas between Central Ave and Ave K	Adjacent to Florida Ave between Edgewood Dr and Glendale St	Areas south of Avenue K



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Map 7-2: Density Threshold Analysis, 2023

Citrus Connection

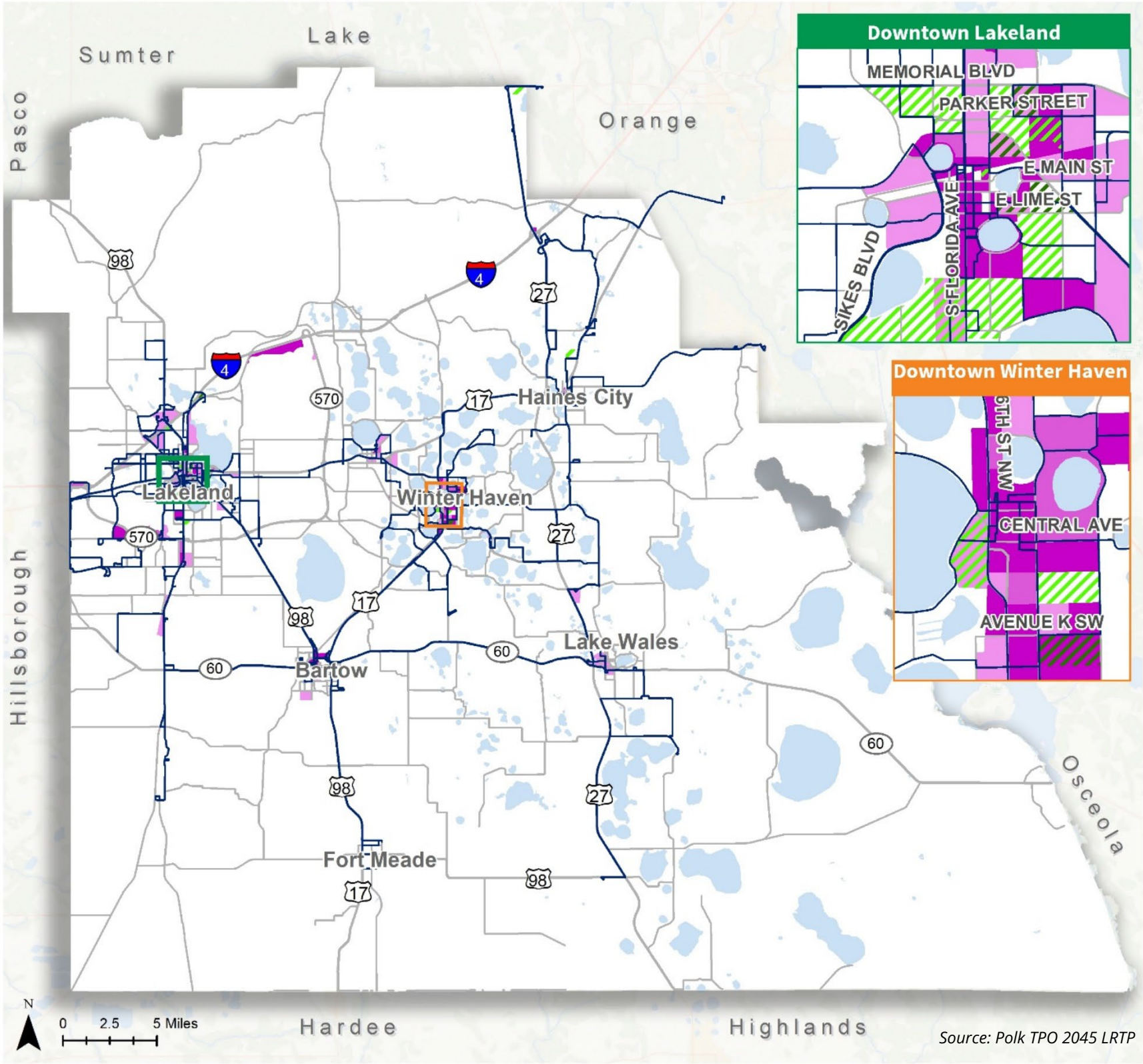
Dwelling Unit Threshold

- Minimum
- High
- Very High

Employment Threshold

- Minimum
- High
- Very High

Source: Polk TPO 2045 LRTP



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Polk Transportation Planning Organization

Map 7-3: Density Threshold Analysis, 2032

Citrus Connection

Dwelling Unit Threshold

- Minimum
- High
- Very High

Employment Threshold

- Minimum
- High
- Very High

Source: Polk TPO 2045 LRTP

Transit Accessibility Analysis

An analysis was conducted to identify the degree of accessibility from key cities via the current Citrus Connection system. The extent to which a given major destination or origin is accessible via transit can provide valuable information on how the current system may impact travel patterns of current and potential Citrus Connection riders.

Existing Network Accessibility Methodology

Using population and service area data and functionalities of FDOT's ridership demand estimation software, TBEST, a travel time analysis for current and potential Citrus Connection users was conducted. The analysis examined the county's areas that are within a gradient of travel sheds ranging from 0–90 minutes in travel time. The following existing Polk County locations were selected for this accessibility analysis:

- Downtown Bartow
- Downtown Lakeland
- Downtown Winter Haven
- Haines City

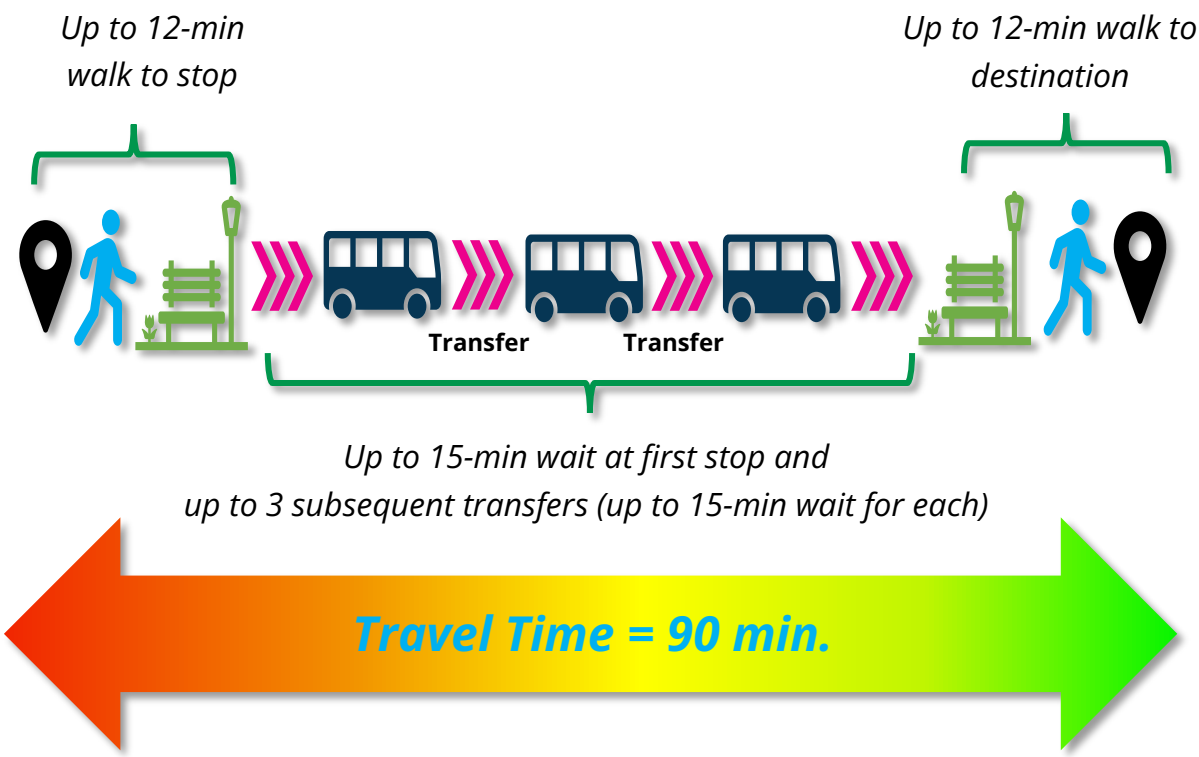
For the aforementioned locations, accessibility was measured for a weekday in the AM peak time period with a ¼-mile walk access to transit.

Network Accessibility Analysis Summary

As shown in Figure 7-4, the total travel time to access any of the locations includes not just the time on-board the bus (travel time), but also wait time to board the first bus, other wait times (if and as necessary), and walk times. For example, it considers whether a transfer is needed after the first bus to reach the destination, the walk time after getting off the first bus and walking to a transfer stop, and whether an additional transfer is needed thereafter to reach the destination, along with the wait time(s) to transfer to any other buses and the walk time to the final destination.

The accessibility/travel patterns analysis is summarized in Maps 7-4 through 7-8, which include the existing route network as well as other key interstates and major roadways. For any areas not colored according to the legend, it can be inferred that they are beyond the 90-minute travel time shed.

Figure 7-4: Components of 90-Min. Bus Trip



Downtown Bartow

The main stop in downtown Bartow, the Polk County Courthouse, is located in central downtown between W Boulevard St and W Church St. Overall, accessibility to the areas surrounding the stop is highest on the US-98 corridor to Lakeland, as shown in Map 2-4. Additionally, riders can reach Mulberry, Fort Meade, Winter Haven, and Lake Wales by routes servicing these areas.

Downtown Lakeland

The downtown Lakeland Transfer Facility is in the downtown area of Lakeland where all existing west Citrus Connection routes connect. Overall, accessibility to the areas surrounding this facility is highest within the City of Lakeland and on S Florida Ave, George Jenkins Blvd, and US-98. Riders originating from downtown Lakeland can reach the majority of the western side of Polk County within 90 minutes, including Bartow and Mulberry on the western side and Winter Haven on the eastern side, by routes servicing these areas (Map 2-5).

Downtown Winter Haven

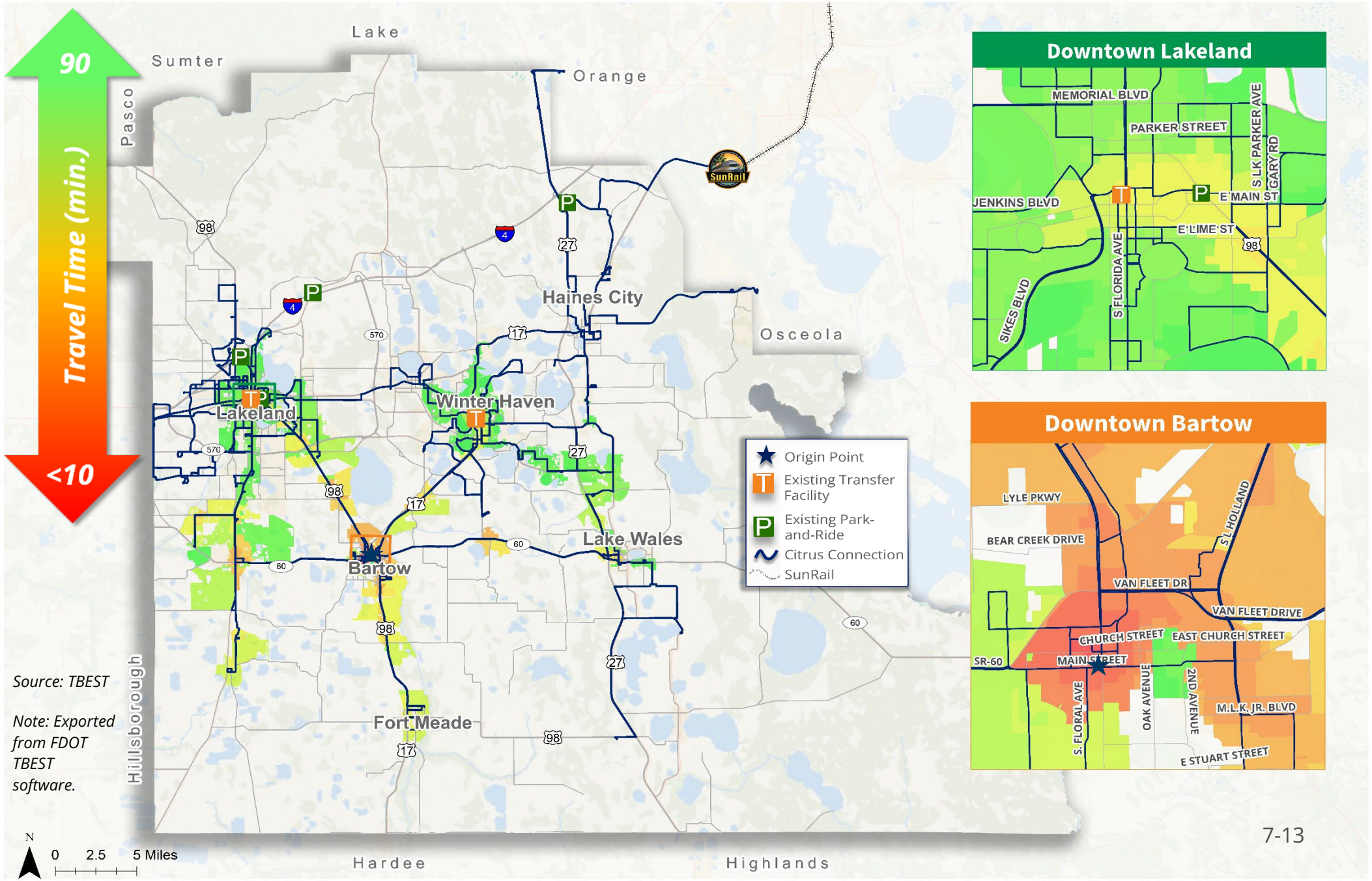
The central connection point, the Winter Haven Transfer Facility, is located in downtown Winter Haven. Overall, accessibility to the areas surrounding this facility

is highest on the US-17 corridor. As shown in Map 2-6, there is accessibility to Bartow, downtown Lakeland, Eagle Ridge Mall (north of Lake Wales), Haines City, and Mulberry by routes servicing these areas.

Haines City

The connection point in Haines City, near Hinson Ave and 17th St, is adjacent to downtown Haines City. Overall, accessibility to the areas surrounding the stop is highest on US-17 and nearby areas. Although accessibility is high in the northeast area of the county, riders can reach the Winter Haven Transfer Facility and Eagle Ridge Mall, which provides access to routes that connect to the east (Map 2-7). Additionally, riders from the Haines City Plaza can access Davenport, Lake Alfred, Osceola County, the Poinciana SunRail station, and the Posner Park-and-Ride. Riders reaching Osceola County or the Poinciana SunRail station can access the LYNX network.

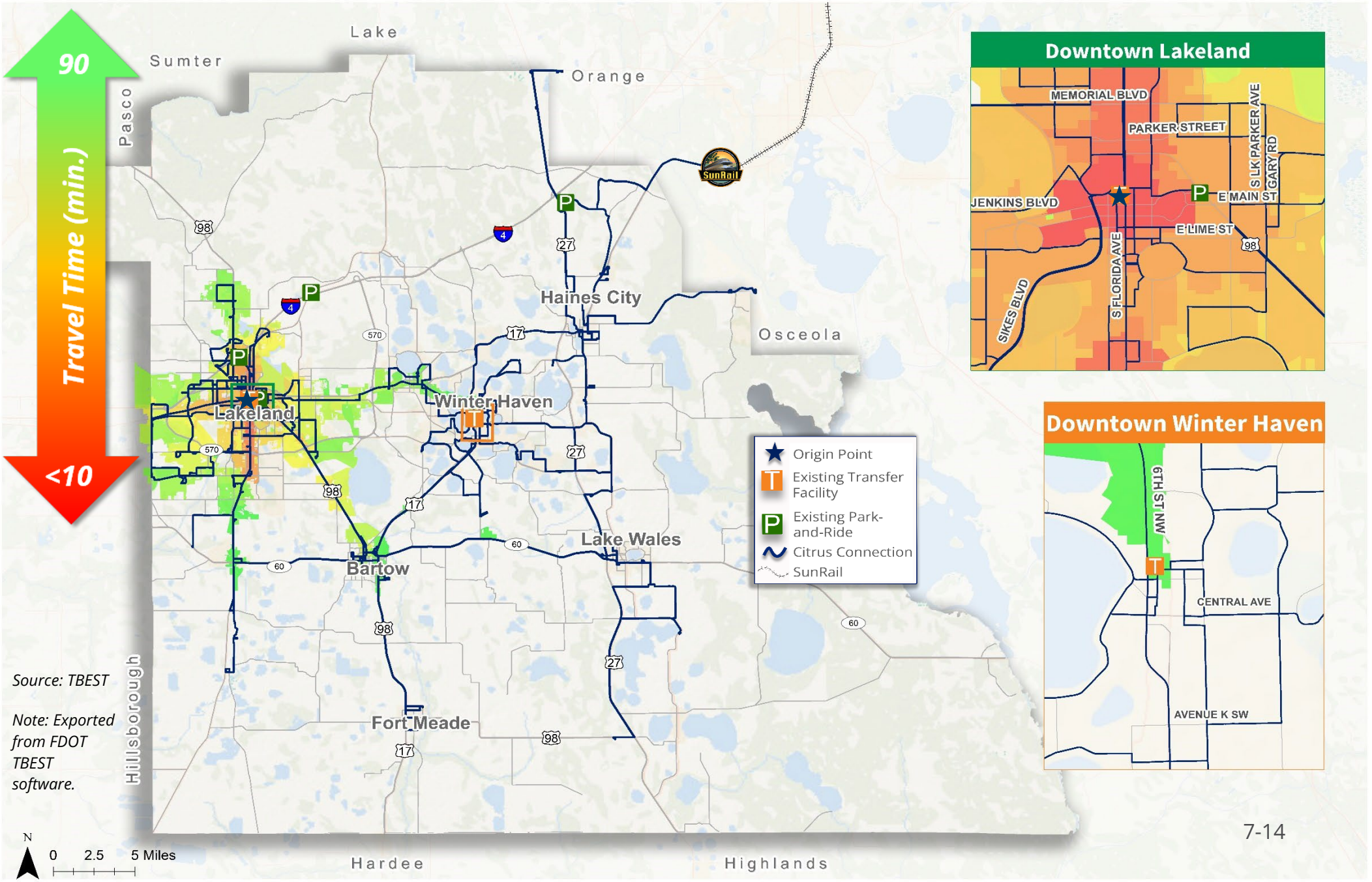
Map 7-4: Accessibility from Downtown Bartow



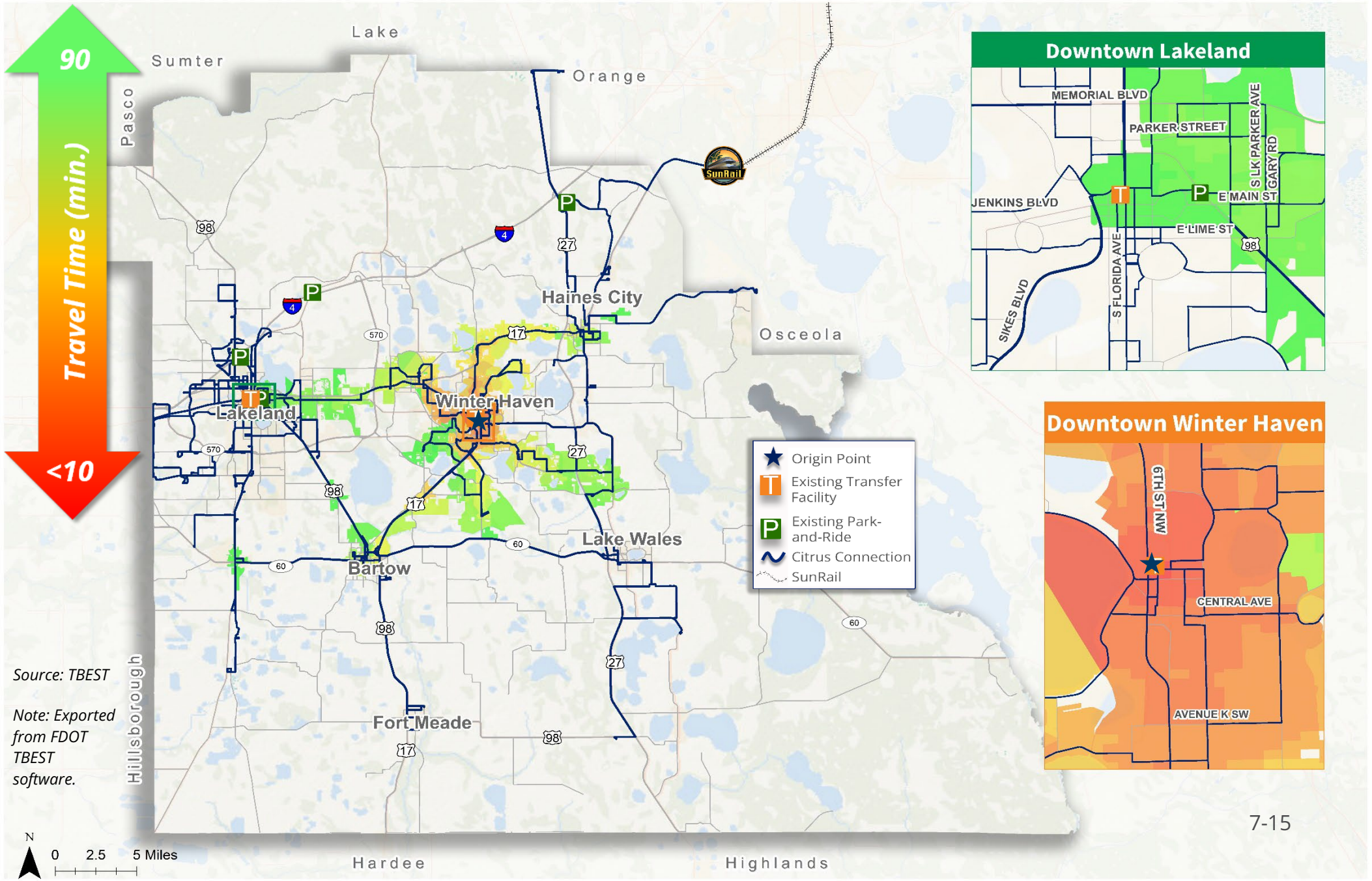
Source: TBEST

Note: Exported from FDOT TBEST software.

Map 7-5: Accessibility from Downtown Lakeland



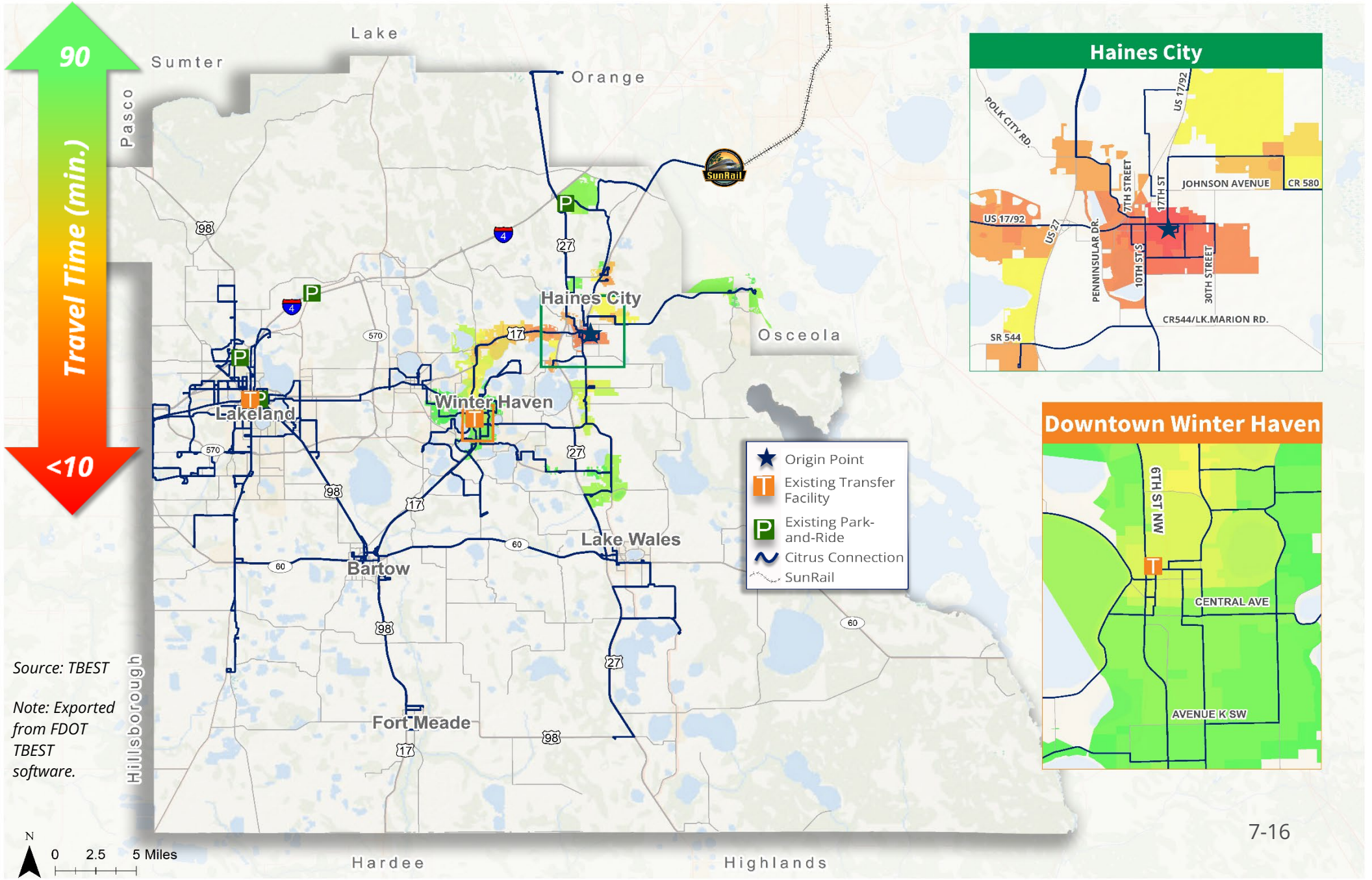
Map 7-6: Accessibility from Downtown Winter Haven



Source: TBEST

Note: Exported from FDOT TBEST software.

Map 7-7: Accessibility from Haines City



Source: TBEST

Note: Exported from FDOT TBEST software.

Ridership Demand Projections

As another component of the transit demand assessment, forecasted transit ridership demand projections for the existing and proposed fixed-route transit networks were analyzed using the ridership forecast data from TBEST, the FDOT-approved ridership estimation software for TDPs. This analysis was conducted to gauge route-level and system-wide demand assuming the maintenance of existing transit service and implementation of the potential improvements proposed by the TDP.

TBEST is a comprehensive transit analysis and ridership-forecasting model that can simulate travel demand at the individual route level. It was designed to provide near- and mid-term forecasts of transit ridership consistent with the needs of transit operational planning and TDP development. In producing model outputs, TBEST also considers the following:

- *Transit network connectivity* – The level of connectivity between routes within a bus network; the greater the connectivity between bus routes, the more efficient the bus service becomes.
- *Spatial and temporal accessibility* – Service frequency and distance between stops; the larger the physical distance between potential bus riders and bus stops, the lower the level of service utilization. Similarly, less frequent service is perceived as less reliable and, in turn, utilization decreases.
- *Time-of-day variations* – Peak-period travel patterns are accommodated by rewarding peak service periods with greater service utilization forecasts.
- *Route competition and route complementarities* – Competition between routes is considered. Routes connecting to the same destinations or anchor points or that travel on common corridors experience decreases in service utilization. Conversely, routes that are synchronized and support each other in terms of service to major destinations or transfer locations and schedule benefit from that complementary relationship.

The following sections outline the model inputs and assumptions, describe the TBEST scenarios performed using the model, and summarizes the ridership forecasts produced by TBEST.

Model Inputs / Assumptions and Limitations

TBEST uses various demographic and transit network data as model inputs. The inputs and the assumptions made in modeling the Citrus Connection system in TBEST are presented below. The model used the TBEST Land Use Model structure (TBEST Land Use Model 2018), which is supported by parcel-level data developed from the Florida Department of Revenue (DOR) statewide tax database. The DOR parcel data contain land use designations and supporting attributes that allow the application of Institute of Transportation Engineers (ITE)-based trip generation rates at the parcel level as an indicator of travel activity.

It should be noted, however, that the model is not interactive with roadway network conditions. Therefore, ridership forecasts will not show direct sensitivity to changes in roadway traffic conditions, speeds, or roadway connectivity.

Transit Network

The transit route network for all existing Citrus Connection routes was created to reflect 2020 conditions after *Re-Route 2020*, the validation year for the model. General Transit Feed Specification (GTFS) data as of October 2020 were obtained from Citrus Connection to provide the input for the base transit system. Data include:

- Route alignments
- Route patterns
- Bus stop locations
- Service spans
- Existing headways during peak and off-peak periods (frequency at which a bus arrives at a stop—e.g., 1 bus every 60 minutes)

The GTFS data were verified to ensure the most recent bus service spans and headways; edits were made as needed. Transfer locations were manually coded in the network properties.

Socioeconomic Data

The socioeconomic data used as the base input for the TBEST model were derived from 2019 ACS Five-Year Estimates, the Bureau of Labor Statistics, the Bureau of Economic Analysis, 2015 InfoUSA employment data, and 2020 parcel-level land use data from the Florida DOR. Using these data inputs, the model captures market demand (population, demographics, employment, and land use characteristics) within ¼-mile of each stop.

TBEST uses a socioeconomic data growth function to project population and employment data. Using ACS socioeconomic data, population and employment growth rates were calculated. Population and employment data are hard-coded into the model and cannot be modified by end-users. As applied, the growth rates do not reflect fluctuating economic conditions as experienced in real time.

Special Generators

Special generators were identified and coded into TBEST to evaluate the opportunity for generating high ridership. Citrus Connection special generators include the following:

- Universities – Florida Southern College, Keiser University, Polk State College campuses, Ridge Technical College
- Transfer hubs – Downtown Lakeland, downtown Winter Haven
- Major rail stations – Poinciana SunRail station, Amtrak stations
- Park-and-ride facilities – Gow B Fields Park-and-Ride, Posner Park-and-Ride, Rose St Park-and-Ride, State Park-and-Ride, future Park-and-Rides
- Shopping malls – Eagle Ridge Mall, Lakeland Square Mall, Lakeland Town Center
- Hospitals – Bartow Regional Medical Center, Heart of Florida Hospital, Lakeland Regional Health Medical Center, Lake Wales Medical Center, Winter Haven Hospital

TBEST Model Limitations

It has long been a desire of FDOT to have a standard modeling tool for transit demand that could be standardized across the state, similar to the Florida Standard Urban Transportation Model Structure (FSUTMS) model used by MPOs in developing LRTPs. However, whereas TBEST is an important tool for evaluating improvements to existing and future transit services, model outputs do not account for latent demand for transit that could yield significantly higher ridership. In addition, TBEST cannot display sensitivities to external factors such as an improved marketing and advertising program, changes in fare service for customers, fuel prices, parking supply, walkability, and other local conditions; correspondingly, model outputs may over-estimate demand in isolated cases.

Although TBEST provides ridership projections at the route and bus stop levels, its strength lies more in its ability to facilitate relative comparisons of ridership

productivity. As a result, model outputs are not absolute ridership projections but, rather, are comparative for evaluation in actual service implementation decisions. TBEST has generated interest from departments of transportation in other states and continues to be a work in progress that will become more useful as its capabilities are enhanced in future updates to the model. Consequently, it is important for Citrus Connection to integrate sound planning judgment and experience when interpreting TBEST results.

Scenarios and Ridership Forecasts

Using the inputs, assumptions, and route-level ridership data obtained from Citrus Connection, the TBEST model was validated for 2021, with a base annual ridership of 558,237. Although this is lower than historic average ridership due to the pandemic, which has impacted every transit system, it is the most recent available data to model TBEST. Using the validation model as the base 2021 model, the following model scenarios and ridership forecasts were developed for this TDP major update:

- 2023 Existing Network Scenario – assumes no change will be implemented to the existing route network.
- 2032 Existing Network Scenario – assumes no change will be implemented to the existing route network.
- 2032 TDP Needs Network Scenario (see Chapter 8 of this report) – assumes adding the TDP Needs network in the next 10 years.

Tables 7-4 and 7-5 show the projected ridership for the 2023 Existing Network Scenario, 2032 Existing Network Scenario, and 2032 Needs Network Scenario at the route and system levels if an improvement is implemented in 2032 and the ridership gains or losses as projected by the TBEST model.

Table 7-4: Existing and Future Citrus Connection Network Scenarios
TBEST Ridership Estimates by Route*

Route	2023 Existing Network	2032 Existing Network	2032 TDP Needs Network	2023-2032 Existing Network % Change	2023-2032 Needs Network % Change
		Existing/Re-purposed Routes			
15	28,947	35,945	57,803	24%	100%
16X	3,764	4,819	5,422	28%	44%
17x	1,721	2,168	n/a	26%	n/a
18X	15,623	20,479	29,542	31%	89%
19X	1,275	1,374	10,046	8%	688%
20X	14,964	19,696	n/a	32%	n/a
21X	1,240	1,417	20,387	14%	1,544%
22XW	20,488	25,450	27,575	24%	35%
25	16,516	22,477	24,346	36%	47%
27x	257	268	n/a	4%	n/a
30	37,694	45,806	73,794	22%	96%
35	8,754	10,611	n/a	21%	n/a
40/44	10,939	13,028	14,789	19%	35%
50	16,262	19,333	21,807	19%	34%
60	6,177	6,447	6,748	4%	9%
Blue	31,629	38,375	48,962	21%	55%
Cyan	1,866	2,299	n/a	23%	n/a
Gold**	156,680	193,402	650,874	23%	315%
Green	18,108	21,997	23,245	21%	28%
Lime	11,440	13,954	19,511	22%	71%
Orange	18,777	22,873	89,688	22%	378%
Peach	14,906	18,919	20,998	27%	41%
Pink	40,398	51,090	64,160	26%	59%
Purple	55,397	68,226	125,959	23%	127%
Red	11,703	14,442	15,627	23%	34%
Silver***	24,312	30,193	120,160	24%	394%
Yellow	24,473	28,999	29,601	18%	21%

*Based on TBEST Model
**Becomes Florida Ave BRT in 2032 Needs Scenario
***Becomes US-98 BRT in 2032 Needs Scenario
Note: n/a denotes route was repurposed or eliminated in the 2032 Needs Scenario.

Table 7-4: 2022 Existing and Future Citrus Connection Network Scenarios TBEST Ridership Estimates by Route (cont.)*

Route	2023 Existing Network	2032 Existing Network	2032 TDP Needs Network
Coral	n/a	n/a	9,391
Downtown Circulator	n/a	n/a	53,633
I-4 Hopper	n/a	n/a	23,824
Lemon	n/a	n/a	23,707
Lakeland–Tampa Express	n/a	n/a	44,149
Polk City to Winter Haven LX	n/a	n/a	34,052
US-27 LX	n/a	n/a	39,133
Davenport MOD	n/a	n/a	17,158
Dundee MOD	n/a	n/a	21,766
Lakeland Highlands MOD	n/a	n/a	21,664
Southeast MOD	n/a	n/a	19,265

*Based on TBEST Model
n/a – Not applicable as these are new routes/services.

Table 7-5: Existing and Future Citrus Connection Network Scenarios TBEST Total Ridership Estimates*

Route	2023 Existing Network	2032 Existing Network	2032 TDP Needs Network	2023-2032 Existing Network % Change	2023-2032 Needs Network % Change
Network	594,310	734,087	1,808,786	24%	204%

*Based on TBEST Model

Transit Ridership Analysis

Based on the TBEST model results shown in the tables, maintaining the status quo will result in only a small increase in Citrus Connection ridership for all routes over time. According to the projections, overall annual ridership is expected to increase by only about 24 percent by 2032, an annual approximate growth rate of two percent.

The model ridership projections indicate that maintaining the existing route structure/alignments may provide only minimal growth for the system over the next 10 years. With the 2032 TDP Needs Network, the total system ridership is

estimated to increase by 204%, to more than 1.8 million riders annually. The 19X and 21X, both in east Polk County, are projected to experience the largest growth, 688 percent and 1,544 percent, respectively.

These results, combined with input from public outreach, could imply that an addition of regional connections and frequency improvements to the current network may lead to more ridership productivity.



Source: Polk TPO

Section 8. Transit Needs Development

This section summarizes the development process and the resulting potential transit improvements for Citrus Connection's 10-Year TDP. Transit needs for the next 10 years were developed without consideration of funding constraints and reflect the true unimpeded needs of the community. The improvements were derived from information gathered through various data collection, analytical, and outreach efforts conducted for the TDP.

Development of Transit Needs

The 2023–2032 TDP transit needs consist of improvements that enhance existing Citrus Connection services, repurpose routes, and expand regional service. These improvements reflect the transit needs for the next decade and have been developed based on information gathered through the following methods:

Community Needs and Vision

Multiple direct and indirect outreach techniques were used to obtain substantive public input on transit needs. Interviews with key stakeholders including elected officials, discussions with business, social service, and rider groups, and public workshops were conducted to gather input from selected stakeholders and the community regarding what improvements should be considered for the next 10 years.

Situation Appraisal

This situation appraisal helps to develop an understanding of Citrus Connection's operating environment in the context of key elements as specified in the TDP Rule. Findings from the relevant plans/studies and implications from the situation appraisal were considered in identifying potential transit alternatives.

Goals and Objectives

The goals and objectives updated as part of this 10-year TDP emphasize many of the agency's existing priorities and outline new priorities for improvements based on transit needs. The objectives and policies often provide insight into transit needs within the community and the potential means with which to meet them.

Transit Demand Assessment

Assessments of transit demand and needs were conducted and included the use of various GIS-based analysis and FDOT-approved demand estimation tools. These technical analyses, together with the baseline conditions assessment and performance reviews previously conducted for the TDP, were used to help identify areas with transit-supportive characteristics when developing the 10-year transit needs.

10-Year Transit Needs

Based on these development methods, service, capital/ infrastructure, technology, and policy improvements were identified, as summarized in the remainder of this section.

Service improvements include strengthening the current system and expanding its regional reach and availability. Improvements to existing service include enhancements to route frequencies and hours/days of service and repurposing of routes to maximize their usefulness to the riding community. The 10-Year needs also include service expansions, including adding new routes and new modes of transit.

As previously noted, the service needs are the result of considering the existing and projected conditions of Polk County, community involvement, input from elected officials and other stakeholders, the situation appraisal, and demand modeling. This network incorporates improvements of existing routes with the highest ridership and forward-thinking, technology-based options that will help make Citrus Connection a practical travel alternative for more people locally and regionally.

The remainder of this section presents the service needs, followed by the capital/infrastructure/technology needs, and policy needs that are proposed to be in place to support the service needs.

Service Needs

Premium Transit

As Polk County's population continues to grow, many opportunities exist to advance mobility options for people by means of the use of transit. Transit will continue to be a part of the solution for the need for better and quicker travel options and growth in traffic congestion due to population and employment growth. Therefore, improvements that are efficient and use technological and operational advancements in transit are essential.

The improvements build on and enhance existing and productive services. Most important, they add advanced technologies and premium transit concepts in Polk County, elevating transit on some corridors to provide rail-like services in a rail-desired community. The following are recommended improvements to meet the needs for a growing Polk County:

- *US-98 BRT* – Input from the community and stakeholders and data analyses indicated that there is a strong demand to quickly connect downtown Lakeland to downtown Bartow. To address this need, service and technology enhancements are recommended for the Silver route, which currently connects Lakeland directly to Bartow approximately every 90 minutes. The service would operate on all days of the week, and frequency is recommended to increase to every 15 minutes. This service would also provide a quick connection to the majority of the proposed west routes at the Lakeland Downtown Terminal and Routes 22XW and 25 from downtown Bartow.

  In addition, this corridor experiences more than 40,000 vehicles daily according to FDOT, suggesting that BRT could help alleviate traffic. To complement the service upgrades, capital/technology upgrades, including transit preferential treatment technologies such as traffic signal priority (TSP) and queue jumps are recommended (see expanded descriptions of these strategies in the Capital Needs section). Although higher frequency would reduce wait times, these technologies would help ensure that the buses are able to navigate through busy intersections quickly to stay on schedule.

Additionally, enhanced amenities such as covered/ sheltered bus stops with real-time passenger information, Wi-Fi, and information kiosks would be added.

The US-98 BRT would operate in mixed traffic (sometimes called "BRT Lite"). Based on demand, Citrus Connection could explore an opportunity for the service to operate on a dedicated lane in the future, making the service an exclusive BRT service.

- *Florida Ave BRT* – Feedback from stakeholders and discussion group members suggested that there was a need to alleviate traffic on the Florida Ave corridor. Furthermore, data from FDOT show that Annual Average Daily Traffic (AADT) reaches 30,000+ vehicles on the majority of Florida Ave. Based on feedback and data, the Florida Ave BRT would provide a high-frequency premium transit connection along Florida Ave from the Lakeland Downtown Terminal to Lake Miriam Square Shopping Center. It also would support the South Florida Ave Lane Repurposing (road diet) project by minimizing vehicle demand and connecting those in the area quickly to adjacent destinations. This route would upgrade the Gold Route, although the origin point, Lakeland Square Mall, would be modified to the Gow B Fields Park-and-Ride.

  The Florida Ave BRT would improve the current frequency on Florida Ave to 12-minute service and serve the areas Monday through Sunday. Similar to the US-98 BRT, key features of the service would include bus preferential treatments such as TSP/queue jumps at needed/applicable intersections and an opportunity to explore an exclusive lane operation based on demand and access to right-of-way.

  The US-98 BRT Feasibility Study conducted by FDOT in 2021 identifies the corridor on US-98 from Lakeland Square Mall to downtown Lakeland as a section that could benefit from premium transit and TOD. However, data suggests BRT should extend south on US-98/Florida Ave from the Gow B Fields Park-and-Ride, the service could be extended north to reach the high-speed rail stop noted in the study or to Lakeland Square Mall if demand warrants.

- *SunRail Extension to Lakeland* – Extending the SunRail into Polk County will enhance attractiveness of transit locally and significantly improve regional connectivity for Polk County's residents and visitors. The existing alignment connects riders to locations from DeBary in Volusia County to Poinciana in

Osceola County. If the SunRail is extended into Polk County, the final alignment and station locations will be determined as part of the proposed TCAR study.

Regional Express

Regional connections were indicated as another need throughout the public involvement process in the general public surveys and by stakeholders. Fast and convenient local connections between regional key points were highlighted as a priority going forward. There was consensus among the key stakeholders that such services may also help bolster economic development, quickly connecting growth centers and jobs to people both locally and regionally. The following improvements were identified to address this need:

- *I-4 Hopper* – This route would provide an express route from the Gow B Fields Park-and-Ride in Lakeland to the Poinciana SunRail station, which also provides access to the LYNX network. Stakeholder feedback from the first phase of public involvement indicated demand for direct routes to regional activity centers. In addition, there is currently no connection from the western part of the county to any SunRail services. This route would eventually connect to the Haines City SunRail station if implemented. The express route, which would operate mostly on I-4, would provide a direct and faster connection between Lakeland and SunRail services while also connecting all existing and proposed park-and-rides. The stops would include the Gow B Fields Park-and-Ride, State Park-and-Ride, Posner Park-and-Ride, and the proposed new park-and-ride facilities until reaching the Poinciana SunRail station.

  This route also would add a new connection to the major education center, Florida Polytechnic University, and employment/ distribution centers along the route and would provide another commuter connection to Osceola County and ultimately Orange County (via SunRail). Based on Census commute flow data, Orange County is the primary area to which workers connect from Polk County, highlighting the potential demand for additional mode/service options. Connecting major park-and-rides, a major education center, and the SunRail station, it would operate every 60 minutes on weekdays. Additionally, since this route would connect to LYNX services, Citrus Connection should coordinate with the agency for funding and/or operations support.

- *Lakeland to Tampa Express* – A regional connection to link to Tampa through the Hillsborough Area Regional Transit (HART) network via I-4 also is recommended. Regional travel flow data in combination with public input pointed to a connection with Hillsborough County, making this connection a regional need. Once connected with the HART network, this peak-hour-only regional commuter express would allow commuters access to the HART network as well as other transit services west of Polk County. Although Orange County is the primary work outflow from Polk County, Hillsborough County has similar mutual flows of workers to and from both counties. However, although the connection is supported by public input and data, this route may not warrant an all-day service; hence, it is proposed as a morning and afternoon peak-hour-only service on weekdays. In addition, as part of this route would be outside Polk County, a regional partnership with HART for funding and/or operations may be necessary to implement this regional bus service.

Local Express

Providing service to areas not currently served in Polk County is a significant need identified through public involvement efforts. Needed improvements to fill the mobility gaps include the following:

- *Polk City to Winter Haven LX* – This route would provide a one-seat express route to connect Polk City to Winter Haven and would introduce transit service to Polk City and add coverage in Auburndale. Additionally, this route is direct, closes mobility gaps, and adds transportation alternatives to areas that show high traditional rider market demand. The route would operate during peak hours every 90 minutes on weekdays and would stop at key locations and terminate at the Winter Haven Transfer Facility. Riders would be able to connect to both East and West routes at this location.
- *US-27 LX* – Public outreach and guidance from local officials indicated demand for a new connection and transit coverage on US-27. This route would operate on Cypress Gardens Blvd and US-27, connecting the Legoland area to Haines City while also serving office parks, and would operate every 45 minutes on weekdays, linking high-employment and recreation areas. Looking forward, this direct connection would provide a critical connection to SunRail services when it is extended to Haines City and will help provide an alternative mode for commuters that use US-27.

Local Network Improvements

Citrus Connection completed the *ReRoute 2020* project, a system overhaul for the West routes to improve route inefficiencies through route streamlining, frequency improvements, and additional evening and weekend service to improve transportation options, particularly for passengers relying on public transit for employment. The updated bus network launched in October 2019. Citrus Connection continues to monitor both system- and route-level performance. Anticipated adjustments and additions to *ReRoute 2020* services, as shown as "Proposed Network Changes" in Map 3-1, include the following:

- New Routes
  - Coral Line – This new route will add coverage in western Lakeland, operating primarily on Pipkin Road from the shopping center on Imperial Blvd to the Publix adjacent to County Line Road. The route also will serve a Polk State College campus and other corporate office centers. Operating on weekdays, the route will provide service from 7:45 am–5:30 pm every 60 minutes.
  - Circulator – Eastside and Westside – This route will run Monday through Saturday every 60 minutes. On Monday through Friday, the route will operate from 6:15 am to 9:05 am, then 1:15 pm to 6:05 pm and from 8:15 am to 2:05 pm on Saturdays. Departing from the Lakeland Downtown Terminal, the routes will connect to Lakeland Town Center, the Lakeland Public Library, Central Park Plaza, and Kathleen High School.
  - Lemon Line – Adding coverage in western Lakeland near County Line Road, the route will operate primarily on US-92, connecting the Lakeland Downtown Terminal, Bonnet Springs Park, Citrus Connection's main office, and shopping and office centers around County Line Road and Swindell Road. It will operate Monday through Saturday; on weekdays, it will operate 5:45 am–5:38 pm and serve riders every 60 minutes. On Saturday, the route will operate every two hours from 7:15 am–3:08 pm.
- Revised Alignments
  - 21X – This route will continue to connect riders from Eagle Ridge Mall to Bradley and SR-60 and will also serve the Mulberry and Bradley areas.
  - Blue Line – The two existing Blue Lines will be reconfigured into north and south alignments and will connect at the Gow B Fields Park-and-Ride. The

north Blue Line will serve destinations along US-98 to Griffin Road and Lakeland Square Mall, and the south Blue Line will serve areas south of Griffin Road, east of Kathleen Road to the Lakeland Downtown Terminal.

  - Green Line – The two existing Green Lines will be consolidated into one that will serve the Lakeland Downtown Terminal and areas east of US-98 to a shopping center at Meadowland Park Blvd.
  - Orange Line – This revised route will serve areas primarily in east Lakeland and will connect the Lakeland Downtown Terminal to Maine Ave via Main St, Gary Road, Lake Parker Drive, and South Combee Road.
  - Peach Line – This route will continue to serve and aid the Florida Ave Lane Repurposing project by adding a segment on Hancock St between New York Ave and Lincoln Ave.
  - Red Line – This modified route will operate primarily on Harden Blvd between the Lakeland Downtown Terminal and the VA Clinic on Pipkin Road.
  - Yellow Line – This adjusted route will connect the Lakeland Downtown Terminal to areas near Swindell Road and will connect to Kathleen High School and serve residents and workers on Memorial Blvd and 10th St.

- Revised Service Spans and Days of Service
  - Some existing routes will have revised service spans and days of service. The Gold, Green, Orange, Peach, and Yellow Lines will begin at 6:15 am, and the Green, Orange, Red, and Yellow Lines will stop service at approximately 6:00 pm. The Gold Line will terminate service at 6:31 pm, and the Peach Line will end service at 7:00 pm. The Purple Line will operate 5:45–6:50 pm weekdays. The Green, Orange, and Red Lines will run on weekdays, and the Gold, Peach, Purple, and Yellow Lines will serve riders Monday through Saturday.

Enhanced Existing Local Network

With direction and support from local stakeholders and the community for increasing service frequency on high-demand corridors/areas over an expansive service area, this TDP recommends increasing frequencies on the most productive routes over the next 10 years. Enhancing frequencies can help attract new discretionary riders and improve the quality of service for current riders using the system. These routes will help build a high-frequency, high-ridership core for Citrus

Connection's fixed-route network that will help improve the quality and appeal of transit to visitors and residents alike. As improving frequency and span of service is a top priority of the public, particularly current riders, potential improvements to existing routes were reviewed. The following routes are recommended for consideration:

- 30-minute service – Route 30 and Green, Orange, Pink, Red, and Yellow lines
- 45-minute service – Routes 15, Purple Line
- Saturday service – Pink Line
- Sunday service – Purple Line
- Expanded service span by an hour – Route 30 and Pink Line

App-based On-Demand Transit

Mobility-on-Demand (MOD) is an increasingly popular transit service concept that allows riders, using a phone app or by calling a designated phone number, to request a ride in real-time or schedule in advance. MOD uses software to automate and optimize trip requests based on trip request times, origin and destination locations, vehicle location, and vehicle capacity considerations. Vehicle operators receive and respond to trip assignments as they are requested in real time.

The service is available and accessible to ambulatory and persons with disabilities in addition to the general public. The concept promotes transit, provides efficient service in low-density areas, and enhances access to transit beyond current service areas. These services also serve as first/last-mile service for riders of regular fixed-route transit services.

Based on data from MOD services implemented in most areas nationally, fares are typically higher than those for using regular fixed-route bus transit services. This is due to the added convenience MOD provides and also may be beneficial to help ensure that anyone who can conveniently use regular fixed-route bus transit for the same trip continues to use it instead of switching to MOD. However, as no ADA complementary paratransit will be available in any of the MOD zones, any eligible ADA paratransit users would still pay only the current ADA fare of $2 per one-way MOD trip to access fixed-route services, regardless of the distance. For riders who are using MOD in conjunction with fixed-route services, the service could be at a reduced fare, as they have already paid or will pay a fare for regular bus service.

The following zones have been identified for the TDP:

- *Davenport* – This service would provide on-demand coverage to neighborhoods and businesses in the growing Davenport area. This zone repurposes Route 20X while expanding coverage in the area to newer subdivision and other residential areas. Although data show ridership demand, especially from traditional rider markets, currently there is no local neighborhood service in the area other than on and around the US-27 corridor. This zone would span as far north as Posner Park, serving the Posner Park-and-Ride, and as far south as Hinson Ave. To the east, the zone would stretch along Power Line Road and to the west near FDC Grove Road. It would operate Monday through Saturday.
- *Dundee* – With the potential repurposing of current routes 17X and 27X, service would be reestablished as on-demand transit in this area Monday through Saturday and would connect riders in the Haines City, Lake Hamilton, and Dundee areas. This zone would encompass households and shopping centers between US-27 and SR-17 from US-17 to Waverly Road.
- *Lakeland Highlands* – This zone expands the reach of Citrus Connection to an area that does not currently have service but has potential demand due to traditional rider markets. It encompasses the area between SR-37, US-98, Polk Parkway, and Carter Road while also serving the adjacent shopping center. This zone would provide on-demand service Monday through Saturday.
- *Southeast* – This zone expands the reach of Citrus Connection in Lake Wales, Highland Park, Hillcrest Heights, and parts of Frostproof while also covering areas of the repurposed Route 35. The zone covers areas south of Burns Ave east of US-27, north of North Scenic Highway, Hillcrest Heights adjacent to Crooked Lake, and along south US-27 west of Reedy Lake in Frostproof to South Scenic Highway. The traditional transit market segments and residents/workers in this zone who are without easy access to transit services would be connected to locations in the zone and to Route 21X, which provides access to the Eagle Ridge Mall, Bartow, and other West routes. This zone would provide on-demand service Monday through Saturday.

Table 8-1 summarizes these improvements by route at the end of the 10-Year TDP. Map 8-1 shows all 10-year needs.

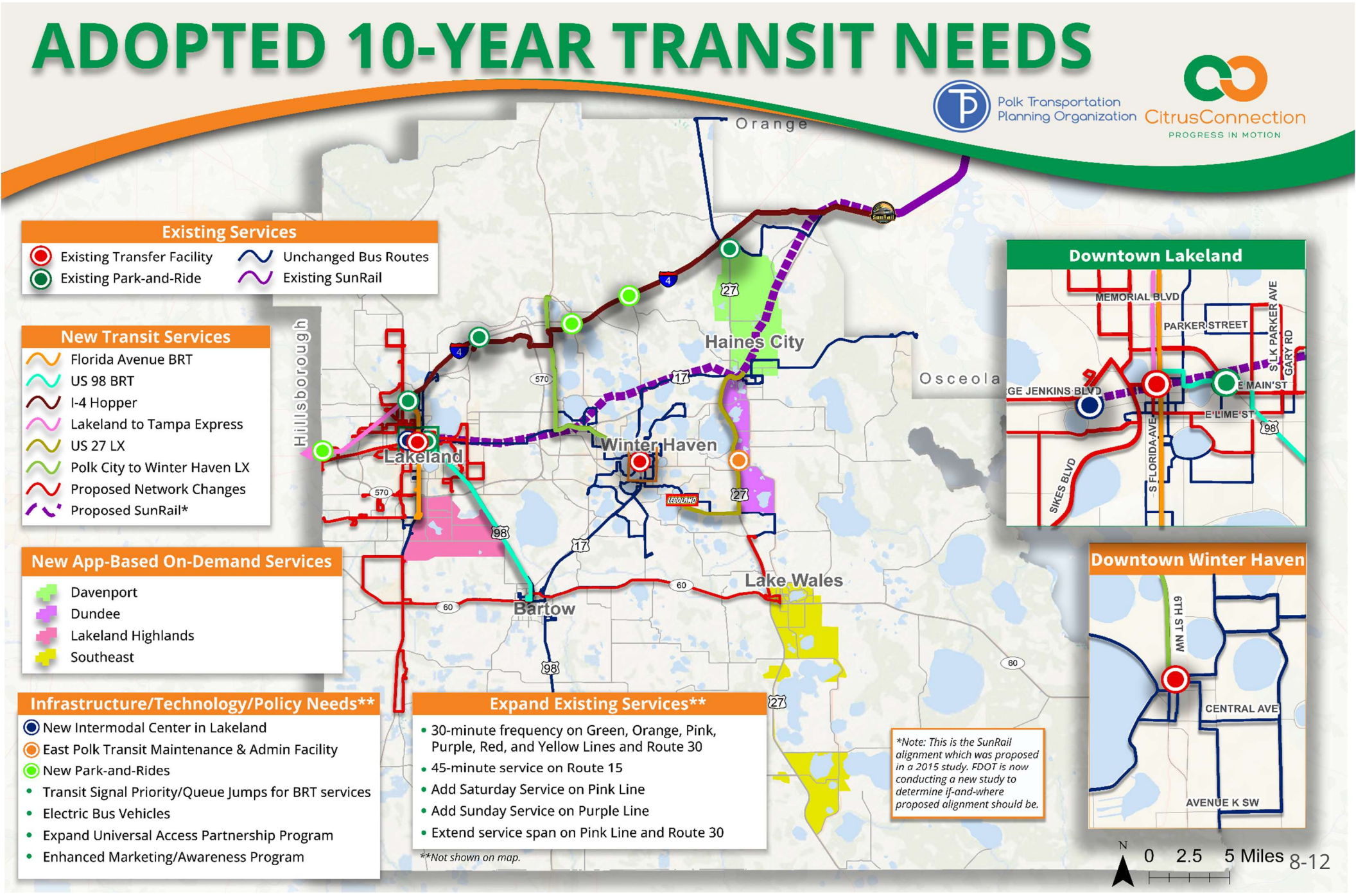
Table 8-1: Citrus Connection 2032 Transit Needs Network

Service Type	Route/Line	2032 Peak Weekday Frequency (min.)	2032 Days of Service
Premium Transit	Florida Ave BRT	12	Monday-Sunday
	US 98 BRT	15	Monday-Sunday
Regional Express	I-4 Hopper	60	Monday-Friday
	Lakeland to Tampa Express	90	Monday-Friday
Local Express	US 27 LX	45	Monday-Friday
	Polk City to Winter Haven LX	90	Monday-Friday
Local	N. Blue	60	Monday-Friday
	S. Blue	45	Monday-Saturday
	Coral	60	Monday-Friday
	Circulator – East and West	60	Monday-Saturday
	Green	30	Monday-Friday
	Lemon	60	Monday-Saturday
	Lime	60	Monday-Friday
	Orange	30	Monday-Friday
	Peach	30	Monday-Saturday
	Pink	30	Monday-Saturday
	Purple	45	Monday-Sunday
	Red	30	Monday-Friday
	Squeeze	12	Monday-Saturday
	Yellow	30	Monday-Saturday
	15	45	Monday-Saturday
	16X	90	Monday-Friday
	18X	90	Monday-Saturday
	19X	60	Monday-Friday
	21X	180	Monday-Saturday
	25	60	Monday-Friday
	30	30	Monday-Sunday
	40/44	90	Monday-Saturday
	50	90	Monday-Saturday
	60	60	Monday-Friday
On-Demand Transit	603	-	Monday-Friday
	Davenport	-	Monday-Saturday
	Dundee	-	Monday-Saturday
	Lakeland Highlands	-	Monday-Saturday
	Southeast	-	Monday-Saturday

Polk Transportation Planning Organization

CitrusConnection
PROGRESS IN MOTION

Map 8-1: 10-Year Needs



Capital/Infrastructure/Technology Needs

Implementation of all aforementioned transit services should be supported by necessary capital infrastructure and technology improvements to ensure an enhanced experience for Citrus Connection users. The following improvements have been identified to support the operational investments summarized previously.

New Intermodal Center in Lakeland

Figure 8-1: Proposed New Intermodal Center in Lakeland



This new facility in downtown Lakeland, as proposed in the 2020 Lakeland Intermodal Study, is planned to be located by the RP Funding Center, near the existing downtown transfer facility (Figure 8-1). It is planned to have more than 18 bus bays, a park-and-ride with 250–500 spots, access to Amtrak services, and eventual access to SunRail and/or Brightline services. The facility is estimated to cost $30 million. A Project Development and Environment (PD&E) study for developing the facility is already funded. The state-of-the-art facility will assist with reducing increasing congestion and parking demand county-wide while also bolstering economic development.

East Polk Transit Maintenance and Administrative Facility

As growth continues, additional transit service will be necessary, as will accompanying capital and supporting buildings. Currently, many vehicles are kept at the Winter Haven terminal, presenting undesirable security and operational challenges. A maintenance facility, as proposed by the 2021 East County Transit Maintenance Facility Siting Analysis, in Winter Haven will assist east-side services and complement the facility in western Polk County. The east county area consists of Auburndale, Davenport, Haines City, Lake Wales, and Winter Haven. The facility will include sustainable design features such as solar power, stormwater management, and appropriate landscaping in addition to a fueling system and a bus wash station.

New Park-and-Ride Facilities

Park-and-ride facilities provide car-riding commuters who wish to avoid traffic an option to use transit as part of their journey to work. To support population and employment growth and proposed new services, park-and-ride facilities are proposed throughout the county. Currently, there are four park-and-ride facilities in the county—in downtown Lakeland, on US-98 near I-4, adjacent to I-4 on SR-33, and in Posner Park.

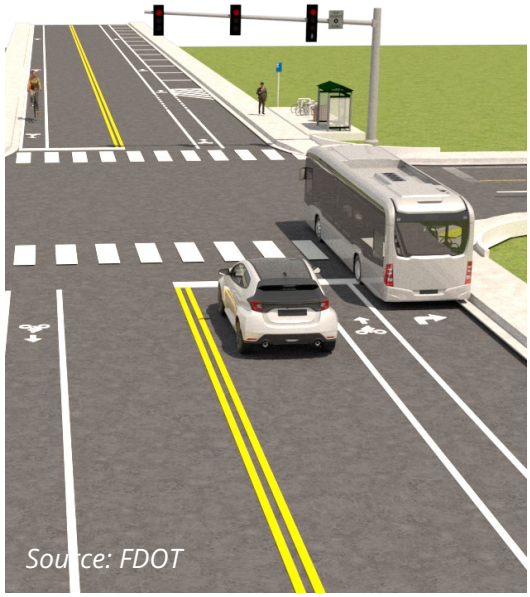
The following park-and-ride facilities locations were also identified as needed to support growth:

- I-4 and County Line Road
- I-4 and Berkley Road
- I-4 and SR 559

TSP/Queue Jumps

Bus preferential treatments such as Transit Signal Priority (TSP) and/or queue jumps may help address increased traffic on key corridors such as US-98 and S Florida Ave. Traffic directly impacts the travel time of current and any new transit services operating in mixed traffic, possibly making transit unattractive to potential riders and unreliable for current riders. These new technological improvements will help Citrus Connection expedite the movement of transit services at intersections where traffic is backed up at peak travel times.

Figure 8-2: TSP with Queue Jumps



TSP and/or queue jumps are needed for selected intersections that are most optimal for supporting enhanced transit services for the successful implementation of the BRT services. This should help buses adhere to their schedules and improve their appeal over driving an automobile on the same corridor. Figure 8-2 shows a TSP and queue jump configuration to prioritize transit movement at an intersection.

Citrus Connection should coordinate with FDOT, any relevant cities, and also refer to the 2015 FDOT study on TSP to plan and implement TSP and queue jumps along

major transit corridors. Identifying intersections that should deploy these measures may require a separate feasibility study to determine congestion levels and intersection volumes to narrow down the list of intersections that may best support both TSP and/or queue jump technologies.

In addition to using transit preferential treatments to ensure the proposed BRT services perform on-time, Citrus Connection may want to deploy TSP and/or queue jumps on other busy corridors with transit services as well.

Alternative Fuel Vehicles

Alternative fuel vehicles should be implemented with presented service needs, especially with the proposed MOD services. Citrus Connection should consider acquiring alternative fuel buses as replacements to its current diesel fleet, when possible, which may attract discretionary riders and also help Citrus Connection's overall marketing strategy and image building.

MOD User App

Phone-based bus transit apps are necessary for users of on-demand services to request rides and pay fares. Once MOD zones are determined, Citrus Connection should consider either creating an app solely for MOD services or combining with Citrus Connection's current "MyStop" transit app to create one app for all services, including MOD services for a one-stop shop for potential riders.

Transit Infrastructure and Accessibility

Citrus Connection needs to continue to purchase and install bus shelters, benches, bike racks, and other amenities and plan to invest in additional infrastructure to support the proposed routes with new bus stops. Also, installing the appropriate level of amenities at bus stops may help attract more discretionary riders and provide current riders with a comfortable and safe experience to the maximum extent possible. To continue investing in infrastructure and making its bus stops accessible to all bus riders, Citrus Connection should also consider developing a Bus Stop ADA Accessibility Transition Plan.

Policy and Other Needs

Transit Marketing and Expansion of Universal Access Program

Citrus Connection needs to expand its marketing efforts and reach out to major employers that are not a part of the UAP. In addition, more public education on the benefits of transit and use of social media campaigns for targeted audiences is needed. Methods to access transit information should be expanded, including adding a travel training to promote the UAP program and promoting the Find My Routes website.

Comprehensive Operational Analysis

Conducting a Comprehensive Operational Analysis (COA) in the next five years is needed. With the "new normal" after the pandemic and after potential implementation of TDP network, conducting a COA may help Citrus Connection re-evaluate the network's effectiveness and efficiency. The findings of such an operational-level assessment, especially as ridership returns after the pandemic, can be fed into any proposed capital and operational recommendations to fine tune them.


Source: Polk TPO

Alternatives Evaluation

After the aforementioned improvements were identified, an evaluation framework was developed and used to assess them for practical applicability in Polk County. The framework with its evaluation criteria was used to help ensure that the resulting transit vision is logical, palatable, and actionable so that, once prioritized, it will be implementable as well. The remainder of this section identifies and defines the evaluation criteria used in prioritizing the improvements and the methodology by which those criteria were applied and presents results of that evaluation.

The four evaluation categories identified for use in the methodological process to rank the improvements are described in Figure 8-3. Table 8-2 presents the evaluation criteria and their corresponding descriptions, the associated measures that were used to evaluate each improvement for those criteria, and the assigned weights for each measure and overall criteria. Detailed descriptions of each of these criteria and measures are provided.

Figure 8-3: Alternatives Evaluation

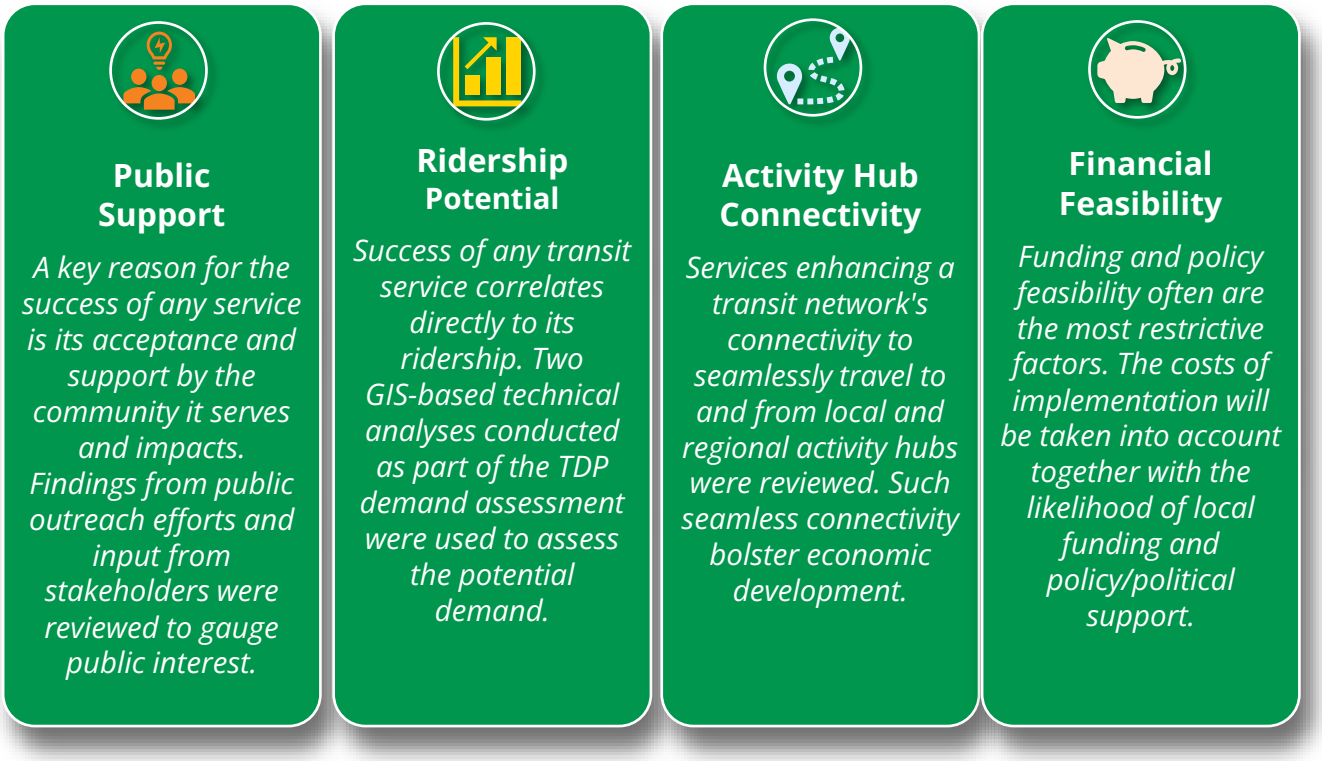


Table 8-2: Evaluation Measures and Weights

Criteria	Measure	Measure Description	Measure Weight	Criterion Weight
Public Support	Public Input	Priority rankings/ outreach data on improvements	15%	30%
	Stakeholder Vision/Direction	Input/level of general direction/vision on transit	15%	
Ridership Potential	Traditional Market Coverage	General overlap with traditional market gaps (areas with "high" or "very high" rating from TOI)	12.5%	25%
	Choice Market Coverage	General overlap with choice market gaps (DTA areas with 6 or more jobs or dwelling units per acre)	12.5%	
Activity Hub/Center Connectivity	Connections to Key Local & Regional Hubs	Connections to popular destinations within city and in immediate region	15%	15%
Financial Feasibility	Political & Funding Support	Likelihood of securing stable operational funding	30%	30%

Evaluation Criteria and Methodology

To prioritize the improvements and identify potential implementation, it is important to weigh the benefits of each improvement against the others. Therefore, a qualitative-quantitative hybrid methodology was developed to evaluate and prioritize the improvements.

The evaluation criteria used in this methodology for prioritizing the improvements are discussed in further detail below. They include:

- *Public Support* – During second phase of TDP outreach, participants were asked to rate the improvements using a survey available either online or in-person at the public workshops. Additionally, stakeholders and selected members in discussion groups were interviewed and asked about the vision of and direction for transit in Polk County would be in the next 10 years. This

criterion used that input from the community, including the general public support, discussion group feedback, and stakeholder direction.

- *Ridership Potential* – Assessment of the choice transit user market (e.g., people who have access to an automobile but may decide to use transit instead) was reviewed based on results from the 2032 DTA analysis. For each improvement, the extent of coverage in choice markets (areas with six or more jobs or dwelling units per acre) was reviewed. The assessment of transit demand in the traditional transit user market (transit-dependent riders such as low-income and zero-vehicle households, older adults, and youths) also was reviewed based on the results from the TOI analysis. For each improvement, the general overlap with traditional market gaps (areas with "high" or "very high" TOI) was reviewed.
- *Activity Hub/Center Connectivity* – Connectivity to key activity centers/hubs plays a critical role as Citrus Connection focuses on enhancing and expanding its services for residents and visitors and meeting the demands of a growing county by creating a multimodal transportation system to improve connectivity. This criterion examines such services based on connection to regional destinations or major activity centers served.
- *Financial Feasibility* – This measure reviews the policy and political support for and likelihood of securing stable operational funding for each improvement. The funding potential for each improvement is evaluated based on the possibility of securing sufficient federal, state, local, and/or private revenue sources.

Alternatives Evaluation

As noted, each evaluation criterion was assigned a weight, which allows the opportunity to measure the relative importance of each criterion. Scores were then assigned based on a relative comparison of each improvement. A higher score is consistent with a higher ranking for a given improvement for the criterion being evaluated. Table 8-3 shows the thresholds and scoring for each criterion used in the evaluation. Table 8-4 shows the results of the alternatives evaluation.

Table 8-3: Evaluation Scoring Thresholds

Criteria	Range	Score
Public Input – Survey Results	Low	1
	Moderate	3
	High	5
	Very High	7
Stakeholder Vision/Direction	Low	1
	Moderate	3
	High	5
	Very High	7
Traditional Market Coverage	Low	1
	Moderate	3
	High	5
	Very High	7
Choice Market Coverage	Low	1
	Moderate	3
	High	5
	Very High	7
Connections To Popular Hubs	Low	1
	Moderate	3
	High	5
	Very High	7
Political & Funding Support	Low	1
	Moderate	3
	High	5
	Very High	7

Table 8-4: Alternatives Evaluation Results

Improvements	Public Input	Stakeholder Vision/ Direction	Traditional Market Coverage	Choice Market Coverage	Connections to Key Local & Regional Hubs	Political & Funding Support	Score
US-98 BRT	5	7	3	5	5	7	**5.7**
Proposed Network Changes	5	5	7	5	3	7	**5.6**
30-min frequency – Green, Orange, Pink, Purple, Red, and Yellow Lines and Rte 30	5	7	5	7	7	3	**5.3**
Florida Avenue BRT	3	5	7	7	3	5	**4.9**
Proposed SunRail to Haines City, Lakeland	7	7	3	3	7	3	**4.8**
I-4 Hopper	3	7	3	3	7	5	**4.8**
Lakeland–Tampa Express	5	7	3	3	5	5	**4.8**
US-27 LX	5	7	3	1	5	5	**4.6**
Saturday Svc – Pink Line	5	5	3	5	3	3	**3.9**
Southeast MOD	3	3	7	1	3	5	**3.9**
Sunday Svc – Purple Line	3	5	5	3	3	3	**3.6**
Extend Service Span – Pink Line, Rte 30	3	5	3	5	3	3	**3.6**
Davenport MOD	3	3	3	1	3	5	**3.4**
Dundee MOD	3	3	3	1	3	5	**3.4**
Lakeland Highlands MOD	5	3	5	3	1	3	**3.3**
45-min service on Rte 15	1	5	5	3	3	3	**3.3**
Polk City to Winter Haven LX	1	1	5	1	3	3	**2.4**

Alternatives Evaluation Results

Each improvement was evaluated using the criteria and process summarized previously. The results are shown by a ranking of "Very High," "High," "Medium," or "Low" based on the hybrid evaluation process. The overall ranking was calculated by assigning a score to each of the ratings, where "Very High" received the highest score (7) and "Low" received the lowest score (1), and a weighted score was derived based on the weight of each category/criterion for each improvement. When developing a TDP implementation plan, these priorities should be balanced with funding realities to determine to what degree that the community's vision can be realized over the next decade.

As shown, the top three improvements resulting from the alternatives evaluation are:

- US-98 BRT linking Bartow to Lakeland and to proposed SunRail service
- Network changes proposed for later 2022
- 30-minute frequency on Green, Orange, Pink, Purple, Red, and Yellow lines and Route 30

Adding the US-98 BRT was determined to be the first priority, with a weighted score of 5.7. The BRT service scored "moderate" in traditional market coverage, "high" in connections to key local and regional hubs, choice market coverage, and public input, and "very high" in stakeholder vision/direction and political and funding support.

The Polk City to Winter Haven LX had the lowest weighted score, making it the lowest priority. The service scored "low" in public input, stakeholder vision/direction, and choice market coverage, "moderate" in connections to key local and regional hubs and political and funding support, and "high" in traditional market coverage.

In the next steps of this TDP process, these priorities will be reviewed together with projections of current and anticipated financial resources for the next 10 years to develop a 10-year implementation plan for the TDP.

Section 9. 10-Year Transit Plan

This section summarizes the recommended 10-year transit plan for Citrus Connection, a plan crafted and prioritized based on findings from data analysis and direction and support from the community and its key stakeholders to meet the transit needs of Polk County. The recommended transit service, capital, technology, and policy improvements are presented and summarized. Thereafter, the capital/operating cost and revenue assumptions used in the development of funded and unfunded needs are summarized before presenting the financial plan for the 10-year period. Subsequently, the proposed 10-year implementation plan is detailed for the Citrus Connection TDP.

It should be noted that this plan also considers the impacts of the public health crisis due to COVID-19. Although normalcy may slowly return or a "new normal" may arise, the impact on transit ridership is expected to be significant and expected to last longer.

Recommended 10-Year Transit Plan

After careful review of the needs presented previously, identification of the projected funding sources assumed to be available in the next 10 years, and discussion with Citrus Connection and TPO staff and their funding partners, the recommended transit plan included in the 10-Year TDP are presented below. The recommended services are identified under each of the major improvement categories, including service, capital/infrastructure, and policy.

Service Improvements

Service improvements include the following:

- Premium Transit
  - *US-98 BRT* – Enhanced connectivity between Lakeland and Bartow, with service every 15 minutes, which will also feature TSP and queue jump technologies at applicable intersections.
- Regional Express
  - *I-4 Hopper* – Connections to/from Lakeland and the Poinciana SunRail Station every 60 minutes and to existing and proposed new park-and-rides along the I-4 corridor.

  - *Lakeland to Tampa Express* – During peak hours, connections to/from Lakeland and the HART bus network in Hillsborough County.
- Local Express
  - *US-27 LX* – During weekdays, added service on US-27 and Cypress Gardens Boulevard from Haines City to Legoland every 45 minutes.
- Proposed Network Changes
  - *New routes* – Coral Line, Lemon Line, and Circulator–Eastside and Westside
  - *Revised alignments* – Route 21X, Blue, Green, Orange, Peach, Red, and Yellow lines
  - *Revised service spans and days of service* – Changes to Gold, Green, Orange, Peach, Purple, Red, and Yellow lines
- Enhanced Local Network
  - *30-minute frequency service* – Route 30 and Green, Orange, Pink, Red, and Yellow lines
  - *Add early/late and weekend service* – After a post-pandemic service efficiency assessment, added early/late hours to weekday service and added/expanded weekend service on appropriate identified routes.
- Technology-based On-Demand Transit – Replacement of routes 17X, 20X, 27X, and 35 with app-based on-demand transit in Davenport, Dundee, and the Frostproof areas and addition of new on-demand service in Lakeland Highlands area.

Table 9-1 shows the recommended weekday frequencies in 2032.

Table 9-1: Recommended Citrus Connection Network

Service Type	Route/Line	2032 Peak Weekday Frequency (min.)	2032 Days of Service
Premium Service	US 98 BRT	15	Monday-Saturday
Regional Express	I-4 Hopper	60	Monday-Friday
	Lakeland to Tampa Express	Peak Hour	Monday-Friday
Local Express	US 27 LX	45	Monday-Friday
Local	N. Blue	60	Monday-Friday
	S. Blue	45	Monday-Saturday
	Coral	60	Monday-Friday
	Circulator- East and West	60	Monday-Saturday
	Gold	30	Monday-Saturday
	Green	30	Monday-Friday
	Lemon	60	Monday-Saturday
	Lime	60	Monday-Friday
	Orange	30	Monday-Friday
	Peach	30	Monday-Saturday
	Pink	30	Monday-Friday
	Purple	45	Monday-Saturday
	Red	30	Monday-Friday
	Squeeze	12	Monday-Saturday
	Yellow	30	Monday-Saturday
	15	90	Monday-Saturday
	16X	90	Monday-Friday
	18X	90	Monday-Saturday
	19X	60	Monday-Friday
	21X	180	Monday-Saturday
	25	60	Monday-Friday
	30	30	Monday-Sunday
	40/44	90	Monday-Saturday
	50	90	Monday-Saturday
	60	60	Monday-Friday
On-Demand Transit	603	-	Monday-Friday
	Davenport	-	Monday-Saturday
	Dundee	-	Monday-Saturday
	Lakeland Highlands	-	Monday-Saturday
	Southeast	-	Monday-Saturday

Capital/Policy/Technology Improvements

- **New Intermodal Center in Downtown Lakeland** – This new downtown Lakeland intermodal center is planned to have more than 18 bus bays and a park-and-ride facility with 250–500 spaces and would provide connections to Amtrak services and eventual access to SunRail and/or Brightline services. A Project Development and Environment (PD&E) study for developing the facility is already funded, but funding for design and construction of the facility has not been identified.
- **East Polk Transit Maintenance and Administrative Facility** – The maintenance and administrative facility in east Polk County will assist in supporting the expanding area and increasing demand for services. Similar to the new intermodal center, funding has not been identified to build this facility.
- **New Park-and-Rides** – The three new park-and-ride facilities, identified to support the implementation of the I-4 Hopper service, are expected to be developed/funded with assistance from FDOT.
- **Deploy TSP/queue jumps at selected intersections** – TSP technologies and queue jumps will be deployed at applicable intersections on US-98 as part of implementing the US-98 BRT service. Currently, there are 20 signalized intersections along US-98 selected for TSP and 10 selected for queue jumps. However, further evaluations/studies are necessary to determine the actual scale of deployment prior to implementing the BRT service.
- **Alternative fuel bus vehicles and infrastructure** – When replacing vehicles as scheduled per FTA lifecycle guidelines, half are recommended to be alternative fuel. This plan also assumes the installation of the appropriate infrastructure.
- **Continue fleet replacement and acquisition program** – As previously noted, Citrus Connection should continue vehicle replacements and acquisitions to operate the proposed 10-year network.
- **On-demand transit technologies** – Citrus Connection using the Software-as-a-Service (SaaS) option to implement MOD would potentially include a Transportation Network Company (TNC) providing the technology to power an on-demand service, including providing technology platforms, a rider app, a driver app, an admin console, and access to data dashboards and reports.

The company would train Citrus Connection on how to use these tools and provide support and service optimization. Citrus Connection would procure vehicles, recruit drivers, and operate/manage the service.

- **Continue bus stop infrastructure and accessibility** – Citrus Connection's transit infrastructure and accessibility program should be continued, including adding new bus stop infrastructure with new services and improving existing bus stop infrastructure where demand warrants it. Improving infrastructure can improve the experience for existing riders and attract new riders.
- **Expand transit marketing and education campaign** – To address the importance of better awareness that was highlighted repeatedly during public outreach, marketing/education efforts should be expanded to increase awareness of transit in the County to help grow ridership. This should include low-cost or cost neutral opportunities (including the use of available social media platforms) for more public education on the availability and benefits of transit. Emphasis also should be on increasing awareness of various technologies available for the riders, such as the MyStop real-time bus app.
- **Enhanced performance monitoring program** – The existing performance monitoring of Citrus Connection's services should be enhanced. A sample performance monitoring program is included in Appendix H for Citrus Connection's consideration. A performance monitoring program tracks the performance and efficiency of routes and the system as a whole and provides a convenient tool for ensuring the provision of efficient and effective transit service.
- **Expansion of Universal Access Program** – As part of expanded marketing efforts, Citrus Connection should reach out to additional employers that are not a part of the current UAP program, which has been an extremely successful initiative by Citrus Connection. This expansion also should include addition of a travel training element.
- **Service efficiency assessment** – As Citrus Connection recovers from the effects of the pandemic and settles into the new normal, a service efficiency assessment/COA could provide an opportunity to assess the post-pandemic network, identify any shifts in demand, and respond accordingly with

necessary realignments/ repurposing. However, with some network changes scheduled for implementation in October 2022, a service efficiency assessment/COA should be done in 2-3 years.

10-Year TDP Financial Plan

A financial plan was developed and is summarized in this section to help program and facilitate the implementation of TDP improvements in the next 10 years. Cost and revenue assumptions used to develop the financial plan and a summary of cost and revenue projections are presented. The summary includes annual costs for service and capital projects including infrastructure/technology/policy improvements programmed for implementation within the next 10 years and supporting revenues that are reasonably expected to be available to fund the implementation.

Operating Cost Assumptions

Numerous assumptions were made to forecast transit operating costs from 2023 through 2032. These assumptions are based on data from Citrus Connection and other transit industry data. Key operating cost assumptions include the following:

- Annual operating costs for fixed-route services were developed based on information from Citrus Connection and by using a fully-allocated cost per revenue hour of $130.01 (2022$).
- Although the 10-year average inflation rate is at 1.9 percent, an inflation rate of 3 percent was used based on information from Citrus Connection and to respond to current inflationary pressures/spikes in inflation.
- Revenue hour estimates for improvements were based on historical data from Citrus Connection and industry practices.
- Operating cost projections for MOD services were based on Citrus Connection paratransit service cost data and using a SaaS model operation. The same size vehicles used for paratransit service were assumed for providing MOD services. Therefore, the current paratransit cost per revenue hour of $41.83 (2022$) was used for projecting MOD costs.

Capital Cost Assumptions

Several assumptions were made to project costs for infrastructure/technology needs to support implementation of the service alternatives described previously. These capital cost assumptions include the following:

- An annual growth rate of 3 percent is used for capital cost projections based on data from Citrus Connection.
- The cost of deploying TSP at an intersection is assumed at $22,000 (2022$,) and converting existing right-turn lanes to queue jump lanes at an intersection is assumed at $136,000 (2022$) per intersection. These assumptions are based on recent data from studies in the southeast region in the U.S.
- Software costs, including rider and driver apps and dashboards, to support implementing MOD services were assumed at $25,000 (2022$) per zone. This cost assumption is based on similar MOD implementation cost estimates from other studies/MOD service providers.
- Bus stop infrastructure and accessibility program costs for the next 10 years were provided by Citrus Connection. On average, $780,232 annually is assumed. This will assist with accessibility/compliance requirements at bus stops and provide safe and convenient access to Polk County's bus stops.
- The Lakeland Intermodal Center PD&E Study is assumed to cost $2 million per FDOT Work Program data. The estimated land value of the City of Lakeland-owned property to build this facility is $491,356, which can be used as local match. Additionally, the City would make future proceeds from its sale available of the current transfer facility site, which also can be used as local match for the future phases of the new facility development.
- Costs for three new park-and-ride facilities are not included and are considered to be fully funded by FDOT as part of its support for the implementation of I-4 Hopper service.
- The cost of the electric vehicle charging infrastructure is assumed at $190,000 per charger, based on average cost for a Depot Charger, as used by TBARTA for its ongoing Regional Rapid Transit capital cost projections.

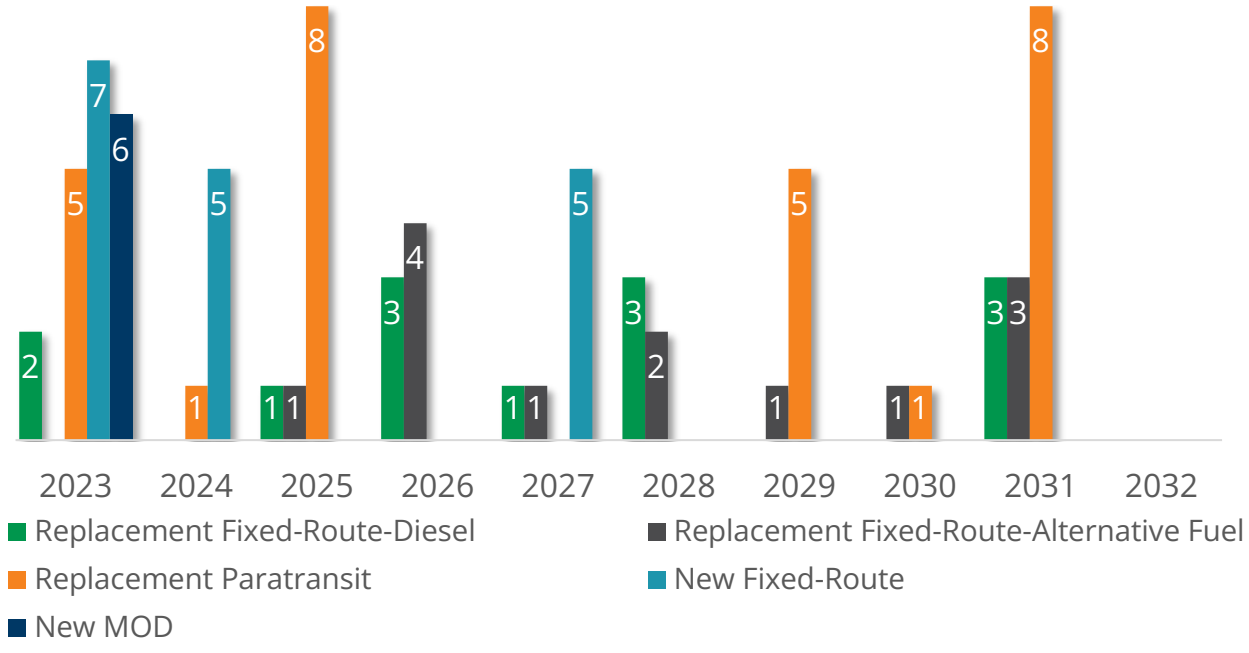
Vehicle Replacement/Acquisition

The vehicle replacement plan is a critical component of the financial plan. Figure 9-1 shows the total replacement and new vehicles by year for the TDP. The FTA-standard rate of 20 percent spare vehicle ratio is assumed for any new vehicle purchases.

The following assumptions were made:

- Vehicle life cycle assumptions are based on guidance from Citrus Connection.
- Replacement vehicles planned to be purchased include those necessary to replace vehicles within the existing fleet that will reach the end of their useful life within the TDP planning period.
- The cost of a diesel bus is assumed at $500,000 (2022$), the cost of an alternative fuel vehicle is assumed at $850,000 (2022$), and the cost of paratransit/MOD vehicles is assumed at $132,431 (2022$). These vehicle costs were derived from data provided by Citrus Connection staff, recent data from PSTA and TBARTA, and industry data.
- As previously noted, an annual growth rate of 3 percent is used for capital cost projections, including vehicles, to adjust for inflationary pressures now and in the future.

Figure 9-1: 10-Year Vehicle Replacement and Acquisition Plan



Other Cost Assumptions

When developing capital or operational improvements, it is important to anticipate supporting services such as additional planning resources and education/ marketing campaign costs.

The following assumptions were made:

- An expanded transit marketing and education campaign, including expansion of the UAP program, is assumed to be $50,000 per year. As the proposed network changes will be implemented in FY2023, $100,000 is allocated for additional marketing/education costs in that year.
- An efficiency assessment, in the form of a full COA study, is assumed at a cost of $250,000 and expected to take place at least two years from implementation of this TDP for it to be a meaningful investment for Citrus Connection.

Revenue Assumptions

Several revenue-related assumptions were used to project streams of revenue to support the 10-year TDP implementation. Revenue assumptions and projections for Citrus Connection are based on data from Citrus Connection staff, historical farebox performance data, and information on transit industry/FDOT funding programs. The basic structure/composition of Citrus Connection's mix of funding sources today, including federal, state, local, and agency-generated revenues (farebox, marketing), is expected to continue for the next 10 years.

The following additional key assumptions were used to project Citrus Connection TDP revenues:

- Revenue projections from federal sources, including annual FTA formula grant funds and short-term grants, such as CARES Act funding, are based on information from Citrus Connection.
- Projections for existing funds from FDOT, such as Transit Corridor, Urban Transit Capital, Congestion Management, and Block Grant funding, are assumed to continue, per Citrus Connection. Support from FDOT for a travel trainer is also assumed to continue, according to Citrus Connection.

- Existing revenues from the Florida Commission for the Transportation Disadvantaged are assumed at approximately $1.3 million per year (2022$), according to Citrus Connection.
- Farebox revenues from both existing PCTA and LAMTD services were provided by Citrus Connection. On average, approximately $620,000 annually is projected to be generated from new services.
- Based on the average of 2019 and 2020 Citrus Connection farebox recovery data from NTD, a farebox recovery ratio of 9 percent was used to determine the fare revenues for the new services.
- Other local sources of funding, including General Revenue, City Contributions, contract revenue, and property taxes, are assumed at $10.8 million annually (2022$).
- This plan assumes additional new FDOT funding to assist with implementation of key regional projects to improve the attractiveness of transit for discretionary riders and increase the quality of service for existing riders locally and regionally. A new FDOT Service Development grant would cover half of I-4 Hopper operating expenses for the first three years of service.

10-Year Cost/Revenue Summary

Annual operating and capital costs and supporting revenues for Citrus Connection are summarized in Table 9-2. As shown, it would cost $333.5 million to operate Citrus Connection services in the next 10 years, with another $50.7 million in capital costs to support the necessary fleet and capital infrastructure. Operating costs would continue to be funded mainly with a mix of local, state, and federal sources and fare revenues generated by existing and new transit services.

Table 9-2: Citrus Connection TDP – Costs and Revenue

Cost/Revenue	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
Operating Costs											
Restructured Citrus Connection Network	$12,689,144	$13,259,310	$13,657,089	$14,066,802	$14,488,806	$14,923,470	$15,371,174	$15,832,309	$16,307,278	$16,796,497	**$147,391,878**
Circulator- Eastside and Westside	$445,662	$455,244	$465,031	$475,030	$485,243	$495,676	$506,333	$517,219	$528,339	$539,698	**$4,913,473**
Frequency Enhancements to Existing Network	$0	$3,270,956	$3,369,085	$3,470,157	$3,574,262	$3,681,490	$3,791,934	$3,905,693	$4,022,863	$4,143,549	**$33,229,989**
Early/Late and Weekend Service	$0	$0	$1,092,727	$1,125,509	$1,159,274	$1,194,052	$1,229,874	$1,266,770	$1,304,773	$1,343,916	**$9,716,896**
New Services	$0	$0	$2,246,410	$2,313,802	$2,383,216	$6,962,147	$7,171,011	$7,386,142	$7,607,726	$7,835,958	**$43,906,412**
Paratransit Service	$8,228,175	$8,475,020	$8,729,270	$8,991,149	$9,260,883	$9,538,709	$9,824,871	$10,119,617	$10,423,205	$10,735,902	**$94,326,800**
Total Operating Costs	**$21,362,980**	**$25,460,529**	**$29,559,612**	**$30,442,448**	**$31,351,684**	**$36,795,544**	**$37,895,197**	**$39,027,749**	**$40,194,185**	**$41,395,520**	**$333,485,448**
Capital Costs											
Vehicles	**$6,650,443**	**$3,323,196**	**$2,632,869**	**$5,514,993**	**$5,042,842**	**$3,820,967**	**$1,859,760**	**$1,244,514**	**$6,666,671**	**$0**	**$36,756,256**
New Vehicle Costs	$4,938,424	$3,182,700	$0	$0	$3,477,822	$0	$0	$0	$0	$0	**$11,598,946**
Fixed-Route Vehicle Replacement Costs	$1,030,000	$0	$1,475,181	$5,514,993	$1,565,020	$3,820,967	$1,045,393	$1,076,755	$5,284,331	$0	**$20,812,641**
Paratransit Vehicle Replacement Costs	$682,020	$140,496	$1,157,687	$0	$0	$0	$814,367	$167,760	$1,382,339	$0	**$4,344,669**
Other Capital and Policy	**$883,600**	**$3,004,063**	**$984,303**	**$1,227,679**	**$3,130,940**	**$848,705**	**$1,107,842**	**$900,391**	**$927,402**	**$955,224**	**$13,970,149**
Bus Stop Infrastructure & Accessibility	$680,600	$701,018	$722,049	$743,710	$766,021	$789,002	$812,672	$837,052	$862,164	$888,029	**$7,802,316**
Lakeland Intermodal Center Facility PD&E Study	$0	$2,000,000	$0	$0	$0	$0	$0	$0	$0	$0	**$2,000,000**
Expand Transit Marketing/Education Program	$100,000	$53,045	$54,636	$56,275	$57,964	$59,703	$61,494	$63,339	$65,239	$67,196	**$638,890**
Deploy TSP at Selected Intersections	$0	$0	$0	$0	$510,081	$0	$0	$0	$0	$0	**$510,081**
Queue Jumps at Selected Intersections	$0	$0	$0	$0	$1,576,613	$0	$0	$0	$0	$0	**$1,576,613**
Initial MOD Software Cost	$103,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$103,000**
Service Efficiency Assessment/COA	$0	$250,000	$0	$0	$0	$0	$0	$0	$0	$0	**$250,000**
Electric Vehicle Infrastructure	$0	$0	$207,618	$427,693	$220,262	$0	$233,676	$0	$0	$0	**$1,089,250**
Total Capital Costs	**$7,534,043**	**$6,327,259**	**$3,617,172**	**$6,742,672**	**$8,173,783**	**$4,669,672**	**$2,967,602**	**$2,144,905**	**$7,594,073**	**$955,224**	**$50,726,405**
Revenues											
LAMTD - Local General Revenue	$1,357,118	$1,403,666	$1,445,776	$1,489,149	$1,533,824	$1,579,839	$1,627,234	$1,676,051	$1,726,332	$1,778,122	**$15,617,111**
PCTA - City Contributions	$549,619	$566,108	$583,091	$600,584	$618,601	$637,159	$656,274	$675,962	$696,241	$717,129	**$6,300,770**
PCTA - Contract Revenue	$3,120,140	$3,213,744	$3,310,156	$3,409,461	$3,511,745	$3,617,097	$3,725,610	$3,837,378	$3,952,500	$4,071,075	**$35,768,907**
LAMTD - Farebox Revenue	$763,269	$943,400	$971,702	$1,000,853	$1,030,879	$1,061,805	$1,093,659	$1,126,469	$1,160,263	$1,195,071	**$10,347,370**
PCTA - Farebox Revenue	$150,959	$186,586	$192,183	$197,949	$203,887	$210,004	$216,304	$222,793	$229,477	$236,361	**$2,046,504**
LAMTD - FTA 5307 Operating	$2,618,167	$2,696,712	$2,777,614	$2,860,942	$2,946,770	$3,035,173	$3,126,229	$3,220,016	$3,316,616	$3,416,114	**$30,014,354**
PCTA - FTA 5307 Operating	$3,012,273	$3,102,641	$3,195,721	$3,291,592	$3,390,340	$3,492,050	$3,596,812	$3,704,716	$3,815,857	$3,930,333	**$34,532,335**
PCTA - FTA 5311 Operating	$1,921,529	$2,375,010	$2,446,261	$2,519,648	$2,595,238	$2,673,095	$2,753,288	$2,835,887	$2,920,963	$3,008,592	**$26,049,511**
Property Tax	$5,799,250	$5,973,228	$6,152,425	$6,336,997	$6,527,107	$6,722,920	$6,924,608	$7,132,346	$7,346,317	$7,566,706	**$66,481,904**
State Block Grant	$1,489,591	$1,700,262	$1,751,270	$1,803,808	$1,857,922	$1,913,660	$1,971,070	$2,030,202	$2,091,108	$2,153,841	**$18,762,733**
FL Transportation Disadvantaged Program	$1,314,662	$1,354,102	$1,394,725	$1,436,567	$1,479,664	$1,524,054	$1,569,775	$1,616,869	$1,665,375	$1,715,336	**$15,071,128**
FD0T Congestion Management	$321,540	$397,424	$409,346	$421,627	$434,276	$447,304	$460,723	$474,545	$488,781	$503,445	**$4,359,010**
FDOT Transit Corridor	$778,680	$802,040	$826,102	$850,885	$876,411	$902,704	$929,785	$957,678	$986,409	$1,016,001	**$8,926,694**
FDOT - Travel Trainer	$60,791	$62,614	$64,493	$66,428	$68,420	$70,473	$72,587	$74,765	$77,008	$79,318	**$696,896**
FTA - 5307 Capital	$742,827	$742,827	$765,112	$788,065	$811,707	$836,058	$861,140	$886,974	$913,583	$940,991	**$8,289,282**
FTA- 5307 Cares Capital	$3,359,528	$3,807,722	$0	$0	$0	$0	$0	$0	$0	$0	**$7,167,250**
FDOT Urban Transit Capital	$551,005	$1,327,970	$1,367,809	$1,408,843	$1,451,109	$1,494,642	$1,539,481	$1,585,666	$1,633,235	$1,682,233	**$14,041,992**
Paratransit Operating Revenue	$6,123,278	$6,311,490	$6,510,555	$6,722,045	$6,948,346	$7,193,043	$7,461,566	$7,762,238	$8,108,046	$8,519,641	**$71,660,249**
New Services Farebox	$38,853	$324,851	$625,366	$643,782	$662,744	$1,075,226	$1,107,115	$1,139,953	$1,173,769	$1,208,590	**$8,000,250**
New FDOT Service Development	$0	$0	$584,067	$601,589	$619,636	$0	$0	$0	$0	$0	**$1,805,291**
Total Revenues	**$34,073,080**	**$37,292,397**	**$35,373,773**	**$36,450,815**	**$37,568,626**	**$38,486,306**	**$39,693,260**	**$40,960,507**	**$42,301,880**	**$43,738,899**	**$385,939,542**
10-Year Cost & Revenue Summary											
Total Revenues	**$34,073,080**	**$37,292,397**	**$35,373,773**	**$36,450,815**	**$37,568,626**	**$38,486,306**	**$39,693,260**	**$40,960,507**	**$42,301,880**	**$43,738,899**	**$385,939,542**
Total Costs	**$28,897,024**	**$31,787,788**	**$33,176,784**	**$37,185,120**	**$39,525,466**	**$41,465,216**	**$40,862,799**	**$41,172,654**	**$47,788,258**	**$42,350,744**	**$384,211,853**
Revenues Minus Costs	**$5,176,056**	**$5,504,609**	**$2,196,988**	**-$734,305**	**-$1,956,841**	**-$2,978,910**	**-$1,169,539**	**-$212,146**	**-$5,486,379**	**$1,388,154**	
Rollover from Prev. Year	**$0**	**$5,176,056**	**$10,680,665**	**$12,877,654**	**$12,143,348**	**$10,186,508**	**$7,207,598**	**$6,038,059**	**$5,825,913**	**$339,534**	
Surplus/Shortfall	**$5,176,056**	**$10,680,665**	**$12,877,654**	**$12,143,348**	**$10,186,508**	**$7,207,598**	**$6,038,059**	**$5,825,913**	**$339,534**	**$1,727,688**	**$1,727,688**

Figure 9-2 shows the annual operating and capital costs for the TDP implementation plan, and Figure 9-3 shows the total costs and revenues by year to support it. Figure 9-4 shows the expected revenues by source.

Figure 9-2: Total Costs – Operating and Capital

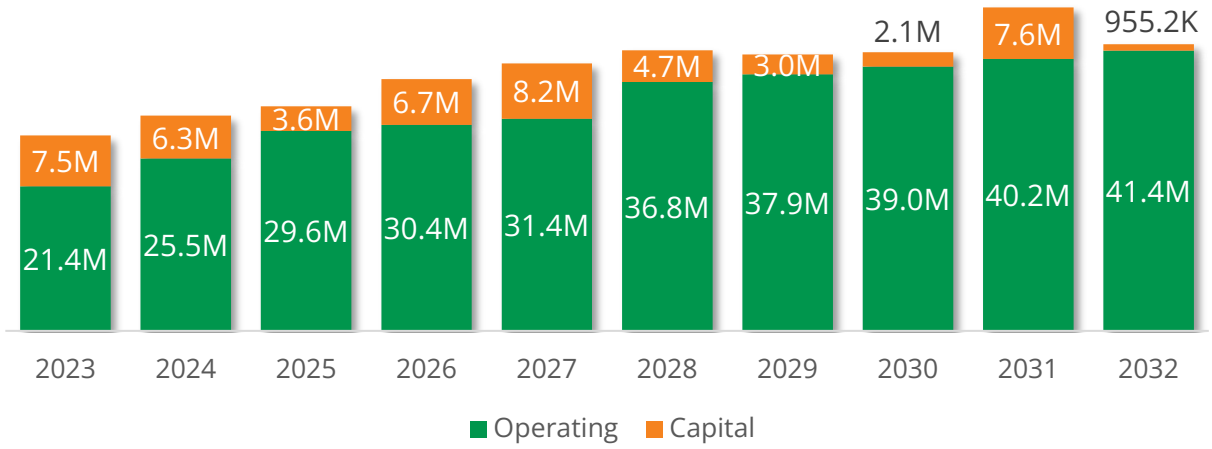


Figure 9-3: Total Costs and Revenues

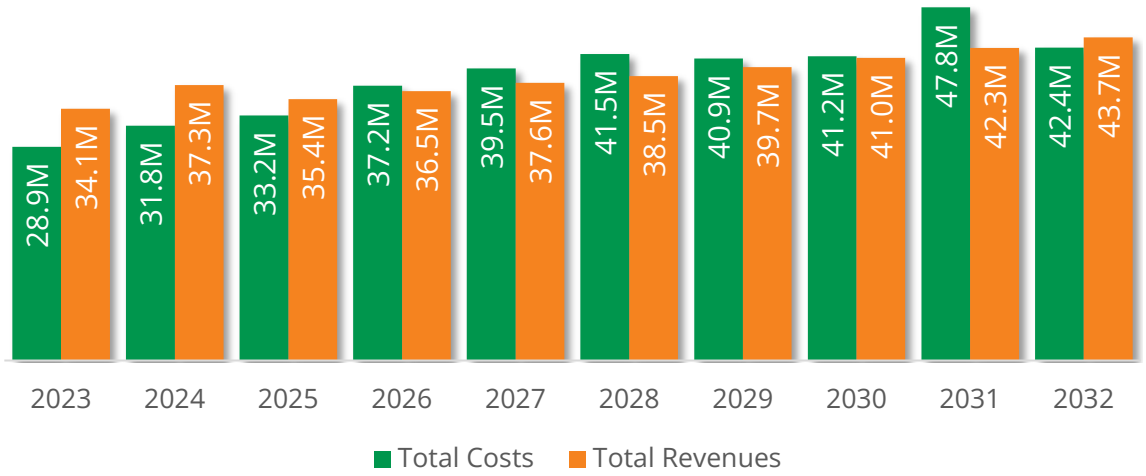
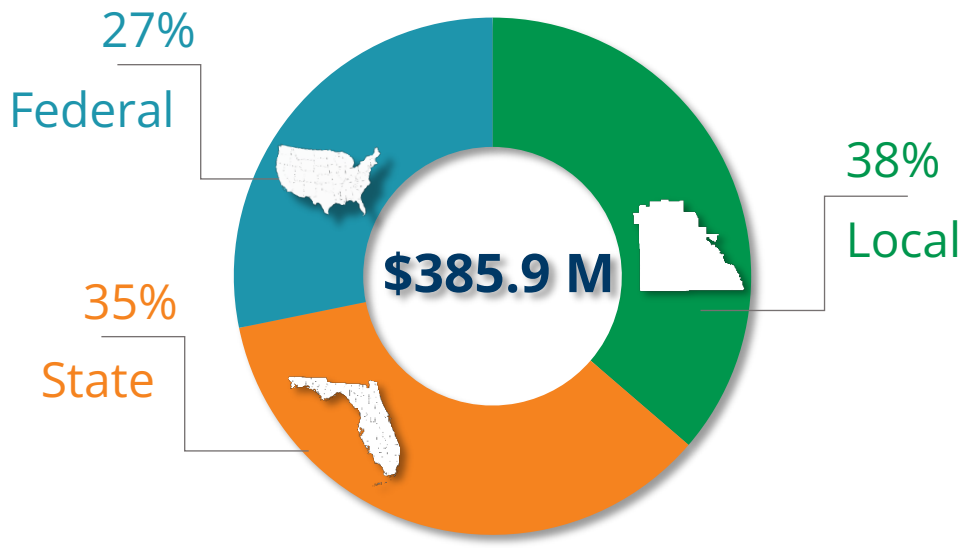


Figure 9-4: 10-Year Revenue Distribution



10-Year TDP Implementation Plan

The implementation plans presented in Tables 9-3 and 9-4 outline operating and capital improvements that are funded in the 10-Year TDP, as well as unfunded needs. The table also shows the implementation years, operating and capital costs associated with the improvements, and type of anticipated funding sources for the plan.

It should be noted that the schedule shown in the table does not preclude the opportunity to delay or advance any projects. As priorities change, funding assumptions do not materialize, and/or more funding becomes available, this project implementation schedule can and should be adjusted.

Table 9-3: Citrus Connection TDP Implementation Plan and Unfunded Needs – Operating

Improvements	Implementation Year (FY)	Annual Operating Cost (2022$)	Total Capital Cost (2022$)	Potential Revenue Source	Goals
Service Improvements					
Restructured Citrus Connection Network*	2023	$13,134,806	$17,550,000	Existing	1 2 3 4
Lakeland Highlands MOD	2024	$178,614	$132,431	Existing	1 2
Frequency Improvements	2024	$3,083,190	$3,500,000	Existing	1 2
Early/Late and Weekend Service	2025	$1,000,000	n/a	Existing	1 2
Tampa to Lakeland Express	2025	$197,355	$500,000	Existing	1 2 4
US-27 LX	2025	$789,421	$1,000,000	Existing	1 2
I-4 Hopper	2025	$1,069,007	$1,000,000	FDOT Service Development and Existing	1 2 4
US-98 BRT	2028	$3,774,905	$2,500,000	Existing	1 2
Florida Avenue BRT	Unfunded	$2,395,460	$1,000,000	Unfunded	1 2
Polk City to Winter Haven Peak LX	Unfunded	$197,355	$500,000	Unfunded	1 2
SunRail Extension to Lakeland	Unfunded	n/a	n/a	Unfunded	1 2 4

**Includes restructured October 2022 network (including Circulator- Eastside and Westside) and Davenport, Dundee, and Southeast MOD zones.*
Note: Citrus Connection should continue its paratransit service and expand as necessary.

Table 9-4: Citrus Connection TDP Implementation Plan and Unfunded Needs – Capital

Improvements	Implementation Year	Annual Operating Cost (2022$)	Total Capital Cost (2022$)	Potential Revenue Source	Goals
Capital Improvements					
Bus Stop Infrastructure & Accessibility	2023-2032	n/a	$680,600 (annually)	Existing	1 3 4
Expand Transit Marketing/Education Program/UAP	2023-2032	n/a	$50,000* (annually)	Existing	1 4 5
Initial MOD Software Cost	2023	n/a	$100,000	Existing	1 2
Electric Vehicle Chargers	2025-2027,2029	n/a	$950,000	Existing	1 3
Service Efficiency Assessment (COA)	2024	n/a	$250,000	Existing	1 2 4
TSP at Selected Intersections	2027	n/a	$440,000	Existing	1 2
Queue Jumps at Selected Intersections	2027	n/a	$1,360,000	Existing	1 2
New Park-and-Rides	2025	n/a	TBD	FDOT	1 2 3 4
Intermodal Center in Downtown Lakeland	n/a	n/a	$30 million	Unfunded	1 2 4
East Polk Transit Maintenance and Admin Facility	n/a	n/a	$13.5 million	Unfunded	1 3 4

**In FY2023, $100,000 is allocated*

Section 10. Plan Implementation & Coordination

The goal of this TDP is to develop an implementable transit plan for Citrus Connection that makes transit a viable option for all. The next step is identifying where and when coordination should occur so the transit plan can be communicated as appropriate.

This section presents a set of actions for Citrus Connection to ensure that the TDP is implemented, coordinated, and communicated in the coming months and years. These actions provide Citrus Connection with a starting point in its efforts to pursue funding and implementation of the TDP.

Implementation/Coordination Action Items

As seen with the COVID-19 pandemic, changes in the operating environment can occur unexpectedly and at significant degrees, thus demonstrating that TDP adoption does not ensure that implementation will proceed according to the recommended schedule. The ultimate success of a TDP requires the balancing of technical challenges with the art of navigating local funding and political landscapes.

The following action items should be carefully considered and followed through to ensure that public support and funding and operational support are preserved until the next major TDP update:

- **Support efforts for additional local funding** – Polk County has put forth significant and repeated efforts in the past to secure local funding to improve and promote transit in the county. Previously, a penny tax was on the ballot in 2010 and 2014; both were rejected by the community. Another effort to adopt a tax by the community may be on the horizon. In discussions during the TDP outreach process, some stakeholders were supportive of the tax but also were concerned about its polarizing nature in the community. It was also stressed that for a sales tax increase to be successful, there would need to be educational campaigns, as lack of education may have caused the demise of previous sales tax referenda. In addition, such effort should also engage professional assistance rather than rely solely on the County's internal resources.

- **Coordinate with FDOT** – Close coordination with FDOT District 1 representatives during development of this plan has given Citrus Connection a strong foundation for continuing to obtain support from its most important regional partner, FDOT. Continuing to coordinate with FDOT as well as LYNX and other regional agencies is key, as they have many shared goals pertaining to making transit a truly viable and attractive alternative mobility option in the region.
- **Coordinate on rail connections** – The TDP also identifies the need for the extension of SunRail service to Polk County to assist with local connections, which is also is supported by TDP stakeholders, discussion group members, and the general public. The opportunity for the service extension requires a TCAR study, as required by FTA, and the Polk TPO has requested that this study be prepared by FDOT. Citrus Connection and the Polk TPO should continue to work with FDOT to advance the extension of SunRail services to Polk County.

  In addition, coordination with Brightline also should continue. At the time of this report, Brightline was nearly 80 percent complete for its 170-mile, $2.7 billion West Palm Beach-to-Orlando International Airport connection, and service is expected to begin in mid-2023. In addition, an Orlando-to-Tampa connection may also be built; however, no timeframe for that link has been discussed. Also, a Lakeland station has not been proposed to date, but that may be a possibility after Brightline establishes the Tampa service. Polk County should continue to be part of Brightline's future westward expansion discussions.
- **Engage other regional partners** – Some needed improvement strategies connect buses regionally to both the east and west, so it will be important to coordinate with regional partners on both sides of the county, including HART, LYNX, and Lake County, for additional/enhanced opportunities for regional connections.
- **Identify potential funding opportunities/grants** –Ensuring that the necessary funding is available each year to maintain and add new services or facilities programmed in the TDP implementation plan is key to the success of the plan. Although the TDP implementation schedule does not preclude Citrus Connection from the opportunity to delay or advance any projects, the agency should make continued efforts to stay on schedule.

FDOT has expressed its support for connecting regionally, especially connecting to Orlando via SunRail, and its commitment to enhancing mobility regionally provides an opportunity for Polk County to partner to secure additional State and Federal funding to help implement the TDP. For local funding, Citrus Connection and the LAMTD Board should continue to work with identified municipalities and maintain their commitment to pay their 20 percent share of the transit costs in their municipal boundaries. The LAMTD Board should explore increasing this 20 percent if the BoCC and municipal partners are agreeable to the increase.

- **Build on efforts and engage with the community** – Throughout the development process, the TDP has identified advocates and stakeholders while reaching out to the public for input and guidance on developing Citrus Connection's future needs. The agency should leverage these relationships to continue building support for the recommended improvements, especially those that may require strong support and buy-in from the community. However, having community advocates is not a new practice in Polk County. Both Citrus Connection (as LAMTD) in 1983 and WHAT in 2001 used the services of a community advocate that helped to keep the idea of new services in front of Polk County leadership and pushed the decision to start both systems. Although a similar strategy is a worthy effort, significant growth in ridership and dedicated funding may require hiring a paid advocate.

  Additionally, community engagement efforts should include working with appropriate agencies to ensure a holistic approach to both land use and transit. Interested agency personnel may serve as facilitators for a grassroots outreach program or could become transit ambassadors to raise awareness of existing services and additional support for new services. However, to assist these efforts, it is important that Citrus Connection prioritize projects and strategies that align closely with and support community's vision and emphasize its commitment to be a good steward of public funds.

- **Boost awareness and motivate with the TDP** – The adopted TDP should be used as a tool to substantiate and explain the reasons for continued investments in transit services and capital needs. The return on investment from conducting this planning effort should span at least over the next five years until the next major update is undertaken. Citrus Connection should

capitalize on and continue to maximize community support whenever possible to realize the recommended implementation plan. Whereas such community awareness/engagement campaigns can be run with existing staff, real success may likely require professional assistance, so Citrus Connection should also explore hiring of a marketing professional.

- **Develop and use a TDP Executive Summary as a marketing tool** – A Citrus Connection TDP Executive Summary should be developed and used as a promotional tool and an effective medium to continue generating support for the TDP's recommendations. A concise document that includes only key information from the TDP may be more effective than distributing a large report with technical details for soliciting support from the general public and/or stakeholders. Citrus Connection should share this Executive Summary as part of marketing/awareness campaigns, targeting meetings, activities, and events to provide details of the planned transit growth and educate the community and leaders to keep the momentum of the TDP process fresh beyond the TDP adoption.
- **Coordinate with other plans** – Ensuring consistency with key state, regional, and local plan priorities should continue to be a focus. For example, coordinating timing of the TDP with the new Transit Asset Management (TAM) plan requirement should be considered, as both plans are designed to govern investment strategies based on needs. Any plans for alternative fuel vehicles and other technology should be leveraged as a catalyst for growth and changes, soliciting support and advocates.
- **Inform other plans** – Analyses completed during the TDP can be used to help update required plans for ADA access and Title VI service provisions, as they document how the system will serve older adults and populations that fall under Title VI protections. The adopted TDP can also be useful to other entities with subsequent planning efforts, such as local TD plans, comprehensive plans, area redevelopment plans, plans to develop affordable housing, and Florida's SIS Needs Plan.
- **Assess periodically for efficiency**–- Conducting a COA in the next five years may help Citrus Connection examine and evaluate where improvements can be made to make transit operations more effective and efficient across the network. Especially in light of COVID and the post-pandemic era, such efforts in operational planning are warranted to foster real growth and recovery.

Appendices

Appendix A: Trip Purposes and Prioritization Policy A-1
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Appendix A: Trip Purposes and Prioritization Policy

The Community Transportation Coordinator (CTC) implements a Local Coordinating Board (LCB) approved Prioritization Policy in order to provide the most critical trips, with available funds. Since at least 2015, it has been established that Medical/ Medical Related services followed by Nutrition and Life Sustaining Activities will be funded as the top two priorities. If funding allows, the other trip purposes will be considered at the discretion of the CTC.

1. Medical/Medical Related - (Ex. Life sustaining medical—dialysis, chemotherapy, radiation, other medical appointments and treatment, mental health, dental, pharmacy, physical therapy, etc.)
2. Nutrition and Life Sustaining Activities - (Ex. Grocery, medical records, hospital discharge, etc.)
3. Specific Education and Training Determined by the CTC to be for Critical Life Skills - (Ex. Sheltered workshop, specialized training for the disabled, etc.)
4. Employment - (Ex. Personal travel to employment)
5. Other Education and Training - (Ex. Personal education, training)
6. Social/Recreational and Other Activities - (Ex. Personal business, ex. Government office, bank, legal, shopping, social, recreation, etc.)

Appendix B:Fleet Inventory

Table B-1: Fleet Inventory*

Total	Year	Type	Manufacturer	Model	Length (Feet)	Fuel Type	Ramp / Lift
5	2005	Low Floor	Gillig	Low Floor	30	Diesel	Ramp
1	2006	Low Floor	Gillig	Low Floor	40	Diesel	Ramp
1	2006	Low Floor	Gillig	Low Floor	35	Diesel	Ramp
1	2007	Low Floor	Gillig	Low Floor	30	Diesel	Ramp
1	2008	Low Floor	Gillig	Low Floor	30	Diesel	Ramp
5	2010	Low Floor	Gillig	Low Floor	30	Diesel	Ramp
1	2012	Low Floor	Gillig	Low Floor	35	Diesel	Ramp
4	2012	Low Floor	ElDorado	EZ Rider 2	30	Diesel	Ramp
1	2012	Cutaway	Chevy	3500 ARBOC	24	Gas	Ramp
1	2013	Cutaway	Chevy	C4500 ARBOC	24	Gas	Ramp
2	2013	Cutaway	Freightliner	Glavel	30	Diesel	Lift
1	2014	Cutaway	Chevy	C4500 Champion	25	Gas	Lift
1	2014	Low Floor	Gillig	Low Floor	35	Diesel	Ramp
1	2014	Low Floor	ElDorado	EZ Rider 2	30	Diesel	Ramp
5	2017	Low Floor	Gillig	Low Floor	35	Diesel	Ramp
3	2018	Low Floor	Gillig	Low Floor	35	Diesel	Ramp
6	2020	Cutaway	Chevy	C4500 ARBOC	26	Gas	Ramp
7	2020	Low Floor	Eldorado	EZ Rider 2	30	Diesel	Ramp

*As of March 2022

Appendix C: Other Providers

POLK COUNTY TRANSPORTATION SERVICE PROVIDER SURVEY

Citrus Connection is in the process of developing its 10-year Transit Development Plan (TDP) Major Update, in accordance with the Florida Administrative Code (FAC) Rule 14-73.001 for the Florida Department of Transportation (FDOT). The State of Florida requires that Citrus Connection list all of the transportation providers within its geographic service area within these documents. Please take the time to fill out this survey and assist Citrus Connection in providing better transportation to all of Polk County's residents.

1. What is the name of your company? _____

2. What type of service do you provide? (e.g., bus, vanpool, taxi, demand response, charter) _____

3. Does your service have any restrictions related to clients, trip purpose, or destination? _____

4. What are the boundaries of your service area? _____

5. What are your hours of operation? _____

6. What is your service frequency? _____

7. What is your average annual ridership? _____

8. What is your fare per trip? _____

9. What are your primary destinations? _____

10. Please list the location of your facilities:

    Name (e.g., dispatch) _____ Location _____

11. Please list your vehicles – type (e.g., car, van, bus), age, number of units, special accessories _____

12. Please list any other equipment used to perform daily operations (e.g., automotive repair) – type, age, number of units, condition (excellent good fair poor) _____

13. Please list any affiliations with groups or programs involved with public transit.

_____

Thank you for taking the time to complete this survey. You may provide additional information regarding your transportation services in the blank space below or by attaching it to your response. Please return the completed survey to Benesch, 1000 N Ashley Drive #400 Tampa, Florida 33602, or fax to (813) 226-2106, or email khuetten@benesch.com. If the information is available in another format, please mail, fax, or e-mail the existing format without completing this questionnaire.

All agencies that complete and send this form will be included in the Citrus Connection TDP transportation provider inventory.

Table C-1: Other Providers

PROVIDER	TYPES OF SERVICES PROVIDED			LEVELS OF SERVICE		FARE STRUCTURE	TYPES OF VEHICLES	PHONE	EMAIL
	General Service Area (Counties)	Eligible Purposes	Eligible Riders	Days	Hours				
OTHER TRANSPORTATION PROVIDERS									
All Generations Transport Service	Polk County; pro-rated mileage outside of Polk County	Medical	Cancer Patient, Disabled, Elderly, General Public, Private Pay Consumer	Mon-Sun	24/7	Wheelchair Van: $50.00 each way plus $3.00 per mile within Polk County and $4.00 outside Polk County. Stretcher van: $95.00 each way plus $3.00 per mile within Polk County and $4.00 per mile outside Polk County	Non-Emergency Stretcher Van, Wheelchair Van	(863) 646-4908	info@allgts.com
American Cancer Society Transportation Program	All	Medical	Cancer Patient	Mon-Fri	8:00AM-6:00PM	Program uses volunteer and private contracted providers. Depending on need, discount vouchers are available for other than volunteer drivers.	Car, Taxi	(800) 227-2345	
Blue One Transportation	Hillsborough County, Polk County	Recreation	Private Pay Consumer	Mon-Sun	24/7	Varies	Bus, Limousine/Luxury Car, SUV	(813) 282-7351	
Caring With Class Van Service	Polk County	Education, Employment, Errands, Medical, Nourishment, Recreation, Shopping	Cancer Patient, Disabled, Elderly, Veterans	Mon-Sat	Mon-Fri: 6:00AM-6:00pm Sat: 11:00AM -4:00PM	service fee plus $7 All wheelchair is door to door - $38 plus mileage Any post anesthesia client is transported in a wheelchair - $38 plus mileage	Wheelchair Van	(863) 709-3961	Amanda@caringwithclass.com
First Florida Limo	All	Medical, Recreation	Private Pay Consumer	Mon-Sun	24/7	Varies	Limousine/Luxury Car, SUV	(352) 229-8758	contact@firstfloridalimo.com

Table C-1: Other Providers (continued)

PROVIDER	TYPES OF SERVICES PROVIDED			LEVELS OF SERVICE		FARE STRUCTURE	TYPES OF VEHICLES	PHONE	EMAIL
	General Service Area (Counties)	Eligible Purposes	Eligible Riders	Days	Hours				
OTHER TRANSPORTATION PROVIDERS									
Florida Shuttle Services	All	Recreation	Private Pay Consumer	Mon-Sun	5:30AM-8:00PM	Varies	Mini-Bus	(321) 250-2820	reservations@floridashuttletransportation.com
Generous Touch Transportation Services	Orange, Osceola, Polk	Education, Employment, Errands, Medical, Nourishment	Cancer Patient, Disabled, Elderly, General Public, Medicaid Eligible, Private Pay Consumer, Veterans	Mon-Sat	5:00AM-10:00PM	Ambulatory Transport $25.00 R/T Wheel-Chair Transport $35.00 One Way $60.00 R/T First 10 miles included, $2.50 per additional mile Stretcher Transport $80.00 One Way First 5 miles included, $2.50 per additional mile $150.00 R/T First 10 miles included, $2.50 per additional mile	Ambulatory Van, Non-Emergency Stretcher Van, Wheelchair Van	(407) 873-7261	Generoustouchtrans@gmail.com
Greenway Medical Transport, LLC	Polk, Hillsborough	Medical	Cancer Patient, Disabled, Elderly, Indigent, Private Pay Consumer, Veterans	Mon-Sat	12:00AM-12:00AM	Ambulatory: $25 each way within 5 miles, then $2 per mile; Wheelchair Van: $40 each way within 5 miles, then $2 per mile	Ambulatory Van, Car, Non-Emergency Stretcher Van, Van, Wheelchair Van	(863) 308-6029	greenwaymedicaltransport@yahoo.com
Independent Community Transportation	Polk	Medical	Disabled, Elderly	Mon-Sat	Mon-Fri: 8:00AM-5:00PM Sat: 5:00AM-5:00PM	Ambulatory Van: $2.00 per mile, minimum $10.00 Wheelchair Van: Within the county $40.00 each way; outside of county add $2.00 per mile	Ambulatory Van, Wheelchair Van	(863) 293-7888	itrnspt@tampabay.rr.com
Lyft	All	All	All	Mon-Sun	24/7	Varies	Car		

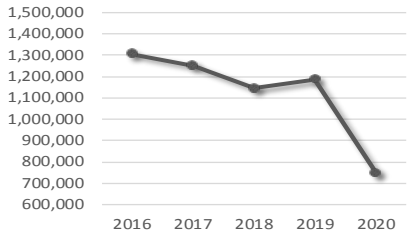
Table C-1: Other Providers (continued)

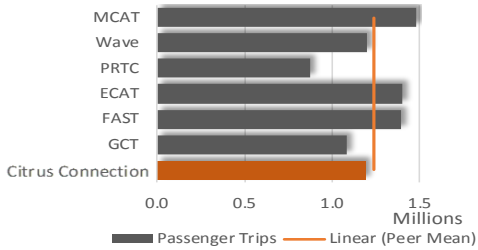
PROVIDER	TYPES OF SERVICES PROVIDED			LEVELS OF SERVICE		FARE STRUCTURE	TYPES OF VEHICLES	PHONE	EMAIL
	General Service Area (Counties)	Eligible Purposes	Eligible Riders	Days	Hours				
OTHER TRANSPORTATION PROVIDERS									
Mobility Works	Polk, Hillsborough, Miami-Dade, Lake, Lee, Duval, Orange	Recreation	Disabled	Mon-Fri	8:00AM-6:00PM	Varies	Wheelchair Van	(877) 275-4915	rentals@mobilityworks.com
Mylecare	All	Medical	Disabled, Elderly, Private Pay Consumer	Mon-Sun	24/7	Varies	Non-Emergency Stretcher Van, Wheelchair Van	(888) 253-2552	support@ridemyle.com
Seniors In Service Of Tampa Bay, Inc.	Hillsborough, Polk, Pasco, Pinellas	Errands	Disabled, Elderly, Veterans	Mon-Fri	Mon-Thurs: 8:30AM-5:00PM Fri: 8:30AM-4:00PM	Fee based on need or income	Car	(813) 932-5228	info@seniorsinservice.org
Stellar Transport Winter Haven	Polk	Medical	Cancer Patient, Disabled, Elderly, Private Pay Consumer, Veterans	Mon-Sun	24/7	Varies	Ambulatory Van, Non-Emergency Stretcher Van, Wheelchair Van	(863) 999-9998	info@stellarofwinterhaven.com
Trinity Non-Emergency Transport, Inc.	All	Errands, Medical, Shopping	Disabled, Elderly, Private Pay Consumer	Mon-Sun	24/7	Wheelchair one way $45.00 Stretcher one way $75.00 Additional Fees: Plus $4.00 per mile After 6:00pm, Weekends and Holidays there will be an additional flat fee of $10.00	Ambulatory Van, Non-Emergency Stretcher Van, Wheelchair Van	(863) 661-5515	trinitytransinc@gmail.com
Uber	All	All	All	Mon-Sun	24/7	Varies	Car	(833) 873-8237	
Viste-Volunteers In Service To The Elderly	Polk	Errands, Medical, Shopping	Elderly	Mon-Fri	8:00AM-4:00PM	No Charge	Car, SUV	(863) 284-0828	info@viste.org

Appendix D: Peer and Trend Analyses

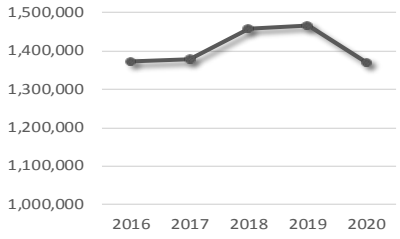
General Performance Indicators

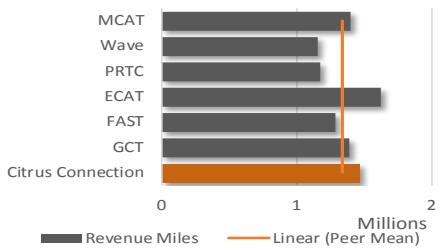
Passenger Trips



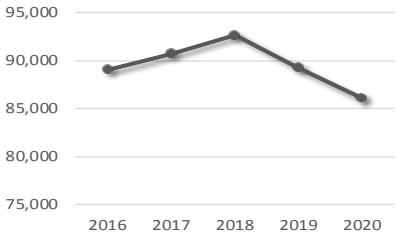


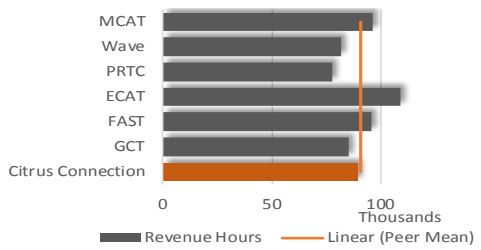
Revenue Miles



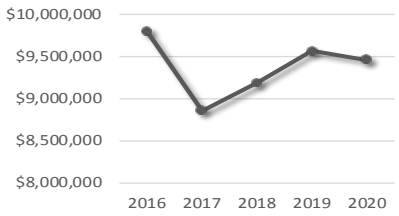


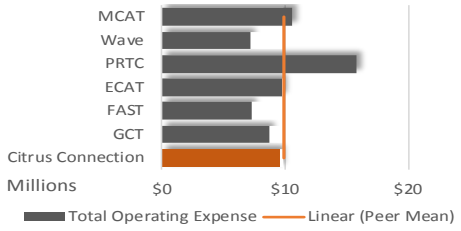
Revenue Hours



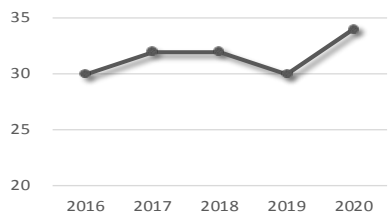


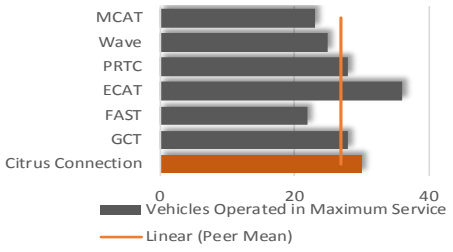
Total Operating Expense





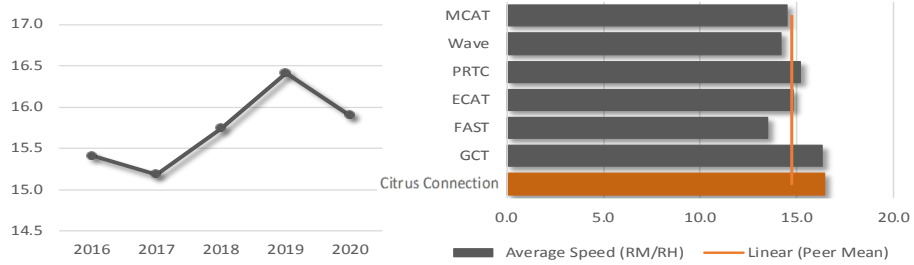
Vehicles Operated in Maximum Service



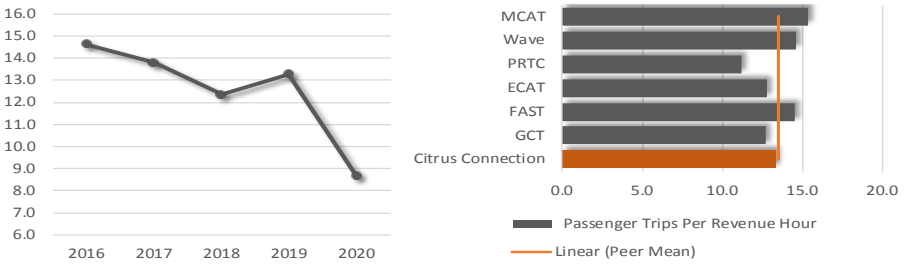


Effectiveness Measures

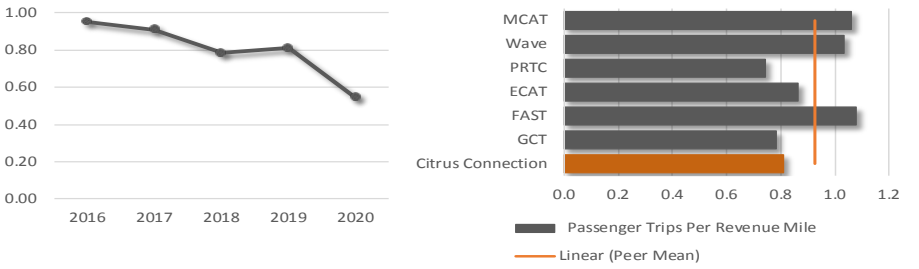
Revenue Miles per Revenue Hour



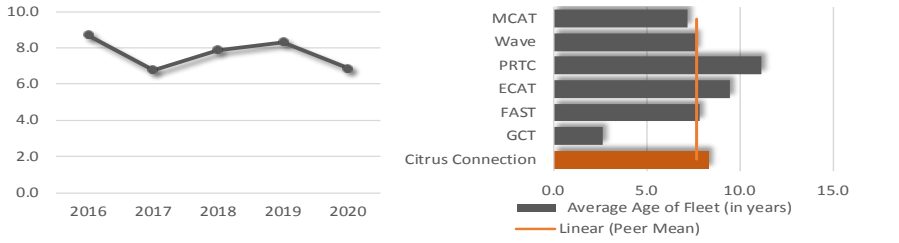
Passenger Trips per Revenue Hour



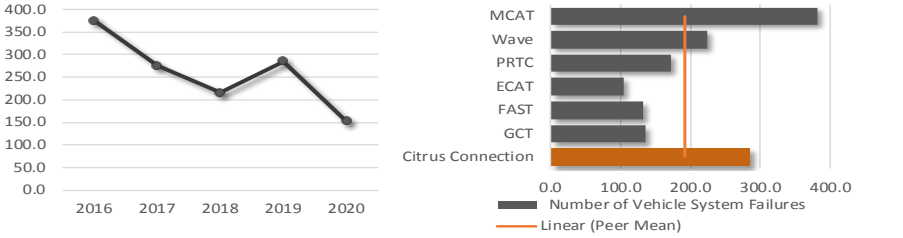
Passenger Trips per Revenue Mile



Average Age of Fleet

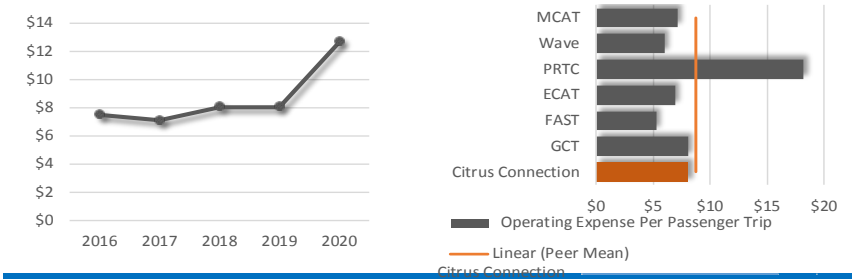


Number of Vehicle System Failures

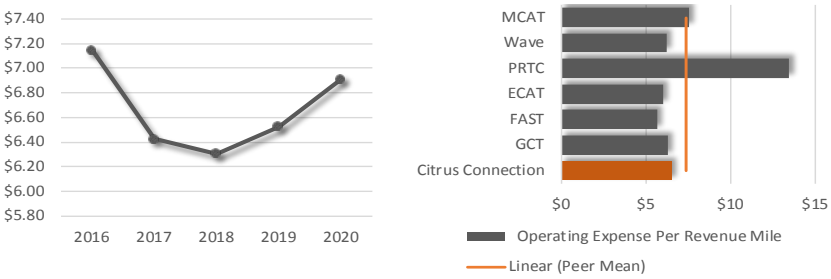


Efficiency Measures

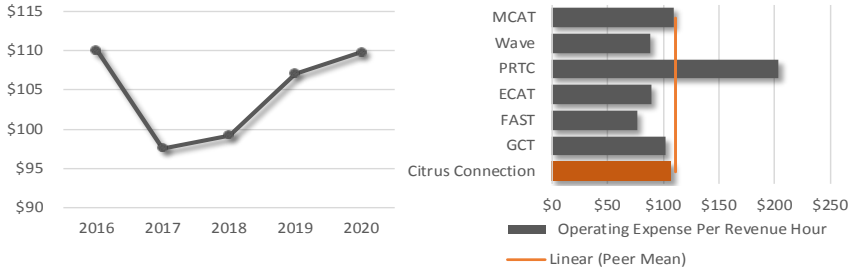
Operating Expense per Passenger Trip



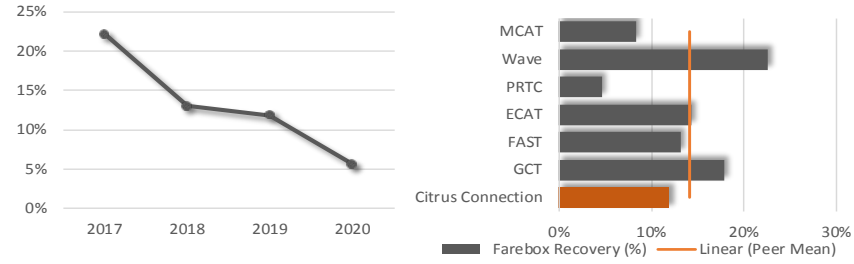
Operating Expense per Revenue Mile



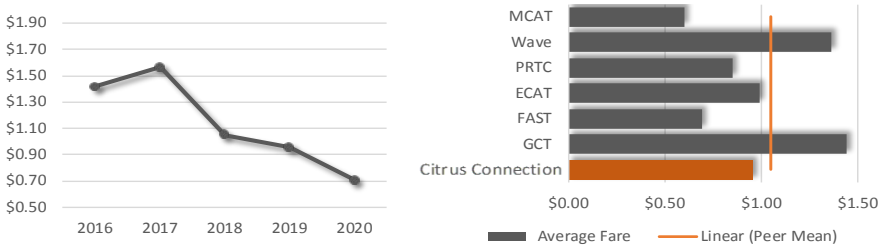
Operating Expense per Revenue Hour



Farebox Recovery (%)



Average Fare



Appendix E: Farebox Recovery Report

ANNUAL FAREBOX RECOVERY RATIO REPORT – October 2022
Citrus Connection
Lakeland, Florida

Current Farebox Recovery Ratio

The farebox recovery ratio (FRR) for Citrus Connection, the public transportation provider for the Polk County, was 10.68 percent in FY 2021. This is a 51.7 percent decrease over the five-year period from FY 2017 to FY 2021.

Prior Year Fare Studies and Changes

No fare studies were conducted or fare changes made during the prior year. The current full fare on the fixed-route system remains at $1.50, $3.00 for unlimited rides per day, and $47.00 for a monthly pass. Older adults (age 65 and older), Medicare recipients, persons with disabilities, and students receive discounted fares. Children under age 7 ride for free with an adult.

Strategies That Will Affect The Farebox Recovery Ratio

The Citrus Connection 2023–2032 Transit Development Plan (TDP) Major Update identifies strategies that will be used to maintain or increase the farebox recovery ratio, including the following:

- Monitor key performance measures for individual fixed routes.
- Ensure that transit serves major activity centers to potentially increase the effectiveness of service.
- Increase ridership through enhanced marketing and community relations activities.
- Minimize costs required to operate and administer transportation services.
- Monitor opportunities to secure additional funding to improve frequencies on existing routes and attract new riders.
- Meet with surrounding counties to form partnerships for funding improved regional transit service.
- Conduct on-board surveys every 3–5 years to gather information on how to make services more convenient and useful to patrons.
- Coordinate with SunRail to implement regional fare

Appendix F: Public Involvement

PUBLIC INVOLVEMENT PLAN (PIP) FOR TDP MAJOR UPDATE 2022-23 TO 2031-32 "CITRUS CONNECTION TDP 2022"

FOR

CitrusConnection
PROGRESS IN MOTION

FINAL - 11-09-2021

BY Polk TPO

Polk Transportation Planning Organization

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1. INTRODUCTION

The Florida Department of Transportation (FDOT) requires that all transit agencies receiving State Block Grant funding prepare a major Transit Development Plan (TDP) update every five years, with annual minor updates and monitoring in the interim years. The CITRUS CONNECTION FY 2022 TDP is a major update. The TDP is a 10-year strategic guide for public transportation in the community and represents Citrus Connection's vision for public transportation during the 10-year time period, FY 2022-23 through 2031-32.

TDP regulations require that major TDP updates contain a Public Involvement Plan (PIP) which can be the local Transportation Planning Organization's (TPO) Public Participation Plan (PPP). The Polk TPO and Citrus Connection worked together to develop a Public Involvement Plan specifically for the CITRUS CONNECTION FY 2022 TDP major update. Rules adopted in 2007 require that the participants document the PIP to be used in TDP development. Applicable language from the 2007 rule states the following:

> *The TDP preparation process shall include opportunities for public involvement as outlined in a TDP public involvement plan, approved by the Department, or local Metropolitan Planning Organization's Public Participation Plan, approved by both the Federal Transit Administration and the Federal Highway Administration.*
>
> *– Rule 14-73.001 F.A.C.*

The following plan has been developed to describe how Citrus Connection will involve the public and stakeholder groups in the development of the CITRUS CONNECTION FY 2022 TDP major update. The overall approach for developing the TDP is presented, followed by the specific efforts that will be undertaken to obtain public input.

Public involvement is an ongoing process that involves continuously receiving and accumulating feedback about service. This PIP has been developed to be used

during the FY 2022–2031 TDP update process to formally document all planned public outreach activities.

2. CITRUS CONNECTION OVERVIEW

Public transit in Polk County is provided by the Lakeland Area Mass Transit District, (LAMTD) operating as Citrus Connection, which includes all public transportation within the County including the Winter Haven urbanized area, rural routes serving Bartow, Fort Meade, and Frostproof, as well as all paratransit service. For years, public transit was made up of three agencies operating independently of each other, creating some challenges for riders who want to utilize the transit system throughout the County. Today, those services, personnel, and assets are all combined together working to bring the County a top-quality transit system under one simplified banner, Citrus Connection "Progress In Motion."

Citrus Connection MISSION: To be a superior provider of transportation services that contributes to the economic growth and quality of life for the communities we serve.

Citrus Connection VISION STATEMENT: Effectively connecting people with their world through expanded, environmentally friendly service with full support of the communities we serve.

Citrus Connection Strategic GOALS:

TA 1 - Enhance public perception of Citrus Connection through a targeted marketing and rebranding plan.
TA2 - Identify new and untapped funding sources.
TA3 - Increase opportunities for county-wide exposure of Citrus Connection through connectivity with key leaders in the 17 municipalities of Polk County.
TA4 - Increase ridership by combining prioritized and necessary elements to enhance the customer experience.
TA5 - Cultivate community partnerships with Citrus Connection through management and board engagement.
TA6 - Increase internal communication through systemic processes.
TA 7 - Examine wages and benefits to maximize rider experience.

Citrus Connection serves Polk County which has an area of approximately 2,000 square miles (roughly the size of Rhode Island). As of its FY 2019 National Transit Database statistics, Citrus Connection operates a total fleet of 39 buses and 42 paratransit vehicles, with 65 of those (30 and 35, respectively) operating in peak service.

Citrus Connection Services and Key Features

- Local fixed-route and express bus services
- Flex service: Lakeland to Mulberry, Posner Park to Loughman, and Mulberry (list has examples, and is not exhaustive.)
- Paratransit service
- Transportation Disadvantaged (TD) Program
- "The Squeeze," coming in late 2021.
- Wheelchair accessibility on all buses and vans
- Bicycle accessibility on all buses
- Travel planning assistance and updated scheduled arrival times, bus stop locations, and service updates for smartphones
- Travel training

3. TDP PUBLIC INVOLVEMENT PROCESS

The public involvement process for the development of the TDP seeks Citrus Connection's user and non-user public input on transit needs, priorities, and implementation strategies to enhance public transportation in Polk County and the region. This outreach effort will ensure that a broad range of groups is consulted as part of the process, including passengers, major employers, human service providers, Citrus Connection employees, and the general public.

This TDP Major Update will be prepared in a collaborative effort between the Polk TPO and Citrus Connection, with assistance from a consultant. These three parties form the basis of the Project Team.

The approach to this PIP consists of three phases:

- **Phase 1** – Reviewing and mining previous data, results, and findings of Re-Route 2020 (in 2019) and the Premium Transit Surveys completed as part of the East Polk Transit Study in 2020-21.
- **Phase 2** – During this phase, the Project Team will conduct outreach to the community to seek public input on transit needs, including service and capital/infrastructure needs for the next 10 years. The Project Team will conduct informal discussion group workshops, general public workshops, online surveys, major employer interviews/employee surveys, as well as stakeholder interviews as part of this phase of the outreach effort.
- **Phase 3**– Following extensive evaluation of the input received and development of recommendations, additional outreach will occur to seek public input on the recommendations, including potential service improvements, priorities, and implementation strategies to enhance public transportation in Polk County.

A variety of public involvement techniques have been selected for inclusion in the PIP to ensure the active participation of citizens in the community. Table 3-1 presents the types of public involvement activities that will be completed for the TDP and the tools associated with each type of activity. These public involvement activities and tools are consistent with the Polk TPO PPP.

Table 3-1

TDP Public Involvement Activities and Tools

PHASE	PUBLIC INVOLVEMENT ACTIVITY	PUBLIC INVOLVEMENT TOOLS
Phase 1	Review Existing Outreach Findings	Evaluation
Phase 2	Employer/Employee Outreach (11 employers)	Employer Interview Script Employee Survey Questionnaire
	Public Workshops (3)	Introductory Presentation Information Boards Handouts/Flyers Electronic Surveys English/Spanish Materials Advertising via: • Legal Advertisement • Social Media

		• TPO Newsletter • Citrus Connection Newsletter • TDP Website
	Review Recent Transit Survey Findings	Evaluation
	Stakeholder Interviews (15)	Interview Script Briefing Packet, including TDP Fact Sheet & Other Study Materials
	Bus Operator/Supervisor Surveys	Operator/Supervisor Survey Questionnaire
	Online Survey (1st of 2)	Survey Question Set Survey Links on Various Websites
	Discussion Group Workshops (4)	Discussion Script Introductory Presentation Briefing Packet, including TDP Fact Sheet & Other Study Materials
Phase 3	Public Workshops (2)	Introductory Presentation Information Boards Handouts/Flyers Electronic Surveys English/Spanish Materials Advertising via: • Legal Advertisement • Social Media • TPO Newsletter • Citrus Connection Newsletter • TDP Website
	Online Survey (2nd of 2)	Survey Question Set Survey Links on Various Websites
All 3 Phases	Media Relations	Citrus Connection, Polk County Communications Department & PGTV
	Social Media & Website Outreach	TDP Website Online & Social Media Content
	Coordination with Citrus Connection, Polk TPO, PGTV, Regional Workforce Board, Elected Officials	

TDP Public Involvement Techniques

The public involvement techniques to be used for the CITRUS CONNECTION TDP 2022 update have been placed into two major categories: public involvement activities and public involvement tools.

Public involvement activities refer to events that engage the public in "hands-on" workshops and/or discussions about the project. Public involvement tools refer to public information materials that are used to inform the general public of issues regarding the project.

Public Involvement Activities

Public involvement activities for the CITRUS CONNECTION TDP 2022 are described below.

- ***Review Findings from Previous Surveys and other Associated Study Efforts*** – The significant outreach efforts employed throughout the Re-Route 2020 and the East Polk Transit Studies will be reviewed.
- ***Employer/Employee Outreach*** – Obtaining feedback and input on public transportation options available to local employers and their employees is a key component of this public involvement effort. In total, 11 major employers will be identified and engaged through interviews and an employee survey to better understand their commuting habits and their use of transit. The Project Team will also include Citrus Connection as one of the included employers, ensuring that Citrus Connection employees will be surveyed about their commuting habits and use of transit.
- ***Public Workshops*** – Public workshops are an effective technique for obtaining substantive public participation in the planning process. A total of five major public workshops, supplemented by Citrus Connection-conducted public outreach throughout the service area, will be conducted to obtain input from the general public during the TDP update process; three major public workshops will be held early in the process to collect input on needs

and two will be held later in the project to collect input on potential alternative improvements and recommendations.

To maximize opportunities for citizen participation, locations will be selected to ensure geographic coverage and, to the extent possible, piggyback on other community events. Hours and locations will be chosen with the recognition of the challenges of riders' daily schedules. The workshops will support participation of those with children, if needed, and those who otherwise have problems accessing public meetings. All workshops will be advertised and promoted through the TDP website and social media platforms along with legal advertisements in local newspapers. Presentation materials and handouts will be developed in both English and Spanish, as needed. Materials will be translated to other languages upon request. The media will be notified through press releases. The Project Team may also choose to stream the workshops through Facebook Live or PGTV to draw more interest and input.

Notes related to Social Media and Other Media Platforms:

Citrus Connection has a website and uses several social media platforms. It makes videos. It has several internal newsletters.

Citrus Connection has interior bus space to place media and can also do so at selected bus stops and transfer stations.

Polk TPO has a website and a monthly electronic newsletter, which is sent out to Facebook, and the "Transportation Advisor Network."

Polk County Communications department provides the TPO with the PGTV resource.

- ***Review Recent On-Board Survey Findings –*** The Project Team will make use of previously conducted surveys of fixed-route bus patrons and other stakeholders to capture demographic, travel behavior, and rider satisfaction data from Citrus Connection fixed-route bus riders, and other viewpoints. The results will be reviewed and incorporated to focus on relevant transit needs and issues such as modifying bus schedules, locating bus stops, modifying the fare structure, planning for future service, focusing on

marketing campaigns, and identifying historical trends in rider satisfaction. The results from recent surveys associated with the following two studies will be considered:

  - Re-Route 2020 (2019)
  - East Polk Transit Study (October 2020-March 2021)

- ***Stakeholder Interviews –*** The Project Team will conduct interviews of 15 key stakeholders as part of the PIP. The Project Team will work with Citrus Connection staff to identify appropriate individuals to interview and will then schedule and conduct the interviews using an interview script that will be developed and submitted to Citrus Connection staff for review prior to the first interview.
- ***Employer Interviews –*** The Project Team will conduct interviews of 11 key local area employers, including Citrus Connection, to obtain input and feedback on currently available public transportation options as part of the PIP. The Project Team will work with Citrus Connection staff to identify appropriate company representatives to interview and will then schedule and conduct the interviews using an interview script that will be developed and submitted to Citrus Connection staff for review prior to the first interview.
- ***Bus Operator/Supervisor Surveys –*** Citrus Connection's bus operators and supervisors drive the streets of Polk County every day and observe riders regularly; as a result, they can provide valuable insight into what the riders need and want. The Project Team will conduct a survey of Citrus Connection bus operators and supervisors to obtain their insights into what changes and improvements can be made to the system.
- ***Discussion Group Workshops –*** Four informal discussion groups will be held to identify and assess perceptions of transit and opportunities for the transit agency. Discussion groups are an excellent tool for revealing the attitudes of a particular group because of the open-ended nature of group discussions. These workshops typically involve a smaller group of participants (8–12

persons) in an intimate meeting setting that permits more in-depth discussion about issues and needs. Workshops will include participants/representatives from the following four groups.

- **Citrus Connection Riders –** Participants may include riders of fixed-route, flex, paratransit services
- **Community Groups –** Participants may include representatives from social service agencies and Limited English Proficiency (LEP) and faith-based organizations/communities
- **Transportation/Land Use Groups –** Participants may include representatives from Bike/Walk programs, County/City/Planning agency staff, and parks and trail and environmental interests
- **Business and Neighborhood Leaders –** Participants may include leaders from area chambers of commerce, Community Redevelopment Agencies (CRAs), and Homeowner Associations (HOAs)

These discussion group workshops will be scheduled prior to the public workshops to help generate buy-in from community leaders and promote participation at the public workshops.

Review Committee Meetings – A Project Review Committee (PRC) comprising the Project Team (Polk TPO staff, Citrus Connection staff, and consultant), a local Workforce Development Board (CareerSource Polk) representative, an FDOT District 1 representative, and other agencies/staffs as necessary will be established at the outset of the project to monitor and provide input throughout the study and to evaluate deliverables. Project deliverables will be distributed to the PRC for review and comment. Most of the communication with the review team will be via e-mail and telephone; however, in addition to the kickoff meeting, additional meetings will be held as needed during the update effort.

Public Involvement Tools

A variety of public involvement tools will be developed and distributed throughout the TDP process to facilitate communication with all audiences, as well as to provide other avenues for them to participate and provide input.

- ***Surveys –*** Two online surveys will be conducted as part of the PIP process. The first online public survey will be conducted to collect input on the primary transit needs in the region as well as suggested service improvements. Links to the survey will be posted on the TDP website and will be included in Citrus Connection's electronic newsletter and on its social media platforms. It also will be available as a tablet survey at the aforementioned public workshops in addition to hard copy surveys. The second online public survey will be developed specifically to get input and reaction for the proposed recommendations that will be developed. Additionally, a third survey will be developed for use with employees at the major employers selected for interviews to help determine their commuting habits and use of transit.
- ***Handouts/Flyers –*** Informational materials for public outreach activities and public workshops will be developed, including handouts/flyers, maps, tables, and graphics. Materials will encourage observers to visit Citrus Connection's website and social media pages for more information and participation in the two project online surveys.
- ***Legal Advertisements –*** All public meetings will be advertised through legal ads in local newspapers, as needed.
- ***Electronic Newsletters –*** The Polk TPO publishes a monthly electronic newsletter that pushes out information on public meetings and other topics to those who subscribe. This resource will be used as needed to help disseminate information about the TDP effort.
- ***Project Presentations –*** As part of the public outreach process, a user-friendly, graphical presentation will be incrementally developed to support the communication and adoption of the TDP. The presentation also will be available for use by Citrus Connection staff beyond the adoption of the TDP to help support the subsequent implementation of its recommendations.
- ***Presentation Boards –*** The Project Team will develop informational presentation boards for use at public workshops and discussion group workshops for the project. These exhibits will consist of service area maps

and other pertinent information. Materials will encourage observers to visit Citrus Connection's website and social media pages for more information and participation in the two project online surveys.

- ***Media Relations –*** The Project Team will develop a list of media contacts related to this effort. As project milestones are accomplished and public outreach events are scheduled, the Project Team will work with the TDP public relations team (Citrus Connection staff and Polk County Communications staff) to distribute press releases to this list. The list will include community-based, local, and regional media, as well as county public information offices and government access channels. Press releases will be provided to staff for review and release to the media.

Information Distribution Methods

- ***Social Media –*** Social networking opportunities for the project will be provided using Facebook and/or Twitter. Regular Facebook and/or Twitter updates (twice a month at a minimum) along with the two online surveys will be used to increase public participation. Social media links will be integrated into the TPO and Citrus Connection websites. The Project Team may elect to stream public workshops through Facebook Live to draw more interest and input.
- ***TDP Website –*** A section of the Polk TPO website will be set up to serve as the TDP update page. A hyperlink can be placed on the Citrus Connection website so that people can "click here for more information on the Major Update to the TDP!" Summary information updates along with links to the two online surveys will be placed on the TDP website. Items on the website will include meeting notices, comment forms, and technical information on study findings and recommendations.
- ***Notification of General Public –*** The general public will be notified about public meetings at least 14 days in advance of events, through legal advertisements; the TDP, Citrus Connection, and TPO websites; flyers; and social media.

- ***Notification of State and Local Agencies –*** Per TDP Rule, the TPO, FDOT, and CareerSource Polk will be advised of all public meetings via email. In addition, project deliverables will be submitted to all to solicit feedback and comments.
- ***Reports and Information for the TDP Website –*** Technical reports, community workshop and meeting schedules, surveys, and other appropriate items will be provided to TPO staff for posting on the TDP website.

4. TDP PUBLIC INVOLVEMENT SCHEDULE

A tentative project schedule has been developed for the public involvement portions of the CITRUS CONNECTION TDP Major Update, as shown in Figure 4-1. Dates for specific meetings and public involvement activities are approximate and subject to change pending guidance from Citrus Connection and Polk TPO staff.

Figure 4-1

TDP Public Involvement Schedule – 2021/2022

(Tentative)

PUBLIC INVOLVEMENT ACTIVITY	SEP 2021	OCT 2021	NOV 2021	DEC 2021	JAN 2022	FEB 2022	MAR 2022	APR 2022	MAY 2022	JUN 2022	JUL 2022	AUG 2022	SEP 2022
Develop Draft and Final PIP													
TRANSPORTATION SUMMIT	X												
Kickoff Meeting		X											
Review Existing Outreach Efforts													
Employer/Employee Outreach													
Public Workshops						3			2				
Online Public Input Surveys													
Stakeholder Interviews													
Bus Operators/Supervisors Survey													
Discussion Group Workshops							3						
Web/Social Media Outreach													
Media Relations													
Project Presentations													
Due to FDOT													X

FDOT
Florida Department of Transportation
801 N. Broadway Avenue
Bartow, FL 33830

RON DESANTIS
GOVERNOR

KEVIN J. THIBAULT, P.E.
SECRETARY

October 21, 2021

Polk Transportation Planning Organization
Ms. Julia Davis
330 West Church Street
Drawer TS05, P.O. Box 9005
Bartow, FL 33831-9005

RE: 2021-2022 Transit Development Plan Public Involvement Plan

Dear Ms. Davis:

This letter pertains to the Department's review of Polk Transportation Planning Organization's 2021-2022 Public Involvement Plan (PIP) of the Transit Development Plan (TDP). District One Department staff received the PIP on Wednesday, October 20, 2021.

The Department completed its review of the document based on Rule Chapter 14-73.001(3)(a), F.A.C. pertinent to the requirements for the TDP on Thursday, October 21, 2021. The Department finds Polk Transportation Planning Organization's 2021-2022 PIP for the TDP to be in compliance with the Chapter 14-73, F.A.C. and makes the follow comments:

- Based on Best Practices as described in the TDP Handbook, FDOT Guidance for Preparing & Reviewing Transit Development Plans, Version III, October 2018, Table 3-4, please consider the following recommendation: Minimum 14-day notification for events open to the public.
- FDOT has adopted the *Justice's Safe Harbor Provision* which supports having written materials translated for LEP populations. Therefore, to show a strong evidence of compliance, the Department recommends Polk TPO's PIP also state that materials will be translated into French-Creole, upon request.

Please provide a copy of this compliance letter as an attachment within the final TDP Major Update.

The Department appreciates the efforts of the Polk Transportation Planning Organization's staff to develop the 2021-2022 PIP for the Transit Development Plan in compliance with Chapter 14-73, F.A.C.

If you have any questions, please contact Charlene Ross via email at Charlene.Ross@dot.state.fl.us or at (863) 519-2390.

Sincerely,

Charlene Ross

Charlene Ross
Transit Projects Coordinator

Cc: Michelle S. Peronto, Transit Programs Administrator
Mary Ross, Congestion Management Multi-Modal Planner

TDP Stakeholders Interviewed

Board	Position	Name
Interviewed Individually		
Polk County	Commissioner	George Lindsey
Polk County	Commissioner	Rick Wilson
Polk County	Commissioner	Bill Braswell
Polk County	Commissioner	Neil Combee
Polk County	Commissioner	Martha Santiago
Auburndale	Commissioner	Keith Cowie (At a Rotary meeting)
Lake Alfred	Mayor	Nancy Daley
Lake Wales	Commissioner	Jack Hiligoss
Lakeland	Mayor	William Mutz
Lakeland	Commissioner (& Chair of LAMTD)	Sara McCarley
Lakeland	Commissioner	Phillip Walker
Lakeland	Commissioner	Chad McLeod
Lakeland	Commissioner	Bill Read
Lakeland	Commissioner	Michael Musick
Lakeland	Commissioner	Stephanie Madden
City of Winter Haven The TPO interviewed individual members of the Winter Haven City Council (WI = City of Winter Haven, interviewed as an individual) in March. The other members listed, attended a briefing which was conducted as part of their regularly scheduled agenda workshop on March 23, 2022. (WG = City of Winter Haven, interviewed as part of the group)		
Winter Haven (WG)	Mayor	Bradley Dantzer
Winter Haven (WG)	City Manager	Mike Herr
Winter Haven (WI)	Mayor Pro Tempore & Chair of TD-LCB	Nat Birdsong
Winter Haven (WG)	Commissioner (& member of TD LCB)	James H Powell
Winter Haven (WG)	Commissioner	Brian Yates
Winter Haven (WG) & (WI)	Commissioner	L. Tracy Mercer

Interviewed as a Group (the US 27 Group) The TPO conducted a group presentation to members of the US 27 Group on 3/08/22. Some members participated in person in the group discussion. All members received a copy of the material and were thus, reached.		
Davenport	City Manager	Kelly Callihan
Dundee	Mayor	Sam Pennett
Dundee	Town Manager	Tandra Davis
Haines City	Mayor	Morris West
Haines City	-	Edward Dean
Lake Hamilton	Town Planner (on behalf of Michael Kehoe and Sara Irvine)	Doug Leonard
Lake Wales	Mayor	Eugene Fultz
Interviewed as a Group (Polk TD LCB) The TPO conducted a public Group Discussion with the Polk Transportation Disadvantaged Local Coordinating Board on March 28, 2022. This was one of the two Public Workshops in Phase I. The comments from that are summarized at the Public Workshop section		
Polk TD LCB	Department of Transportation (FDOT)	Charlene Ross
Polk TD LCB	Public Education Community	Lisa Miller
Polk TD LCB	Regional Workforce Development	Stacy Campbell-Domineck
Polk TD LCB	Representing Veterans	Joseph Lesniewicz IV
Polk TD LCB	Citizen advocate	Diane Durr
Polk TD LCB	Citizen advocate	Sheryl Brown
Polk TD LCB	A local representative for children at risk	Tiara Dasher
Polk TD LCB	Florida Department of Elder Affairs	Kevin Gilds
Polk TD LCB	Florida Agency for Health Care Administration	Emily Hughart
Polk TD LCB	Agency for Persons with Disabilities	Connie Miller
Polk TD LCB	Local medical community	Joy Johnson

Members of the US 27 Group
Mayor Mike Kehoe
Town Administrator Sara Irvine
Mayor Sam Pennant
Town Manager Tandra Davis
Mayor Morris West
City Manager Edward Dean
Mayor Rob Robinson
City Manager Kelly Callihan
Mayor Eugene Fultz-
City Manager James Slaton
Mayor Jonathan Albert
City Manager Nicole McDowell

Polk County
Ten-Year Transit Development Plan (TDP)
2022 Major Update

Stakeholder Interview Guide

PURPOSE OF INTERVIEW

- The Polk Transportation Planning Organization (TPO) is working with the Lakeland Area Mass Transit District (LAMTD) to develop a10-year transit development plan (TDP) for Citrus Connection. Citrus Connection is the fixed-route bus transit service operated by LAMTD. The TDP helps Citrus Connection meet FDOT requirements for state funding eligibility.
- As part of the TDP process, meetings are held with key stakeholders in the county and the region to gauge awareness of current public transit, as well as garner input on the need for and viability of transit services in Polk County and its immediate region.
- The TDP also serves as an opportunity to discuss improvements that might be needed to the transit system and to discuss initiatives for future system growth.

BACKGROUND INFORMATION

- A TDP is a strategic guide for public transportation development in the county.
- The TDP:
    - Evaluates existing services,
    - Reviews demographic information of riders and their travel behaviors,
    - Summarizes local community and transit policies and priorities,
    - Gauges public perception through accessible activities for the general public and interested parties,
    - Compares the local transit system or community to other similar systems, and

    - Reviews performance of the local system.
- It is a ten-year implementation plan which provides recommendations on:
    - How, where, when, and if new transit services should be introduced to the transit system, and,
    - Adjusting, removing, or improving aspects of the transit system that may not be adequately serving the public or that is not meeting performance measures.
- Finally, a ten-year financial plan is constructed as part of the TDP that:
    - Estimates costs of existing and new services, and,
    - Projects known and potential revenues.
- Although transit systems are required to submit a TDP to FDOT, TDPs can also be very useful as they provide a review of the current transit system, recommendations for improvements, and outlines the cost of improvements.
- TDPs are not budgets or CIPs and do not necessarily bind decision-makers to elements of the TDP. However, great effort is put into developing a comprehensive overview of the transit system and planning for the future needs of the general public that can:
    - Encourage residents, businesses, and government officials to support and advocate use of public transportation,
    - Use transit to improve connectivity and convenience,
    - Promote sustainable and environmentally friendly transportation, and
    - Improve overall quality of life of residents.
- Candid discussions and continued participation from stakeholders in the transit development process allows:
    - Decision-makers to become more knowledgeable about the transit planning process and,
    - The County to construct and support a plan that not only has input from the local public, private and government sector, but helps foster consensus in the decision-making process ("everyone is on the same page").

INTERVIEW QUESTIONS

Transit Today

1) How much awareness of and support for transit is there in the community? Have the levels of awareness and support changed in recent years?
2) What is your perception of transit's role in Polk County? (transport workers, elderly, low income, individuals with disabilities, tourists, attracting choice riders, to prevent congestion, to reduce emissions, to create economic opportunities)?
3) Is Citrus Connection responsive to community needs? How are those needs communicated to Citrus Connection?
4) Is information on transit readily available in the community? If not, where should transit information be available in the community?

Where Do We Want to Go

5) What goals have the City and County elected officials voiced for transit?
6) What do you see as appropriate goals for the transit system in the next 5 to 10 years?
7) What is happening in the County in terms of growth and development? Where? How can transit best respond to these trends?
8) Should Polk County be looking at new markets for transit service, or should it concentrate on its existing markets?
9) Is there a need for premium transit (such as bus rapid transit or rail) within the County?
10) Is more regional transportation needed to connect Polk County with surrounding areas?
11) Is there demand for a SunRail connection to Polk County (Winter Haven, Haines City, Auburndale, and Lakeland)?
12) Is there a need for more service to the Poinciana SunRail station?
13) What benefits do you see with a potential Brightline connection for Polk County? Do you see a need to connect local transit to Brightline stations?

14) Is there a willingness in the community to consider additional local funding for transit? If so, what type of local funding (increased bus fares, sales tax, property tax, etc.)?
15) The Citrus Connection Universal Access Program (UAP) was implemented about 10 years ago. There are currently 8 major employers and schools entering contracts to pay directly to Citrus Connection for employees, students, and facility free access to transit services using their employee and student identifications. Do you think engaging additional participants in the UAP or implementing other similar private-public partnerships should be a priority for Citrus Connection?

How Do We Get There

16) What improvements are needed in the transit system in the next 10-years to attract more riders?
17) Is there a need for more park and ride lots, possibly in conjunction with Rail and express bus services to local and regional destinations?
18) Are there areas currently not served or underserved by transit that should receive a higher priority?
19) Do you believe further branding is needed? If so, what do you think the community would like to see?
20) Are there other policies that should be changed to help the transit system reach its goals?

Final Thoughts

21) What are the major strengths and accomplishments of existing transit services?
22) What are the weaknesses, if any, of existing transit services?
23) If you could pick one thing to change about the transit system, what would it be?
24) What is your vision for transit in the next 5 to 10 years? Next 20 years?

Polk County
Ten-Year Transit Development Plan (TDP)
2022 Major Update

Major Employer Interview Guide

PURPOSE OF INTERVIEW

- The Polk Transportation Planning Organization (TPO) is working with the Lakeland Area Mass Transit District (LAMTD) to develop a10-year transit development plan (TDP) for Citrus Connection. Citrus Connection is the fixed-route bus transit service operated by LAMTD. The TDP helps Citrus Connection meet FDOT requirements for state funding eligibility.
- As part of the TDP process, meetings are held with key stakeholders in the county and the region to gauge awareness of current public transit, as well as garner input on the need for and viability of transit services in Polk County and its immediate region.
- The TDP also serves as an opportunity to discuss improvements that might be needed to the transit system and to discuss initiatives for future system growth.

BACKGROUND INFORMATION

- A TDP is a strategic guide for public transportation development in the county.
- The TDP:
    - Evaluates existing services,
    - Reviews demographic information of riders and their travel behaviors,
    - Summarizes local community and transit policies and priorities,
    - Gauges public perception through accessible activities for the general public and interested parties,
    - Compares the local transit system or community to other similar systems, and
    - Reviews performance of the local system.

- It is a ten-year implementation plan which provides recommendations on:
    - How, where, when, and if new transit services should be introduced to the transit system, and,
    - Adjusting, removing, or improving aspects of the transit system that may not be adequately serving the public or that is not meeting performance measures.
- Finally, a ten-year financial plan is constructed as part of the TDP that:
    - Estimates costs of existing and new services, and,
    - Projects known and potential revenues.
- Although transit systems are required to submit a TDP to FDOT, TDPs can also be very useful as they provide a review of the current transit system, recommendations for improvements, and outlines the cost of improvements.
- TDPs are not budgets or CIPs and do not necessarily bind decision-makers to elements of the TDP. However, great effort is put into developing a comprehensive overview of the transit system and planning for the future needs of the general public that can:
    - Encourage residents, businesses, and government officials to support and advocate use of public transportation,
    - Use transit to improve connectivity and convenience,
    - Promote sustainable and environmentally friendly transportation, and
    - Improve overall quality of life of residents.
- Candid discussions and continued participation from stakeholders in the transit development process allows:
    - Decision-makers to become more knowledgeable about the transit planning process and,
    - The County to construct and support a plan that not only has input from the local public, private and government sector, but helps foster consensus in the decision-making process ("everyone is on the same page").

INTERVIEW QUESTIONS

1. How many employees do you have and what percent of them are full-time (including any multiple facilities and/or satellite locations)?
2. Do you also have your clients/customers visiting your facility on daily basis? If so, how many per day on average?
3. Do you perceive transportation to be a challenge for your company to hire and retain employees? If yes, what are a few of the reasons why you feel this challenge exists?
4. How do you view public transit services provided in Polk County by Citrus Connection?
5. What do you know about Citrus Connection services/connections to your company location?
6. Is your organization a part of the Universal Access Partnership (UAP) that allows free bus rides to employees, students, etc. by simply showing a valid ID badge? If not, are you interested in joining the program?
7. If Citrus Connection currently does not provide service to your location, would you like them to consider future bus route connections and bus stops near your company location?
8. How much interest do you think your employees have in using alternative modes of travel, such as public transit, biking, carpool/rideshare/ride-hail?
9. Have you asked your employees about their commuting habits in the past (e.g. any employee survey related to commuting habits)?
10. Have you conducted any programs (Dump the Pump, etc.) for your employees to encourage them to use alternative modes of travel, such as public transit?
11. What are the regular work hours/most common work shifts for your employees?
12. What are your regular business hours?
13. Do you consider the amount of available on-site parking to be enough or not enough?
14. Is providing adequate employee parking a problem at this time or as you plan your growth? If so, have you thought about employees using public transit to commute as one of the solutions to reduce the need for parking as they do in other cities?

15. Have you worked with the Commute Connector program? (Commute Connector is a program by the Florida Department of Transportation focused on improving shared mobility in southwestern Florida assist commuters and businesses in the region with services to cut costs associated with commuting to and from work.)
16. Does your organization provide commuter benefits to your employees? If yes, would you be willing to share any participation data?
17. If your organization does not provide commuter benefits to your employees, are you interested in exploring/establishing such benefit programs? (Commuter benefits provide savings to companies and employees. Employers can give employees up to $270 per month to help them commute by transit or vanpool. The employer pays for the benefit and receives an equivalent deduction from business income taxes. Employees receive the benefit free of all payroll and income taxes.)
18. What could Citrus Connection do better to meet the commuting needs of your employees?
19. Do any of your employees work from home (telework.) How many/what percentage do so? How often?

OUR NEXT STEP

Our next step is to conduct a survey of your Employees, to find out about their commuting needs. This would be an on-line survey. What is the best way for us to reach your employees?

Discussion Group Discussion Guide

- What is your **perception** of Citrus Connection's role in the community?
- How much **awareness** of and **support** for transit is there in the community?
- Have the **levels of awareness** and support changed in recent years?
- What is Citrus Connection **doing well** and what do they **need to improve**?
- Is the transit system **responsive** to community needs? How are those needs communicated to the transit systems?
- Is **information on transit** readily available in the community?
- What goals have the City and County elected officials **voiced** for transit?
- What is happening in Polk County in terms of **growth and development**? Where? How can transit best respond to these trends?
- What do you see as **appropriate** goals for the transit system in the next 5 to 10 years?
    - Examples: increase ridership, focus on serving more areas, improving regional connectivity, supporting land use policies.
- Is there a need for **premium transit** (such as bus rapid transit or rail) within the County?
- Is there **demand** for a SunRail connection to Polk County (Haines City, Auburndale, and Lakeland)?
- Is there a **need** for more service to the Poinciana SunRail station?
- What **benefits** do you see with a potential Brightline connection for Polk County? Do you see a need to connect local transit to Brightline stations?
- What role should **on-demand** transit and technology play in providing transit services in Polk County?
- Is there a need for more **regional transit** connections? Where?
- Are there other **policies** that should be changed to help Citrus Connection reach its goals?

- What **improvements** are needed in the existing transit system to attract more riders and meet community goals? Specify where? Why?
    - Examples: Increased service frequency, later service
- Is there a need for **more transit facilities** (transfer centers, park and ride lots, etc.), possibly in conjunction with rail or express services?
- How do you feel about the **current fare** and **fare payment** options available?
- Do you believe that there a **willingness** in the community to consider additional local funding sources for transit?
- What are the major **strengths and accomplishments** of existing transit services?
- What are the **weaknesses**, if any, of existing transit services?
- If you could pick one thing to **change** about the transit system, what would it be?

Polk County
Ten-Year Transit Development Plan (TDP)
2022 Major Update

Bus Rider Discussion Guide

- How much awareness of and support for transit is there in the community? Have the **levels of awareness** and support changed in recent years?
- What is your **perception** of Citrus Connection's role in the community?
    - Is it transport workers, elderly, low income, individuals with disabilities, tourists, attracting choice riders, to prevent congestion, to reduce emissions, to create economic opportunities?
- Is Citrus Connection **responsive** to your needs?
    - How are those needs **communicated** to riders?
- Is **information on transit** readily available in the community?
    - If not, **where and how** should transit information be available in the community?
- What do **you see as** appropriate **goals** for the transit system in the next 5 to 10 years?
- What **improvements are needed** in the transit system in the next 10-years to help you ride it more or attract more riders?
- Is there a need for **faster connections to SunRail** Station in Poinciana?
- Is there a need for **premium transit** (such as bus rapid transit or rail) within the County?

    WHERE?:
- Is more **regional transportation** needed to connect Polk County within its major cities and with surrounding areas? (& Where)
- Is there a need for **more park and ride lots**, possibly in conjunction with more express or regional connections?
- Is there a need for **more amenities at bus stops**, possibly in conjunction with more express or regional connections?
- Are there areas currently **not served or underserved** by transit that should receive a higher priority?
- What do you want to see happen (your vision for transit) in the next 5 to 10 years?

TPO #

CitrusConnection
PROGRESS IN MOTION

GROUP DISCUSSIONS - PASSENGERS

As Passengers of Citrus Connection, you are the whole point. Your trips matter. Your needs matter. We want to know what your needs are, now, as well as your thoughts on issues with and improvements to current bus services.

Please take a few moments to answer the following questions so Citrus Connection can get your input for the ongoing Transit Development Plan (TDP) Major Update. The TDP is a plan Citrus Connection will use to improve its bus services for the next 10 years.

1. The following is a list of possible complaints bus riders may have. Please read the list carefully and **mark or tell me, the 3 complaints that you hear most frequently from other riders.**

___ need more frequent service
___ bus doesn't go where I want
___ bus is late
___ bus leaves stop too early
___ bus is not clean
___ bus is not comfortable
___ safety/security at bus stop
___ safety/security onboard bus
___ need more later service. Until what time?____
___ need better sidewalk connections to bus stops
___ need express service. Where?_____
___ need connections to other cities/counties. Where?___
___ need more bus shelters/benches
___ bus schedule too hard to understand
___ fare is too high
___ other (please specify)_____

2. Do you think these complaints are valid? Please explain.

_____

_____

_____

_____

3. What do riders like about Citrus Connection? Please **list the 3 compliments** that you hear most frequently from riders.

_____

_____

_____

_____

4. Do you know of any **safety problems** on any routes? Please explain.

5. **Suggest some service improvements** to existing bus routes. Examples of service improvements include improving bus running times, adding new destinations/areas, improving service frequency, combining services with other Citrus Connection routes, etc. (This can be on routes that you drive and that you don't drive.)

Route	Service Improvement Needs/Comment

6. Use the space below to provide any other comments that could help improve bus services in Polk County.

These Surveys are being collected by:

Julia B. Davis, Senior Transportation Planner, Polk Transportation Planning Organization (TPO)
330 W. Church Street, Bartow FL – Second floor of Polk County Admin Building
(863) 534-6529. Email: juliadavis@polk-county.net

Polk Transportation Planning Organization

Adviser Network

CitrusConnection
PROGRESS IN MOTION

VIRTUAL COMMUNITY FORUM









SAVE THE DATE

Feb. 24, 2022 - 10 a.m.

The Future of Public Transportation

Live at 10 a.m. on Polk County Government Facebook

facebook.com/polkcountygovfl

(863) 534-6486 • www.polktpo.com

Polk Transportation Planning Organization

Adviser Network

CitrusConnection
PROGRESS IN MOTION

FORO COMUNITARIO VIRTUAL







RESERVE LA FECHA

24 de febrero a las 10 a.m.

El Futuro de la Transportación Pública

En vivo a las 10 a.m. en la página de Facebook del condado de Polk.

facebook.com/polkcountygovfl

(863) 534-6486 • www.polktpo.com

El foro será conducido en inglés.



1

What it is
Citrus Connection's 2022 TDP

- 10-Year strategic plan for transit
  - Evaluates existing conditions
  - Integrates outreach for local input
  - Determines future needs
  - Outlines phased service and implementation plans
- FDOT requirement for $ Grant Funds
- Incorporates best practices

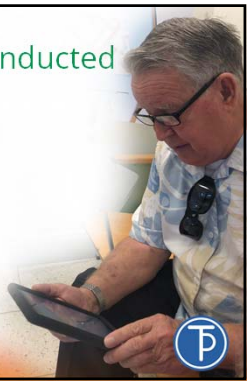
2

QUICK UPDATE ON PROJECT

- Public Outreach
  - Stakeholders
  - Employers/Employees
  - Public Survey
- What's Next?
- Why Should You Care?
  - Needs and Priorities
- Upcoming Events – When
- How to Get/Stay Engaged
- Where to find info
- TDP Timeline
- More Info

3

Public Outreach - Conducted



- Employer/Employee Outreach
- Stakeholder Interviews
- Bus Operator Survey
- Discussion Group Workshops
- Online Surveys
- Public Workshops

Big THANK YOU to all the great people and organizations who contributed time and input so far!

4

Stakeholder Interviews

- County & 17 municipalities
  - 16 individual interviews, 6 groups of elected officials
- Suggested enhanced marketing
- High interest for SunRail
- Majority wants Brightline stop in Polk County
- Some interest in electric, hybrid, or CNG vehicles

5

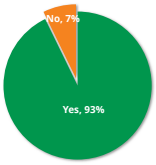
Employer Outreach

- Interviewed:
  - Advent Health, Citrus Connection, Lakeland Regional Health, Polk County Board of County Commissioners, and Polk County Schools
- Represents over **21,000 employees**
- Also have **daily** visitors/clients/students
- Perceives **transportation as a challenge** for hiring/retention
- Majority have **lot of interest** in having transit connections
- **Interest** in implementing commuter programs and **Universal Access Pass (UAP)**

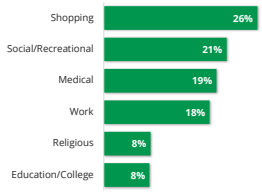
6

Public Input Survey

Need additional or improved transit?



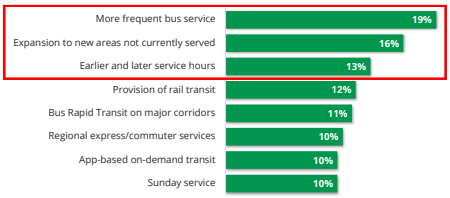
Where would you go using it?



7

Public Input Survey

- Improvement priorities for next 10 years?



8

Why It's Important for <u>You</u> To Get Involved

Join the Discussion on Vision

- **Where should Citrus Connection be in 10 years**

Join the Discussion on Transit Needs & 10-Year Transit Priorities

#1.

#2.

#3.

#4.

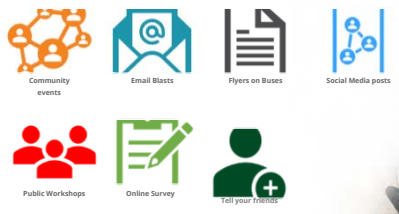
9

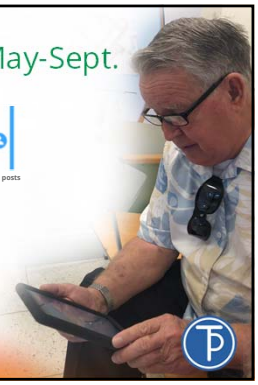
Upcoming Events - When

- **Public Workshops**
  - Wednesday, 5/18 - LAMTD Offices, 1212 George Jenkins, Lakeland, 8:00 am -11:00 am
  - Thursday, 5/19 - Winter Haven Terminal, 555 Ave E NW, Winter Haven, 8:00 am-11:00 am
- **Public Events**
  - 5/17 Polk County Hunger Action Summit, Stuart Center, Bartow
- **Public Survey** – on-line in May –www.polktpo.com

10

Public Outreach – May-Sept.





How to get/stay engaged

11

Where to find info

- o Polk TPO Website – **www.polktpo.com**
- o Polk TPO Facebook
- o Polk County Government Facebook
- o Polk PGTV portal

- o Citrus Connection Website – **www.ridecitrus.com**
- o Citrus Connection Facebook
- o Citrus Connection CCTV
- o posters on Buses & Vans

- o Flyers distributed at Community Events

12

TDP Timeline

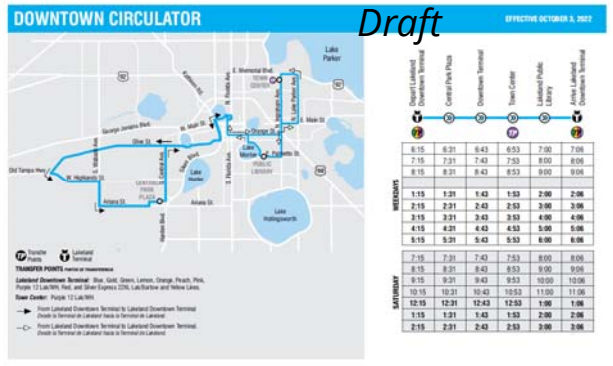
May
Public Workshops & Survey

Aug/Sep
LAMTD Board mtgs

Due by:
Oct 28

13

Draft



14

Contact Us

Julia Davis, AICP
Senior Transportation Planner
Polk Transportation Planning Organization (TPO)
❑Contact Julia about:
→Transit Development Plan (TDP)
→Where and When the Public Workshops are
www.polktpo.com

Tom Phillips
Executive Director
Citrus Connection -The transit system for all of Polk County.
❑Contact Tom about:
→ Day-to-day operations
→ Employment at Citrus Connection
www.ridecitrus.com

15

CitrusConnection

Bus Operator/Supervisor Survey

As ambassadors of Citrus Connection, bus operators and route supervisors have the most opportunity for and greatest depth of contact with existing patrons on a day-to-day basis. This makes you a valuable asset for vetting rider input and providing important insights into route and system issues/ enhancements.

Please take a few moments to answer the following questions so Citrus Connection and Polk TPO can get your input for the ongoing Transit Development Plan (TDP) Major Update. Do NOT put your name or other identifying mark on the survey. When complete, please return the survey to the Operations Manager's mailbox or _____.

1. The following is a list of possible complaints bus riders may voice to bus operators. Please read the list carefully and **mark the 3 complaints that you hear most frequently from riders.**

___ need more frequent service
___ bus doesn't go where I want
___ bus is late
___ bus leaves stop too early
___ bus is not clean
___ bus is not comfortable
___ safety/security at bus stop
___ safety/security onboard bus
___ need more later service. Until what time?____
___ need better sidewalk connections to bus stops
___ need express service. Where?_____
___ need connections to other cities/counties. Where?___
___ need more bus shelters/benches
___ bus schedule too hard to understand
___ fare is too high
___ other (please specify)_____

2. Do you think these complaints are valid? Please explain.

_____

_____

_____

_____

3. What do riders like about Citrus Connection? Please **list the 3 compliments** that you hear most frequently from riders.

_____

_____

_____

_____

4. Do you know of any **safety problems** on any routes? Please explain.

5. Provide **specific service improvements** to existing bus routes. Include information for routes that you drive and that you don't drive. Examples of service improvements include improving bus running times, adding new destinations/areas, improving service frequency, combining services with other Citrus Connection routes, etc.

Route	Service Improvement Needs/Comment

6. Use the space below to provide any other comments that could help improve bus services in Polk County.

TPO #

CitrusConnection
PROGRESS IN MOTION

Operador de Autobus/Encuesta de Supervisor

Como embajadores de el Citrus Connection, los operadores de autobuses y los supervisors de ruta, ustedes se comunican con los pasajeros de autobuses todos los dias. Esto hace que ustedes sean un recurso muy valuable para que el Citrus Connection pueda entender mejor las nececidades de los clientes y tambien para entender sus opiniones acerca de cualquier asunto o oportunidades de mejora que puedan ser hechas acerca de nuestro servicio de autobuses.

Por favor tome un momento para contestar estas preguntas para que el Citrus Connection pueda colectar su aporte para el Transit Development Plan (TDP) Major Update. El TDP es un plan que el Citrus Connection usara para hacer mejorias en su servicio de autobuses publicos para los proximos 10 años.

Estas encuestas estan enumeradas, pero por favor no ponga su nombre o cualquier otra informacion que pueda identificarlo a usted. Por favor regreselo a la caja que se encuentra en la sala de descanso para los trabajadores (Breakroom). Por favor regrese esta encuesta para el 6 de enero de 2022. Estas encuestas seran collectadas por el Polk TPO. Por favor imprima sus contestaciones para poder entender las respuestas mejor.

1. Aqui esta una lista de quejas que los usarios del sistema de autobus pueden tener y que a veces le informan al chofer de el autobus. Por favor lean las opciones disponibles aqui y eligan las que mas usualmente tienen los usuarios del autobus. **Por favor marquen las tres quejas que escuchan con mas frequencia.**

___ necesitan servicio mas frecuente.
___ necesitan el servicio mas tarde. ¿Hasta que hora?____
___ el autobus no viaja a donde yo quiero ir.
___ se nesesitan aceras que lleven a la parada.
___ el autobus llega tarde.
___ se nesecita servicio rapido. ¿Hacia donde?_____
___ el autobus se va de la parada muy rapido.
___ se necesitan conecciones para otra ciudad/condado. ¿Hacia donde?___
___ el autobus no esta limpio.
___ se necesitan mas albergas para esperar el autobus
___ el autobus no es comodo.
___ el iteneraneo del autobus es muy dificil de entender .
___ no hay seguridad en la parada de autobus.
___ el costo de la tarifa es muy alto.
___ no hay seguridad dentro del autobus.
___ otra queja (por favor especifique)_____

2. ¿Usted piensa que estas quejas son validas? Por favor explique.

3. ¿Que cosas le gustan a los usuarios del servicio de Citrus Connection? Por favor indique **3 cumplidos que usted escucha con mas frecuencia de los usuarios de los autobuses**.

4. ¿Sabe usted de algun problema de seguridad que exista en algunas de nuestras rutas? Por favor explique.

5. **Sugerencias para mejorar el servicio** (a excepcion de las que ya van a ponerse en marcha) de las rutas de los autobuses. Ejemplos de mejoras al servicio incluyen mejorando el tiempo entre los autobuses, añadiendo nuevas destinaciones/areas de servicio, mejorar la frequencia del servicio, combinado el servicio con otras rutas del Citrus Connection, etc. (Estas mejoras pueden ser para otras rutas en adicion a las suyas.)

Ruta	Mejorias al servicio/Commentarios

6. Por favor use el espacio proveeido a continuacion para proveer cualquier otra sugerencia que nos pueda ayudar a mejorar el servicio en el condado de Polk.

Estas encuentas estan siendo colectadas para la organizacion de transporte del condado de Polk:

Julia B. Davis, Senior Transportation Planner, Polk Transportation Planning Organization (TPO)
330 W. Church Street, Bartow FL – Second floor of Polk County Admin Building
(863) 534-6529. Email: juliadavis@polk-county.net

CitrusConnection
PROGRESS IN MOTION

Transit Development Plan – Major Update

Public Input Survey

1. **Have you or a member of your household used Citrus Connection?**
   - ☐ Yes, I have used Citrus Connection
   - ☐ No, I have never used Citrus Connection
2. **Do you think there is a need for additional/improved transit services in Polk County?**
   - ☐ Yes
   - ☐ No
3. **If you use Citrus Connection services now or decide to use them in the future, where would you go using it?** (Select up to THREE)
   - ☐ Work
   - ☐ Shopping
   - ☐ Social/Recreational
   - ☐ Education/College
   - ☐ Medical
   - ☐ Religious
4. **What should Citrus Connection consider as priority service improvements over the next 10 years?** (Select up to THREE)
   - ☐ More frequent bus service
   - ☐ Sunday service
   - ☐ Regional express/commuter services
   - ☐ App-based on-demand transit
   - ☐ Earlier & later service hours
   - ☐ Provision of rail transit
   - ☐ Bus Rapid Transit (BRT) on major corridors
   - ☐ Expansion to new areas not currently served. Where? _____
5. **What capital/technology improvements should Citrus Connection consider in the next 10 years?**
   - ☐ Provide real-time bus arrival information at major stops
   - ☐ Implement mobile fare payment
   - ☐ Improve bus stop amenities (shelters, bike storage, etc.)
   - ☐ Add more Park-and-Ride lots
   - ☐ Improve pedestrian/bicycle access to bus stops
   - ☐ Other (please specify) _____

Polk County
Ten-Year Transit Development Plan (TDP)
2022 Major Update
Employee Transit Survey

1. **How do you view public transit services in Polk County?**

- ☐ It must be provided and current services are adequate
- ☐ It must be provided and needs to be improved
- ☐ Not sure if we need public transit
- ☐ I don't have an opinion

2. **Is there a bus stop within walking distance of where you live?**

Yes No Don't know

3. **Is there a bus stop within walking distance of your workplace?**

Yes No Don't know

4. **If you already use Citrus Connection, <u>do</u> the routes fit your travel needs?**

Yes No Don't know

5. **If not, how could they be more convenient for you?**

_____

6. **Do you have a vehicle you can use for your commute to/from work?**

Yes No

7. **Which form(s) of transportation DO YOU USE MOST OFTEN to commute to work? (Check all that you use)**

- ☐ Drive a car
- ☐ Take a bus
- ☐ Drive to a park-and-ride and take a bus
- ☐ Carpooling/vanpooling
- ☐ Bike to work
- ☐ Walk to work
- ☐ None, I work from home

8. What is the distance you normally commute to work?

- ☐ Less than 1 mile
- ☐ 1 mile to 5 miles
- ☐ 6 to 10 miles
- ☐ 11 to 20 miles
- ☐ 21 to 40 miles
- ☐ More than 40 miles

9. On a typical day, when do you arrive at work and when do you depart from work?

Arrive _____
Depart _____
Neither, I work from home _____

10. Please select the average length of time it takes to commute to/from work.

- ☐ 0 – 10 minutes
- ☐ 11 – 20 minutes
- ☐ 21 – 30 minutes
- ☐ 31 – 40 minutes
- ☐ 41 – 60 minutes
- ☐ Greater than 60 minutes

11. How difficult is it to find a parking spot at your work location?

- ☐ Easy
- ☐ Neutral
- ☐ Difficult
- ☐ I don't drive to work

12. What would you consider the greatest challenges or issues with your current commute? Check all that apply.

- ☐ None, I work from home.
- ☐ The cost of gas, tolls, car ownership and maintenance is very high
- ☐ Traffic or Complicated commute – lots of roads, ramps, merges
- ☐ Transit service does not come often enough or at the correct time for me
- ☐ Commute time or distance takes too long

- ☐ My home is not located along a bus route
- ☐ My workplace is not located near a bus route
- ☐ The bus fares are too high
- ☐ Walking distance to bus stops is too far
- ☐ No (or not enough) sidewalks to walk to bus stop or to work (or, the sidewalk is in bad shape, or it's not safe)
- ☐ Park-and-ride lot is located too far to park and ride a bus
- ☐ Inadequate lighting
- ☐ Other_____

13. Have you ever had to turn down or change jobs because transportation to and from work was too difficult [or because of these issues?]

- ☐ Yes
- ☐ No

14. Please share your Home Zip Code? _____ Work Zip Code?_____

15. Have you ever used any of the following transit services for your commute? Check all that apply (skip if you don't use transit).

- ☐ Regular/Local Bus
- ☐ Express Bus
- ☐ FLEX Line
- ☐ Vanpool
- ☐ Paratransit Service
- ☐ Park-and-Ride
- ☐ SunRail

16. If you already use Citrus Connection for all or part of your work commute, how often do you ride? (skip if you don't use transit).

- ☐ 5 – 7 days a week
- ☐ 3 – 4 days a week
- ☐ 1 – 2 days a week
- ☐ Occasionally

17. What improvements or assistance could encourage you to use transit as an option to get to and/or from work? <u>Check all that apply</u>

- ☐ Free bus pass from my employer
- ☐ Programs that help pay for or discounted bus passes
- ☐ Learning more about what options are available and feasible
- ☐ Learning more about park-and-ride locations near my home/work
- ☐ A way to get home in case of an emergency/ or miss the last bus
- ☐ More frequent buses (bus every 10 to 20 minutes)
- ☐ More first-mile/last-mile connections to get to and from your bus stop
- ☐ More bicycle storage at bus stops and on buses
- ☐ A bus route near my home and near my work
- ☐ Other (please specify)_____

TRANSIT DEVELOPMENT PLAN

CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

WELCOME!

TODAY'S WORKSHOP

- **Review Display Boards**
- **Ask Questions**
- **Complete Interactive Exercise**
- **Provide Feedback**
- **Complete Survey**

Goals and Objectives

CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

Vision

"Effectively connecting people with their world through expanded, environmentally-friendly service with full support of the communities we serve."

Mission

"We strive to be a superior provider of transportation services that contribute to the economic growth and quality of life for the communities we serve."

Core Values

- Safe and reliable transportation should be available to all regardless of their age, ability, or social status.
- Transportation is a part of the fabric of our community. Transportation projects and services should support vibrant communities and our vision for the future.
- The best plans come from community collaboration. Leveraged resources go farther.

Goals and Objectives

Goal 1: Maintain a public transportation system to provide safe travel for all users that supports livable communities and economic activity.

Objective: Provide safe and secure travel conditions on public transportation.
Objective: Provide equitable mobility options for all persons, regardless of age, income, race, or abilities.
Objective: Provide public transportation options for intercity and local travel.
Objective: Encourage economic development and support job creation and job retention.

Goal 2: Increase transit ridership to improve cost efficiency.

Objective: Provide quality service for all Citrus Connection riders.
Objective: Make the best use of existing resources to provide cost-efficient services and be a good steward of public resources.
Objective: Provide transportation infrastructure and services that support economic vitality and job creation.
Objective: Review local development codes and coordinate to enhance the ability to fund and develop new transit alternatives in growing areas.
Objective: Use new technologies and employ creative thinking to generate value for the community.

Goal 3: Reduce environmental impacts and support resilient infrastructure.

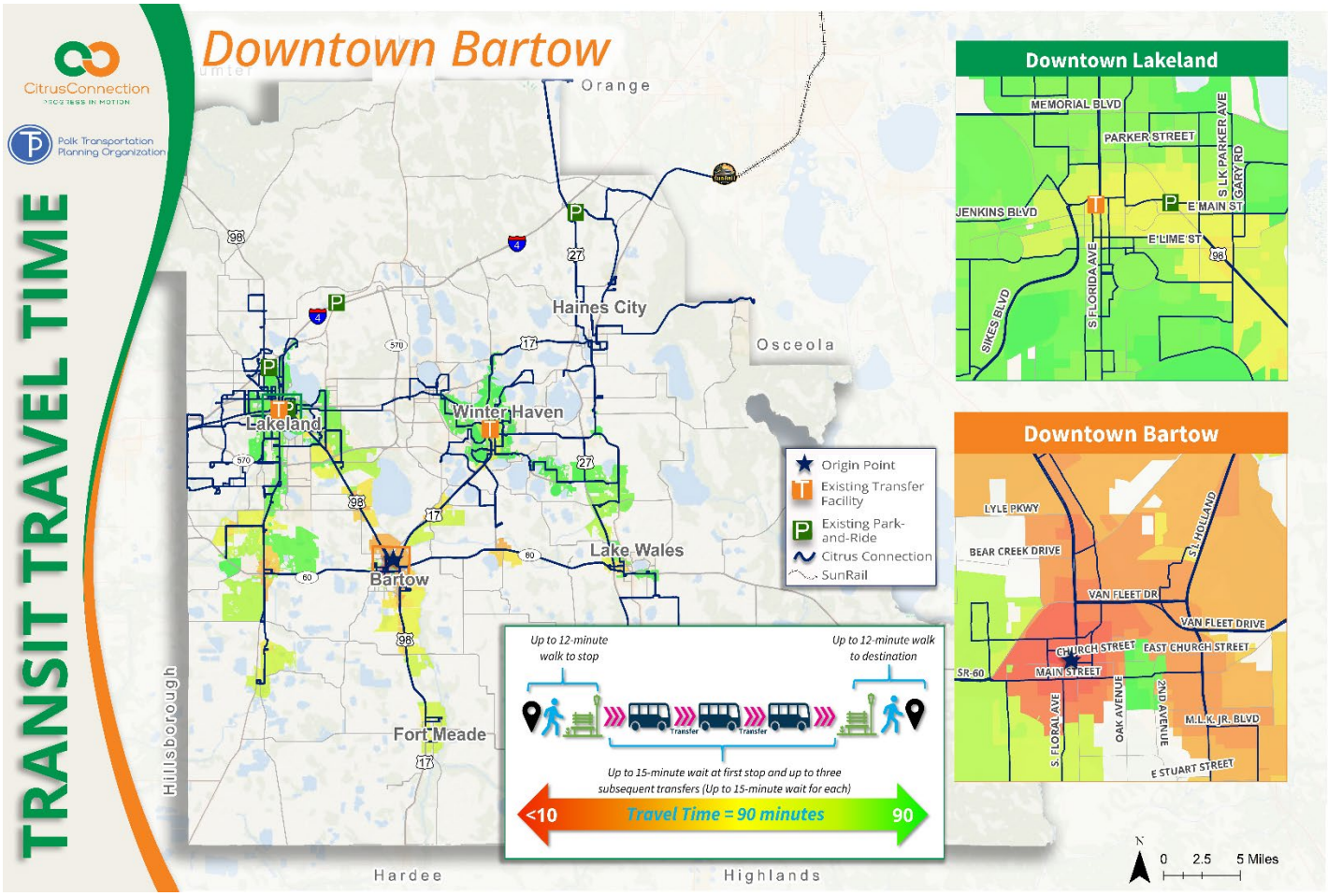
Objective: Evaluate the feasibility of converting at least part of the transit fleet to electric vehicles as the existing stock reaches useful life maximums.
Objective: Investigate opportunities to encourage and promote biking and walking as alternative modes and help with first/last mile connections to bus stops.

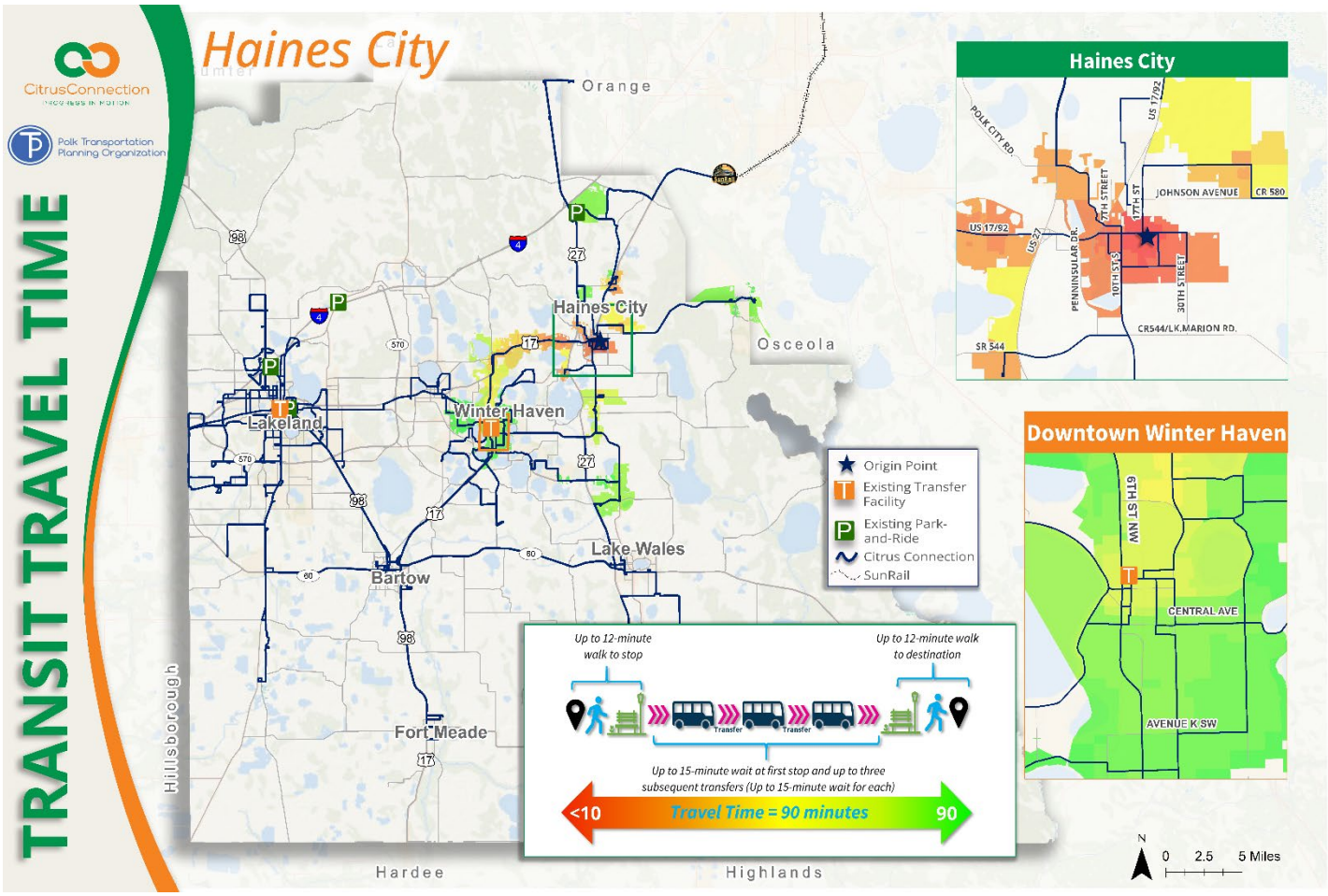
Goal 4: Pursue coordination activities with regional agencies and neighboring counties.

Objective: Ensure coordination and consistency with local and regional plans for the future provision of public transit services.
Objective: Promote, facilitate, and provide regional connectivity from Citrus Connection transfer hubs and Polk County employment hubs and activity centers to other regionally-significant transportation hubs.

Goal 5: Increase awareness of service through education, marketing, and outreach.

Objective: Provide information and training about transit services and infrastructure to prospective passengers, community partners, and staff.


TRANSIT TRAVEL TIME
CitrusConnection
Polk Transportation Planning Organization
Downtown Bartow
Orange
Haines City
Osceola
Winter Haven
Lakeland
Lake Wales
Bartow
Fort Meade
Hillsborough
Hardee
Highlands
Origin Point
Existing Transfer Facility
Existing Park-and-Ride
Citrus Connection
SunRail
Up to 12-minute walk to stop
Up to 12-minute walk to destination
Transfer
Transfer
Up to 15-minute wait at first stop and up to three subsequent transfers (Up to 15-minute wait for each)
<10
Travel Time = 90 minutes
90
Downtown Lakeland
MEMORIAL BLVD
PARKER STREET
S LK PARKER AVE
GARY RD
JENKINS BLVD
E MAIN ST
E LIME ST
S FLORIDA AVE
SIKES BLVD
Downtown Bartow
LYLE PKWY
BEAR CREEK DRIVE
S. HOLLAND
VAN FLEET DR
VAN FLEET DRIVE
CHURCH STREET
EAST CHURCH STREET
SR-60
MAIN STREET
S. FLORAL AVE
OAK AVENUE
2ND AVENUE
M.L.K. JR. BLVD
E STUART STREET
N
0
2.5
5 Miles

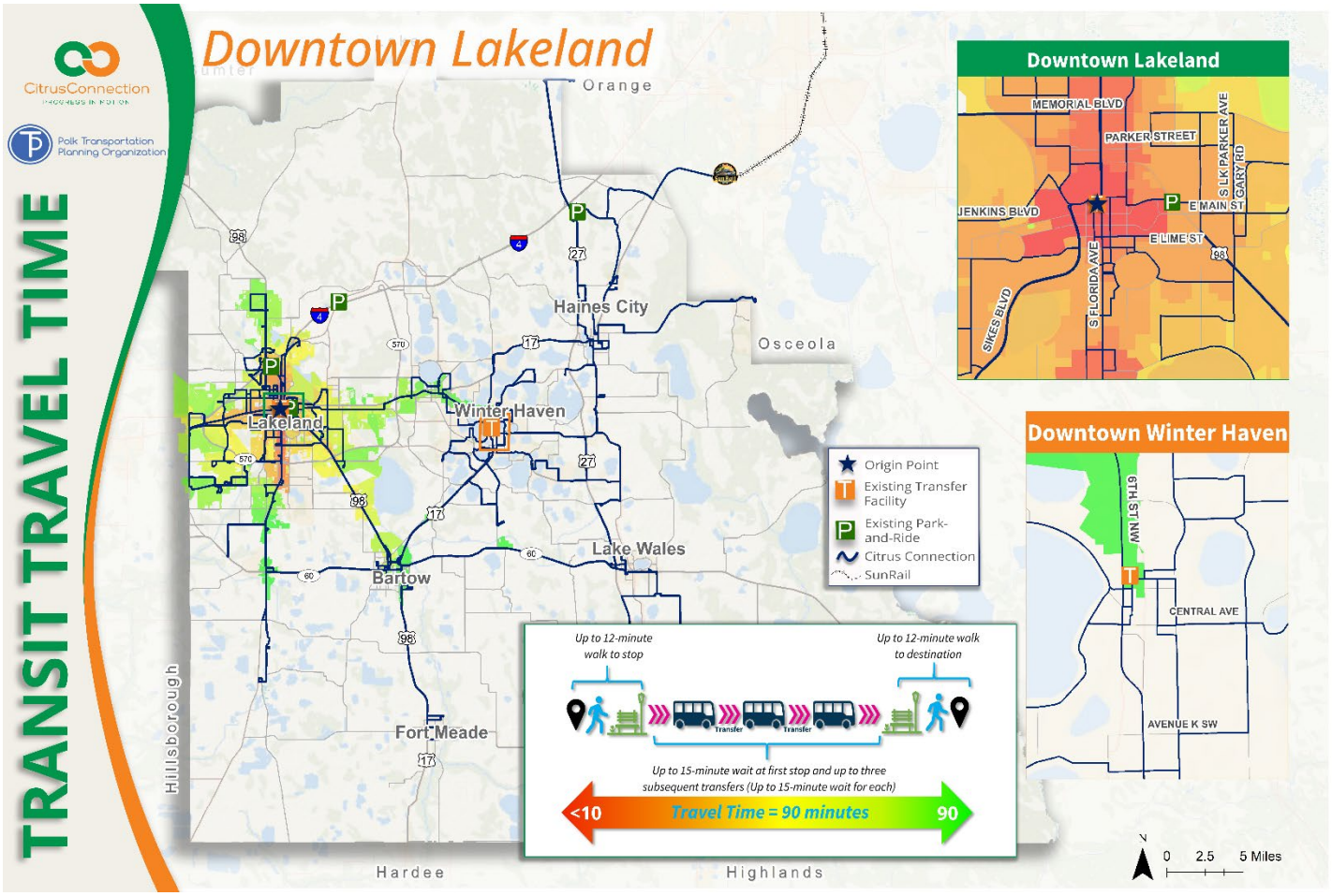

TRANSIT TRAVEL TIME
CitrusConnection
Polk Transportation Planning Organization
Haines City
Orange
Osceola
Winter Haven
Lakeland
Lake Wales
Bartow
Fort Meade
Hillsborough
Hardee
Highlands
Origin Point
Existing Transfer Facility
Existing Park-and-Ride
Citrus Connection
SunRail
Up to 12-minute walk to stop
Up to 12-minute walk to destination
Transfer
Transfer
Up to 15-minute wait at first stop and up to three subsequent transfers (Up to 15-minute wait for each)
<10
Travel Time = 90 minutes
90
Haines City
POLK CITY RD.
US 17/92
7TH STREET
17TH ST
JOHNSON AVENUE
CR 580
US 17/92
US 27
PENNINSULAR DR.
10TH ST S
30TH STREET
CR544/LK.MARION RD.
SR 544
Downtown Winter Haven
6TH ST NW
CENTRAL AVE
AVENUE K SW
N
0
2.5
5 Miles

CitrusConnection

Polk Transportation Planning Organization

TRANSIT TRAVEL TIME

Downtown Lakeland

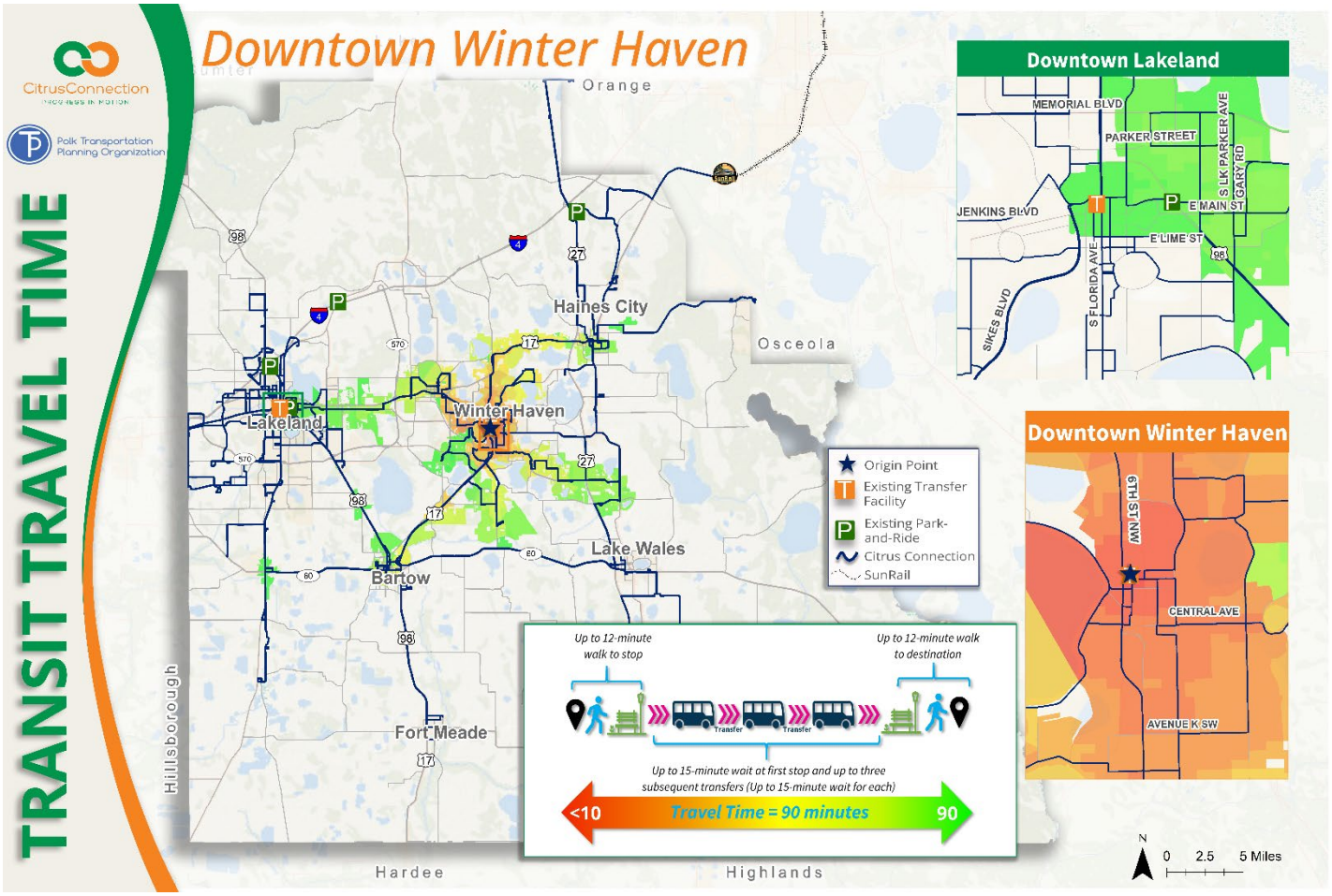


CitrusConnection

Polk Transportation Planning Organization

TRANSIT TRAVEL TIME

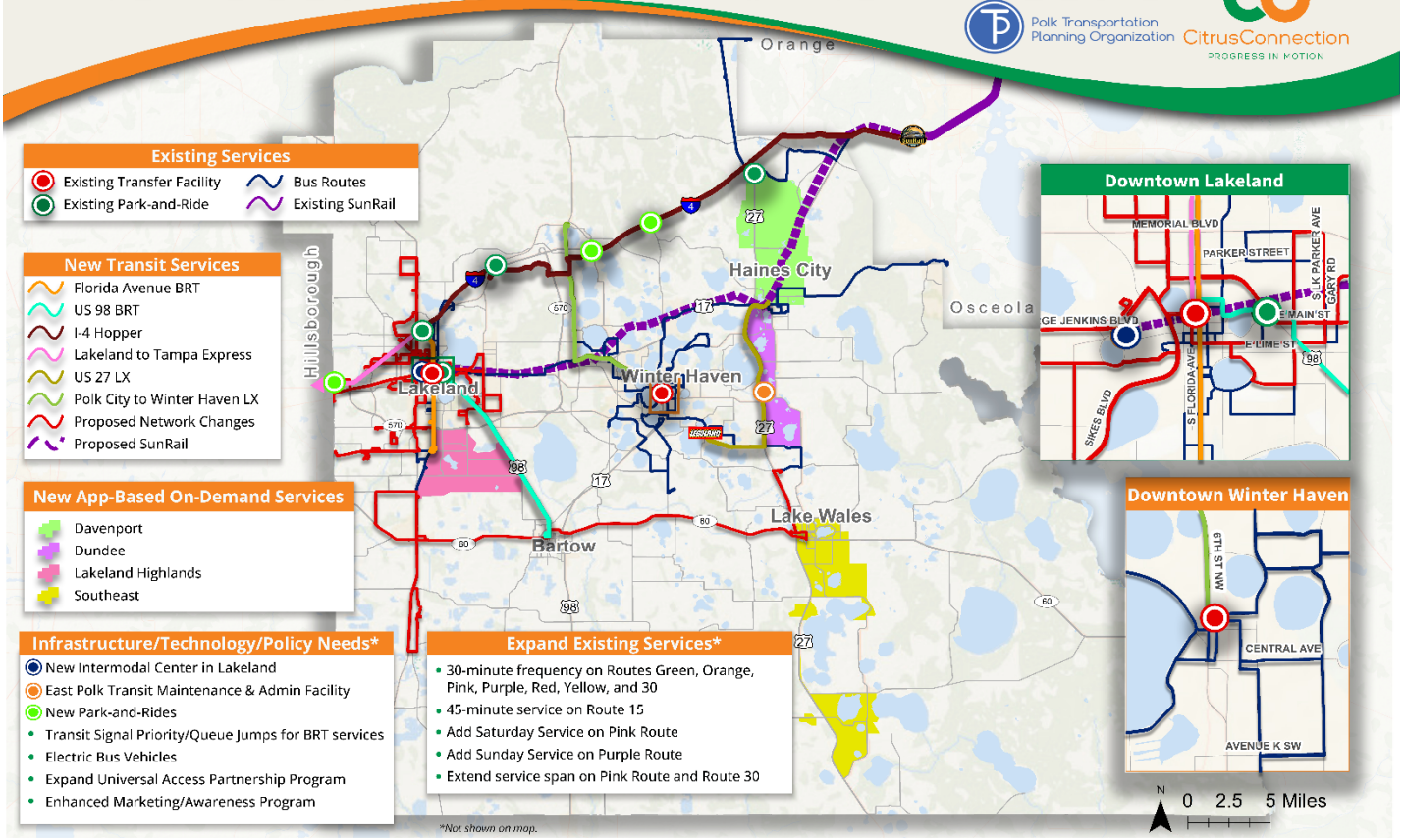
Downtown Winter Haven



PROPOSED 10-YEAR TRANSIT NEEDS

Polk Transportation Planning Organization

CitrusConnection
PROGRESS IN MOTION

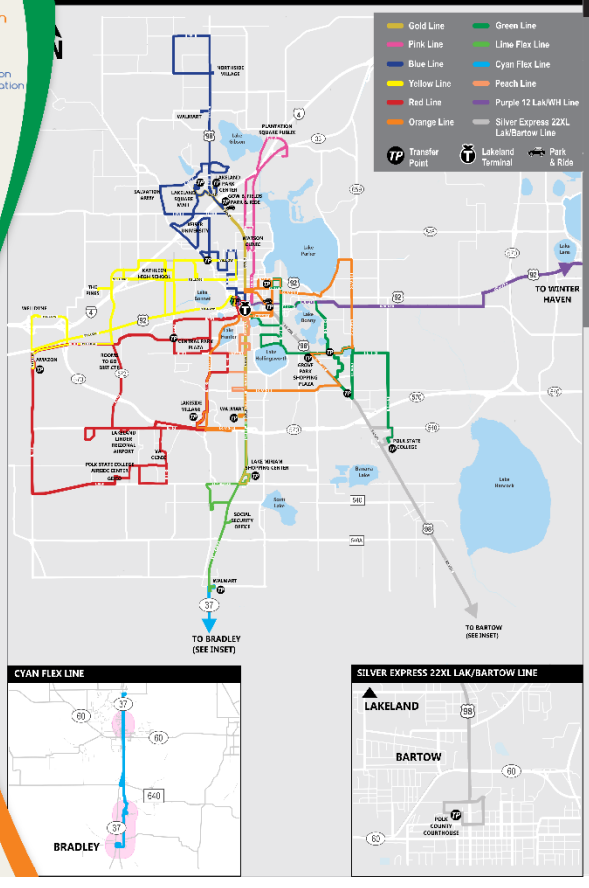


CitrusConnection
PROGRESS IN MOTION

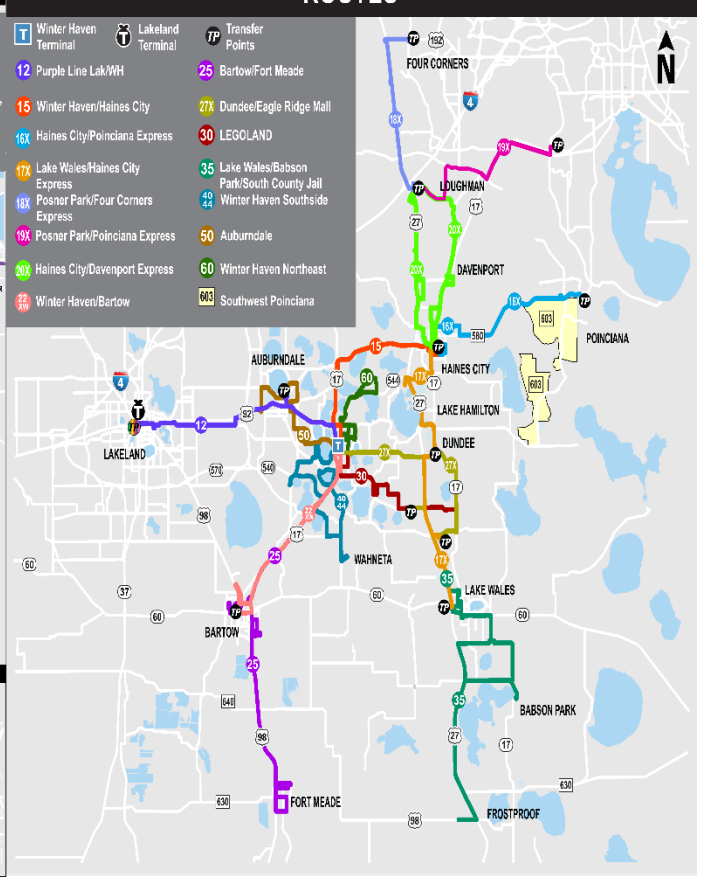
Polk Transportation Planning Organization

EXISTING SERVICES

WEST COUNTY ROUTES



EAST COUNTY ROUTES



Interactive Exercise

CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

FREQUENCY VS. GEOGRAPHIC COVERAGE

A I want more bus service that comes every 10-20 minutes even if it means I have to walk a bit extra.

Agree with A	Neutral	Agree with B

I want bus coverage to expand even it it means a bus only comes once every hour. **B**

QUICK TRIP VS. EASY ACCESS

A I am willing to walk about 3 minutes to my bus stop if it means much quicker trip to my destination. (Less stops = shorter travel time)

Agree with A	Neutral	Agree with B

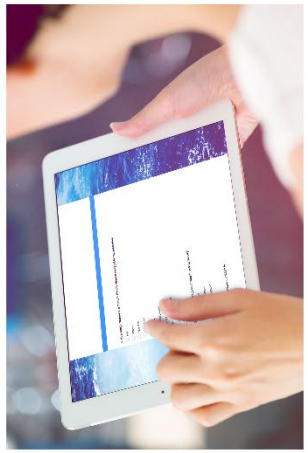
I would rather have a shorter 1-2 minute walk to my bus stop, even if it means more stops will slow down my bus ride. (More stops = longer travel time) **B**

I WOULD USE APP-BASED ON-DEMAND TRANSIT IF...

...it serves my neighborhood	...it comes when regular bus service is not available	...it is affordable

GIVE US YOUR FEEDBACK
TAKE THE SURVEY

Fill it out



Scan it

CitrusConnection
PROGRESS IN MOTION

Polk Transportation Planning Organization

TRANSIT DEVELOPMENT PLAN

Polk Transit Vision 2032
Transit Development Plan
Major Update

Stakeholder Discussion to the Polk TD-LCB - 3/28/2022
Julia B. Davis, AICP, Senior Transportation Planner, Polk TPO

1

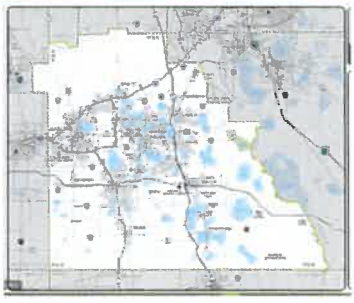
Agenda

- Introduction
  - How to reach Citrus Connection
- What is the TPO
- What is Public Transit
- Transit Development Plan (TDP)
  - Overview
  - Baseline data review
  - Public involvement process
  - →Group Discussion Opportunity
- Upcoming events
- For More Information



2

Polk Transportation Planning Organization (TPO)



- The TPO is a transportation policy-making organization mandated by federal and state laws.
- The TPO's role is to develop and maintain the required transportation plans for a metropolitan area in order to ensure Federal funds support local priorities.
  - Polk TPO - Lakeland and Winter Haven Urbanized Areas
- The Polk TPO is directly responsible for making sure federal and state dollars spent on existing and future transportation projects and programs are based on a ***continuing, cooperative and comprehensive*** transportation planning process

3

What the TPO (Staff) Does



- Monitor growth & development
- Write & update plans
  - LRTP, TIP, TDP, TDSP
- Present policy recommendations & projects to the TPO Board for their approval
- Coordinate with Federal, State, and local partners

"Momentum 2045"

4

Polk County – "The Crossroads of Central Florida"

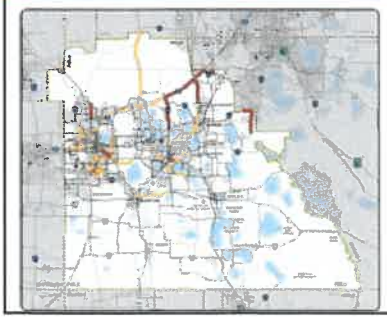


- 4th Largest County in Florida
- 2,011 Square Miles
  - Rhode Island-1,214 sq. miles, Delaware-1,982 sq. miles
- 9th Most Populous County
  - 725,000 residents (Census 2020)
  - 765,000 residents (2021)
  - 40-50 people move to Polk, per day

These development patterns do not support transit. They contribute to congestion.

5

Polk Challenges – Congestion



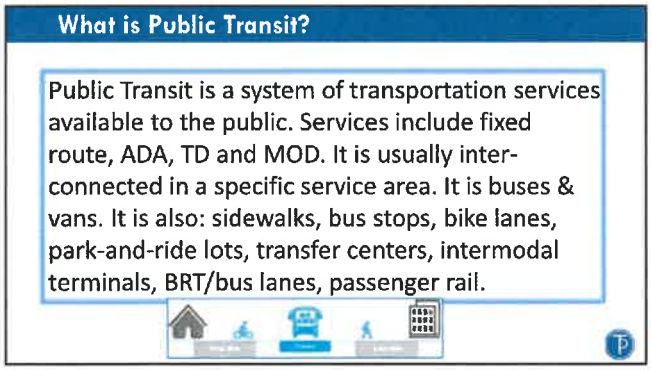
2020 Congested Corridors

PM Peak-Hour Volume/Capacity
- Uncongested (1,106.73 Miles)
- Approaching Congestion (95 Miles)
- Congested (36.67 Miles)

6


BENEFITS OF ONE BUS

7


What is Public Transit?
Public Transit is a system of transportation services available to the public. Services include fixed route, ADA, TD and MOD. It is usually inter-connected in a specific service area. It is buses & vans. It is also: sidewalks, bus stops, bike lanes, park-and-ride lots, transfer centers, intermodal terminals, BRT/bus lanes, passenger rail.

8



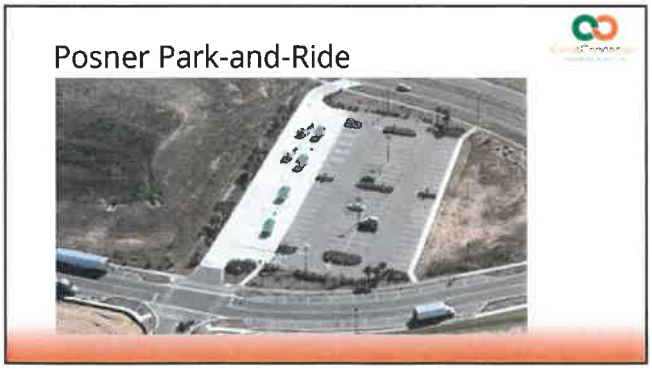
9



10



11



12

Sun Rail Station @ Ponciana



13



14

What is a TDP?

Transit Development Plan (TDP)

- 10-Year strategic plan for transit
  - Evaluates existing conditions
  - Public input provides current opinions
  - Determines future needs
  - Outlines phased service and implementation plans
- FDOT requirement → "shovel-ready projects"
- Incorporates best practices

15

Components of the TDP process:

Consultant	TPO & Citrus Connection
• Evaluate existing operating conditions • Assess existing transit options • Determine transit needs • Develop service and implementation plans • Develop financial plan	TPO - Project Management and coordination TPO & Citrus Connection - Conduct public outreach

16

COMPONENTS OF THE TDP

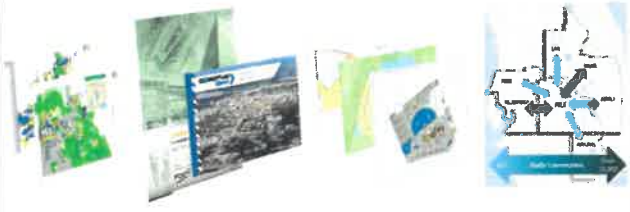
Baseline Conditions



Polk Transportation Planning Organization

17

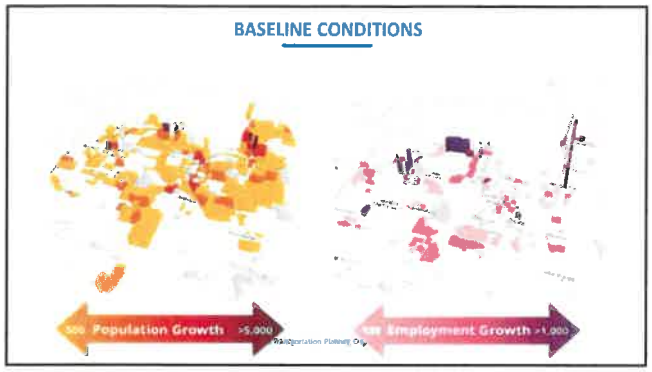
BASELINE CONDITIONS



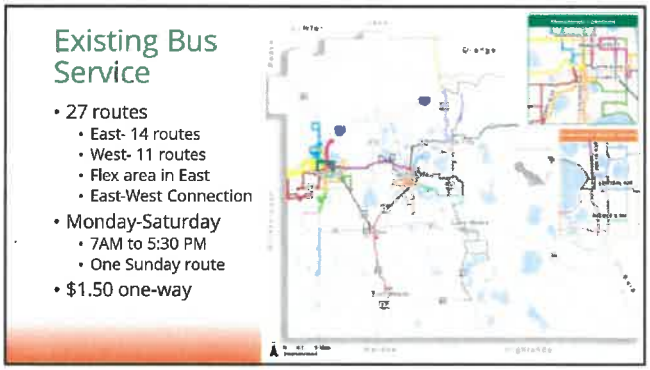
Land Use | Plans Review | Development/Major Activity Centers | Commuter/Travel Flow

Polk Transportation Planning Organization

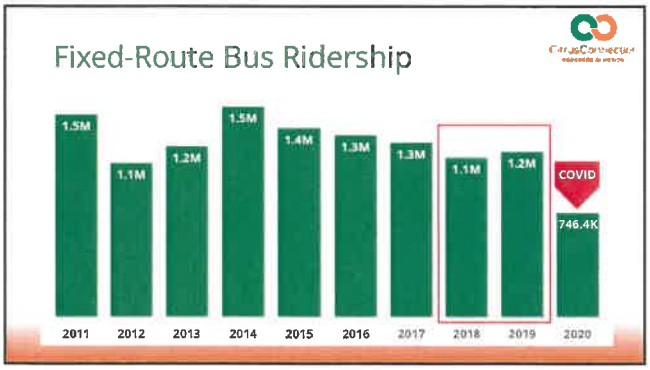
18


BASELINE CONDITIONS
Population Growth >5,000
Employment Growth >1,000

19


Existing Bus Service
• 27 routes
• East- 14 routes
• West- 11 routes
• Flex area in East
• East-West Connection
• Monday-Saturday
• 7AM to 5:30 PM
• One Sunday route
• $1.50 one-way

20


Fixed-Route Bus Ridership
1.5M
1.1M
1.2M
1.5M
1.4M
1.3M
1.3M
1.1M
1.2M
COVID
746.4K
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

21

Paratransit Service

- ADA service
- Community Transportation Coordinator (TD)
- Eligibility criteria
  - Have a disability, older adults, or disadvantaged citizens
- ADA certified lift-equipment
- $2 one-way fare
- Dial-a-ride or door-to-door



22

PUBLIC OUTREACH

As of 3-28-22

6 Employers/
530 Employees
Outreach

Stakeholder Interviews
County + 17 Municipalities
All 5 BoCC + Reps from 8
Municipalities

Bus Operator Survey
31 completed surveys

Discussion Group
Workshops /
Presentations
5 by Zoom
5 in Person

Online Surveys
Phase One, completed
(208 English/4 Spanish)
Phase Two, coming soon!

Public Workshops, Career Fairs, Senior Expos
2-24-22 & 3/10/22 & 3/11/22
3/28/22 TD LCB
& more being scheduled - week of May 16th

Scheduled Briefings –
– Polk TPO & TAC,
& LAMTD
& Polk Vision Teams

Polk Transportation Planning Organization

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WHAT IS YOUR VISION FOR TRANSIT IN POLK

What are your mobility needs?

Existing Service → What Services do you want & need → How Do We Get There? → Final Thoughts

...Five Years from now... (2027)
...Ten Years from now ... (2032)

Polk Transportation Planning Organization

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EXISTING TRANSIT



1. Do people know about Transit services in Polk County?

2. What are the major **strengths and accomplishments** of existing transit services in Polk County?
3. What are the **weaknesses**, if any, of existing transit services?

4. If you could pick one thing to **change** about the transit system, what would it be?

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WHAT SERVICES ARE NEEDED AND WANTED?



5. How would you improve the transit system in the next 5 to 10 years? Examples: increase ridership, focus on serving more areas, improving regional connectivity, branding and marketing, supportive land use policies; premium transit (such as bus rapid transit or rail)?

6. Do you see a need for a **SunRail Extension** to Polk County (Where? Haines City, Auburndale, and Lakeland)?

7. Do you see a need to connect local transit to **Brightline** stations?

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HOW DO WE GET THERE?



8. Are there policies that should be changed to help Citrus Connection reach its goals?
   - → Transit Oriented Development (TOD), Density, impact fees.

9. How do you feel about the **current fare** and fare **payment options** available?

10. Is there a willingness in the community to consider additional **local funding** sources for transit?

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OTHER THOUGHTS



11. In what ways can Transit serve our **elderly, minority,** and/or **low-income populations**?
12. In what ways can Transit help in **reducing congestion** and **improving our environment?**
13. In what ways can Transit help our community be more **storm ready**?
14. In what ways can Transit improve our **economy**?

Polk Transportation Planning Organization

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Public Workshops and Events:

PHASE ONE:

- **February 24, 2022** – Polk TPO's Virtual Community Forum, "*The Future of Public Transportation.*" (Available on You Tube)
- **March 11, 2022** – Community Senior Adult Health & Resource Fair. *Recently concluded*
- **March 28, 2022** – 1:30 PM, In person at the Polk County Commission Chambers and on Zoom. Polk Transportation Disadvantaged Local Coordinating Board – "*What Are Your Mobility Needs? Polk Transit Vision 2032.*

PHASE TWO:

- **April 29, 2022** – 10:00 AM- Polk TPO's Virtual Community Forum on Polk County Government Florida Facebook – "*Polk Transit Vision 2032*" – status report
- More **In-Person Events** being Scheduled

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For More Information:

Julia B. Davis, AICP
Senior Transportation Planner
Polk Transportation Planning Organization
Email: JuliaDavis@polk-county.net
(863) 534-6529

Polk TDP Major Update on TPO website:
www.polktpo.com

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Citrus Connection is conducting a transit priorities survey for their 10-Year Transit Development Plan (TDP). Please answer the following questions to help us understand how we can better meet the County's transit needs in the next 10 years!

1. Have you or member of your household used Citrus Connection?

☐ Yes, I have used Citrus Connection.
☐ No, I have never used Citrus Connection.
☐ No, I was not aware that public transit is available in this area.

2. Please review the **Proposed 10-Year Transit Needs** map and indicate your level of agreement with the following potential service improvements.

Recommendations	Strongly Agree		Neutral		Disagree
Proposed New Transit					
Florida Avenue BRT	5	4	3	2	1
US 98 BRT	5	4	3	2	1
I-4 Hopper	5	4	3	2	1
Lakeland to Tampa Express	5	4	3	2	1
US 27 Limited Express	5	4	3	2	1
Polk City to Winter Haven Limited Express	5	4	3	2	1
Proposed Network Changes	5	4	3	2	1
Proposed SunRail to Haines City & Lakeland	5	4	3	2	1
Expand Existing					
30-minute Frequency on Routes Green, Orange, Pink, Purple, Red, Yellow, & Route 30	5	4	3	2	1
45-minute Service on Route 15	5	4	3	2	1
Add Saturday Service on Pink Route	5	4	3	2	1
Add Sunday Service on Purple Route	5	4	3	2	1
Extend Service Span on Pink Route & Route 30	5	4	3	2	1
New App-Based Mobility On-Demand					
Davenport	5	4	3	2	1
Dundee	5	4	3	2	1
Lakeland Heights	5	4	3	2	1
Southeast	5	4	3	2	1

Recommendations	Strongly Agree		Neutral		Disagree
Infrastructure/Technology/Policy					
New Intermodal Center in Lakeland	5	4	3	2	1
East Polk Transit Maintenance & Admin Facility	5	4	3	2	1
New Park-and-Rides	5	4	3	2	1
Transit Signal Priority/Queue Jumps for BRT Services	5	4	3	2	1
Electric Bus Vehicles	5	4	3	2	1
Expand Universal Access Partnership Program	5	4	3	2	1
Enhanced Marketing/Awareness Program	5	4	3	2	1

***Mobility-On-Demand (MOD)** services would work as follows: Point-to-point trip within a zone, connections can be made between a point within a zone and nearby fixed route. The fixed route can connect you further to another zone or other destination on the route. Service by request, using a mobile phone application or by calling a contact center.*

***Transit Signal Priority/Queue Jumps -** Transit Signal Priority utilizes vehicle location and wireless communication technologies to advance or extend the green light of a traffic signal to allow a bus to continue through an intersection, which helps reduce travel times and ensure on-time arrivals. When combined with TSP, Queue Jump lanes (usually right-turn lanes) at intersections provide buses a head-start over other queued vehicles, letting buses merge into the regular travel lanes immediately beyond the signal.*

If you have any comments, please use the space below.

_____

_____

_____

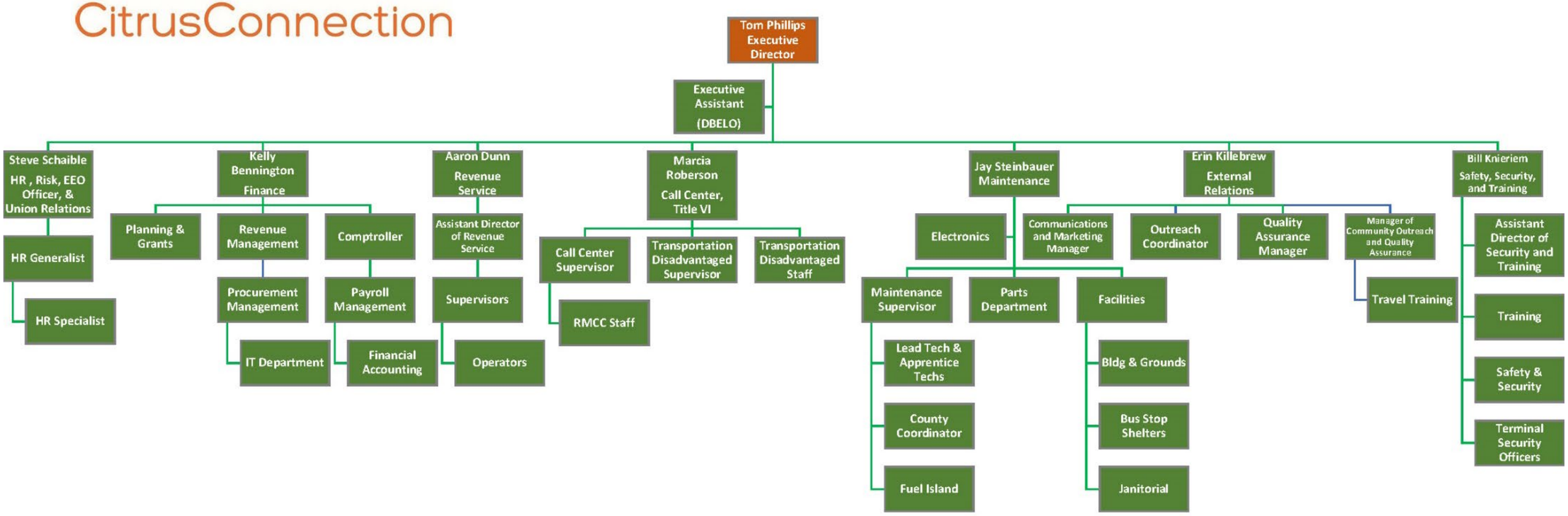
_____

_____

Thank you for participating!

Appendix G: Citrus Connection Organization Chart

CitrusConnection



Appendix H: Performance Monitoring Program

Performance Measures and Indicators

Once the proposed transit services are implemented, the following performance indicators and measures should be monitored by Citrus Connection on a quarterly basis for its fixed-route services as part of the recommended performance-monitoring program:

- Passenger Trips – Annual number of passenger boardings on the transit vehicles.
- Revenue Hours – Number of annual hours of vehicle operation while in active service (available to pick up revenue passengers).
- Revenue Miles – Number of annual miles of vehicle operation while in active service (available to pick up revenue passengers).
- Passenger Trips per Revenue Hour – Ratio of passenger trips to revenue hours of operation.

However, as fixed-route-type services typically take up to three years to become established and productive, performance data to that point should be reviewed and interpreted cautiously. Although adjustments/modifications are encouraged, outright discontinuations based on performance monitoring data alone are discouraged.

Evaluation, Methodology, and Process

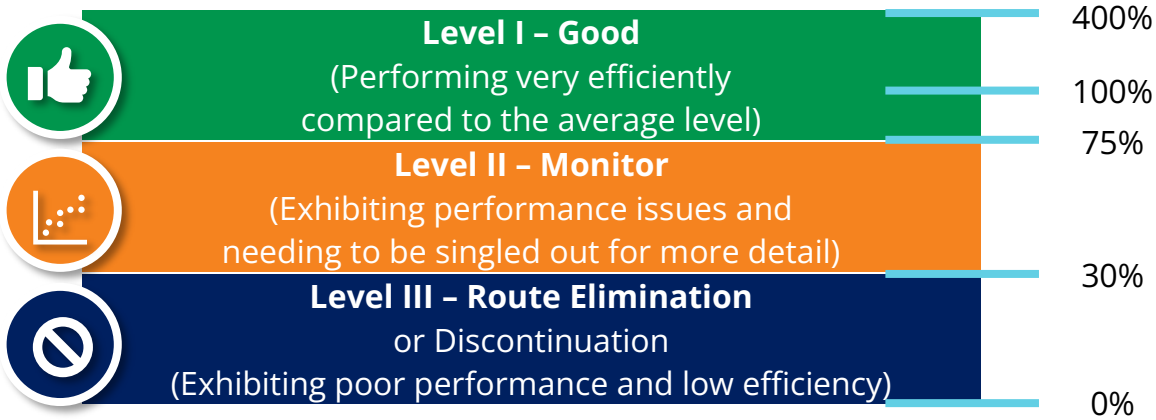
Performance monitoring is based on two measures—trips per mile and trips per hour, which are weighted equally to derive an overall route score. An individual route's score for a particular measure is based on a comparison of the measure as a percentage of the system average for that particular measure. These individual measure scores are added together and divided by 2 to get a final aggregate score. This final composite performance score is an indication of a route's performance for the two measures when compared to the system average for those measures. A higher score represents better overall performance when compared to other routes. The noted comparative performance evaluation can be beneficial, but caution should be exercised when using the final scores and rankings, because

these numbers are comparing routes to one another and may not reflect the specific goals established for a particular route (i.e., geographic coverage vs. ridership performance). The process is particularly useful, however, in highlighting those routes that may have comparative performance-related issues. These routes can then be singled out for closer observation in future quarters or years to determine specific changes that may help mitigate any performance issues. Once a route score is determined, routes can be ranked to show the highest performing and lowest performing routes. The rankings are a useful proxy for determining the comparative performance of any route, as well as highlighting changes in performance over time. To track the performance variation over time, three performance levels have been developed:

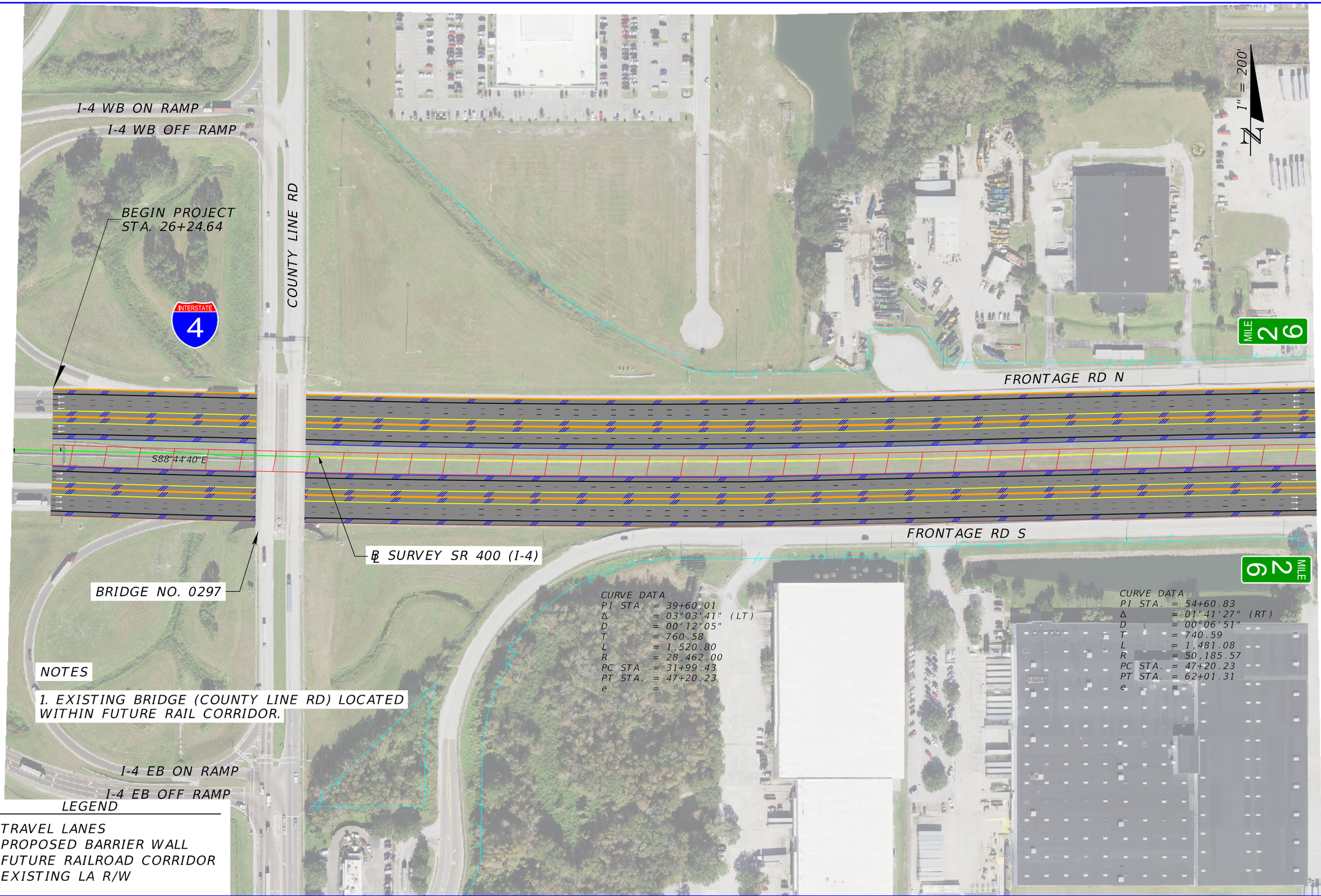
- Level I – Good (≥ 75%) – Transit routes in this category are performing efficiently compared with the average level of all the agency's routes.
- Level II – Monitor (30–74%) – Routes in this category exhibit varying levels of performance problems and require more detailed analysis (e.g., ride checks, on-board surveys, increased marketing efforts, etc.) to aid in identifying specific changes that can be made to help improve the route's performance.
- Level III – Requires Attention (≤ 29%) – Routes in this category exhibit poor performance and low efficiency. Recommendations for these routes may include truncation of the route, reduction in the route's number of revenue hours, or discontinuation of the route.

Figure H-1 illustrates the three evaluation levels and notes the recommended thresholds for each level.

Figure H-1: Citrus Connection Route Performance Monitoring Evaluation



Appendix B



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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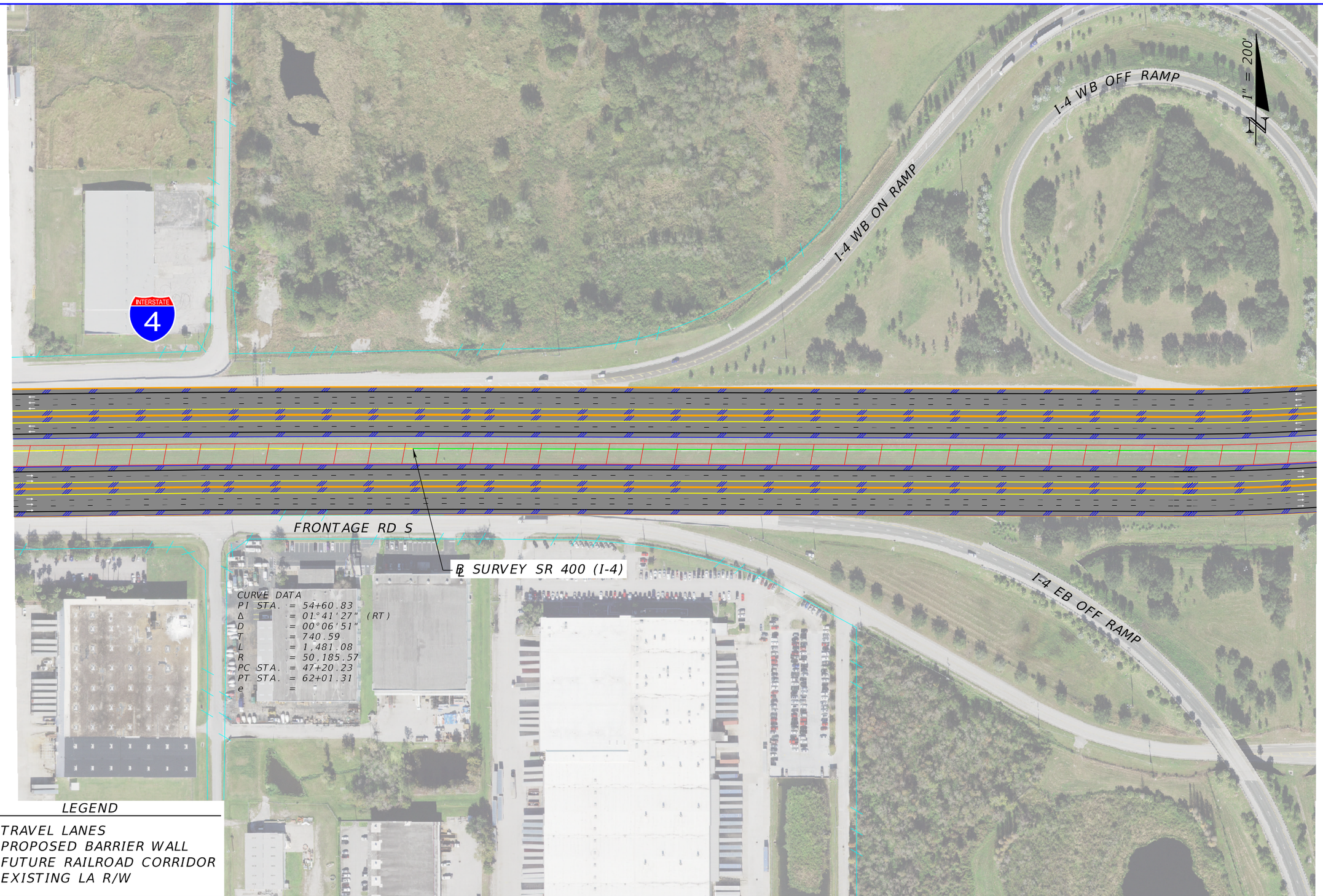

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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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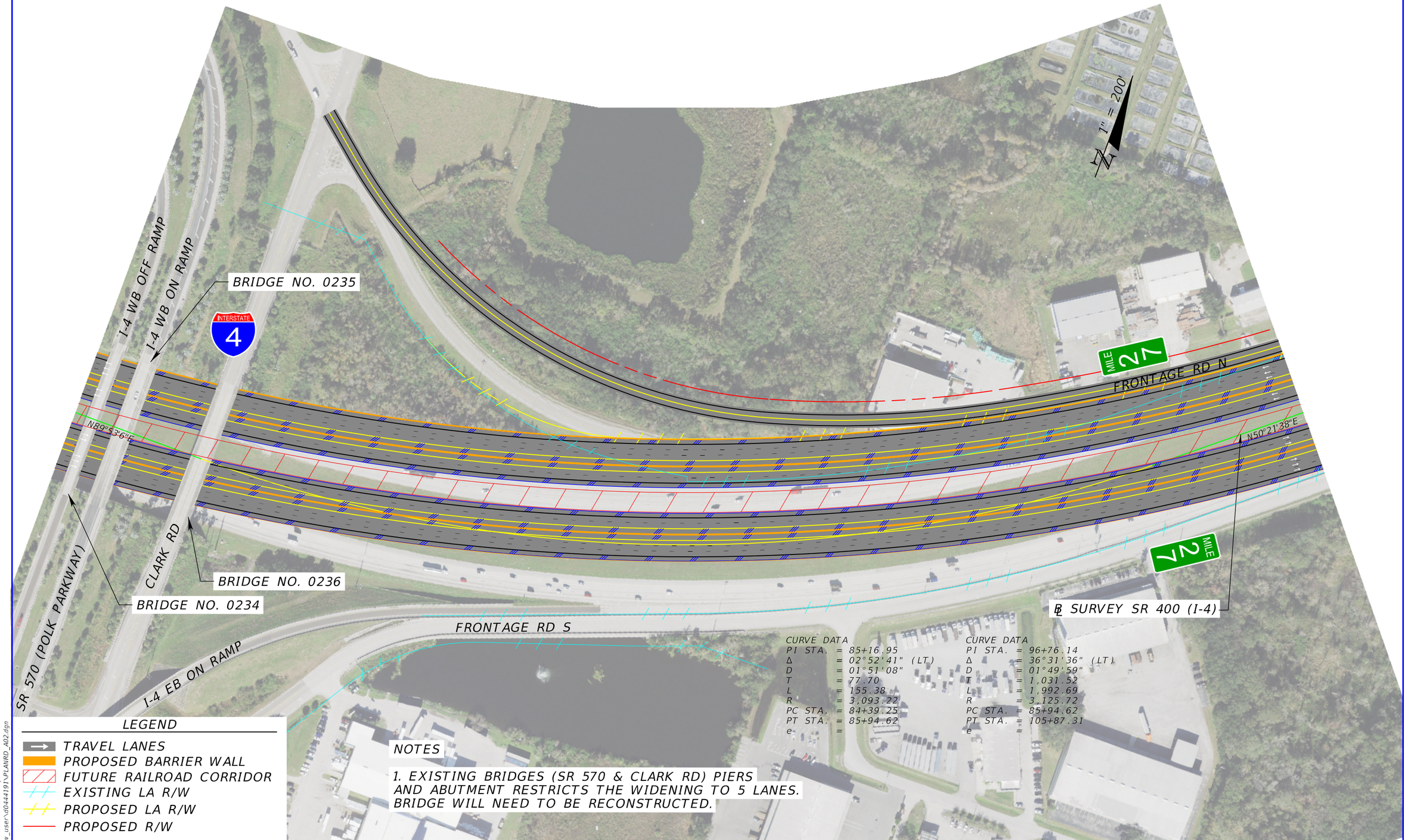

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LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- PROPOSED LA R/W
- PROPOSED R/W

NOTES

1. EXISTING BRIDGES (SR 570 & CLARK RD) PIERS AND ABUTMENT RESTRICTS THE WIDENING TO 5 LANES. BRIDGE WILL NEED TO BE RECONSTRUCTED.

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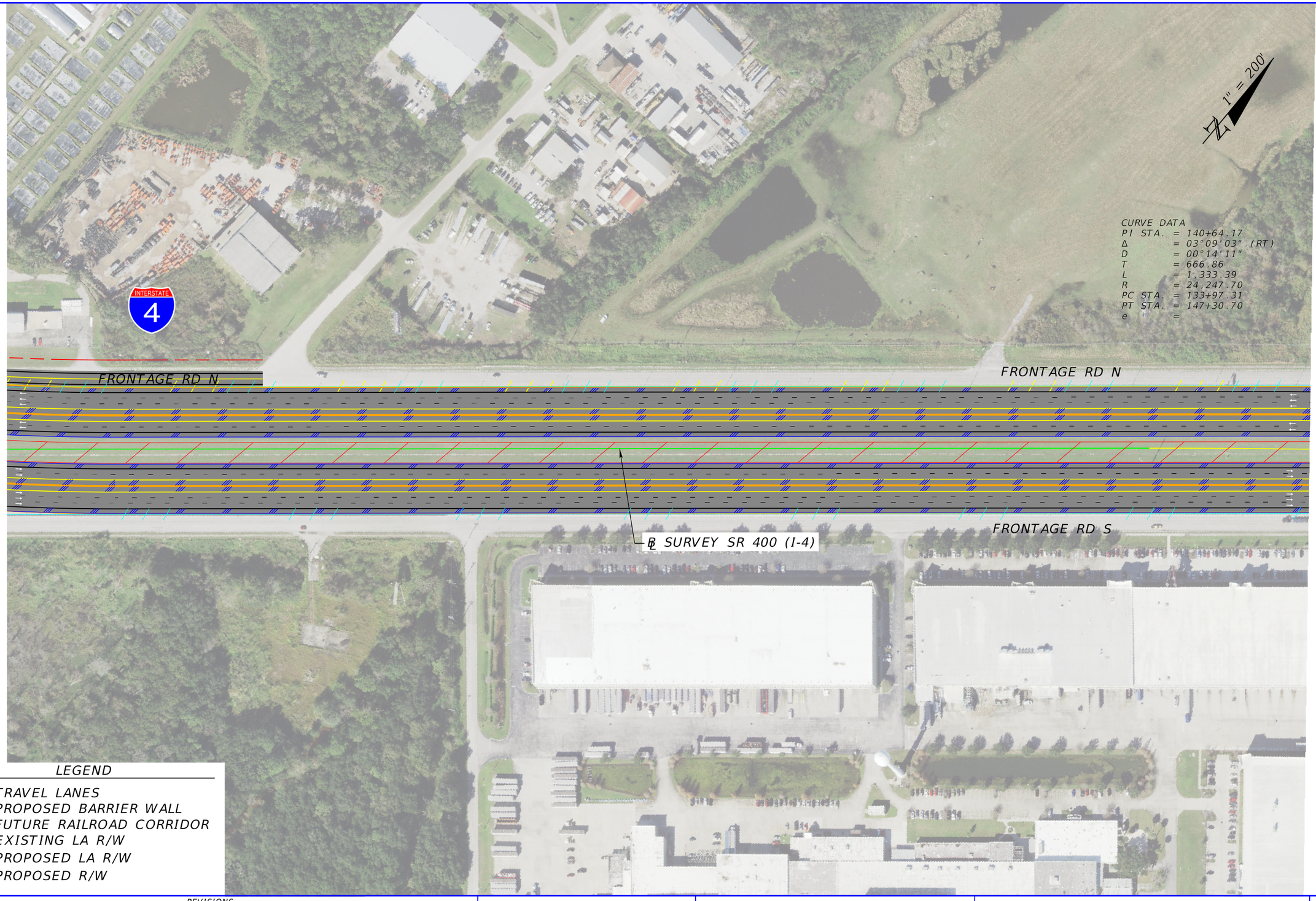

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- PROPOSED LA R/W
- PROPOSED R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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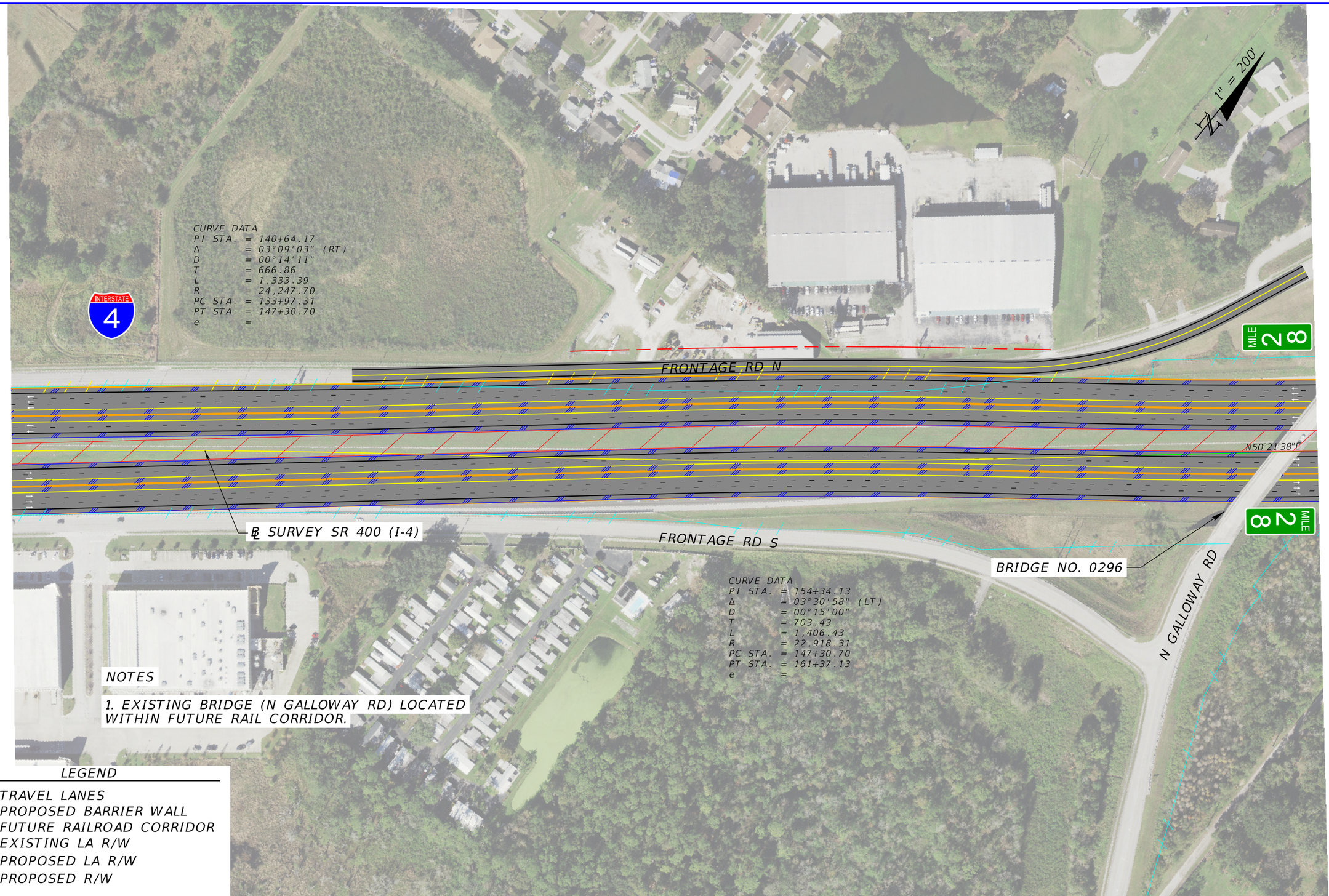

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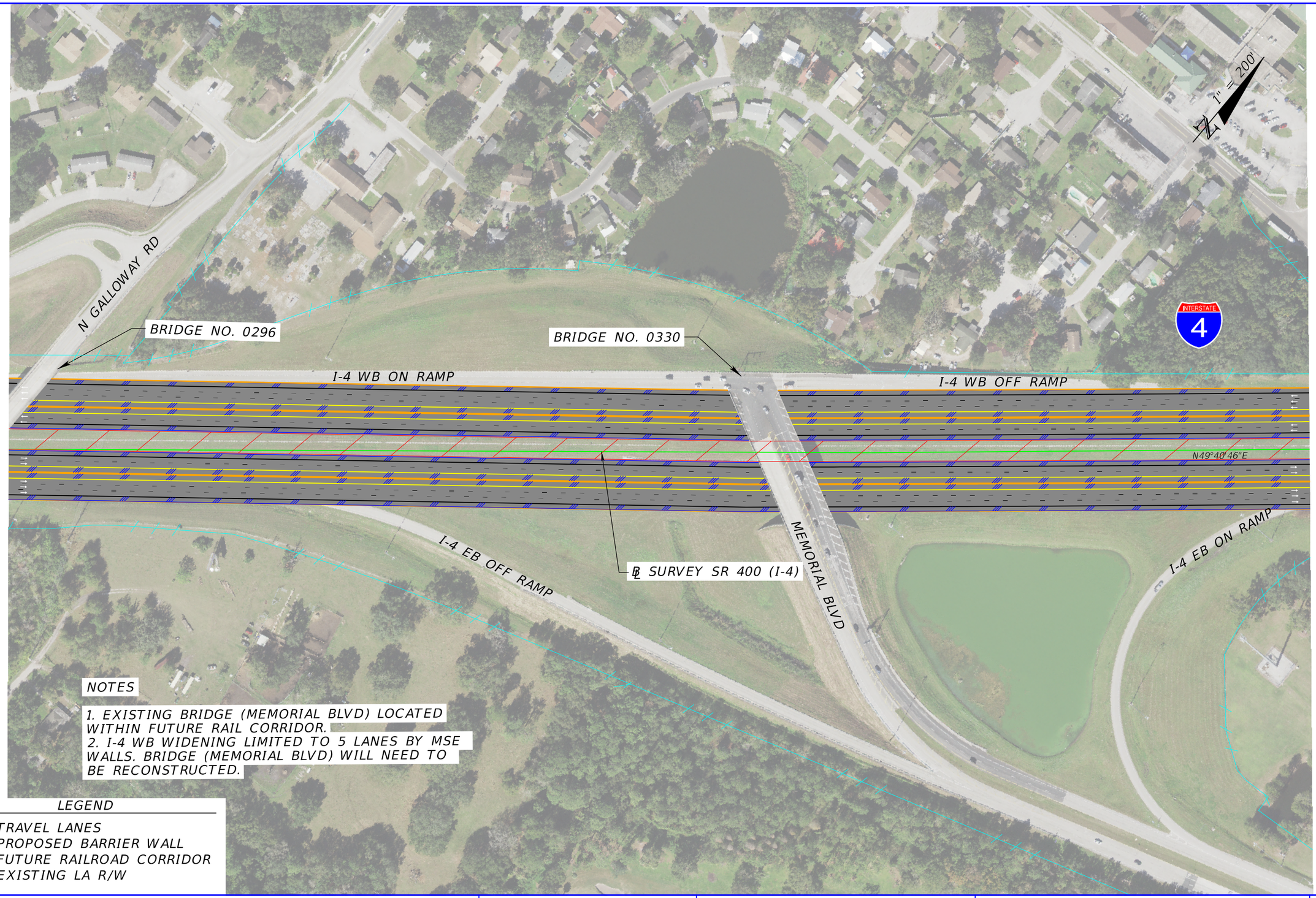

NOTES

1. EXISTING BRIDGE (MEMORIAL BLVD) LOCATED WITHIN FUTURE RAIL CORRIDOR.
2. I-4 WB WIDENING LIMITED TO 5 LANES BY MSE WALLS. BRIDGE (MEMORIAL BLVD) WILL NEED TO BE RECONSTRUCTED.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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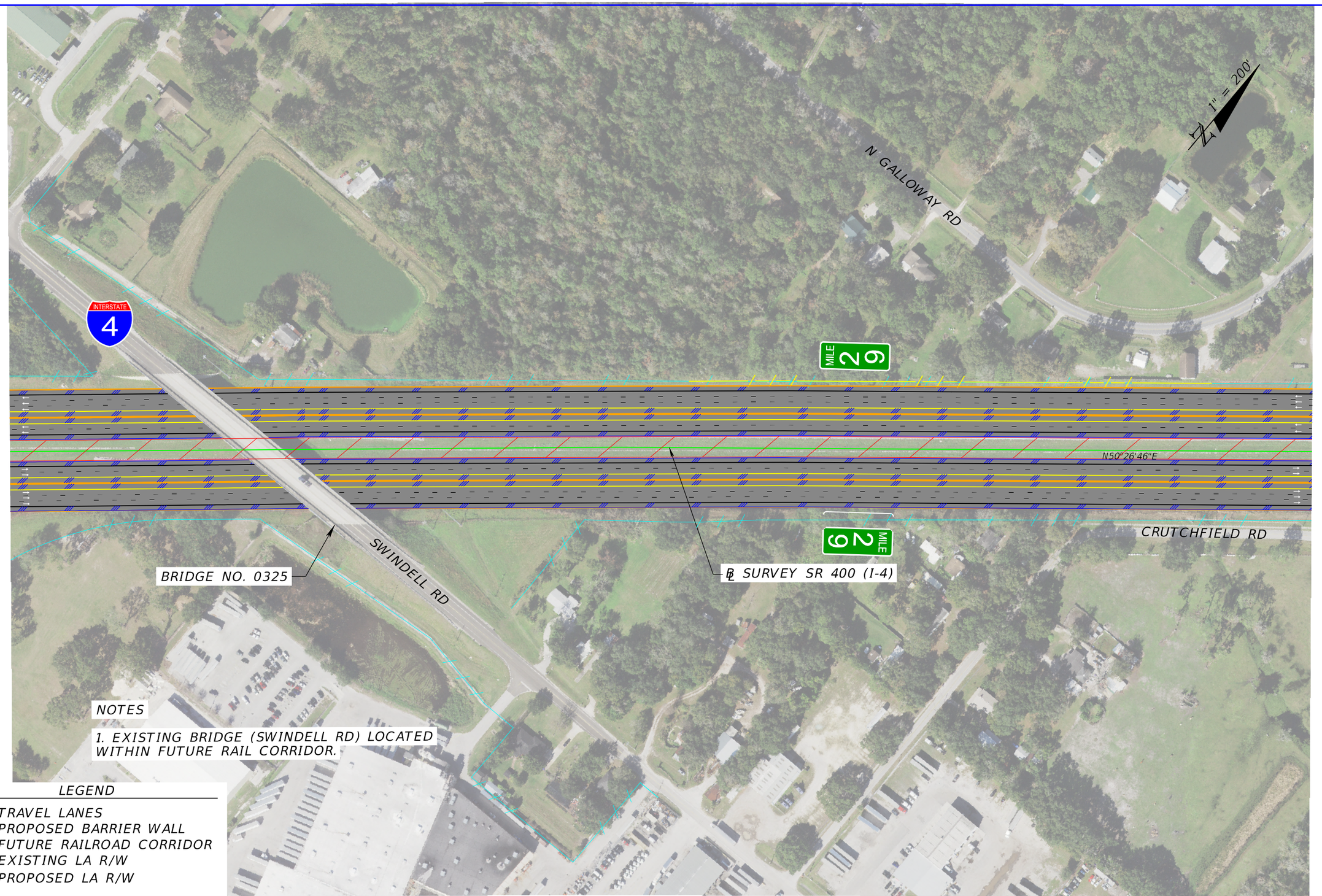

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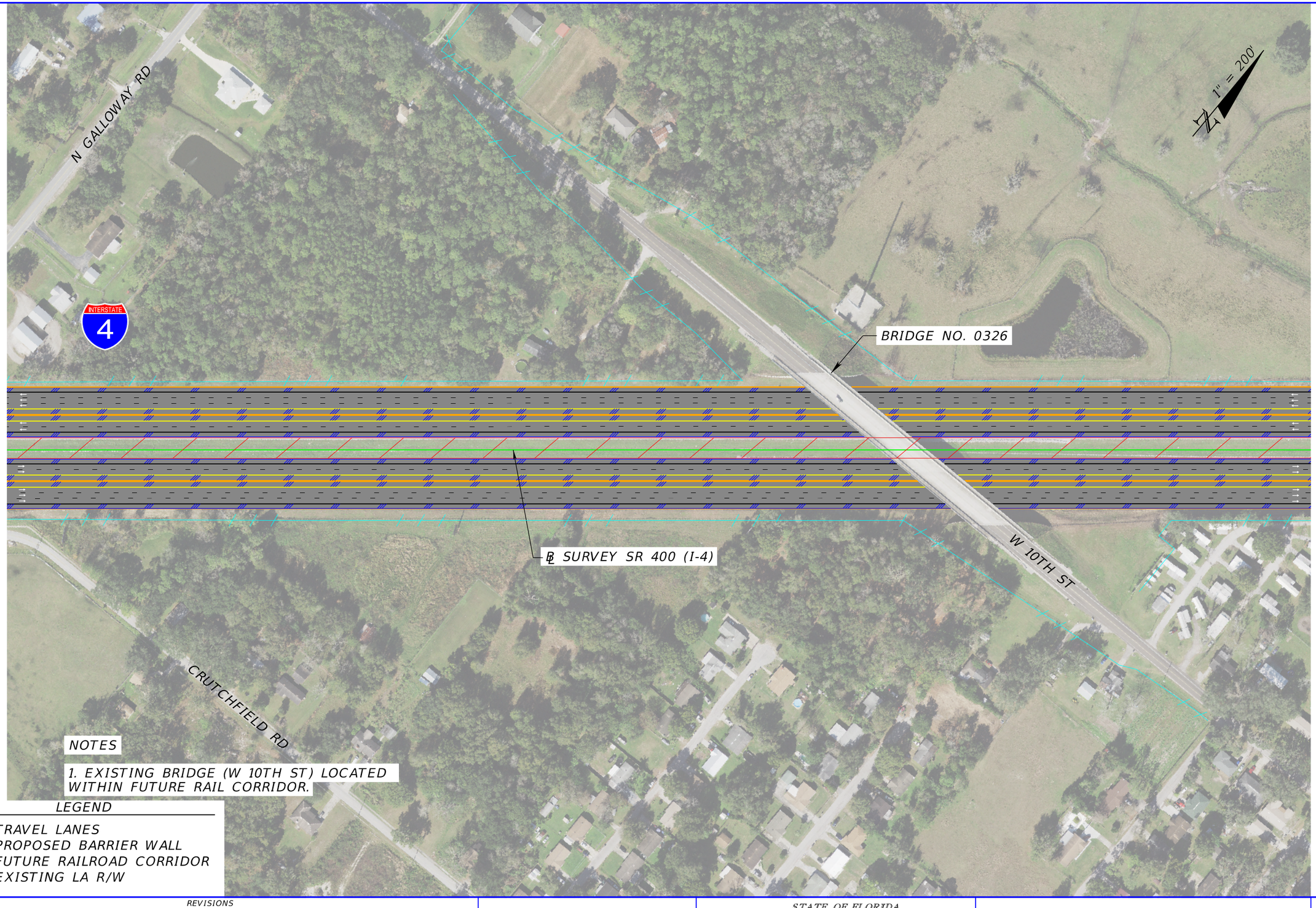

NOTES

1. EXISTING BRIDGE (W 10TH ST) LOCATED WITHIN FUTURE RAIL CORRIDOR.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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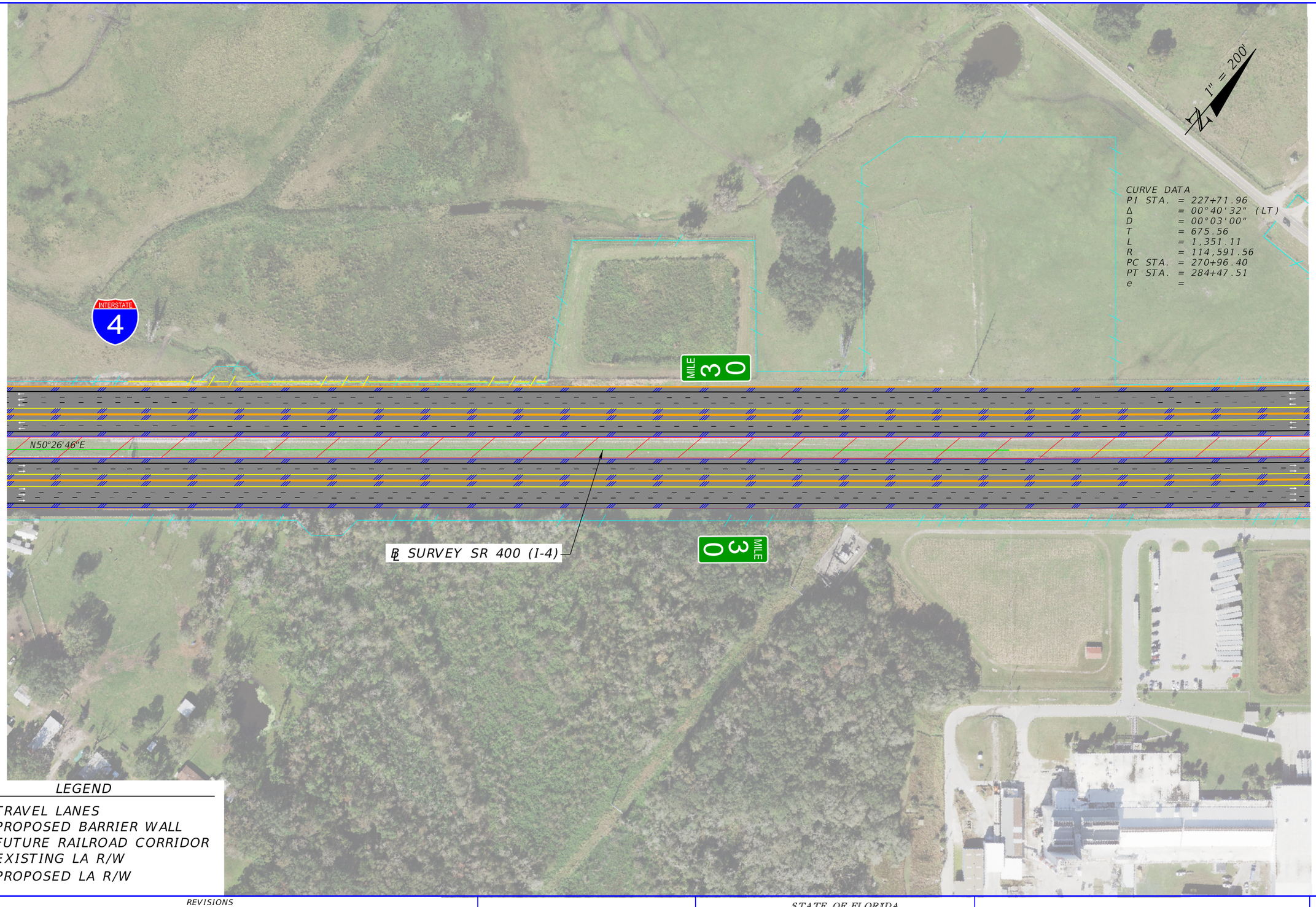

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PT STA. = 284+47.51
e =

1" = 200'

W BELLA VISTA ST

I-4 WB ON RAMP

I-4 WB OFF RAMP

BRIDGE NO. 0328

INTERSTATE 4

N49°45'10"E

℄ SURVEY SR 400 (I-4)

BRIDGE NO. 0173

BRIDGE NO. 0327

I-4 EB OFF RAMP

SR 539

I-4 EB ON RAMP

NOTES

1. EXISTING BRIDGE (BUENA VISTA ST) LOCATED WITHIN FUTURE RAIL CORRIDOR.
2. EXISTING BRIDGE (SR 539) LOCATED WITHIN FUTURE RAIL CORRIDOR.
3. EXISTING BRIDGE (CSX RAIL) LOCATED WITHIN FUTURE RAIL CORRIDOR.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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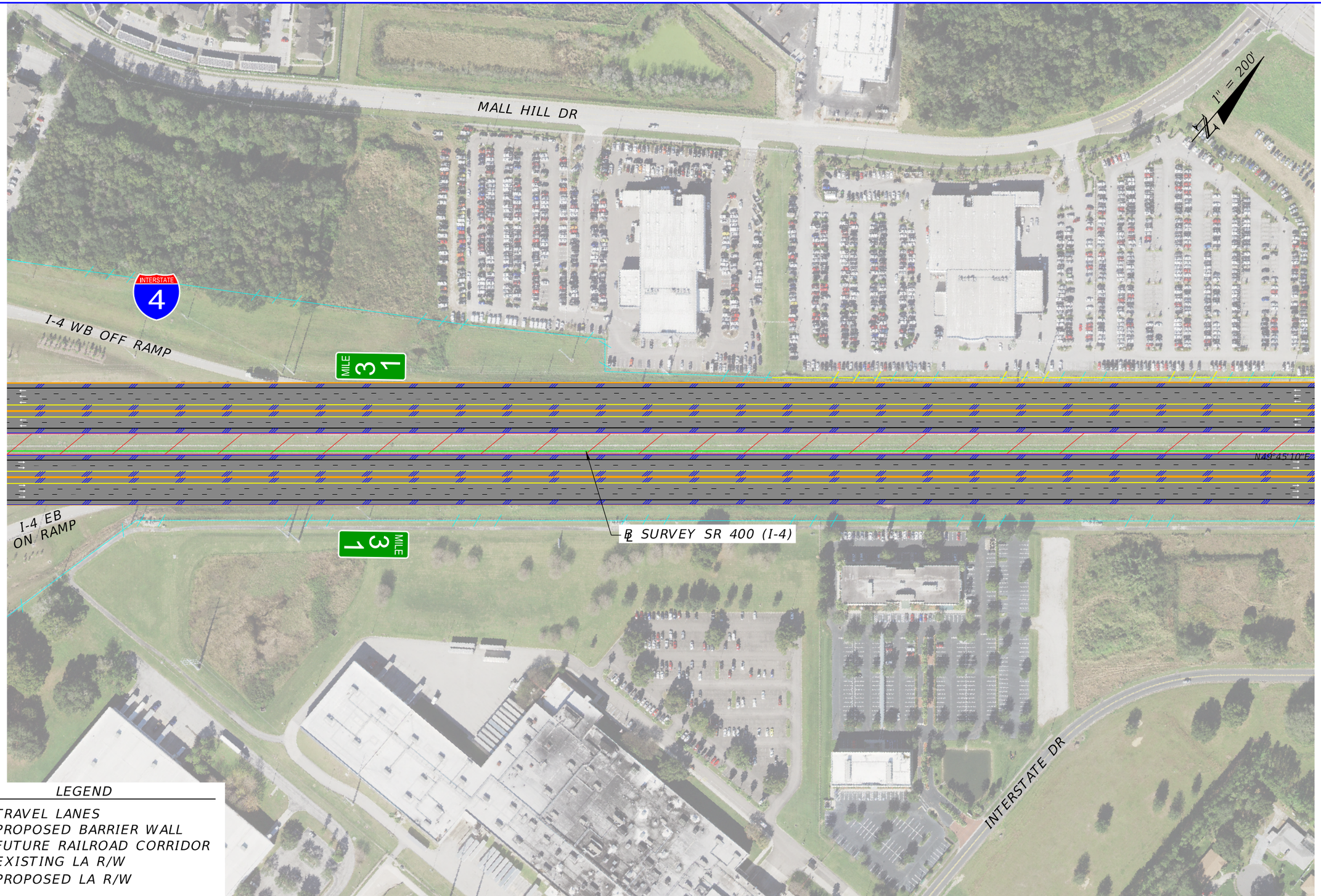

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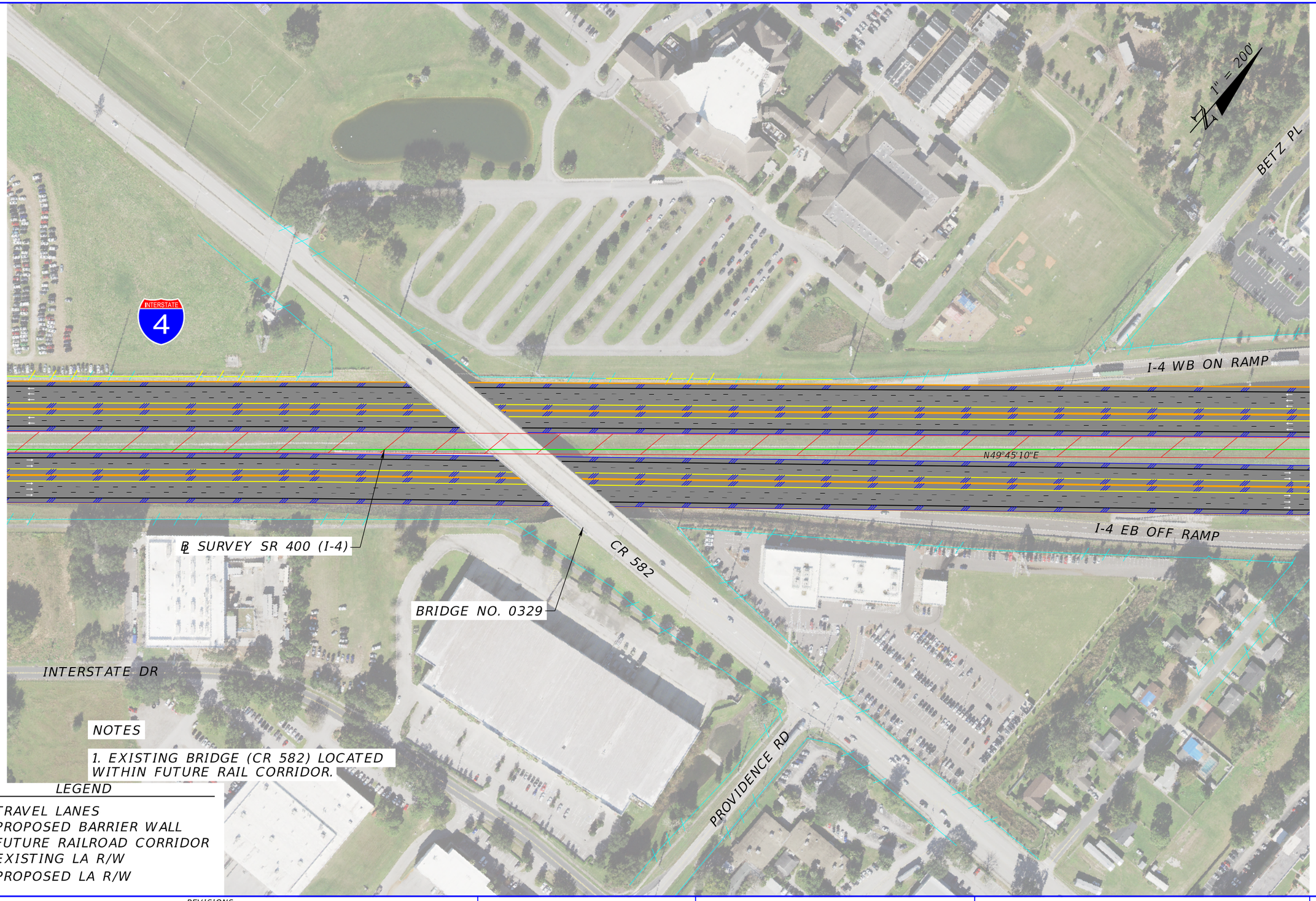

NOTES

1. EXISTING BRIDGE (CR 582) LOCATED WITHIN FUTURE RAIL CORRIDOR.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- PROPOSED LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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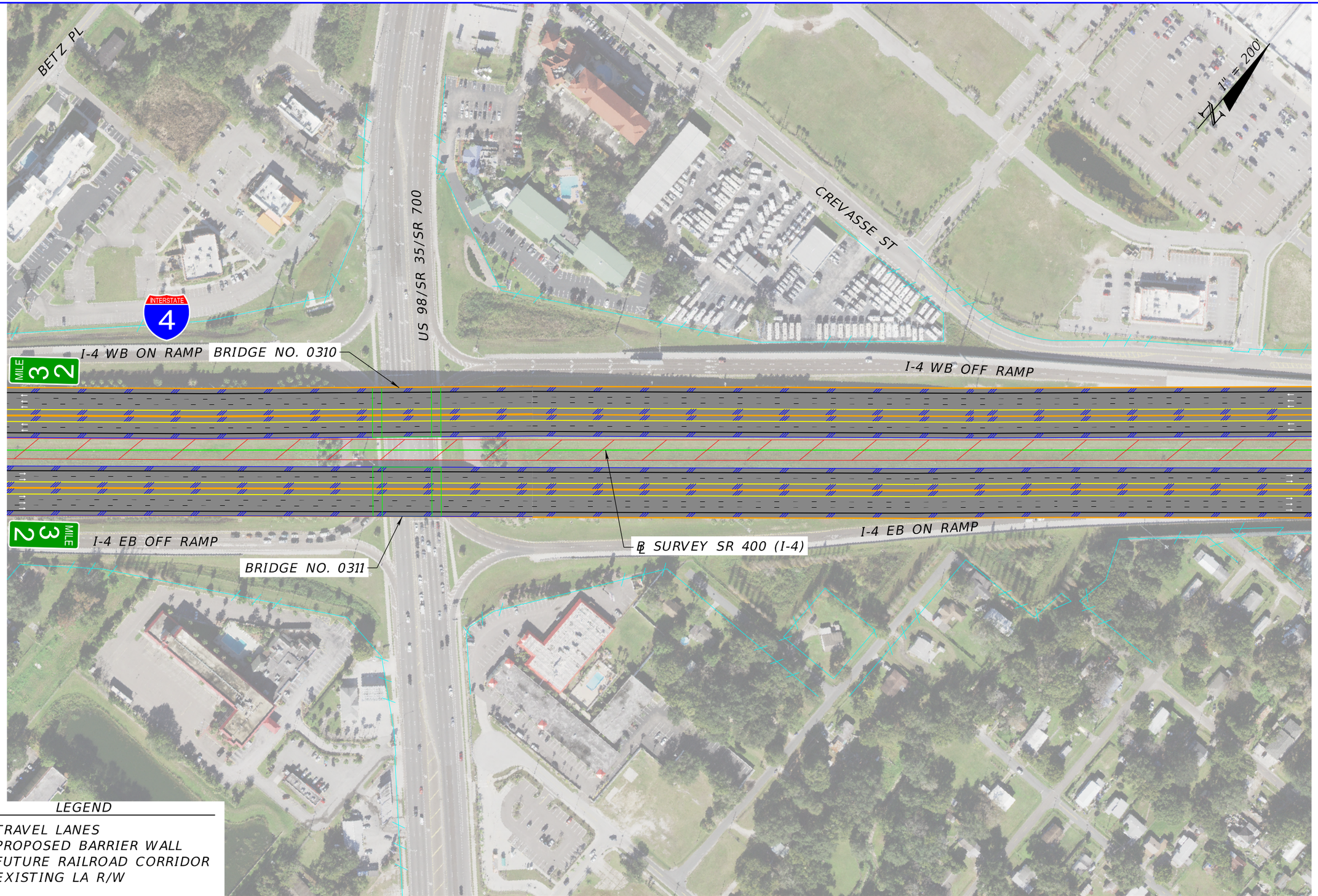

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

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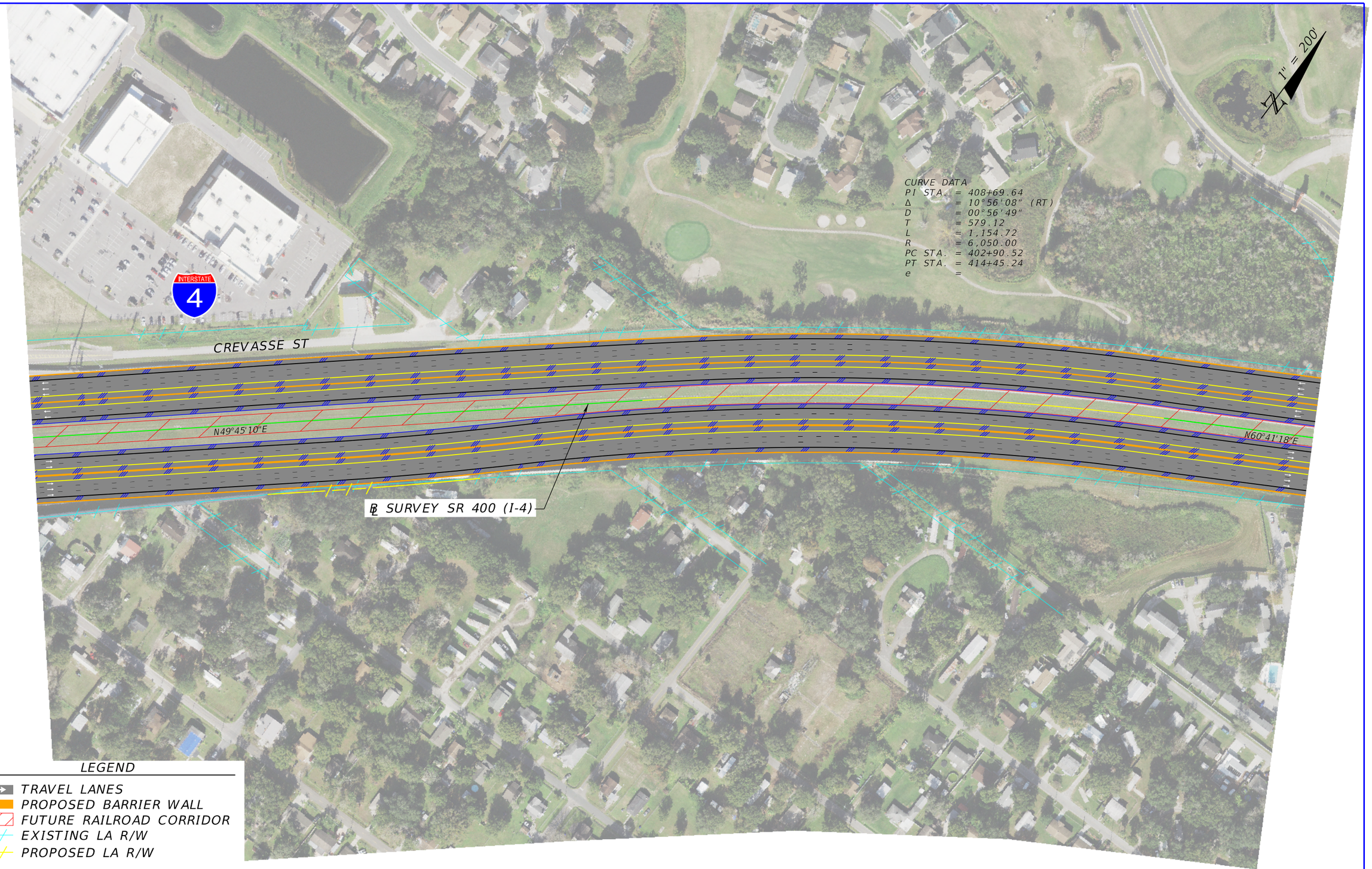

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- PROPOSED LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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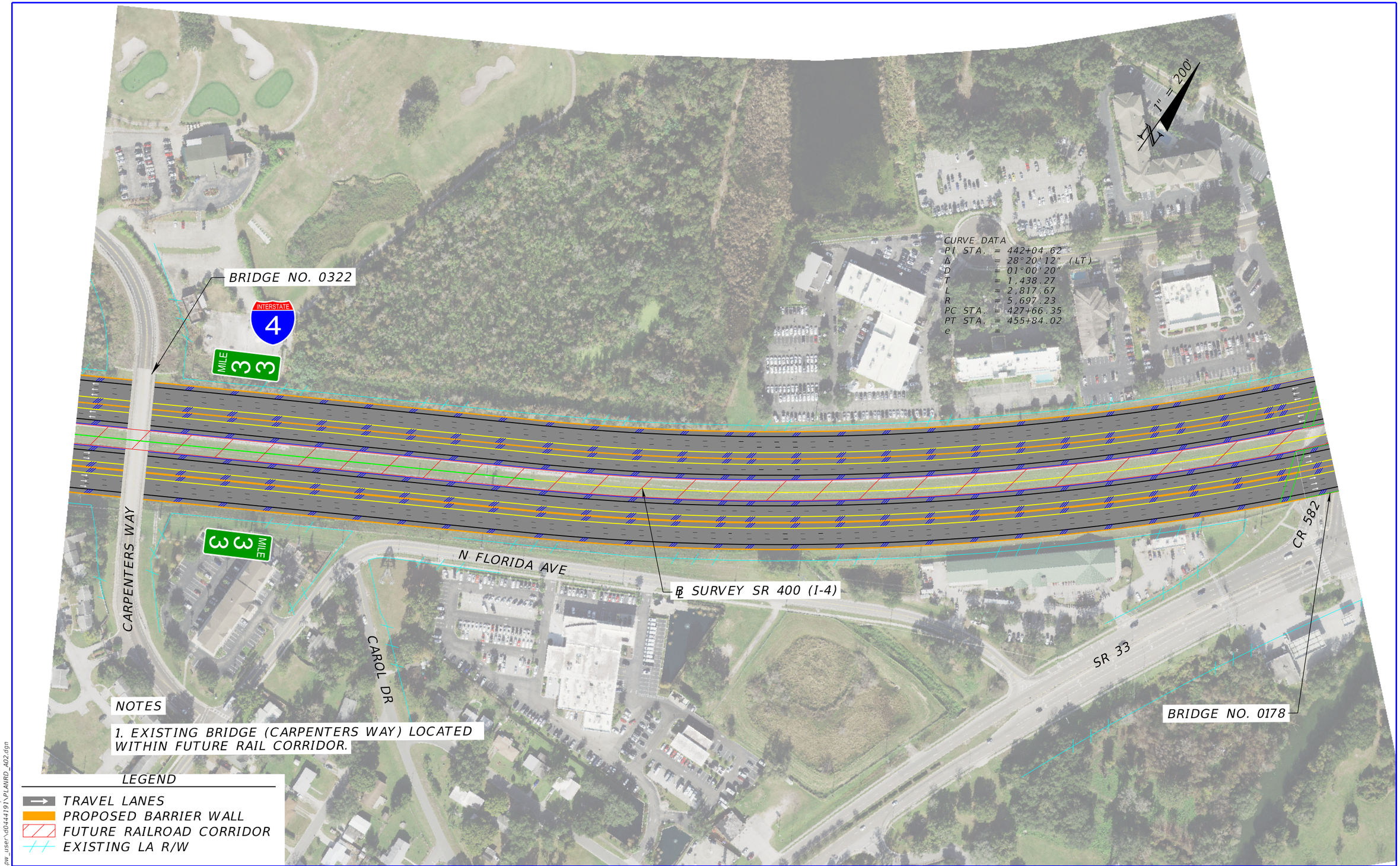

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 15

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CURVE DATA
PI STA. = 442+04.62
Δ = 28°20'12" (LT)
D = 01°00'20"
T = 1,438.27
L = 2,817.67
R = 5,697.23
PC STA. = 427+66.35
PT STA. = 455+84.02
e =

BRIDGE NO. 0177

CR 582

I-4 WB ON RAMP

I-4 WB OFF RAMP

INTERSTATE 4

1" = 200'

N32°21'6"E

BRIDGE NO. 0178

℄ SURVEY SR 400 (I-4)

SR 33

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

8/16/2023 10:06:59 AM USER: ryan.rockford
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 16



NOTES

1. EXISTING BRIDGE (OLD COMBEE RD LOCATED WITHIN FUTURE RAIL CORRIDOR.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 17

8/16/2023 10:07:06 AM USER: ryan.rockford
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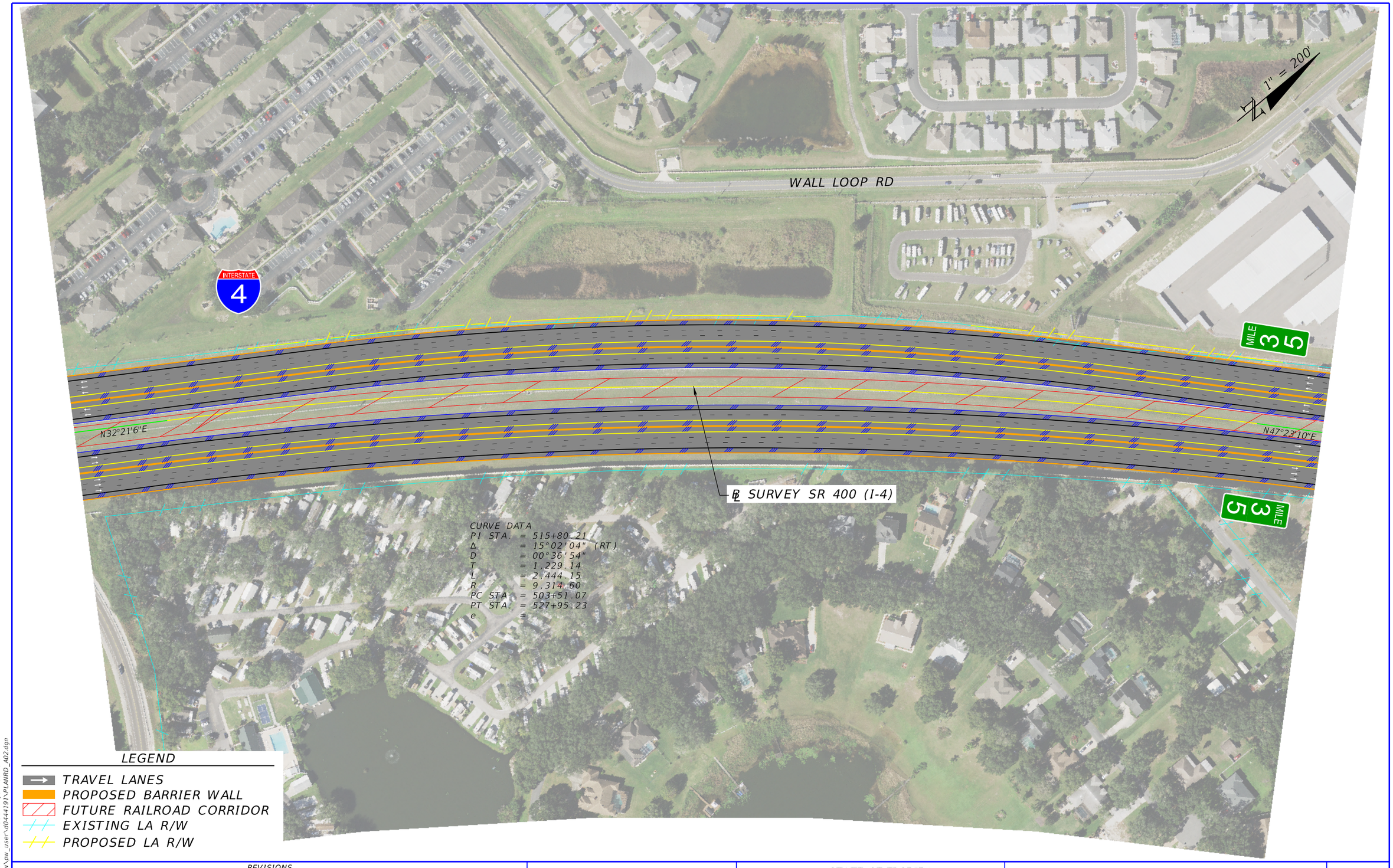

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- PROPOSED LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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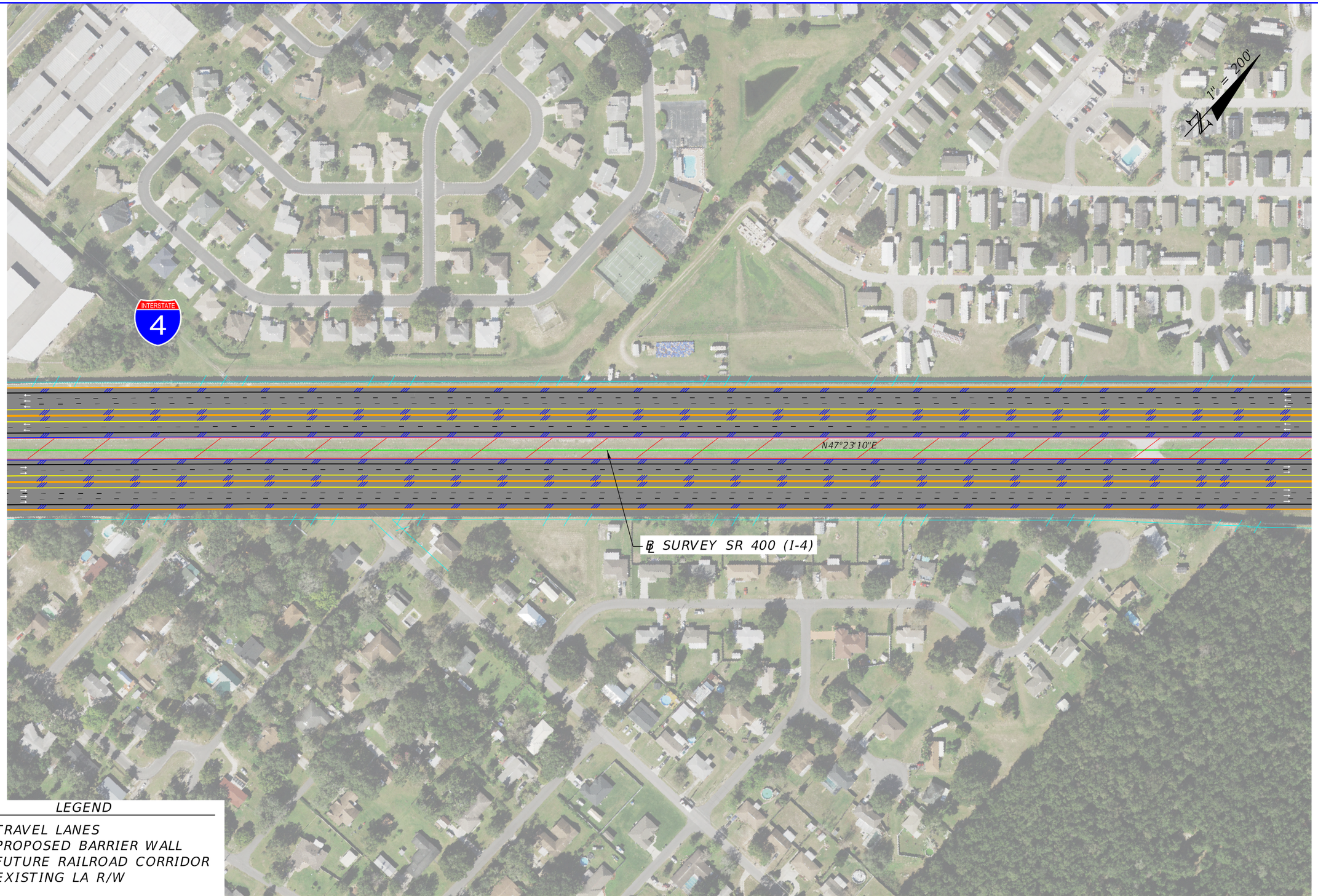

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN
CONCEPT PLAN II

SHEET NO. 19

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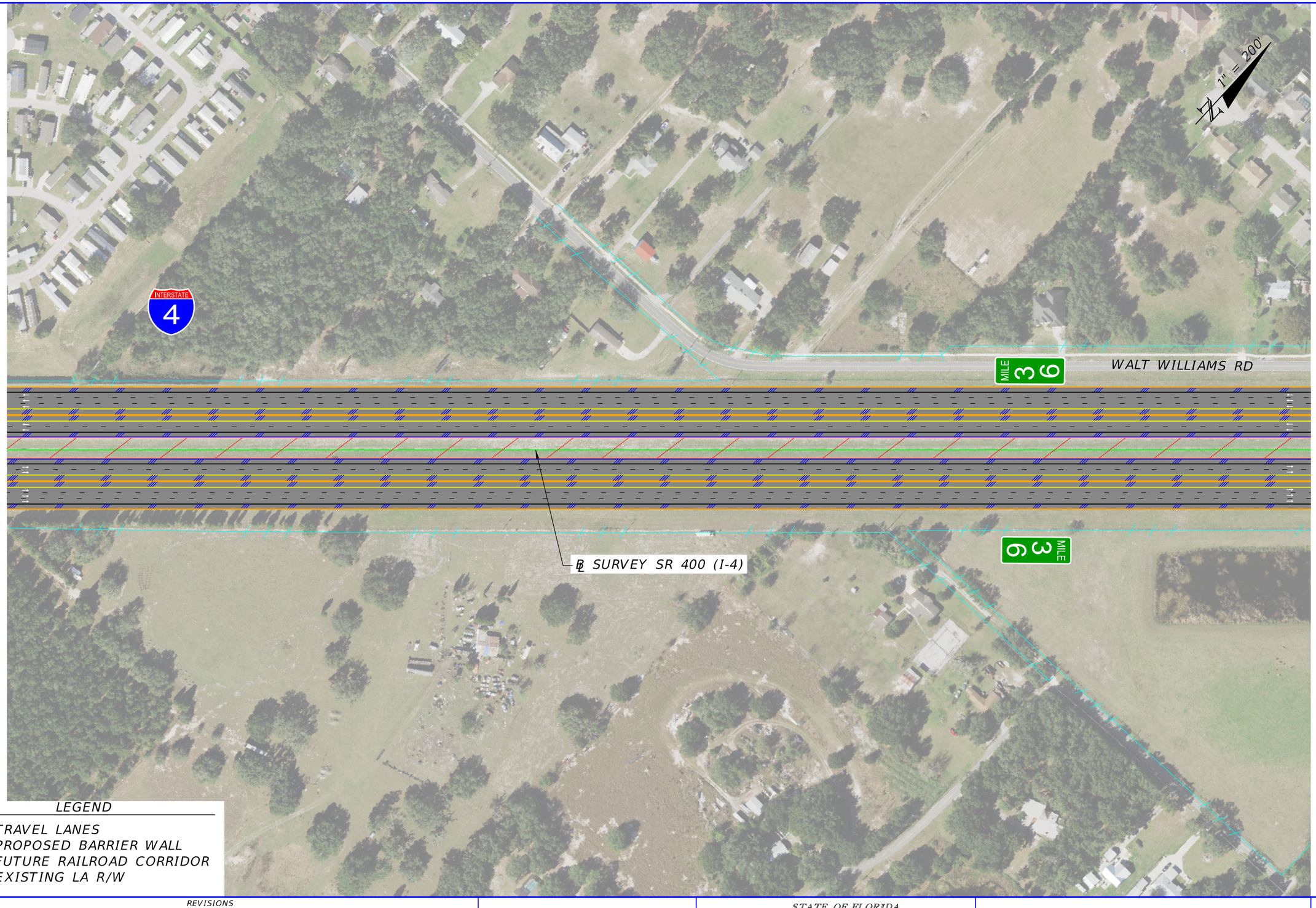

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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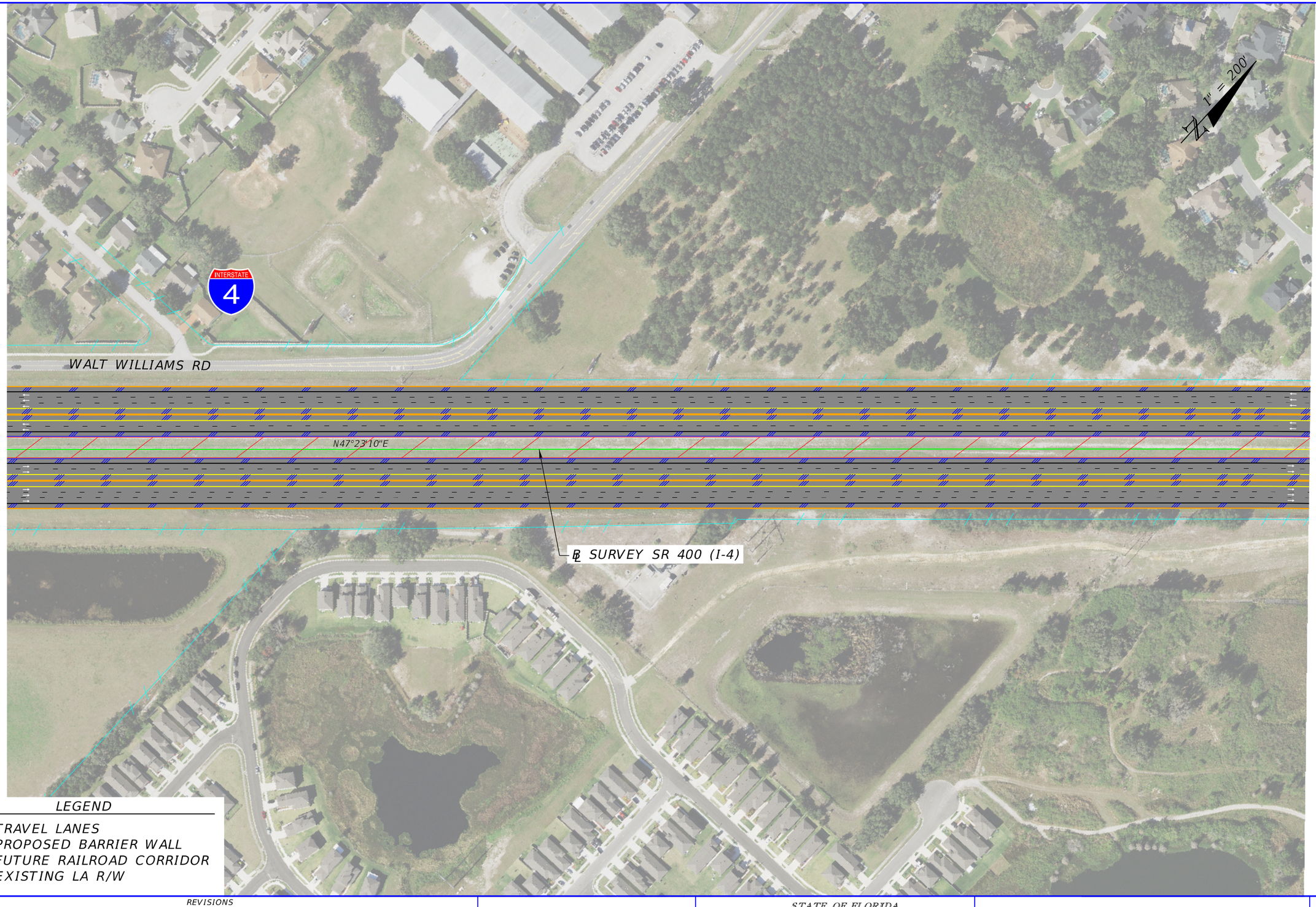

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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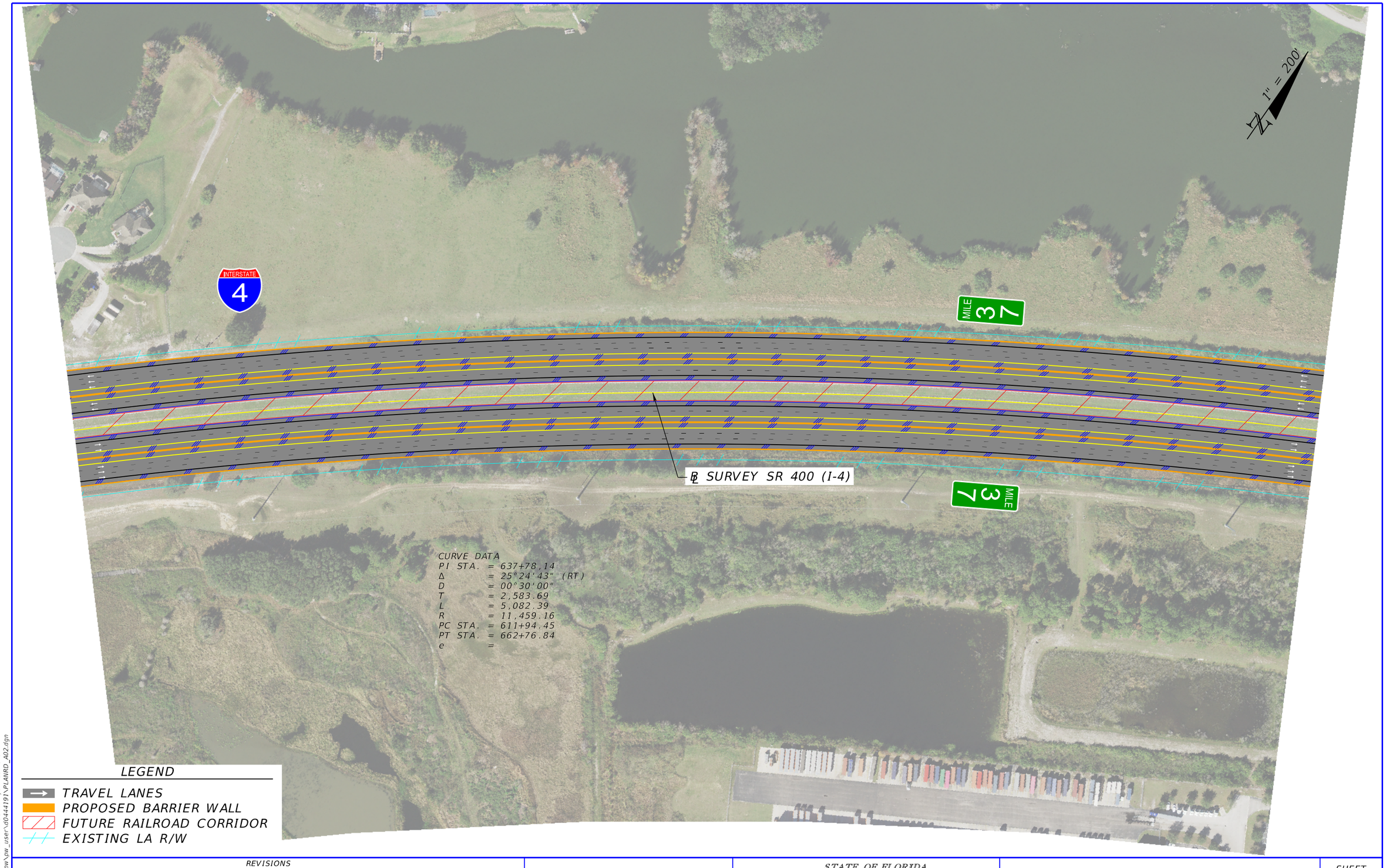

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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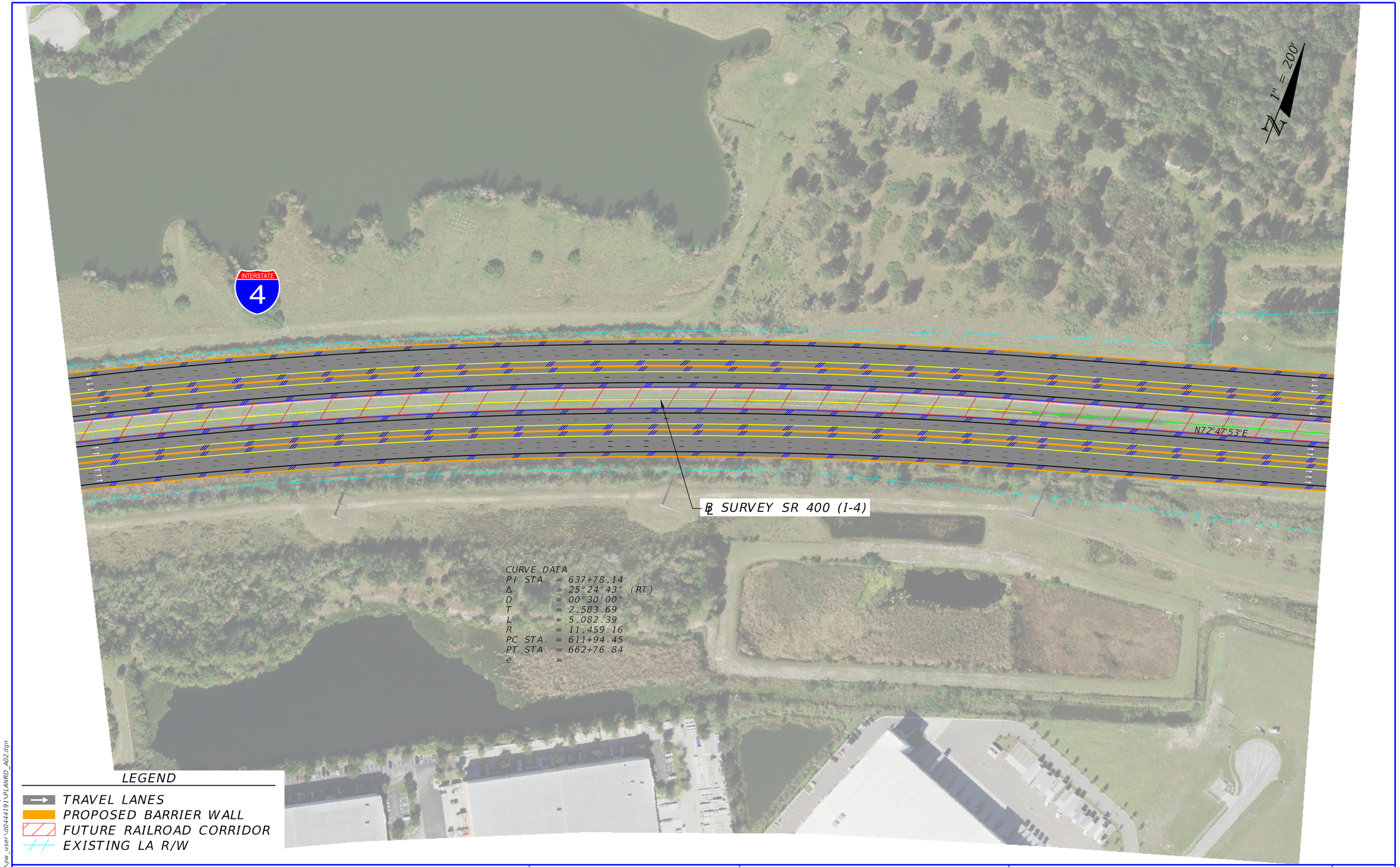

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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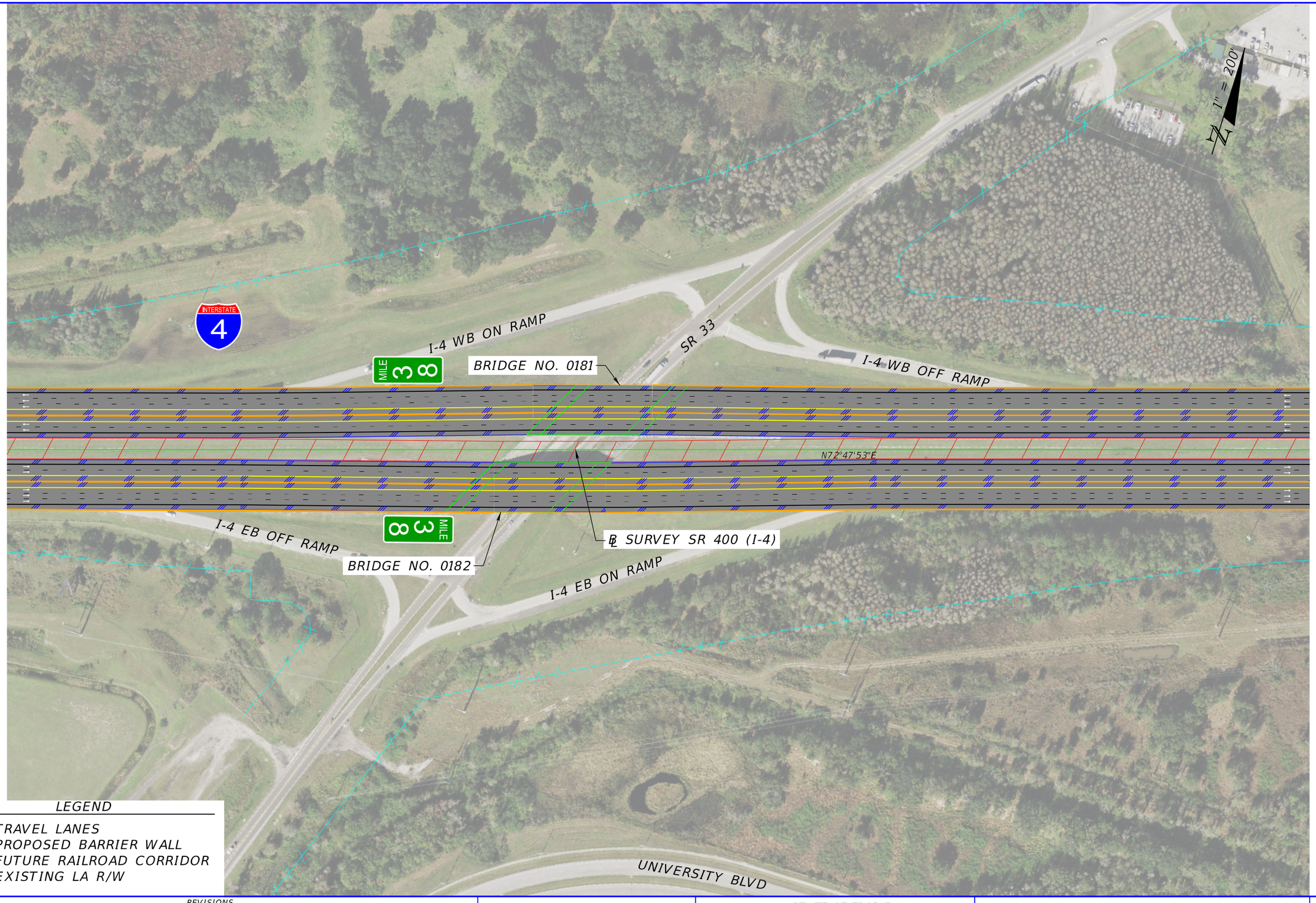

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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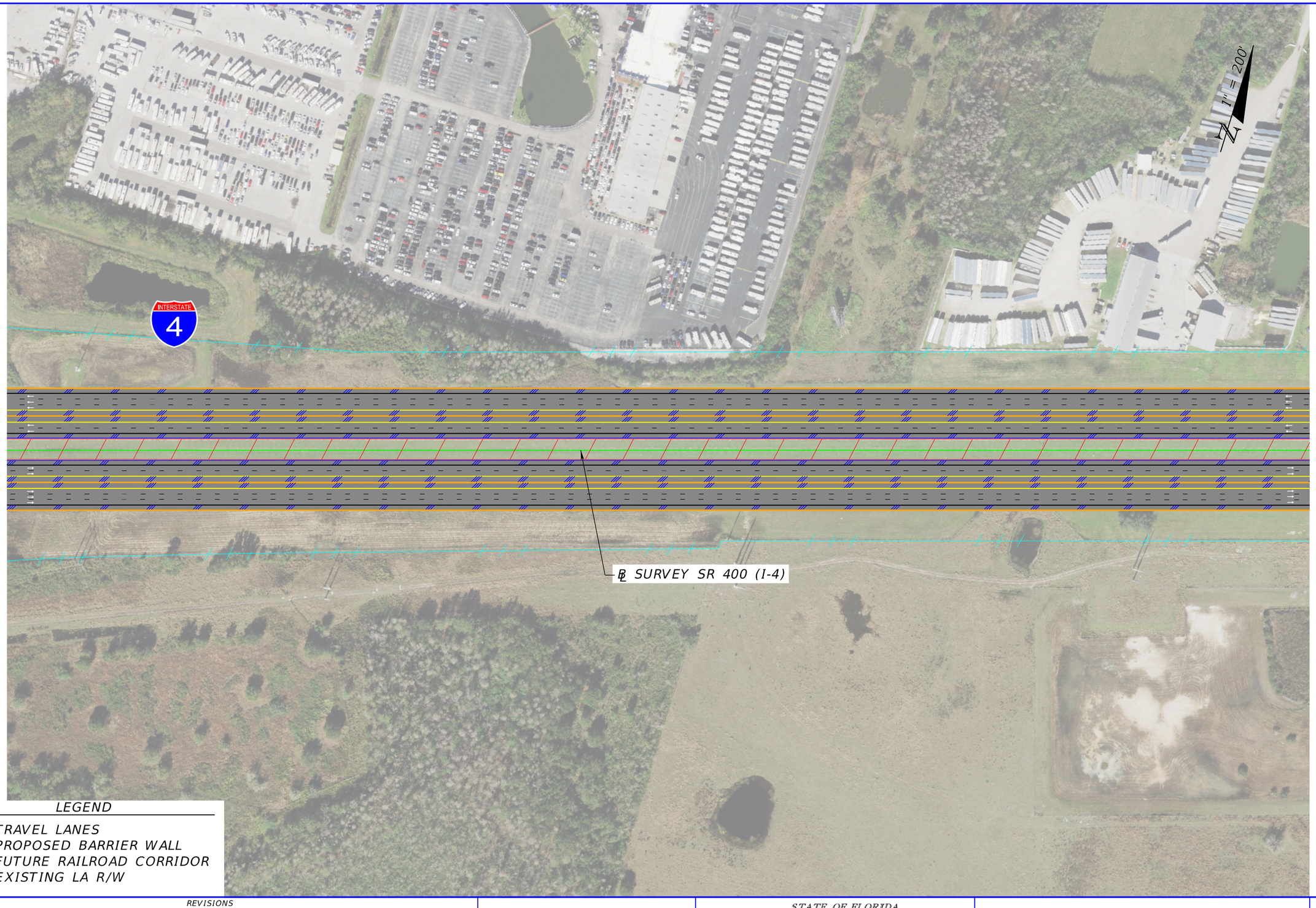

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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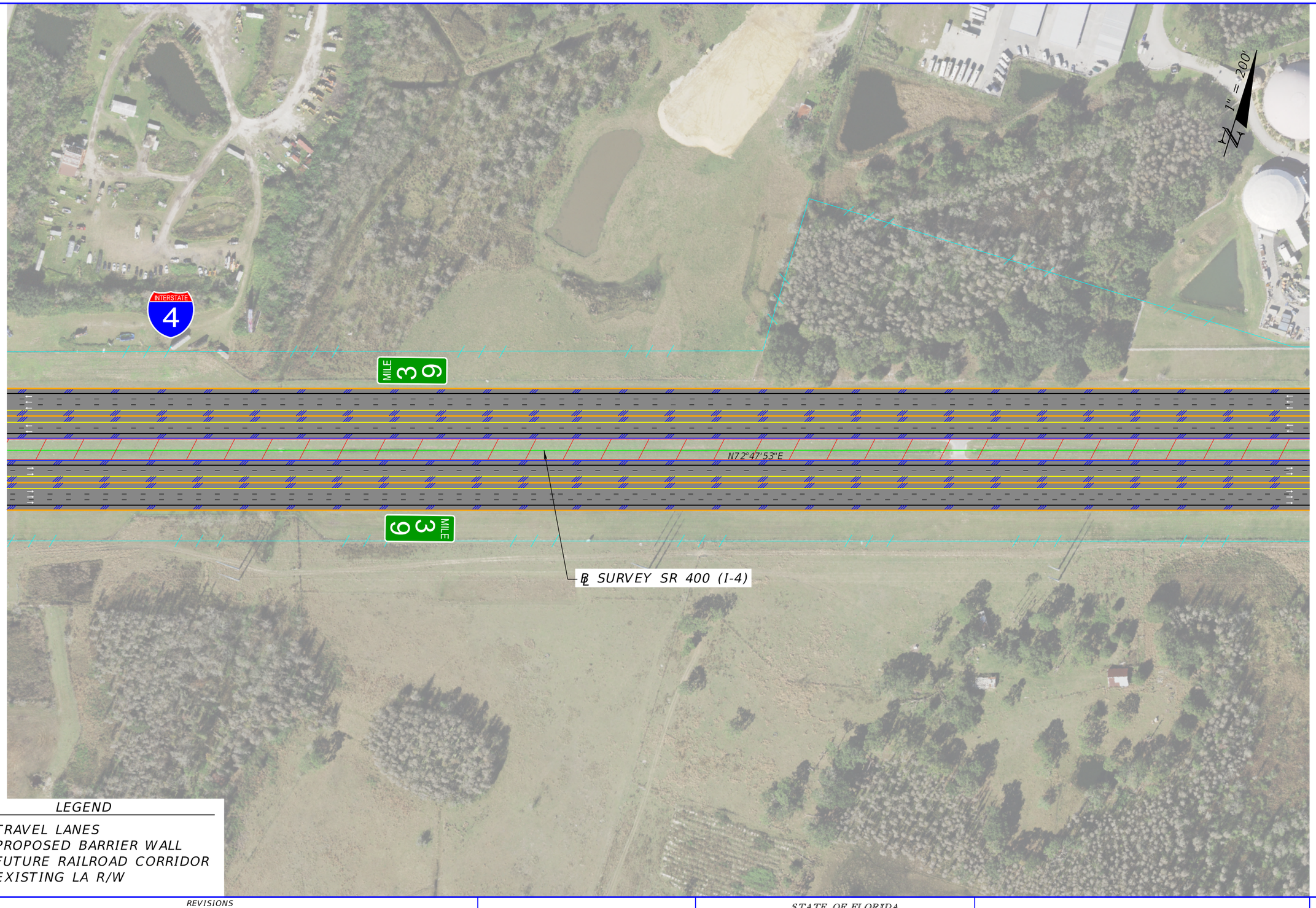

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 26

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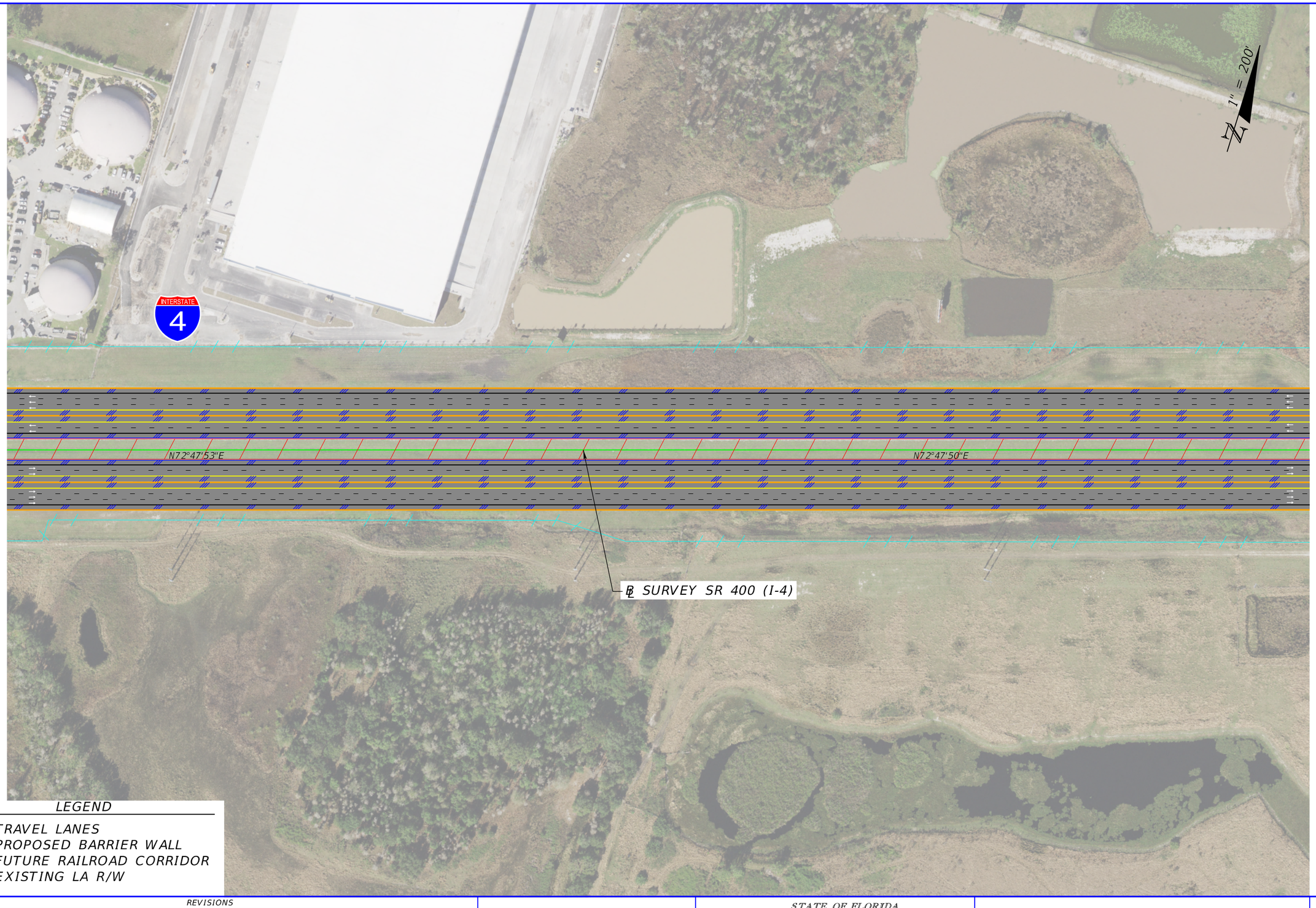

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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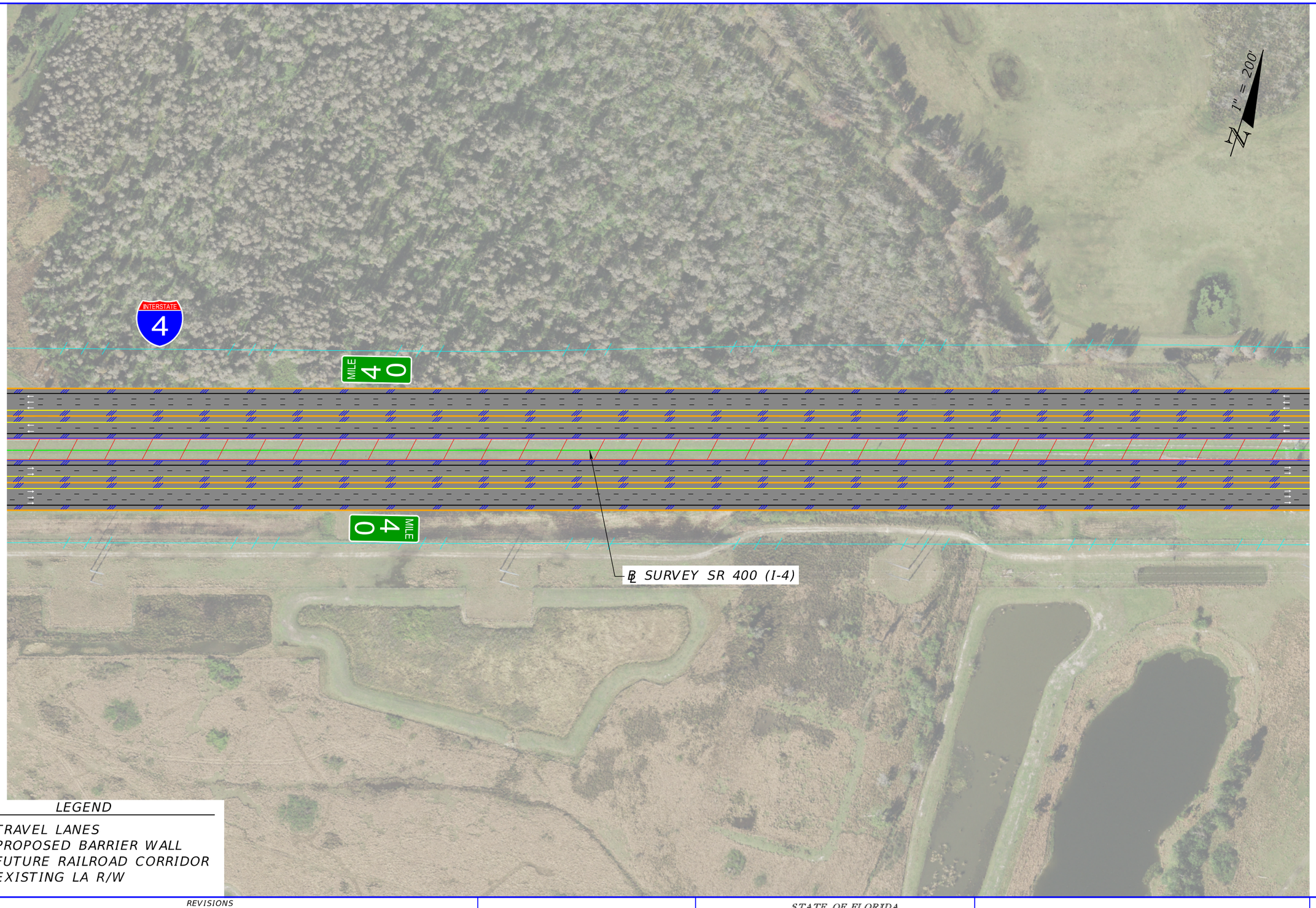

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 28

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LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 29

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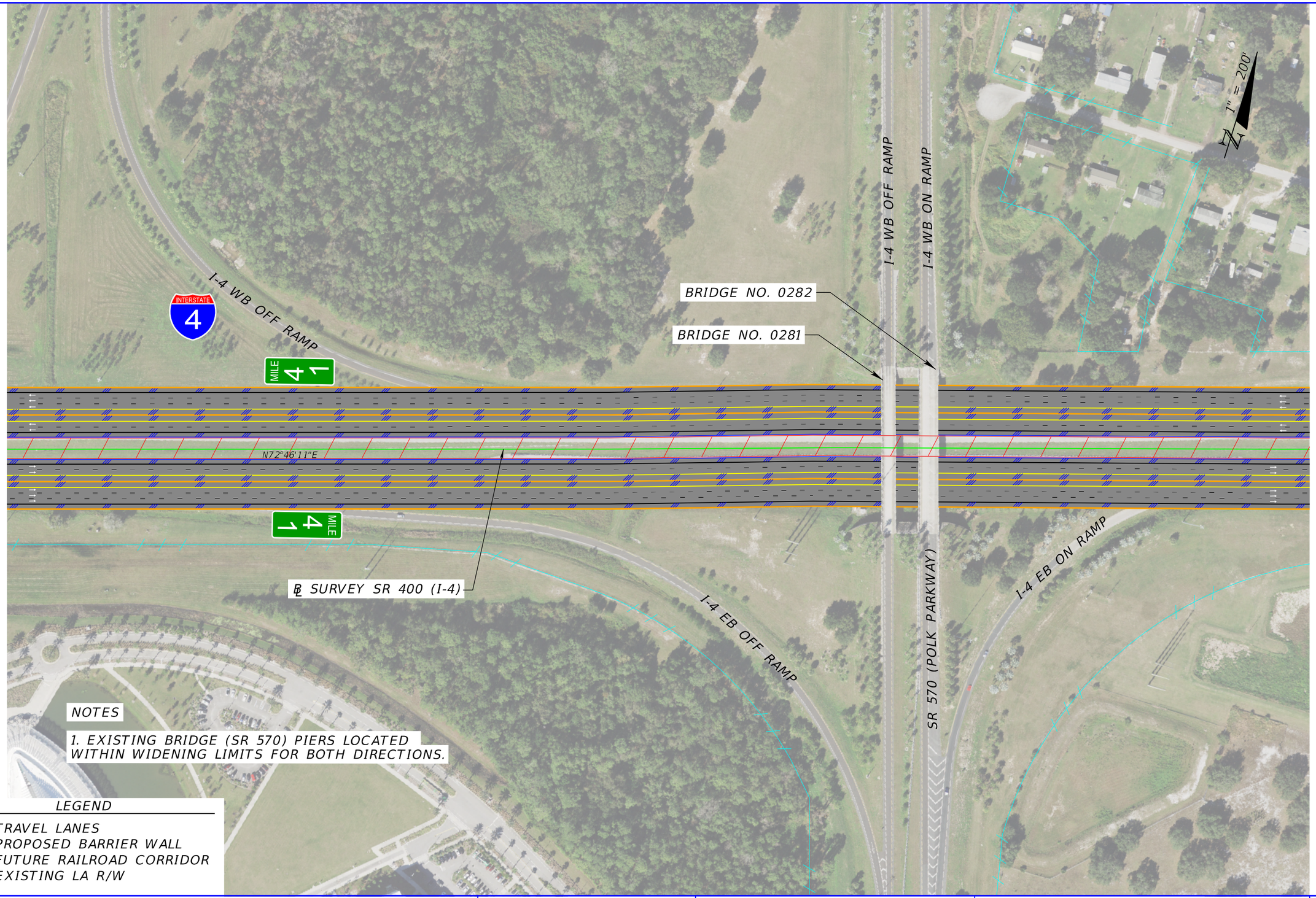

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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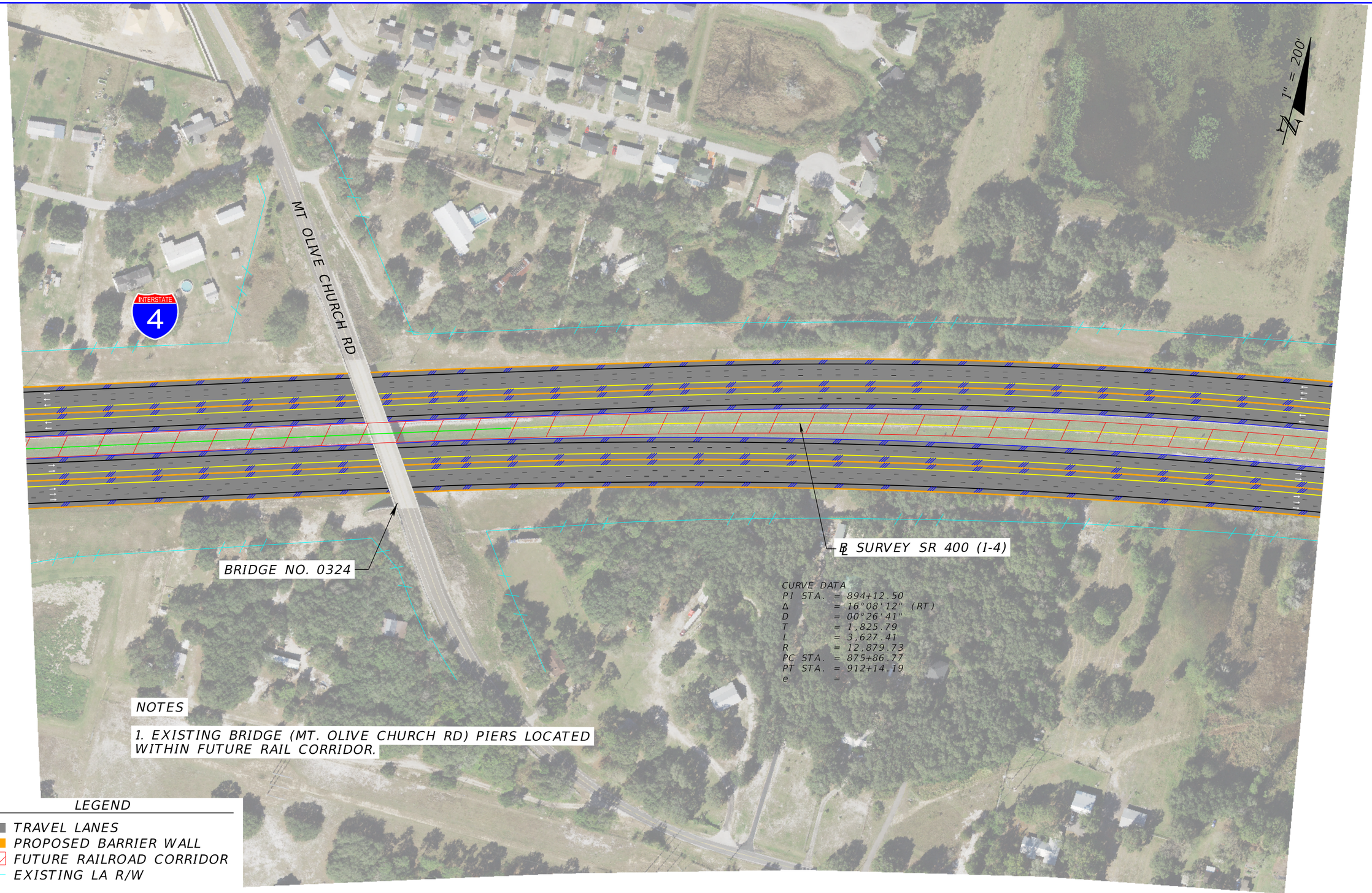

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 PHASE II MASTER PLAN CONCEPT PLAN II	SHEET NO.
ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
SR 400	POLK	442512-1-12-01		31

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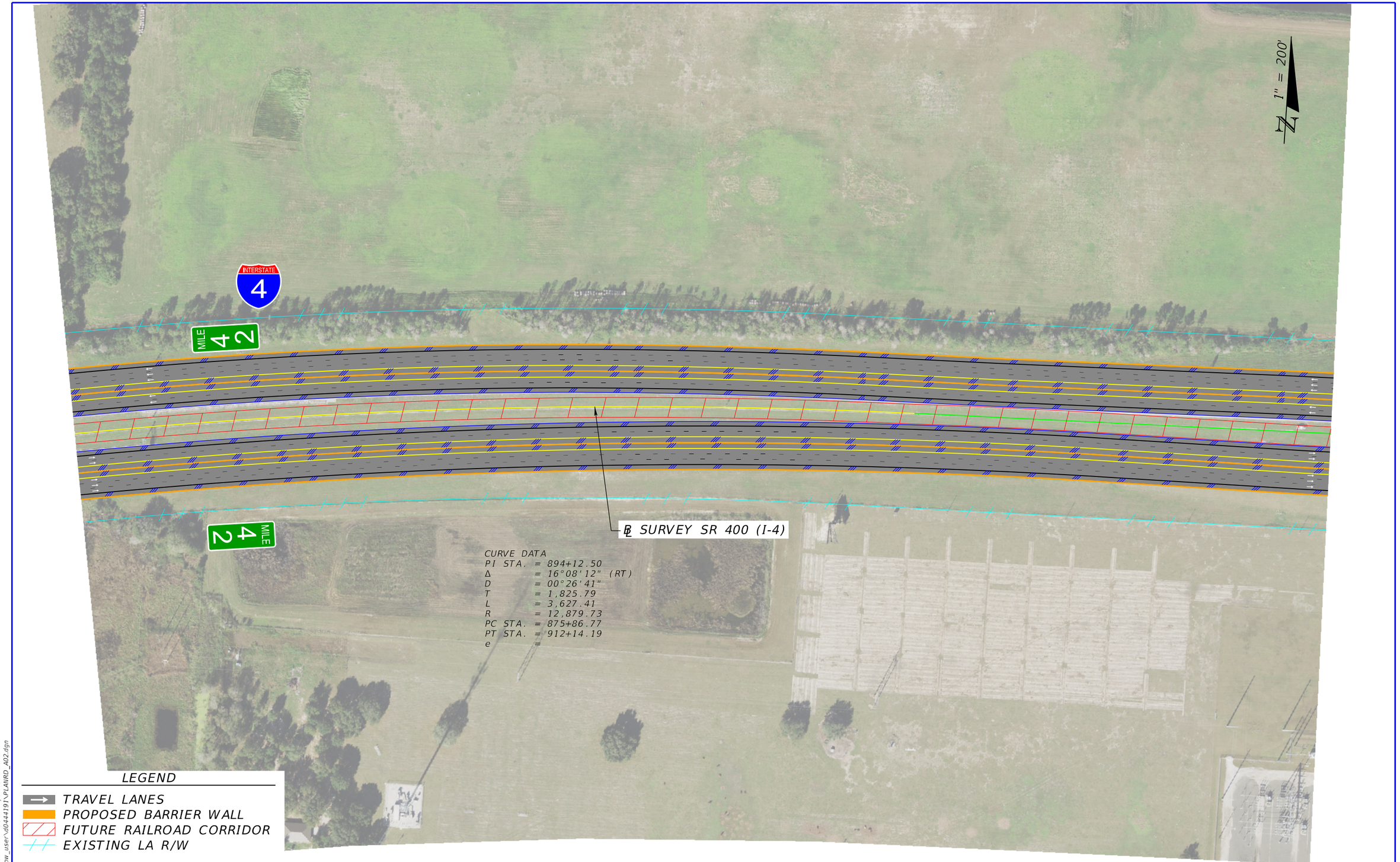

REVISIONS					STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	I-4 PHASE II MASTER PLAN CONCEPT PLAN II	32
					SR 400	POLK	442512-1-12-01		

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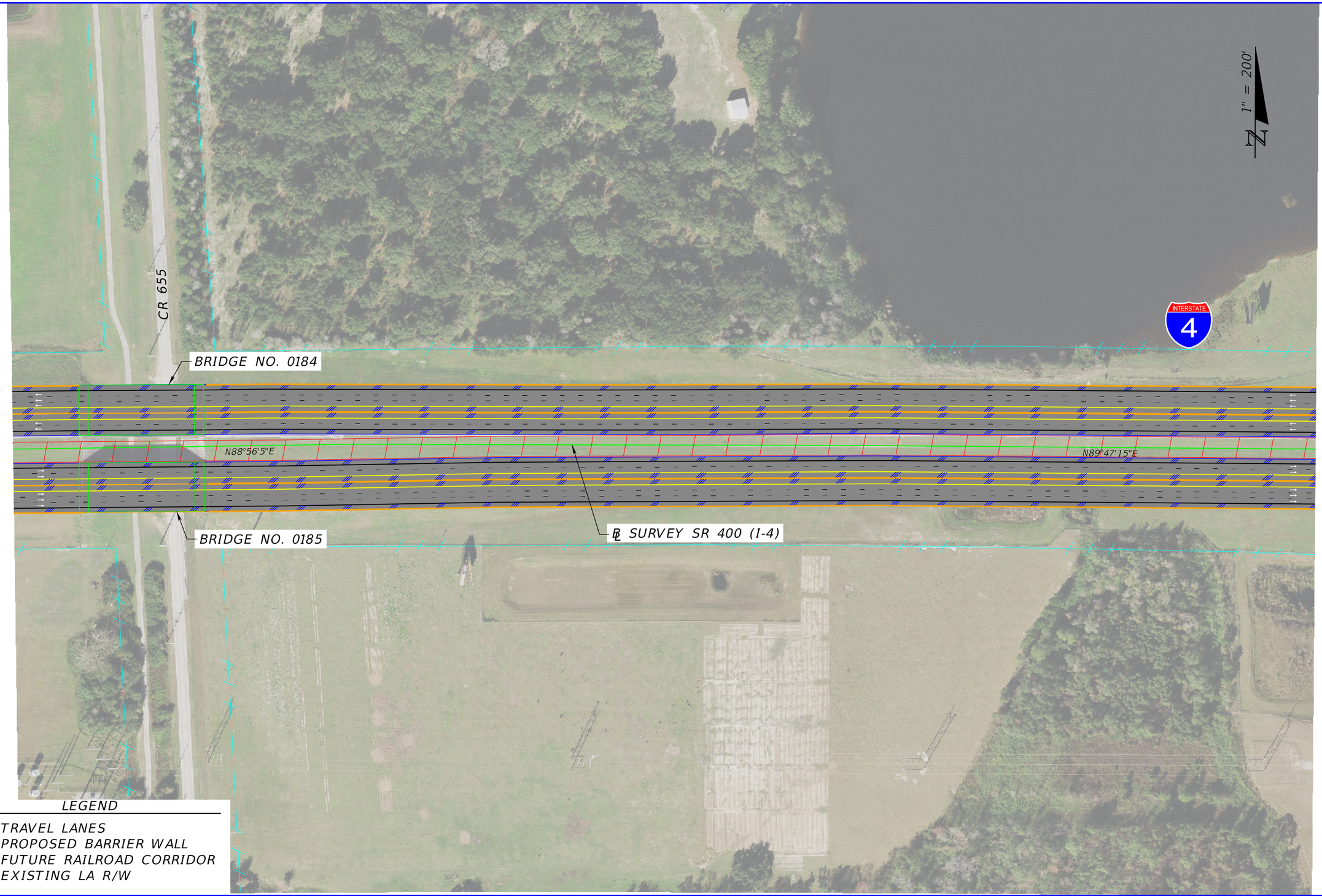

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 33

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LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 34

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REVISIONS				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 PHASE II MASTER PLAN CONCEPT PLAN II	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 400	POLK	442512-1-12-01		35

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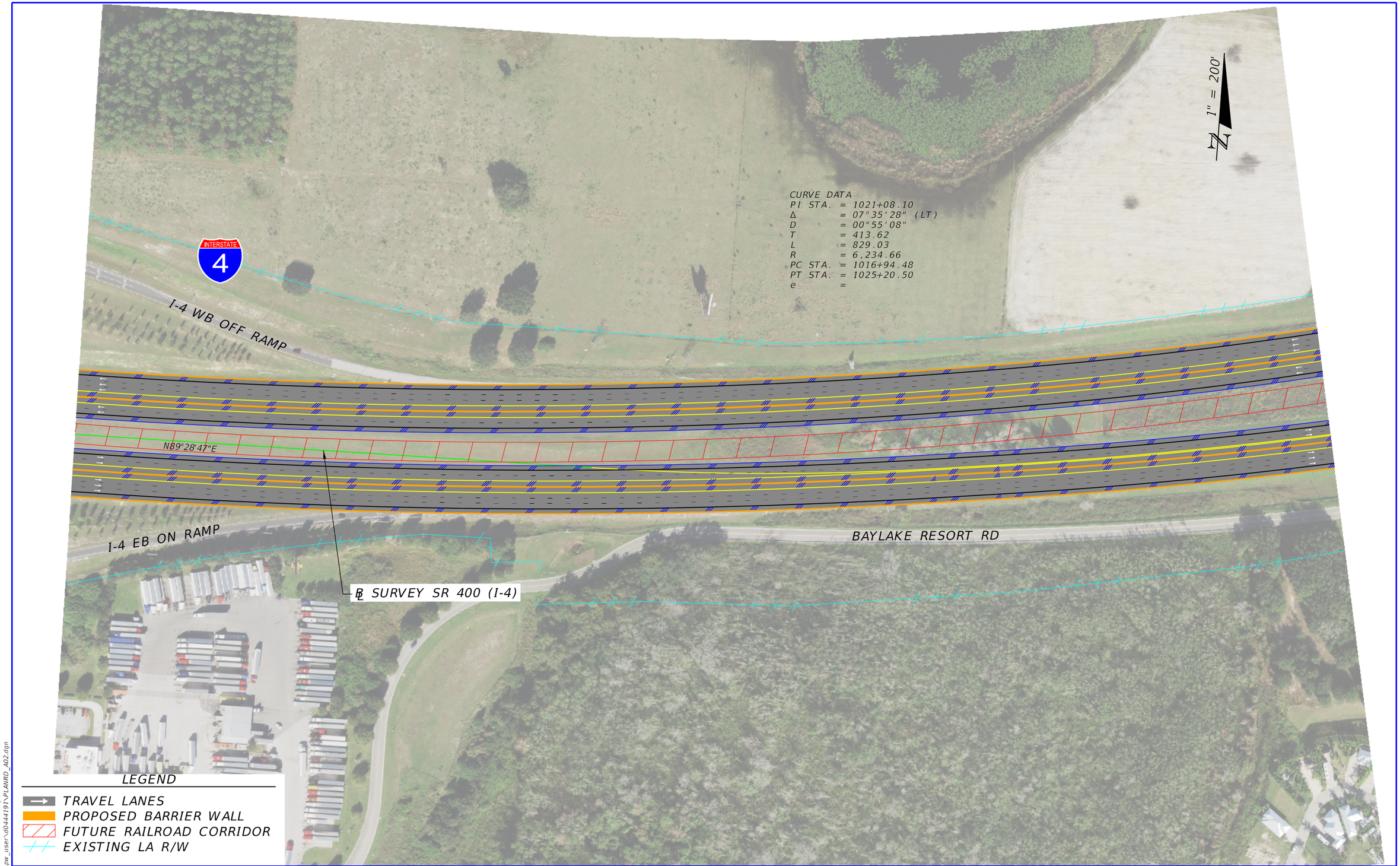

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 36

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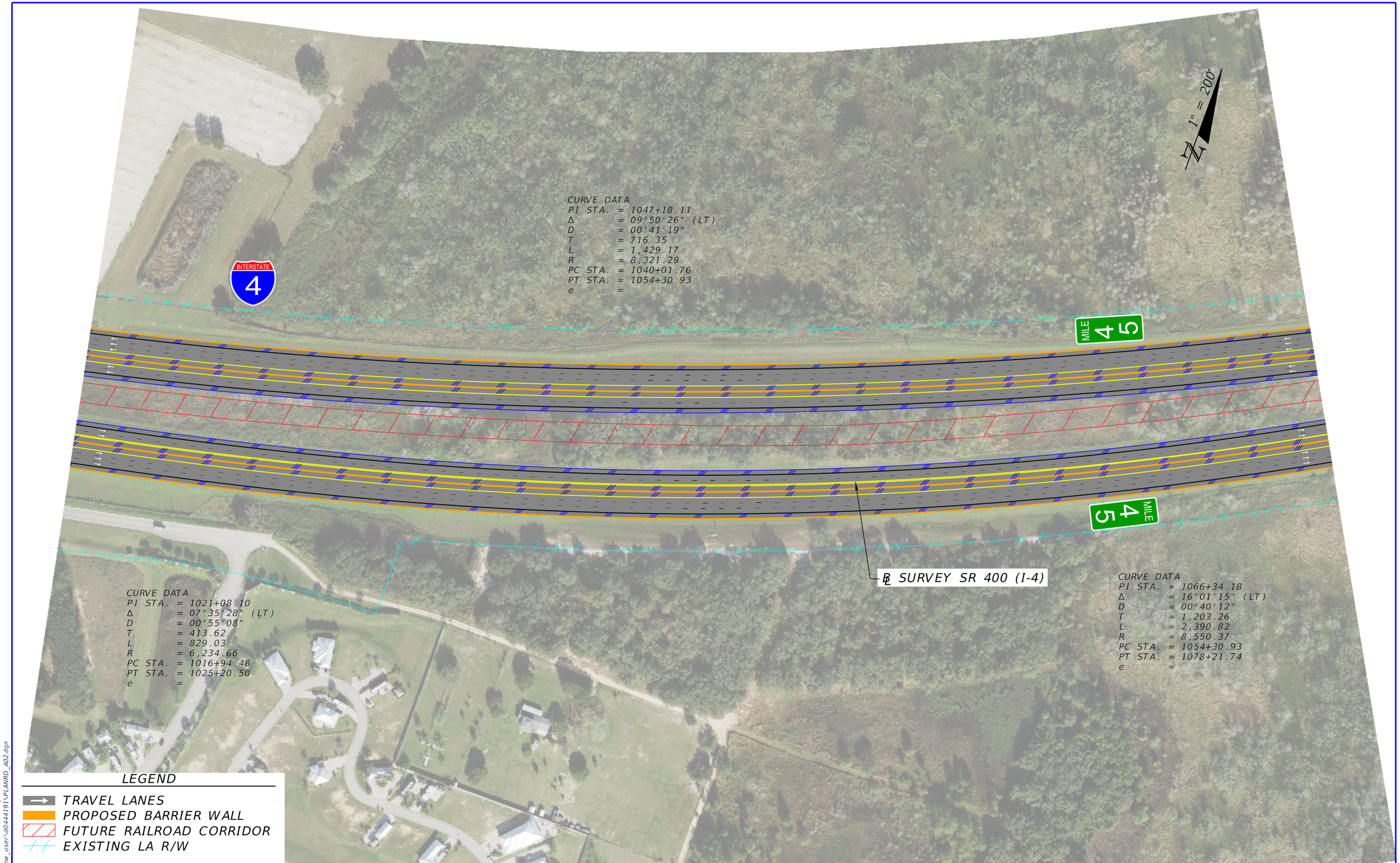

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 37

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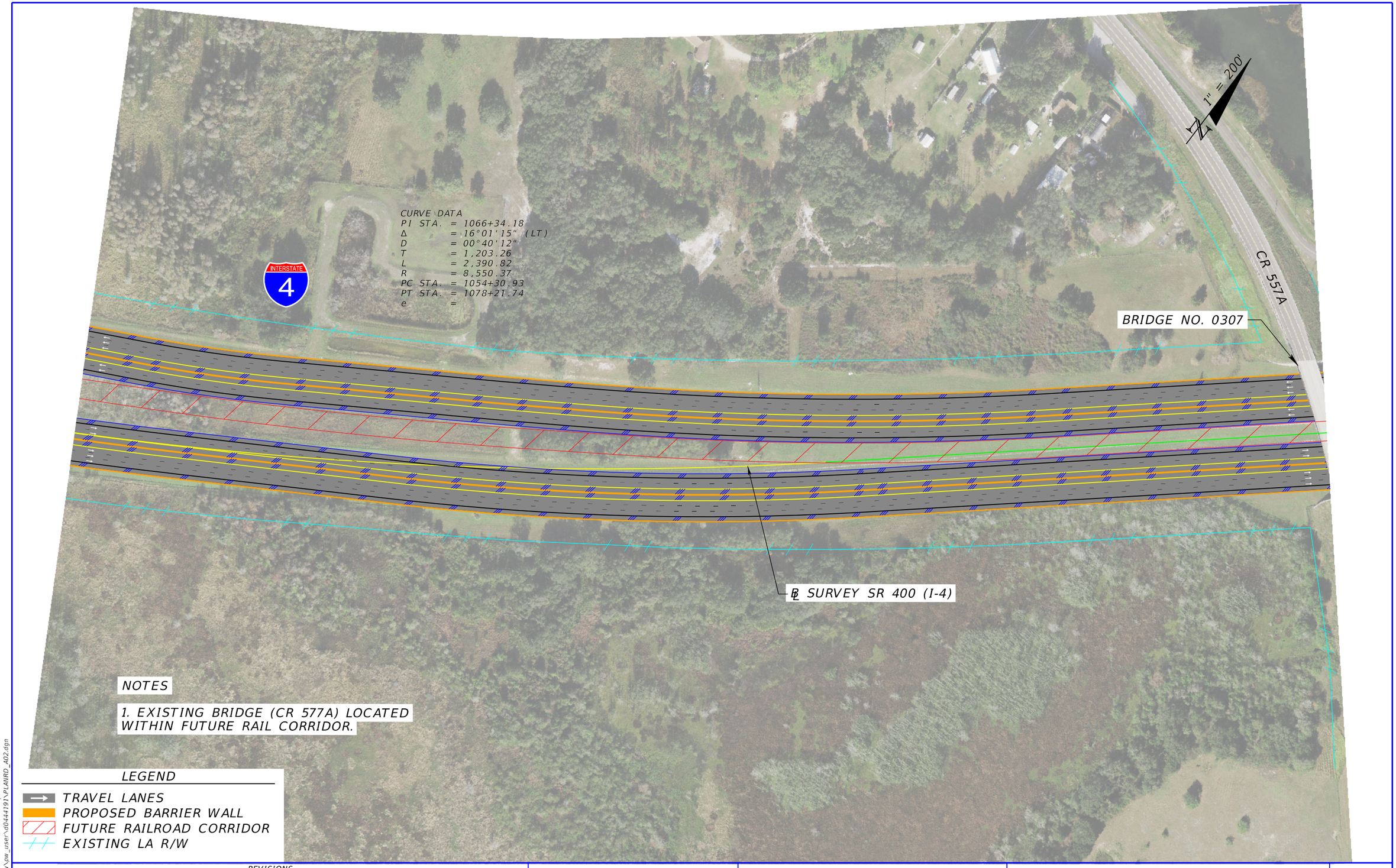

NOTES

1. EXISTING BRIDGE (CR 577A) LOCATED WITHIN FUTURE RAIL CORRIDOR.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 38

8/16/2023 10:16:09 AM USER: ryan.rockford
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HOLY COW RD

INTERSTATE 4

MILE 46

N49°28'14"E

CR 557A

BRIDGE NO. 0307

℄ SURVEY SR 400 (I-4)

MILE 47

CURVE DATA
PI STA. = 1132+09.59
Δ = 16°14'18" (RT)
D = 00°11'59"
T = 4,093.26
L = 8,131.64
R = 28,691.90
PC STA. = 1091+16.33
PT STA. = 1172+47.97
e =

NOTES

1. EXISTING BRIDGE (CR 577A) LOCATED WITHIN FUTURE RAIL CORRIDOR.

POLK COUNTY I-4 REST AREA EASTBOUND

1" = 200'

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- EXISTING R/W

8/16/2023 10:16:15 AM USER: ryan.rockford
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 39

POLK COUNTY I-4 REST AREA
WESTBOUND

HOLY COW RD

1" = 200'

INTERSTATE 4

℄ SURVEY SR 400 (I-4)

CURVE DATA
PI STA. = 1132+09.59
Δ = 16°14'18" (RT)
D = 00°11'59"
T = 4,093.26
L = 8,131.64
R = 28,691.90
PC STA. = 1091+16.33
PT STA. = 1172+47.97
e =

LEGEND
- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- EXISTING R/W

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REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 40

1" = 200'

INTERSTATE 4

MILE 47

MILE 47

℄ SURVEY SR 400 (I-4)

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D = 00°11'59"
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L = 8,131.64
R = 28,691.90
PC STA. = 1091+16.33
PT STA. = 1172+47.97
e =

OLD POLK CITY RD

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

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REVISIONS				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 PHASE II MASTER PLAN CONCEPT PLAN II	SHEET NO.
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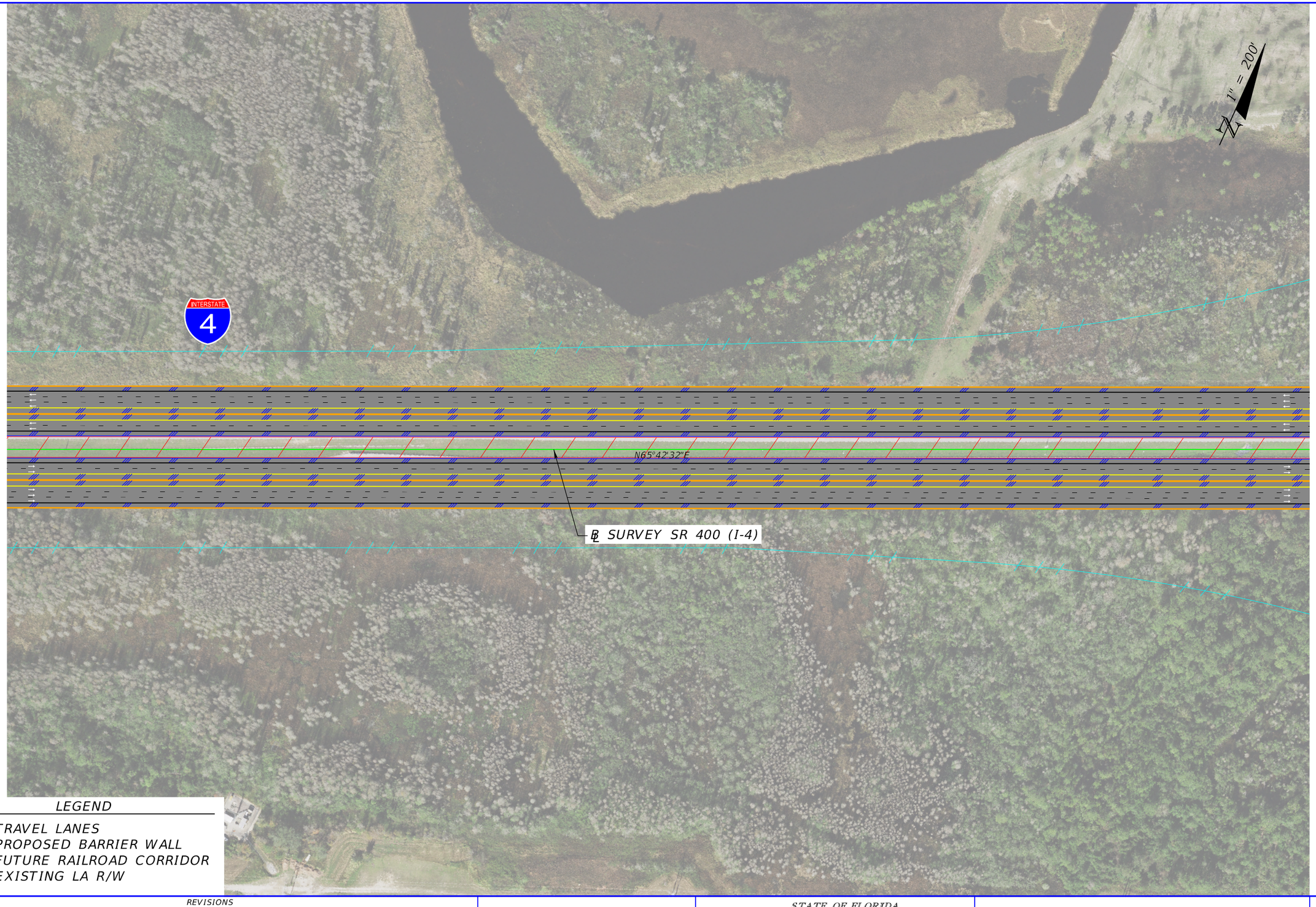

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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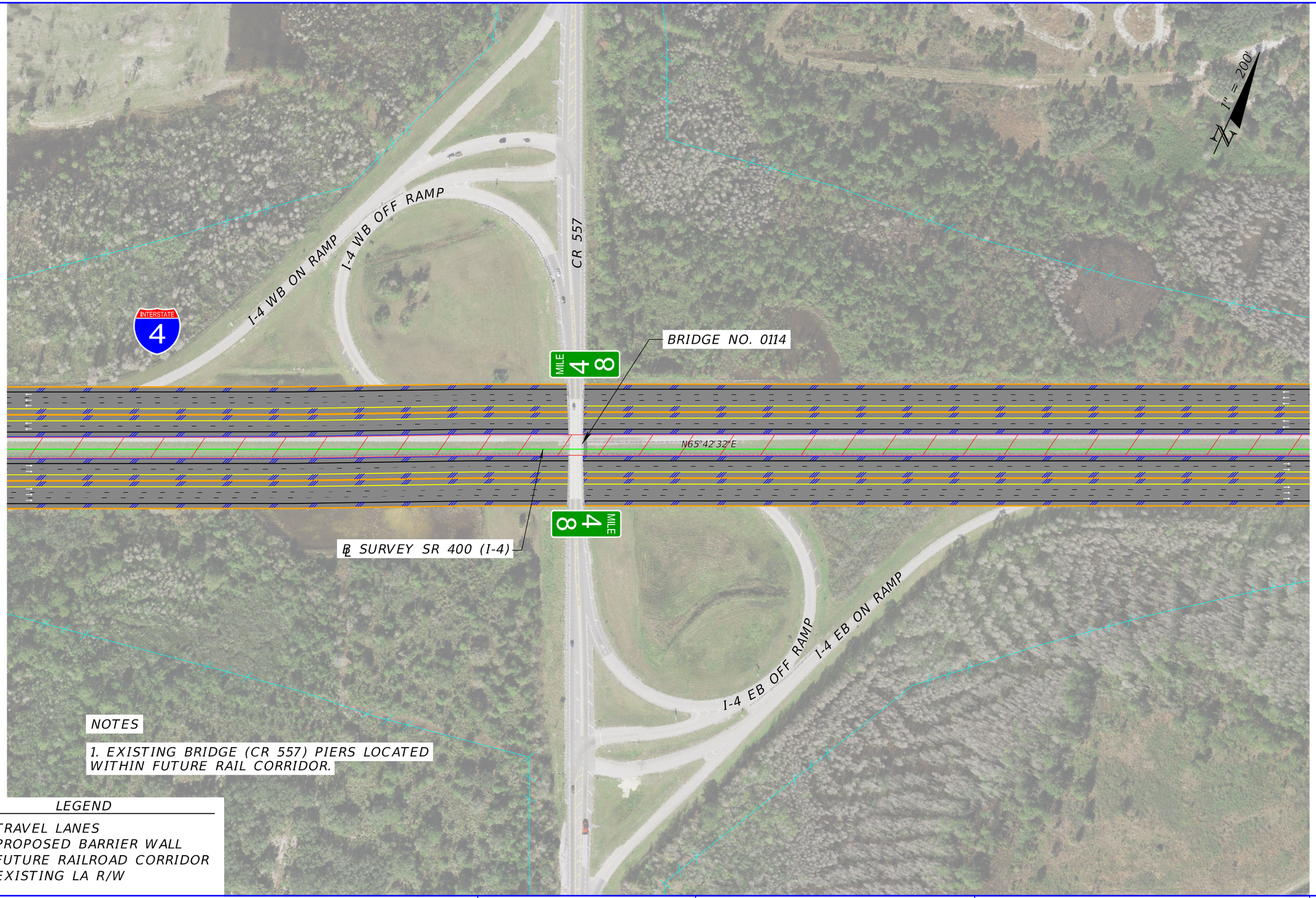

NOTES

1. EXISTING BRIDGE (CR 557) PIERS LOCATED WITHIN FUTURE RAIL CORRIDOR.

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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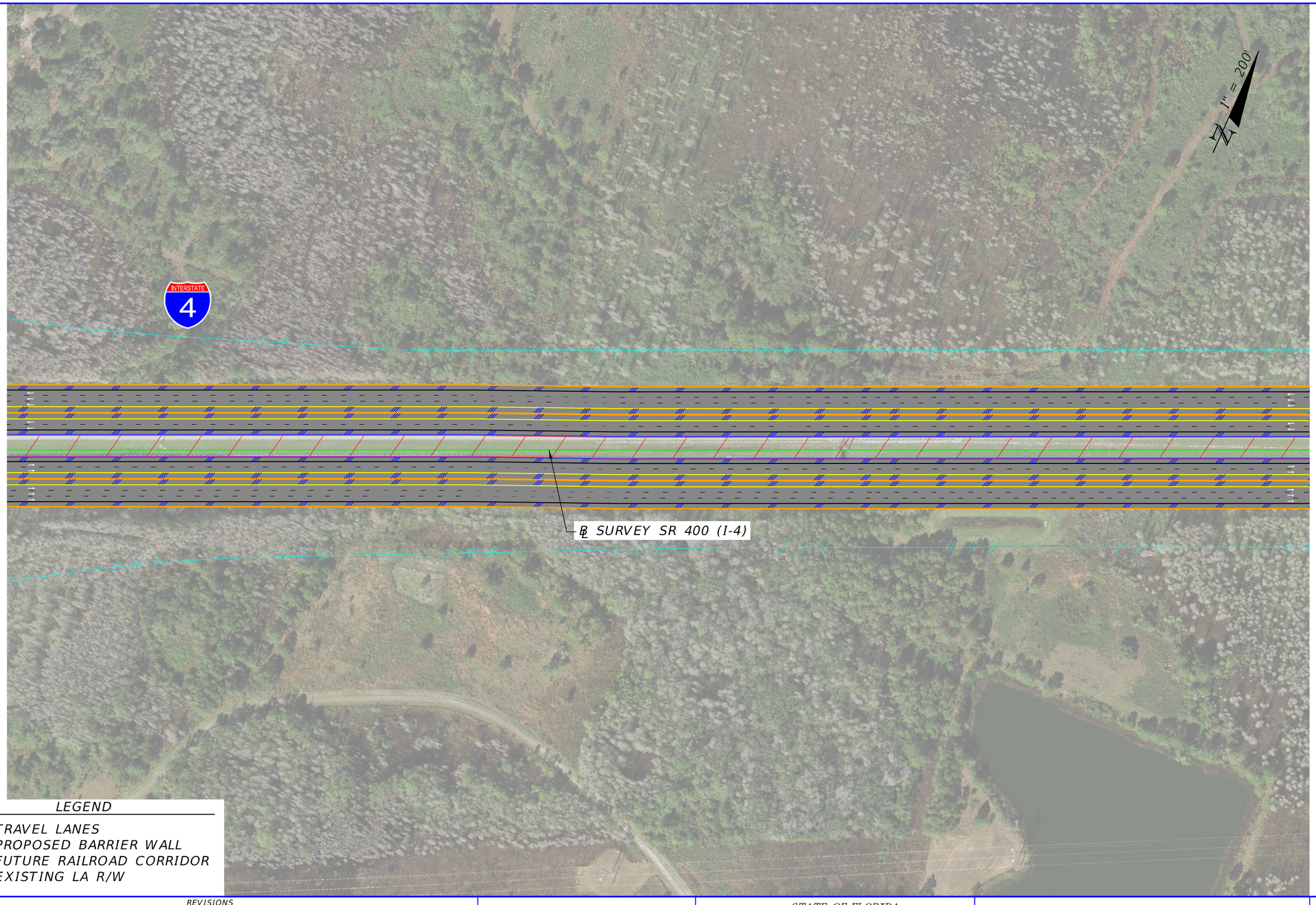

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- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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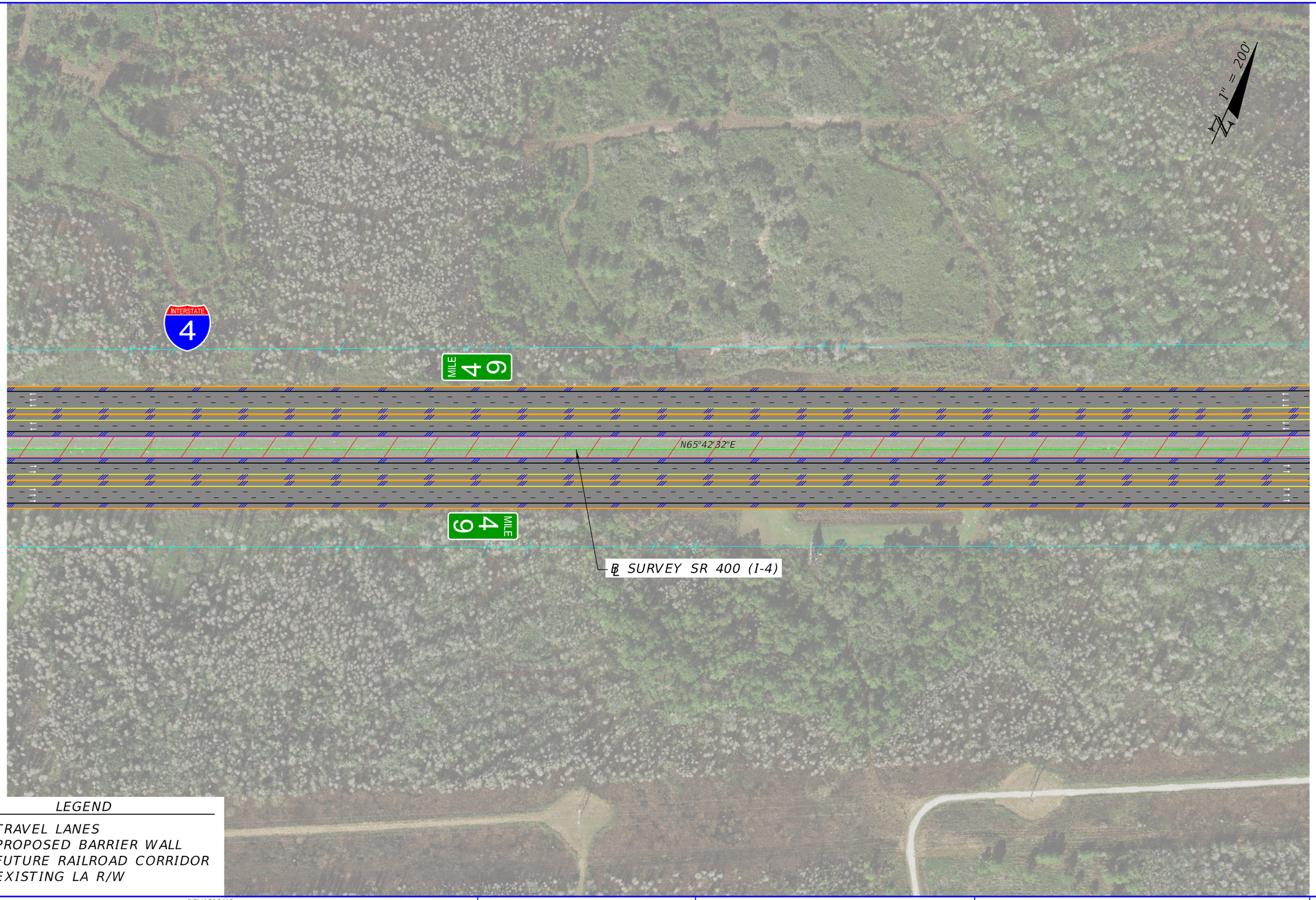

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 PHASE II MASTER PLAN CONCEPT PLAN II	SHEET NO.
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LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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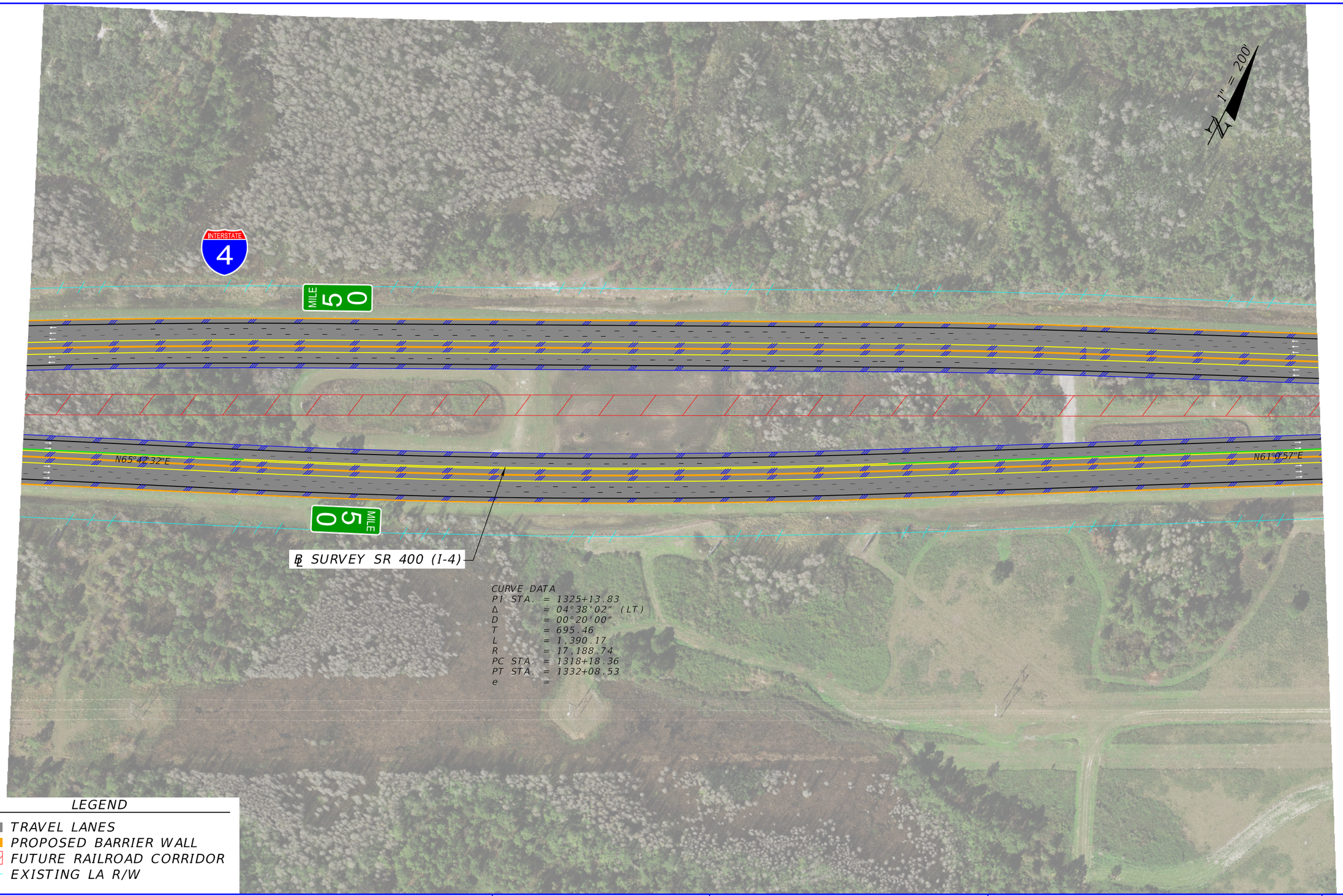

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REVISIONS				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 PHASE II MASTER PLAN CONCEPT PLAN II	SHEET NO.
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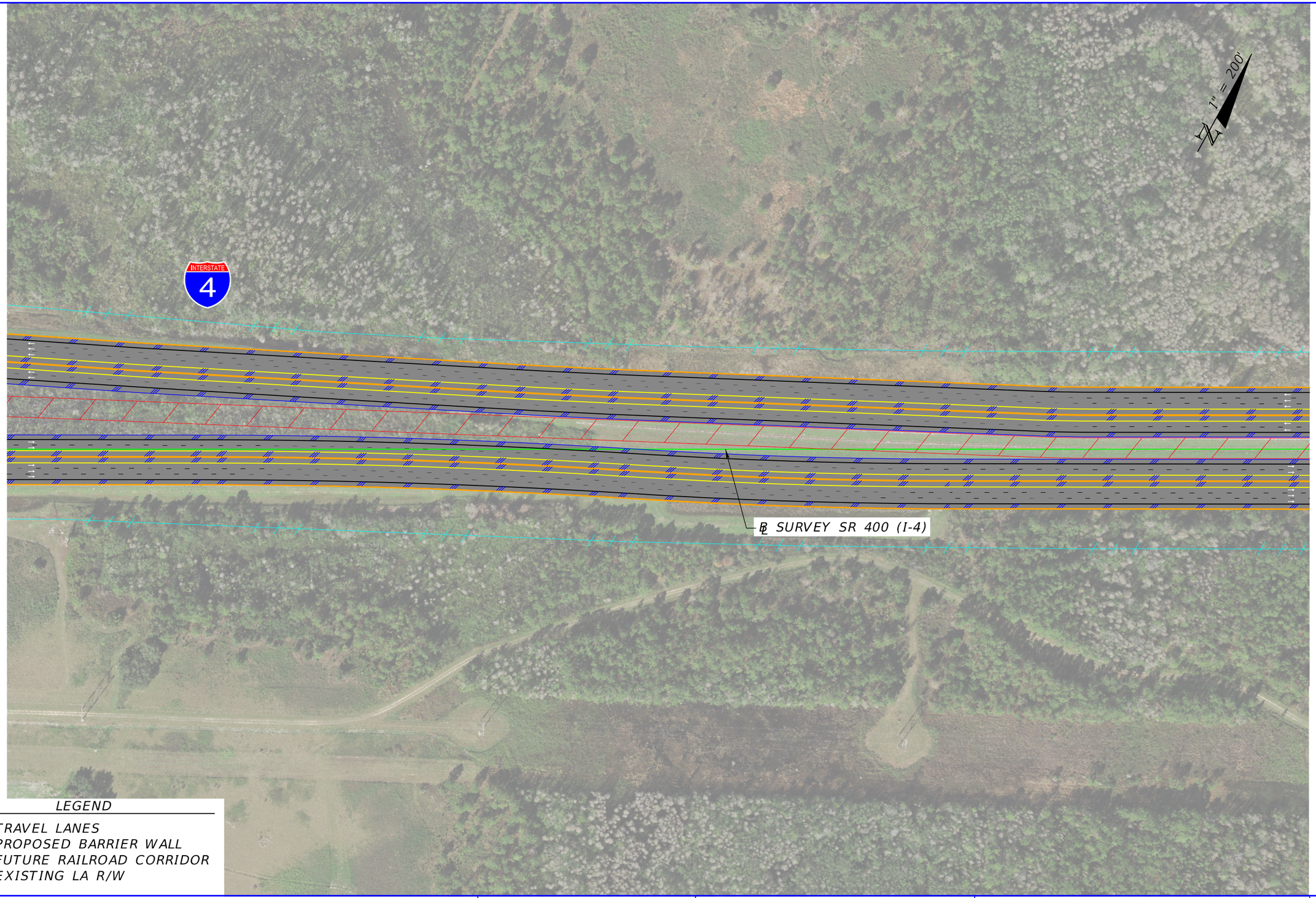

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS				RS&H, INC. 1715 N WESTSHORE BLVD, SUITE 600 TAMPA, FL 33607	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 PHASE II MASTER PLAN CONCEPT PLAN II	SHEET NO.
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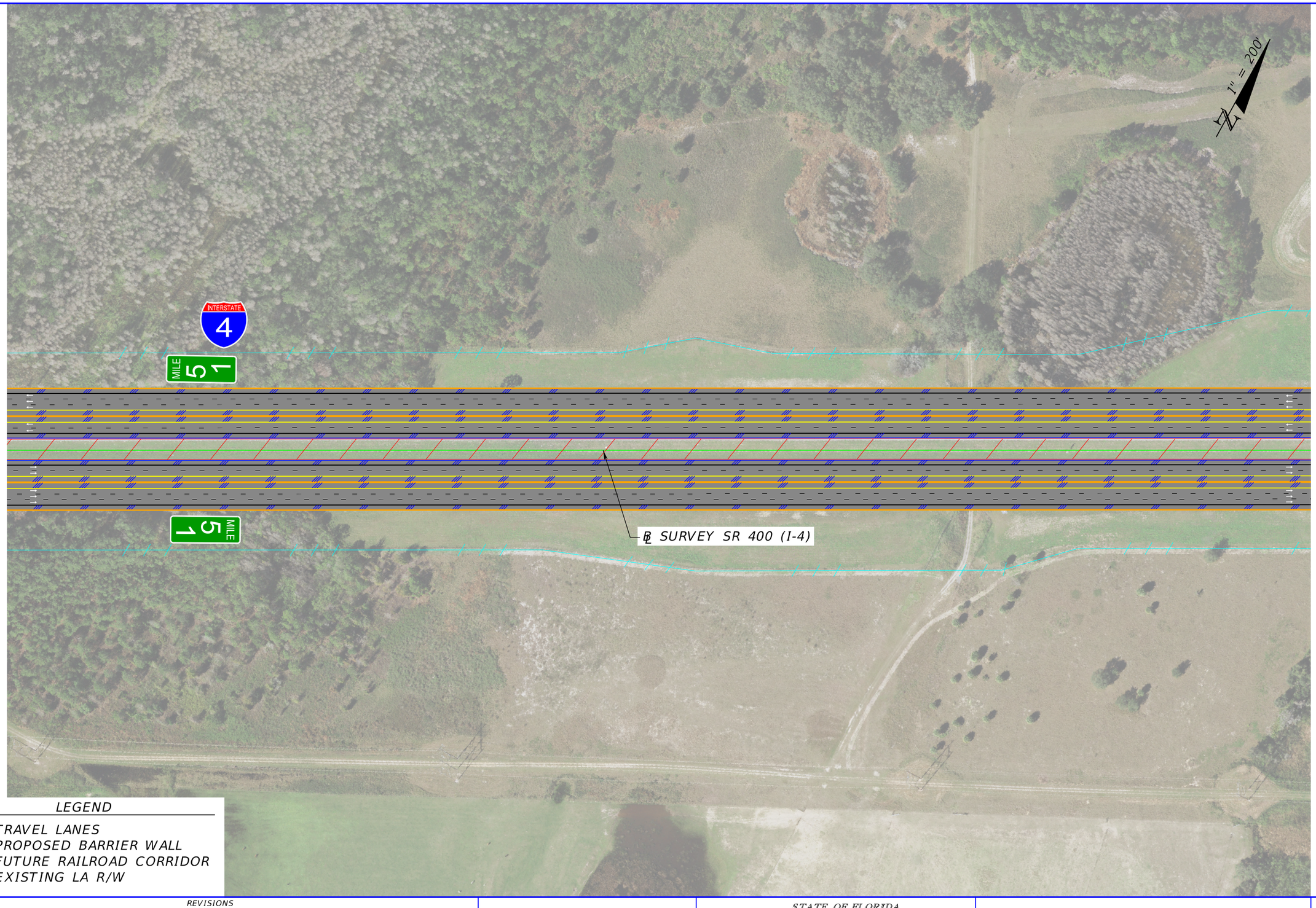

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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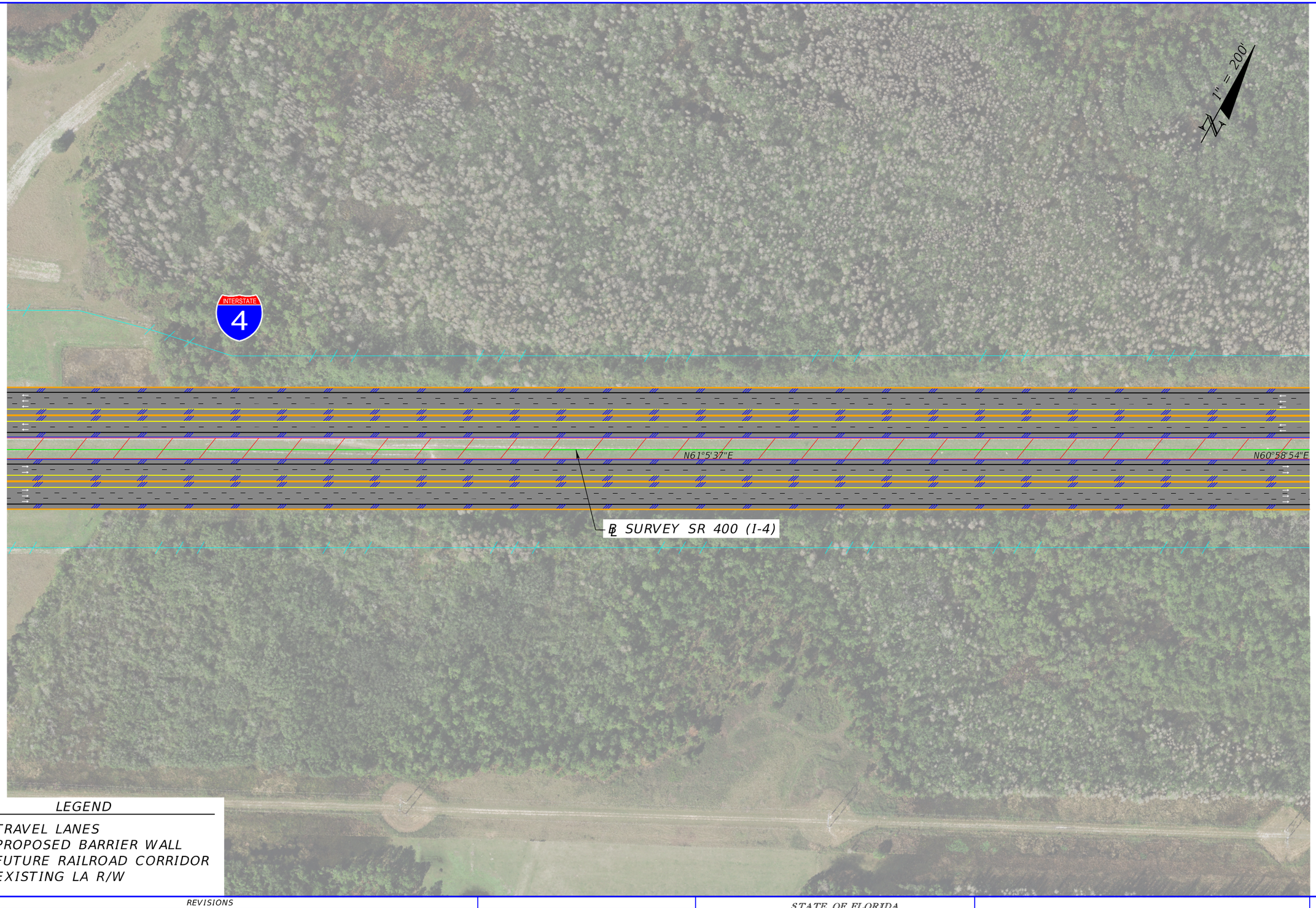

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W

REVISIONS					
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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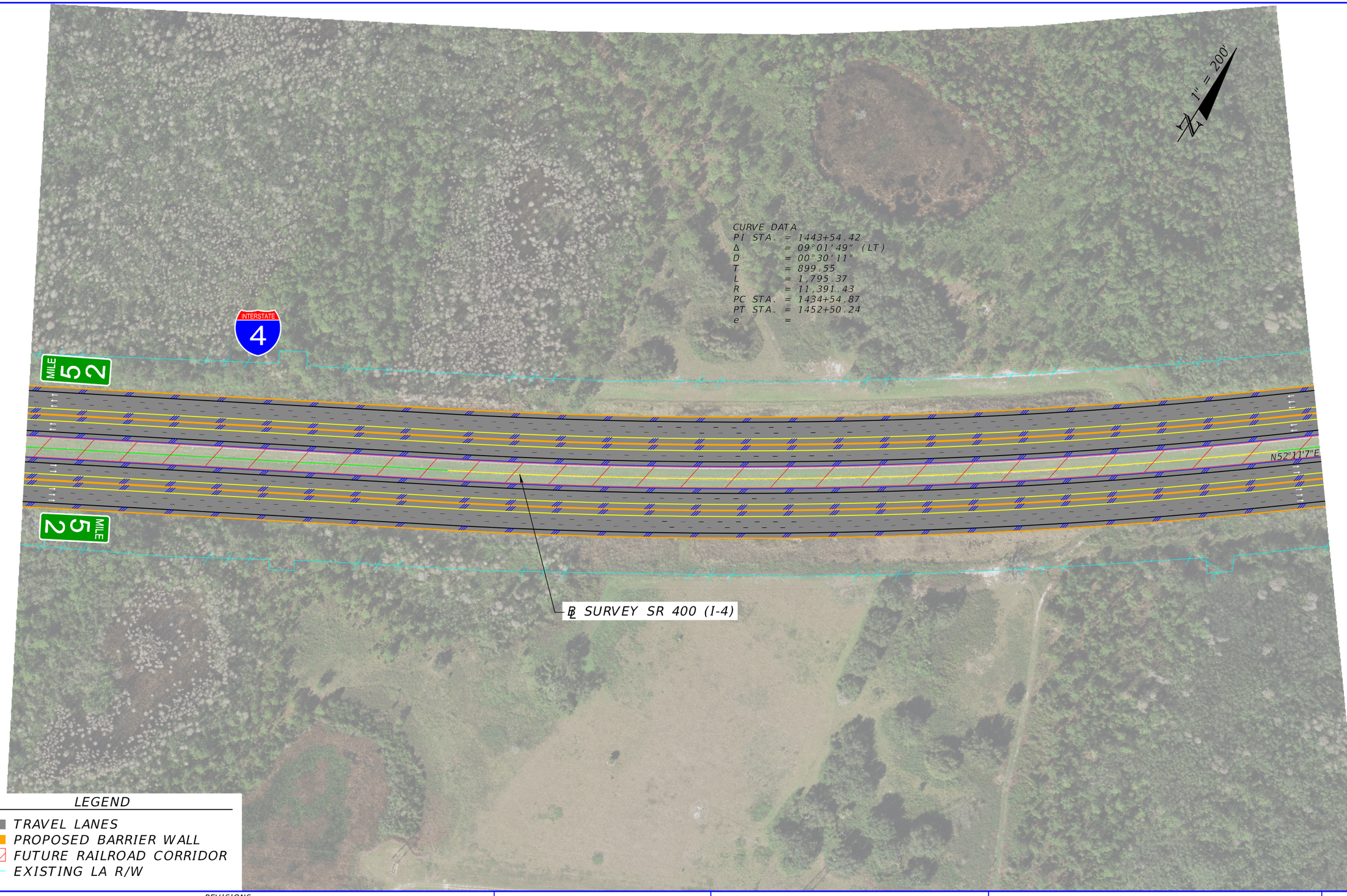

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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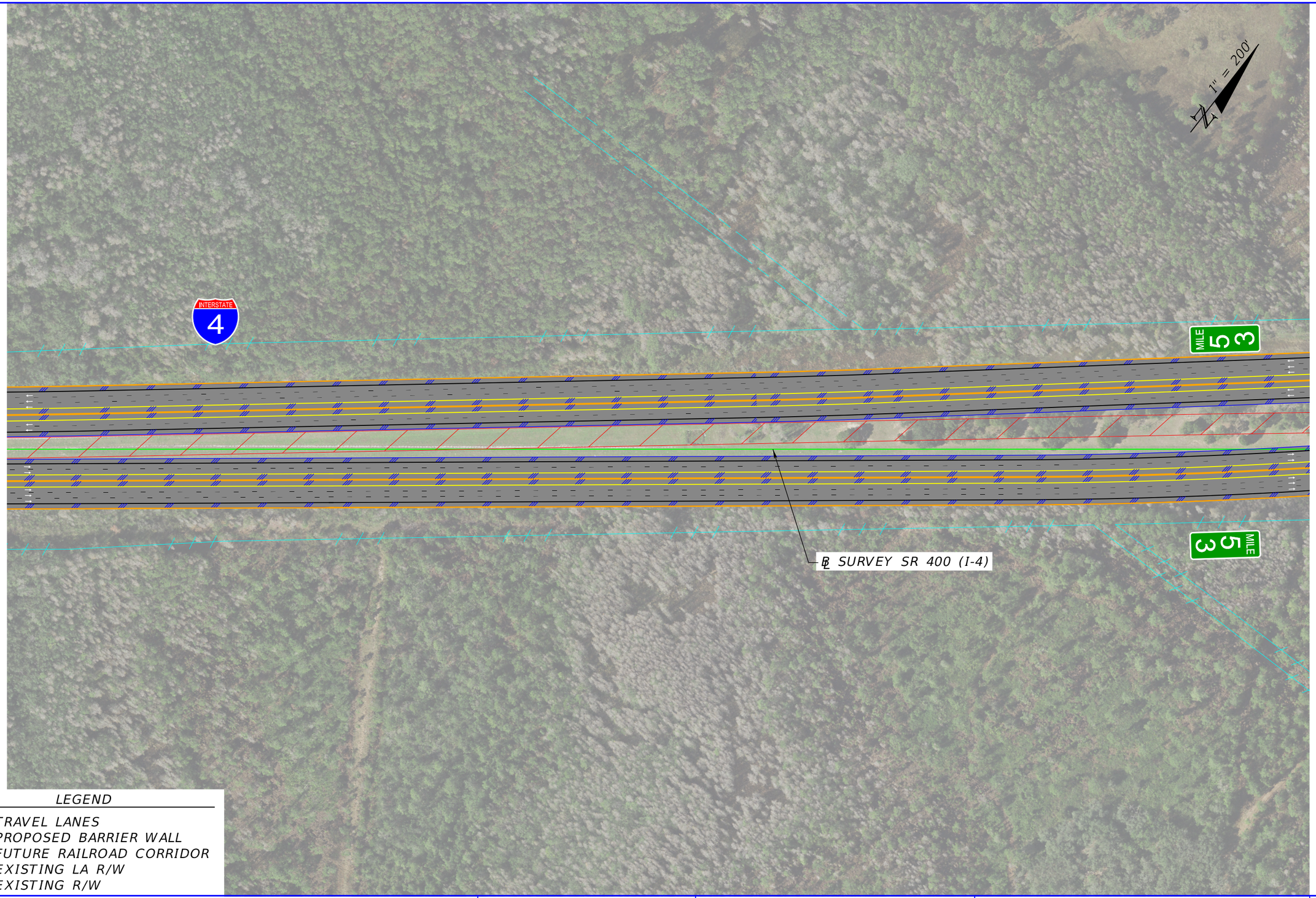

LEGEND

- TRAVEL LANES
- PROPOSED BARRIER WALL
- FUTURE RAILROAD CORRIDOR
- EXISTING LA R/W
- EXISTING R/W

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
1715 N WESTSHORE BLVD, SUITE 600
TAMPA, FL 33607

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

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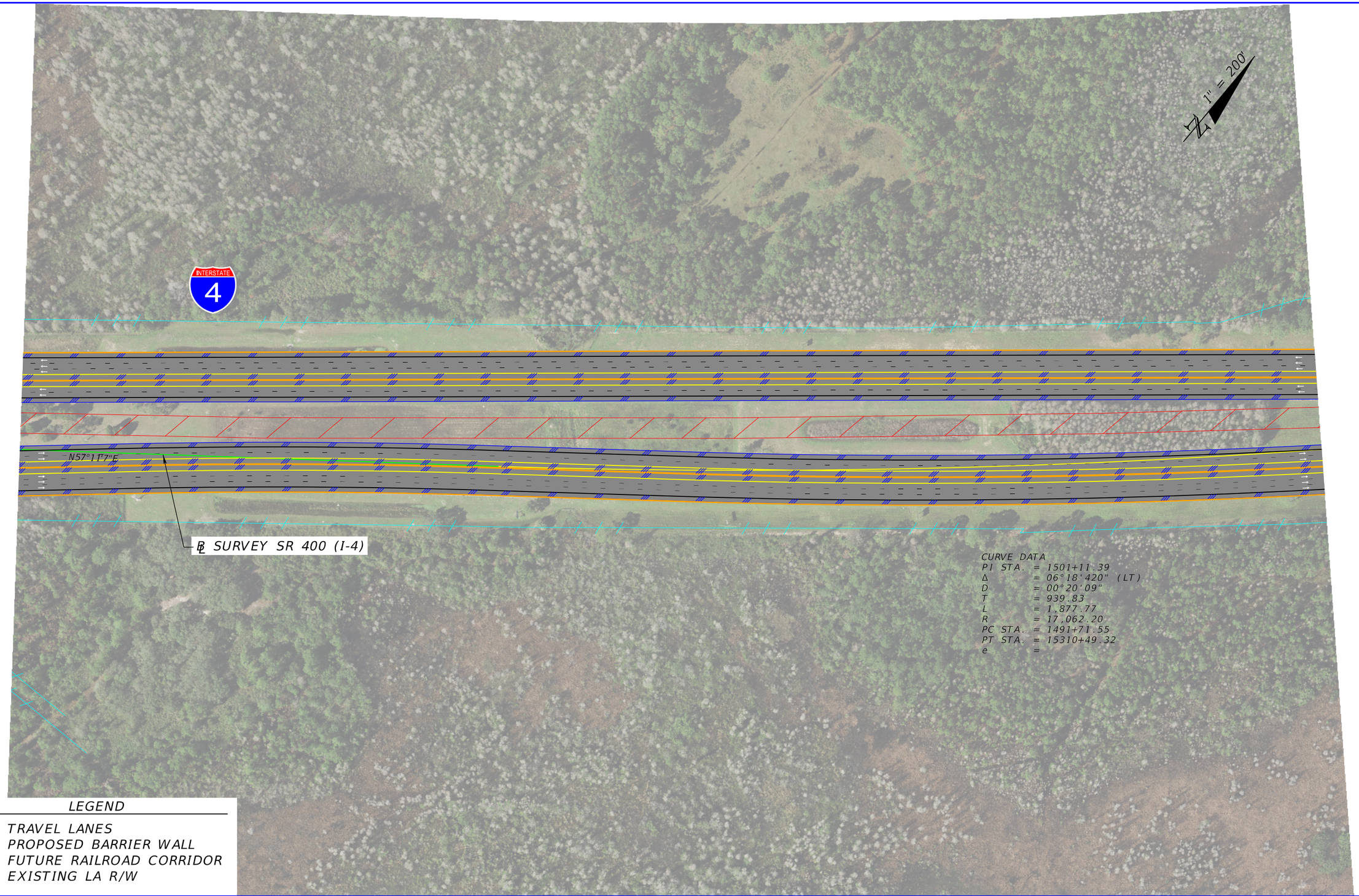

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 53

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	442512-1-12-01

I-4 PHASE II MASTER PLAN CONCEPT PLAN II

SHEET NO. 54

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Appendix C

MEMORANDUM

Date: May 31, 2023

To: Michael Coleman, RS&H

From: Domingo Noriega and Tanzina Atique, AECOM

Project: Master Plan Study I-4 (SR 400) from West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2) Financial Project Identification (FPID) Nos.: 442512-1; 442512-2

Subject: Revised Draft Build Alternatives Traffic Analysis Memo (Phase 2)

Florida Department of Transportation (FDOT) District One has initiated a Master Plan study for Interstate 4 (I-4)(SR 400) in Polk County. The study limits extend from west of SR 570 (Polk Parkway) to west of US 27 interchange, about 27.6 miles in length and traverses the major urban area of Lakeland in Polk County. I-4 supports vital commerce and tourism of the state as it connects employment and population centers, including Tampa, Lakeland, Orlando, and Daytona Beach, within Florida. It is one of few east-west limited access facilities in the central portion of the state along with Florida's Turnpike. I-4 is also a designated state hurricane evacuation route and part of Florida's Strategic Intermodal System (SIS) highway network.

Project Background

I-4 Feasibility Study for Phase 1 was completed in October 2021. The study consists of data collection, traffic analyses and public involvement with a focus on the I-4 mainline. Also, it defines the area of traffic influence, determines the year when interchanges are anticipated to fail, and identifies the locations where improvements are needed. A summary of Build Alternatives evaluated under Phase 1 Feasibility Study is as follows:

- Build Alternative 1 – Add 2 general use lanes (GULs) in each direction
- Build Alternative 2 – Add 2 buffer separated express lanes (ELs) in each direction
- Build Alternative 3 – Add 2 barrier separated express lanes (ELs) in each direction
- Build Alternative 4 – Add 1 GUL and 1 HOV lane in each direction

Note: Buffer/barrier separation does not affect traffic operations, so Alternative 2 and Alternative 3 were analyzed as Alternative 2 at the Feasibility stage. Based on operational and safety analyses as well as public input collected, Build Alternative 1 and 2 were recommended to be evaluated further in the Phase 2.

Phase 2 Feasibility Study

It was established that the primary purpose of Phase 2 of the Feasibility Study was to develop interchange improvements, identify long and short-term capacity needs along the I-4 mainline and managed lanes ***(referred to as Express Lanes herein***), and address capacity deficiencies of segments identified as operating below the Level of Service (LOS) target (LOS D) adopted for this facility as part of the Strategic Intermodal System (SIS) designation. The Memorandum of Agreement (MOA) for Phase 2 has been approved by FDOT District One and the I-4 Master Plan team (attached in **Appendix A**) on October 10, 2022.

Following improvements are assumed for the Phase 2 traffic analysis:

No-Build Alternative

- I-4 interchange improvements at CSX Railroad (bridge replacement)
- SR 33 interchange modification - roundabout
- SR 557 interchange modification – roundabout
- SR 559 interchange ramp terminals – signalized

Build Alternative 1

I-4 mainline widening from six to ten lanes: addition of two General Purpose Lanes (GPLs) on each direction.

Build Alternative 2

I-4 mainline widening from six to ten lanes: addition of two Express/High Occupancy Toll (HOT) lanes on each direction.

The purpose of this Draft Build Alternative Traffic Analysis memorandum is to document the Build Alternatives traffic analysis using the Synchro (signalized intersection), SIDRA (roundabout) and HCS (freeway mainline) software for Design Year 2045 within the study limits. Existing conditions Vissim calibration and future analysis using Vissim model for the I-4 at US 98 and I-4 at North Socrum Road/Lakeland Hills Boulevard interchanges along with adjacent arterial intersections will be submitted in a separate memo. The Facility Enhancement Element memorandum will address long-term improvements for I-4.

1.0 Purpose and Need Statement

The purpose of the I-4 Master Plan is to address deficiencies in operational capacity of I-4 in Polk County, also known as Florida's State Road (SR) 400, from west of SR 570 (Polk Parkway) to west of US 27 interchange in Polk County to accommodate future travel demand projected as a result of population and employment growth along the corridor. I-4 also serves significant freight distribution centers in Polk County. Capacity deficiencies are present under the existing condition and are expected to increase in the future. The goal of this Phase 2 study is to evaluate the potential addition of managed lanes, additional general-use lanes, and develop interchange improvements.

Other goals of the project are to:

- Preserve the operational integrity and regional functionality of I-4 (and, therefore, the regional transportation network) by complementing similar corridor improvements to the east and west
- Enhance emergency evacuation and response times

The need for this project is based on the following criteria:

Capacity/Transportation Demand: The project is anticipated to improve traffic operations on I-4 by increasing capacity and better dispersing traffic (i.e., separating managed lanes traffic from general-use traffic). The traffic dispersal and reduced congestion can decrease vehicle conflicts and, therefore, enhance travel conditions of the corridor. Under the current condition, the queue on the I-4 segments approaching US 27 from the west backs up significantly (about 5 miles) at evening peak hours. I-4 within the project limits currently operates at Level of Service (LOS) C to F, with annual average daily traffic volumes ranging from 74,000 vehicles to 140,000 vehicles per day (source: FDOT Florida Traffic Online 2021). Traffic volumes on the corridor are projected to increase to between 151,800 and 203,400 vehicles per day by 2045 (source: I-4 Master Plan Phase 1 Traffic Projection). If the proposed project improvements do not occur, the operating conditions along the corridor will continue to deteriorate as the traffic increases.

Safety: I-4 serves as part of the emergency evacuation route network designated by the Florida Division of Emergency Management. Also designated as an evacuation facility of Polk County, I-4 is vital in facilitating traffic during emergency evacuation periods as it connects to other major arterials and highways of the state evacuation route network [such as SR 570 (Polk Parkway) and US 27].

The project is anticipated to:

- Improve emergency evacuation capabilities by enhancing connectivity and accessibility to other major arterials designated on the state evacuation route network;
- Increase traffic volumes that can be evacuated during an emergency event, and
- Allow for enhanced emergency access and incident response time due to the ability to maintain operational speeds within the managed lanes.

System Linkage: As part of Florida's SIS highway network, I-4 plays a significant role in facilitating commuter, visitor, and freight traffic within the state. The proposed project improvements are part of a larger, regional set of projects on the interstate system to the west [in Hillsborough, Pinellas, Manatee, Sarasota, Charlotte, Lee, and Collier Counties] where managed lanes, additional general use lanes and auxiliary lanes are being considered to increase the operational capacity of not only I-4 but I-75 and I-275 as well. The intent is for all these project improvements to work together to improve the overall reliability and performance of the interstate system in moving high volumes of goods and people at efficient speeds. It is important to note that managed lanes also create an opportunity for the provision of efficient and reliable transit service. As such, these improvements are critical to enhancing regional mobility. They are also key in preserving the operational integrity and regional functionality of the I-4 corridor.

2.0 Project Limits

This project is located along I-4 from west of SR 570 (Polk Parkway) to west of US 27 interchange. The study area is shown in **Figure 1.**

The study area includes seven existing service interchanges on I-4 and two system interchanges at I-4 and Polk Parkway. The on-and off-ramps and merge/diverge areas for the existing interchanges are encompassed along I-4 and Polk Parkway. The interchanges are listed below:

- I-4 and SR 570 (Polk Parkway) System-to-System Interchange
- I-4 and US 92/SR 546 (West Memorial Boulevard)
- I-4 and SR 539 (Kathleen Road)
- I-4 and US 98/SR 35/SR 700
- I-4 and CR 582 (North Socrum Loop Road)/SR 33 (Lakeland Hills Boulevard)
- I-4 and SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)
- I-4 and SR 570 (Polk Parkway) System-to-System Interchange
- I-4 and SR 559
- I-4 and SR 557

This section of I-4 consists of a six-lane divided typical section with a maximum posted speed limit of 70 miles per hour. The functional classification of I-4 within the project limits is Urban Principal Arterial – Interstate. Existing right of way along the corridor ranges from approximately 300 feet to 450 feet in width.

3.0 Data Collection

Traffic and Crash Data

Data collection for the study consists of information from the FDOT, local government officials and other sources as available. It includes existing and field collected data. Sources of information include, but not limited to:

- Straight Line Diagrams (SLDs)
- Roadway Characteristic Inventory (RCI) Data
- Florida Geographic Data Library (FGDL) Geographic Information System (GIS) Data
- FDOT Design Standards
- Latest Five-Year Crash History
- Existing Traffic Signal Timings
- Existing AADT counts along mainline and ramps from the FDOT FTO
- Traffic count data, and
- District One Regional Planning Model (D1RPM v 2.0) 2015 Base Year and 2045 Cost Feasible Model

Figure 1. Project Location and Study Area (Sheet 1 of 3)

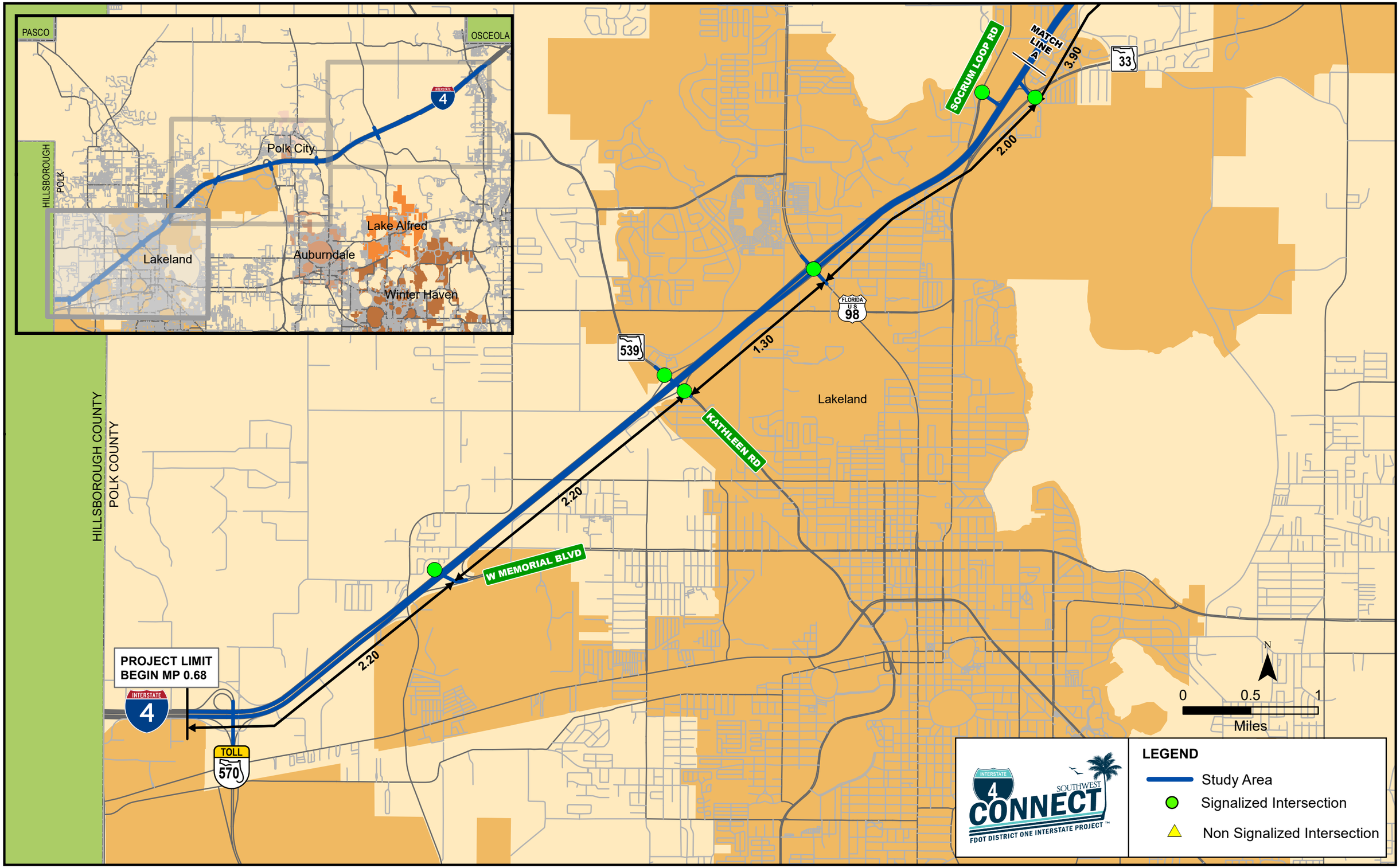


Figure 1. Project Location and Study Area (Sheet 2 of 3)

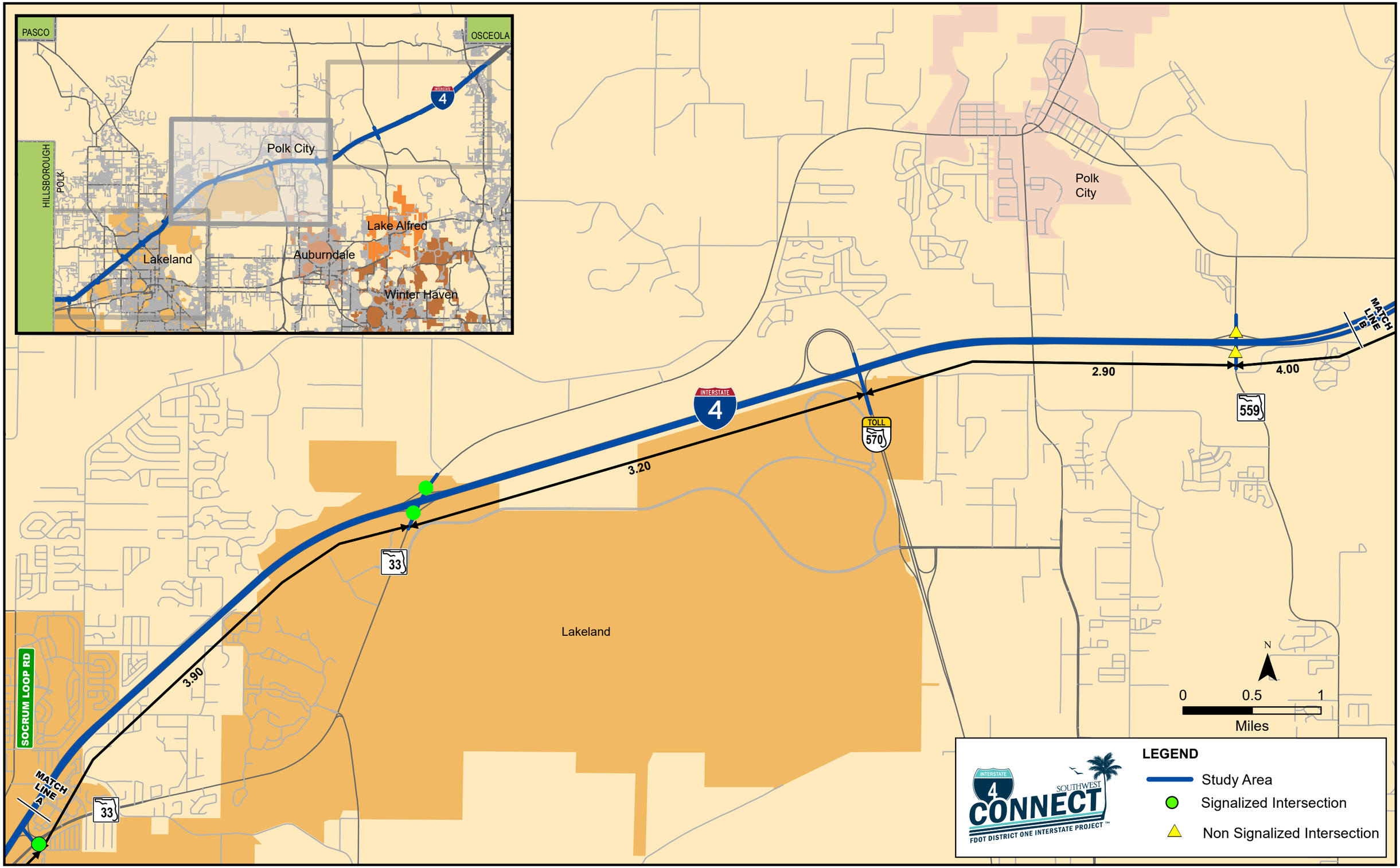


Figure 1. Project Location and Study Area (Sheet 3 of 3)



Based on approved methodology and the scope of service, an assessment of future traffic conditions and year of failure analysis from Phase 1, recent Turning Movement Counts (TMC) were collected at specific locations as discussed below. Other TMCs were considered from Phase 1 traffic analysis.

Traffic Counts

24-hour volume tube counts (bi-directional approach volumes at 15-minute increments with hourly totals) and concurrent 4-hour (two-hour AM and two-hour PM) vehicle turning movement counts (TMC) (at 15-minute increments with hourly totals) for peak periods (7AM to 9 AM and 4PM to 6 PM) were conducted in mid-August 2022 at the following locations (See **Figure 2**):

- US 98 at Lakeland Square Mall (4-hour TMC)
- US 98 at Lakeland Park Center Drive (4-hour TMC)
- US 98 Ramp Terminals (4-hour TMC)
- US 98 at Pyramid Parkway (4-hour TMC)
- US 98 at Griffin Road (4-hour TMC)
- N Socrum Loop Road at Lakeland Park Blvd (4-hour TMC)
- N Socrum Loop Road at Old Combee Road (4-hour TMC)
- Lakeland Hills Blvd. at Melody Lane (4-hour TMC)
- N Socrum Loop/Lakeland Hills Blvd Ramp Terminals (4-hour TMC)
- SR 33 Ramp Terminals (4-hour TMC)
- SR 559 Ramp Terminals (4-hour TMC and including 24-hour volume counts)
- SR 557 Ramp Terminals (4-hour TMC)

Figure 2 Traffic Count Locations (Sheet 1 of 3)

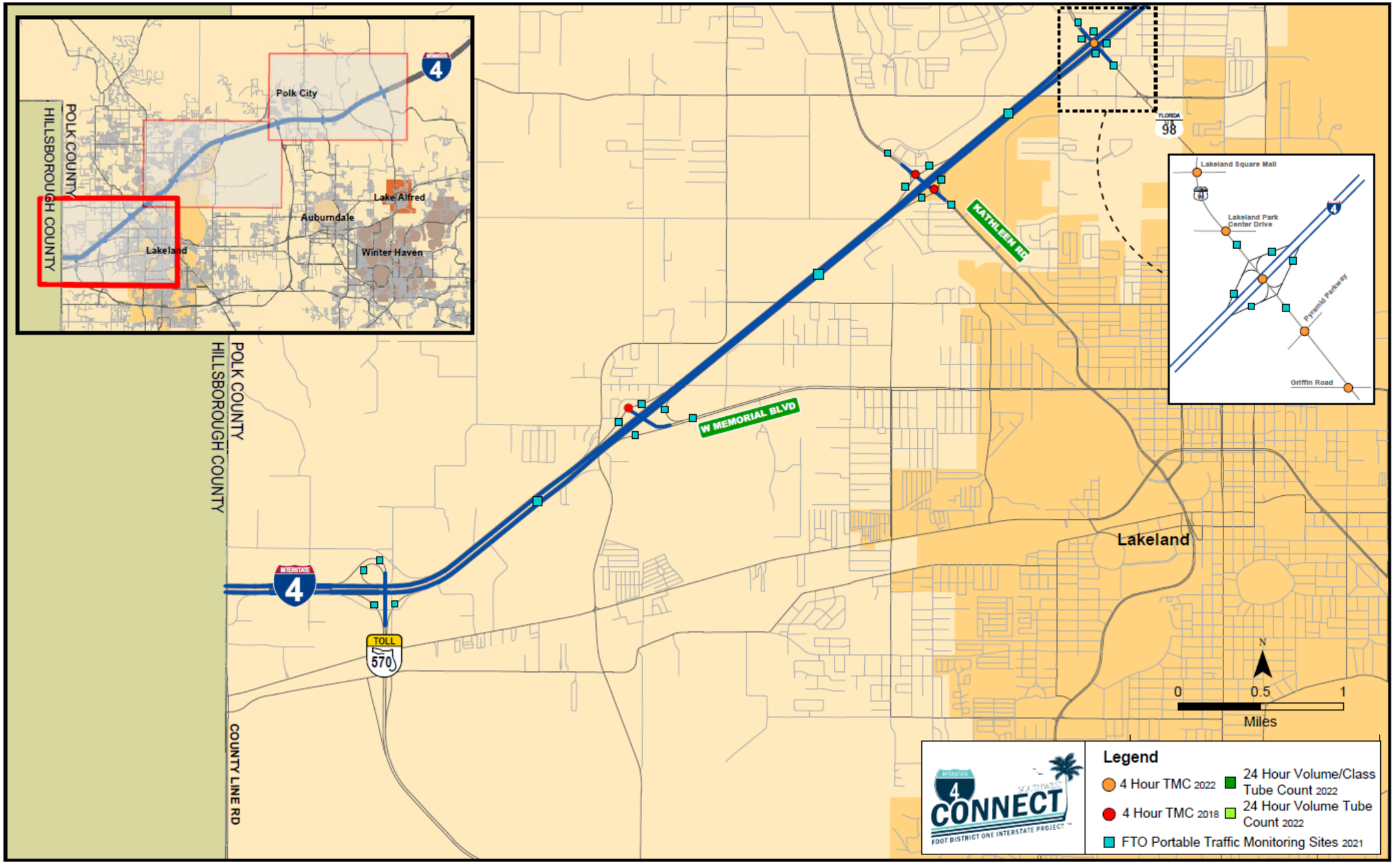


Figure 2 Traffic Count Locations (Sheet 2 of 3)

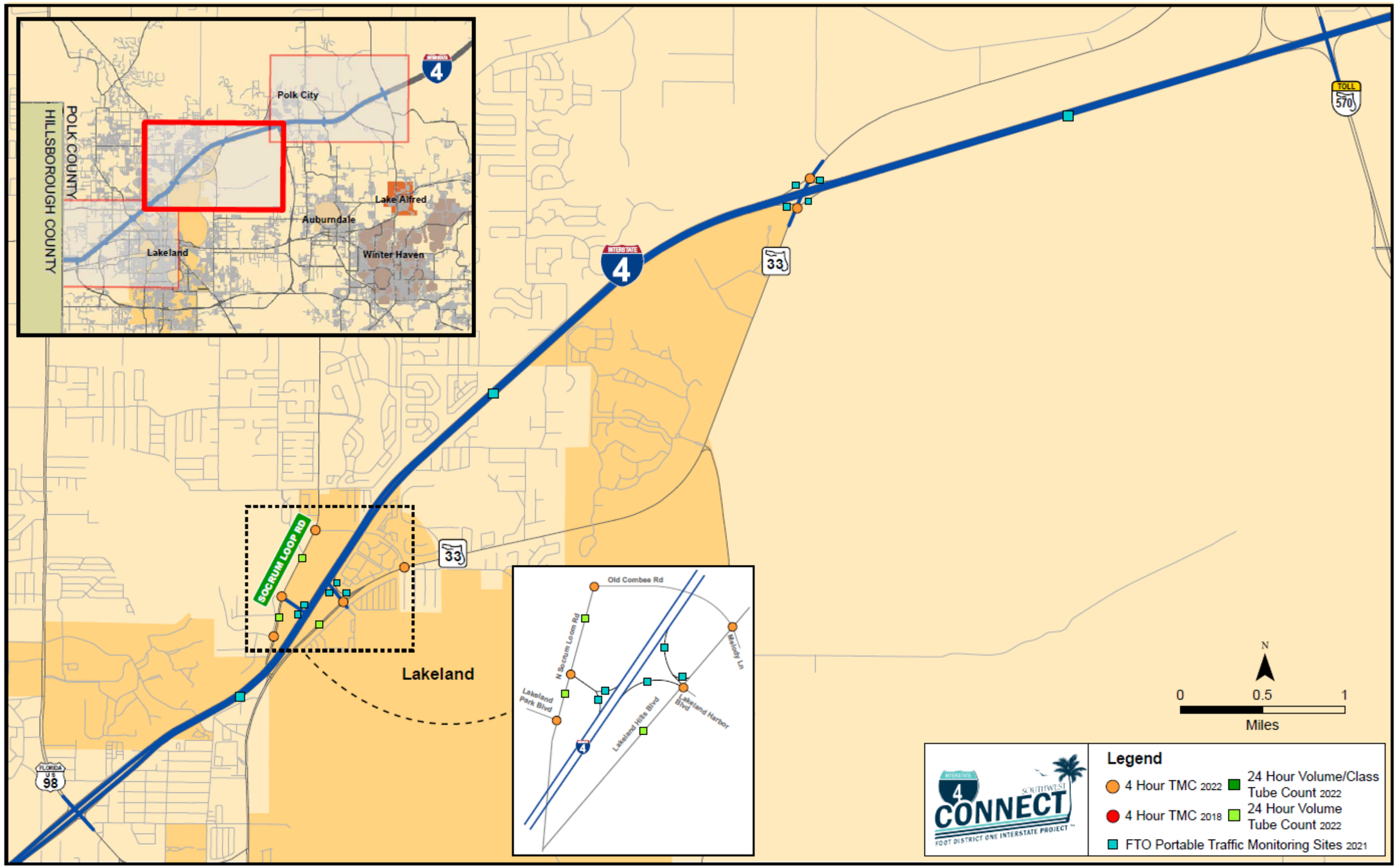
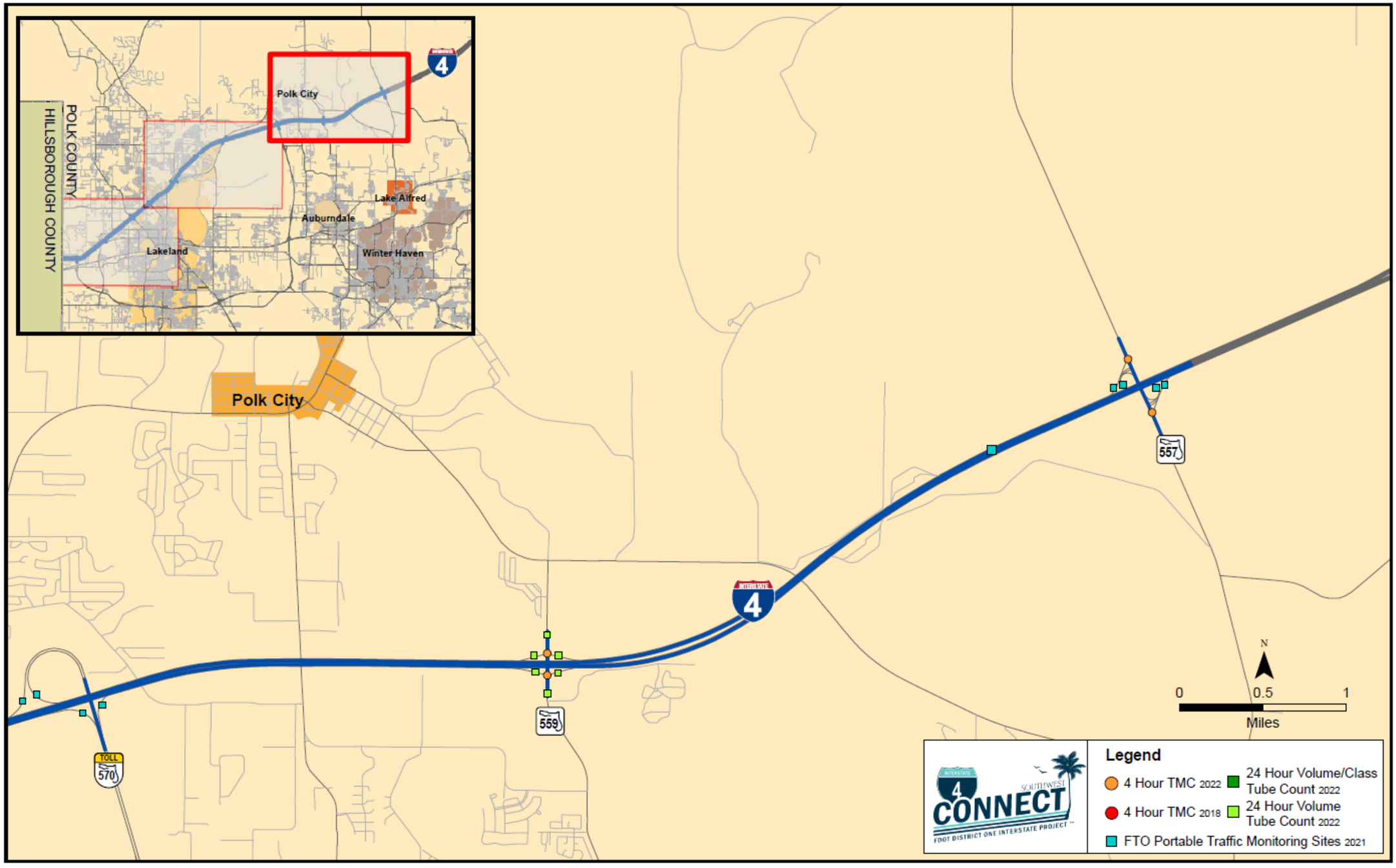


Figure 2 Traffic Count Locations (Sheet 3 of 3)



Following TMCs were taken from the I-4 Selected Interchanges Analysis Report (SIAR):

- I-4 and US 92/SR 546 (West Memorial Boulevard)
- I-4 and SR 539 (Kathleen Road)

Note that SIAR data from year 2018 was used for turning movement percentage only.

I-4 mainline count data was obtained from 2021 FDOT's Florida Traffic Online database. Based on the *FTO and I-4 Selected Interchanges Analysis Report (SIAR),* the peak hours were determined to be 7:15 AM-8:15 AM for the AM peak hour and 4:45 PM – 5:45 PM for the PM peak hour for the I-4 mainline. The supporting traffic counts and signal timing data are included in **Appendix B.**

4.0 Existing Traffic Volumes

Existing Year 2022 Annual Average Daily Traffic (AADT) volumes were developed by applying appropriate seasonal adjustment factors (SF) and axle correction factors (AF) to the Average Daily Traffic (ADT) obtained from recent available traffic counts or new counts collected to supplement available counts. Historical growth rates along I-4 corridor were calculated based on the past 10 years. **Table 1** below shows the comparison of growth rates before and after Covid-19 impacts. The results show two percentage points less between the two scenarios growth rate estimates (4.84% minus 3.03%).

Table 1

Annual Average and Annual Historical Growth Rate on I-4

FDOT Count Site	To/From	Annual Average Growth Rate (2012 - 2021)	Trend Annual Historical Growth Rate (2012-2021)	Annual Average Growth Rate (2010 -2019) Pre COVID	Trend Annual Historical Growth Rate (2010-2019) Pre COVID
I-4 (SR 400)					
160105	Southwest of SR 546/West of Memorial Blvd.	3.33%	2.99%	4.21%	5.05%
160117	Northeast of SR 546/West of Memorial Blvd.	1.52%	2.61%	4.22%	5.12%
160116	Northeast of SR 539/Kathleen Road	3.70%	3.30%	3.87%	4.76%
160115	Northeast of SR 35/700/US 98	0.93%	2.02%	3.90%	4.79%
160114	Northeast of Old Combee Road Overpass	4.58%	4.07%	4.58%	4.92%
160113	East of SR 33	6.05%	5.97%	4.39%	4.98%
169951	0.6 miles of W of SR 559	-0.50%	0.74%	3.96%	4.51%
160112	East of SR 559	0.51%	2.04%	3.89%	4.85%
160108	SW of SR 25/US 27	4.16%	3.81%	4.07%	5.48%
Source: Florida Traffic Online 2021	**Average**	**2.72%**	**3.03%**	**4.02%**	**4.84%**

Arterial growth rates were estimated separately for each individual corridor. **Table 2** shows the estimated historical growth rates for the arterials. It is deemed to use 5% growth rate for arterials as the average growth rate is 4.44%.

Table 2

Crossroads AADTs and Annual Average Growth Rates

FDOT Count Site	Location	AADT 2012	AADT 2021	Annual Average Growth Rate
169927	SR-546/MEMORIAL BLV,0.75 MI E I-4,LAKELAND	14,225	19,181	3.87%
161031	SR 546/MEMORIAL BLVD CONNECTOR, TO WB I-4	9,300	10,700	1.67%
160142	SR 539, SOUTHEAST OF SR 400/I-4	25,500	34,000	3.70%
164964	KATHLEEN ROAD, N OF KNIGHTS-GRIFFIN RD	15,100	18,700	2.65%
165198	SR 35/700/US 98, N OF CR 582/GRIFFIN RD & S OF I-4	44,500	44,000	-0.12%
160135	SR 35/700/US 98, NORTH OF SR 400/I-4	53,000	60,000	1.47%
163030	SR 33, NORTHEAST OF CR 582/SOCRUM LOOP ROAD	14,500	18,400	2.99%
164155	CR 582/SOCRUM LOOP ROAD, N OF I-4	24,500	25,500	0.45%
160118	SR 33, SOUTH OF SR 400/I-4	9,300	12,300	3.58%
160027	SR 33, NORTHEAST OF SR 400/I-4	8,300	13,700	7.23%
160133	SR-559, S OF SR 400/I-4	11,800	21,500	9.13%
160131	SR 559, NORTH OF SR 400/I-4	4,000	6,900	8.06%
165221	SR 557, SOUTH OF SR 400/I-4	10,500	19,300	9.31%
165196	SR 557 ON OVERPASS BRIDGE OVER I-4	6,500	11,300	8.21%
Source: Florida Traffic Online 2021			**Average**	**4.44%**

Anchor Point Selection

A count location just east of SR 539 (Kathleen Road) (FDOT Count Site ID 160116) was selected as an anchor point. The 2021 AADT based on FTO at this location is 112,000 vehicles per day (vpd). The year 2022 AADT at this segment was developed by multiplying the 2021 volume by a 5% growth rate (117,600 vpd). **Table 3** shows the comparison between FTO data from 2019 thru 2021 and estimated AADTs for year 2022. An average growth rate of 3.1% from year 2019 (Pre Covid-19) to year 2022 considered to be reasonable. Additionally, based on the traffic data at station 160108, year 2022 estimated balanced traffic is only 300 vpd more than year 2021 AADT. Using less than 5% growth rate along the corridor will produce estimated 2022 traffic volumes that would be lower than 2021 at this location, which was not deemed reasonable.

Therefore, an average trend annual growth rate of 5% (before COVID-19 pandemic) was applied to previous year counts to develop year 2022 AADTs. The 2021 ramp AADTs then were multiplied by a 5% growth rate and adjusted to achieve mainline balanced volumes in between the interchanges. The 2022 AADTs are presented on **Figure 3**.

Table 3

AADTs Comparison

FDOT Count Site	Segments of I-4 (SR 400)	AADTs from Florida Traffic Online			Est. 2022 AADTs	Growth Rate 2021-2022	Growth Rate 2019-2022	Notes
		2019	2020	2021				
161005	Southwest of SR 546/West of Memorial Blvd.	120,000	102,500	115,000	127,200	10.6%	2.0%	
160117	Northeast of SR 546/West of Memorial Blvd.	109,000	100,500	95,500	117,600	23.1%	2.6%	
160116	Northeast of SR 539/Kathleen Road	104,500	92,000	112,000	117,600	5.0%	4.2%	Controlling Point
160115	Northeast of SR 35/700/US 98	100,000	88,000	84,000	111,400	32.6%	3.8%	
160114	Northeast of Old Combee Road Overpass	92,500	79,500	104,500	105,600	1.1%	4.7%	
160113	East of SR 33	90,000	96,000	105,000	104,400	-0.6%	5.3%	
169951	0.6 miles of W of SR 559	99,000	85,157	74,000	103,800	40.3%	1.6%	Permanent Station
160112	East of SR 559	96,500	84,000	80,000	103,600	29.5%	2.5%	
160108	SW of SR 25/US 27	102,500	86,000	106,500	106,800	0.3%	1.4%	Diff. of only 300 vph between 2021 and 2022
						Average	**3.1%**	

Approved Design Traffic Factors

Table 4 illustrates the traffic factors for I-4 mainline and ramps.

Table 4
Design Traffic Factors for I-4 Corridor

Roadway	K_{STD}	D	T	Tf
I-4 Mainline	9.0	52.0	14.0	7.0
I-4 Ramps	9.0	100.0	14.0	7.0
Arterials	9.0	*	*	*

*Source: * D and T factors were estimated based on 2021 FTO.*
The Standard K is from FDOT Project Traffic Forecasting Handbook

Note that based on the approved methodology, turning movement traffic counts were performed at some selected locations. No tube counts were collected except at SR 559 interchange ramps. Historic D-Factor, heavy vehicle percentage, peak to daily ratios, growth rate estimations were documented in the **Appendix C.** Cross street growth rates, peak directions, D-Factor, and T-Factor were also included in **Appendix C** as a reference**.**

D-Factor

A historical D factor has been developed by averaging the estimated D factor from permanent count stations along I-4 over a ten-year period based on FDOT FTO data.

Peak Hour Factor

Peak Hour Factor (PHF) is the ratio of total peak hour volume to the peak rate of flow within the hour. It accounts for the variability of traffic within the hour. Existing PHFs were considered from the latest count data for existing operations analysis.

T-Factor

The historical T-Factors based on FTO along I-4 corridor and at the individual ramps are summarized in **Table 5** and **6**, respectively. An average daily track percentage at the ramps is approximately 14%, which is similar to I-4 mainline truck daily traffic percentage. Therefore, it was deemed reasonable to assume a T-Factor of 7% on the ramps during the peak hours.

K-Factor

Based on information obtained from FDOT Project Traffic Forecasting (2019) handbook, a Standard K-Factor of 9.0 percent was used in development of the Existing Year (2022) and the future year traffic volumes. This is the predominant K-Factor utilized in urbanized, transitioning to urbanized, and urban areas and represents a typical weekday peak hour. Directional Design Hour Volumes (DDHVs) were developed by applying the Standard K Factor of 9.0 percent and Directional Factor (D) to the AADT volumes based on the approved methodology. Actual peak to daily ratios along I-4 corridor ranges from 5.58% to 7.47% (See **Table** 7).

Existing Traffic Volumes

The peak hours were determined to be 7:15 AM-8:15 AM for the AM peak hour and 4:45 PM – 5:45 PM for the PM peak hour. Directional Design Hour Volumes (DDHVs) for existing year 2022 were developed by applying the Standard K Factor of 9.0 percent and Directional Factor (D) to the 2021 AADT volumes for mainline, ramps and ramp terminals. The peak direction of travel was assumed to be consistent with the existing counts. At the intersections, the existing turning movement volumes were obtained by applying the existing turning movement percentages to the approach volumes. The Vissim model was calibrated based on 'raw' AM and PM peak hour volumes which were collected from the field and have been reviewed and adjusted for accuracy. The Existing Year (2022) AM. and PM peak hour traffic is shown on **Figure 4**. The supporting documentation is included in **Appendix C**.

Table 5
Historical Design Traffic T-Factor (Percentage) on I-4 Corridor

FDOT Count Site	Roadway	To/From	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
160105	I-4 (SR 400)	Southwest of SR 546/West of Memorial Blvd.	14.70	14.60	12.90	13.20	13.00	13.00	13.00	13.90	10.60	12.90	14.90	13.00	13.04
160117	I-4 (SR 400)	Northeast of SR 546/West of Memorial Blvd.	15.10	14.50	12.30	14.50	14.40	13.30	13.30	13.30	10.60	14.20	16.10	16.10	13.81
160116	I-4 (SR 400)	Northeast of SR 539/Kathleen Road	15.30	14.00	12.20	14.30	13.90	13.60	12.50	13.90	13.90	13.90	15.00	13.10	13.63
160115	I-4 (SR 400)	Northeast of SR 35/700/US 98	15.40	14.70	13.00	14.70	14.50	13.80	12.60	12.60	12.60	14.20	15.70	15.70	13.94
160114	I-4 (SR 400)	Northeast of Old Combee Road Overpass	16.90	15.40	13.40	16.20	16.20	15.80	15.80	15.80	13.10	15.40	18.20	15.60	15.55
160113	I-4 (SR 400)	East of SR 33	16.50	15.10	14.40	16.00	15.90	15.40	13.70	13.70	13.70	13.50	18.20	18.90	15.34
169951	I-4 (SR 400)	0.6 miles of W of SR 559	N/A	N/A	11.20	11.00	10.50	10.10	9.40	9.40	10.30	11.20	13.80	13.30	11.02
160112	I-4 (SR 400)	East of SR 559	16.60	16.00	14.10	14.60	16.00	15.20	14.50	16.20	15.30	15.30	15.30	18.90	15.54
160108	I-4 (SR 400)	SW of SR 25/US 27	15.70	15.70	13.80	15.70	14.80	15.80	13.60	14.80	13.40	13.40	13.40	18.90	14.76

Source: Florida Traffic Online 2021 **Average** **14.07**

Table 6

Historical Design Traffic T-Factor (Percentage) on Ramps along I-4 Corridor

FDOT Count Site	Ramp Location	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg.
SR 570 (Polk Parkway) System-to-system Interchange																		
974009	Eastbound off-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
974008	Eastbound on-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
974001	Westbound off-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
974002	Westbound on-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
Memorial Boulevard																		
167101	Eastbound off-ramp	-	-	13.60	13.80	13.80	13.80	13.00	13.00	13.00	11.40	11.40	11.40	13.10	13.50	18.20	13.60	13.33
167102	Eastbound on-ramp	-	-	14.60	14.60	14.60	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	14.73
167105	Westbound off-ramp	-	-	27.60	27.60	27.60	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	17.51
167104	Westbound on-ramp	-	-	13.20	13.20	13.20	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	14.43
SR 539 (Kathleen Road)																		
167110	Eastbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167113	Eastbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167112	Westbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167111	Westbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
US 98/SR 35/SR 700																		
167115	Eastbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	9.30	12.84
167116	Eastbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	8.20	12.74
167117	Westbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	8.90	12.80
167114	Westbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	8.80	12.79
CR 582 (North Socrum Loop Road)/SR 33 (Lakeland Hills Boulevard)																		
167120	Eastbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167121	Eastbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167122		-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	
167119	Westbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167118	Westbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18

Table 6 (Continued)

Historical Design Traffic T-Factor (Percentage) on Ramps along I-4 Corridor

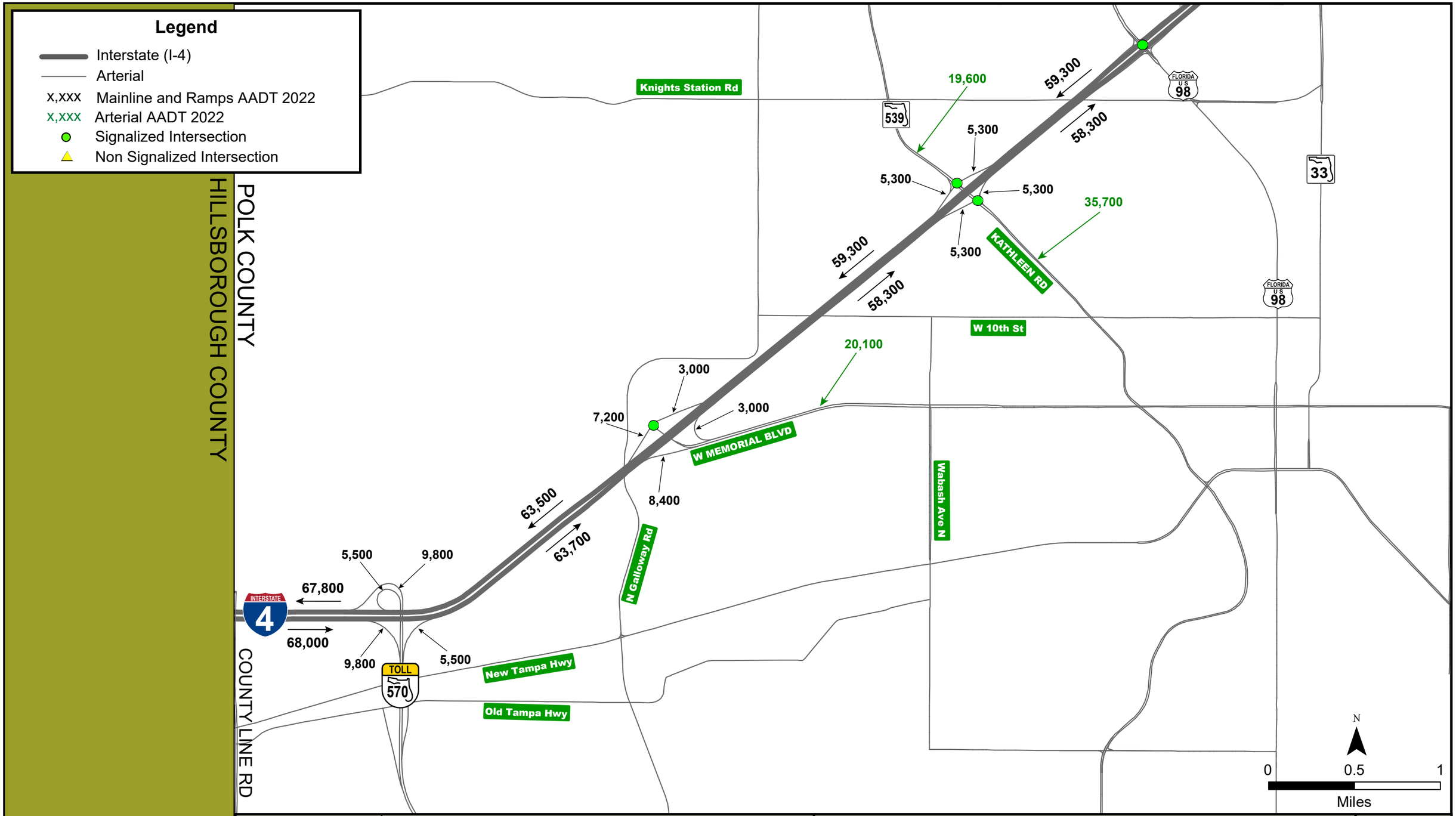
FDOT Count Site	Ramp Location	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Avg.
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)																		
167123	Eastbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167125	Eastbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167126	Westbound off-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
167124	Westbound on-ramp	-	-	-	-	-	14.00	12.20	13.80	13.70	13.40	12.50	13.90	10.60	12.80	15.00	13.10	13.18
SR 570 System-to-System Interchange																		
974082	Eastbound off-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
974081	Eastbound on-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
974084	Westbound off-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
974083	Westbound on-ramp	-	-	-	-	-	-	9.90	10.30	11.00	11.30	11.90	12.90	14.10	14.30	16.10	13.90	12.57
SR 559																		
167051	Eastbound off-ramp	16.70	13.70	29.80	29.80	29.80	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	17.64
167053	Eastbound on-ramp	16.70	13.70	28.90	28.90	28.90	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	17.47
167054	Westbound off-ramp	16.70	13.70	25.50	25.50	25.50	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	16.83
167052	Westbound on-ramp	16.70	13.70	25.10	25.10	25.10	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	16.76
SR 557																		
167061	Eastbound off-ramp	16.70	13.70	23.30	23.30	23.30	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	16.42
167063	Eastbound on-ramp	16.70	13.70	12.20	12.20	12.20	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	14.34
167064	Westbound off-ramp	16.70	13.70	10.50	10.50	10.50	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	14.02
167062	Westbound on-ramp	16.70	13.70	23.00	23.00	23.00	15.00	13.10	14.40	14.40	14.30	12.60	14.90	13.10	13.50	18.20	18.90	16.36

Average 13.88

Table 7

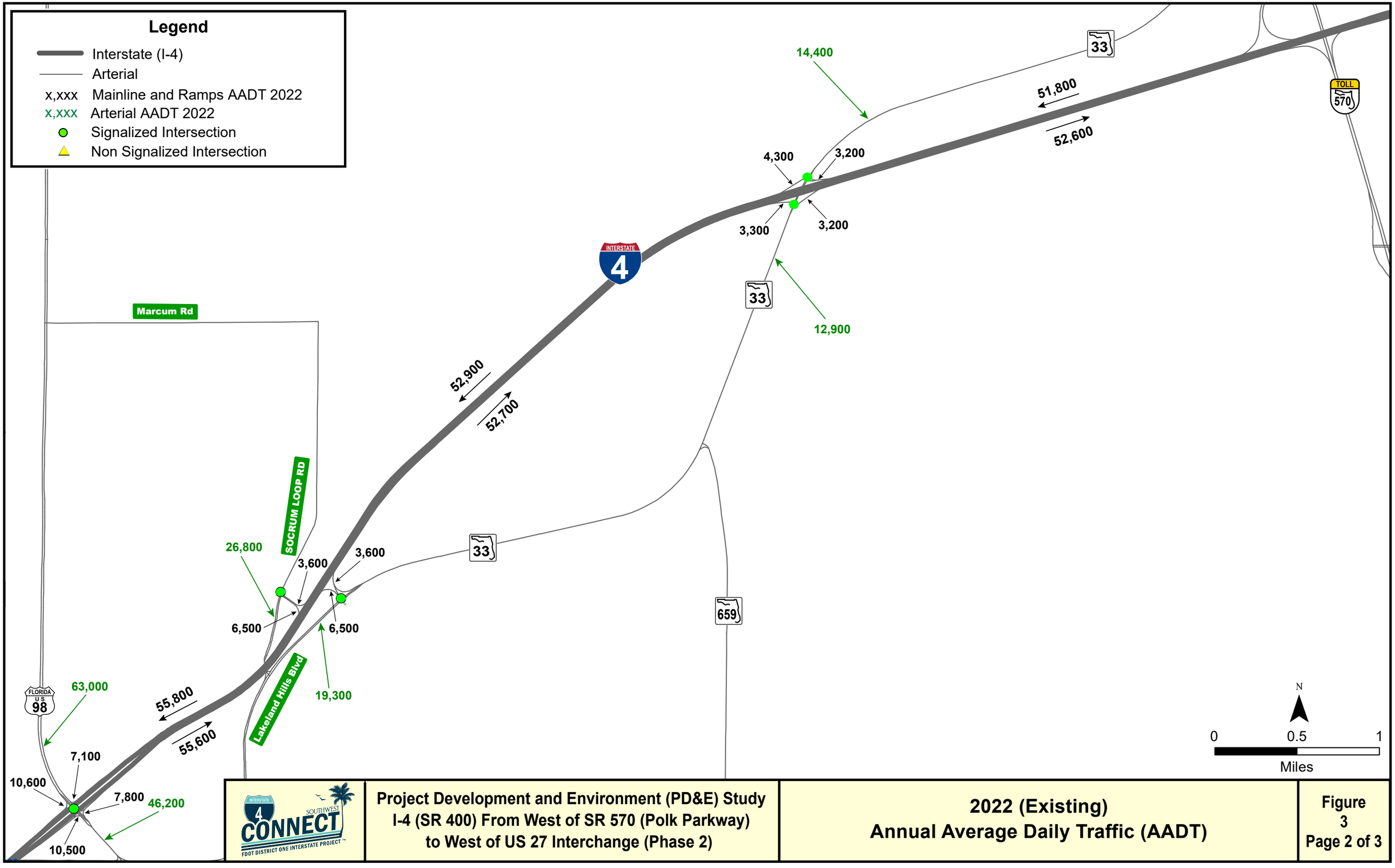
Peak to Daily Ratio for I-4 Corridor

FDOT Count Site	Count Site Location Along I-4	2021 AADT Counts[1]	2021 Existing Peak Hour Traffic									
			AM Peak hour 7:15-8:15					PM Peak hour 4:45-5:45				
			EB	WB	Total	Peak Direction	Peak to Daily Ratio	EB	WB	Total	Peak Direction	Peak to Daily Ratio
160103	SR 400/I-4, EAST OF HILLSBOROUGH/ POLK COUNTY LINE	140,000	4,221	4,393	8,614	WB	6.15%	4,887	4,555	9,442	EB	6.74%
161005	SR 400/I-4, SOUTHWEST OF SR 546/WEST MEMORIAL BLVD	115,000	3,063	3,349	6,412	WB	5.58%	4,010	3,298	7,308	EB	6.35%
160117	SR 400/I-4, NORTHEAST OF SR546/WEST MEMORIAL BLVD	95,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160116	DESCRIPTION: SR 400/I-4, NORTHEAST OF SR 539/KATHLEEN ROAD	112,000	2,987	3,838	6,825	WB	6.09%	3,998	3,558	7,556	EB	6.75%
160115	SR 400/I-4, NORTHEAST OF SR 35/700/US 98	84,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160114	SR 400/I-4, EAST OF HILLSBOROUGH/ POLK COUNTY LINE	104,500	2,531	3,555	6,086	WB	5.82%	3,537	3,781	7,318	WB	7.00%
160113	SR 400/I-4, EAST OF SR 33	105,000	2,935	3,903	6,838	WB	6.51%	3,771	4,070	7,841	WB	7.47%
160112	SR 400/I-4, EAST OF SR 559	80,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160108	SR 400/I-4 SW OF SR 25/US 27, POLK COUNTY	106,500	2,840	3,298	6,138	WB	5.76%	3,507	3,491	6,998	EB	6.57%
						Average	**5.99%**					**6.81%**

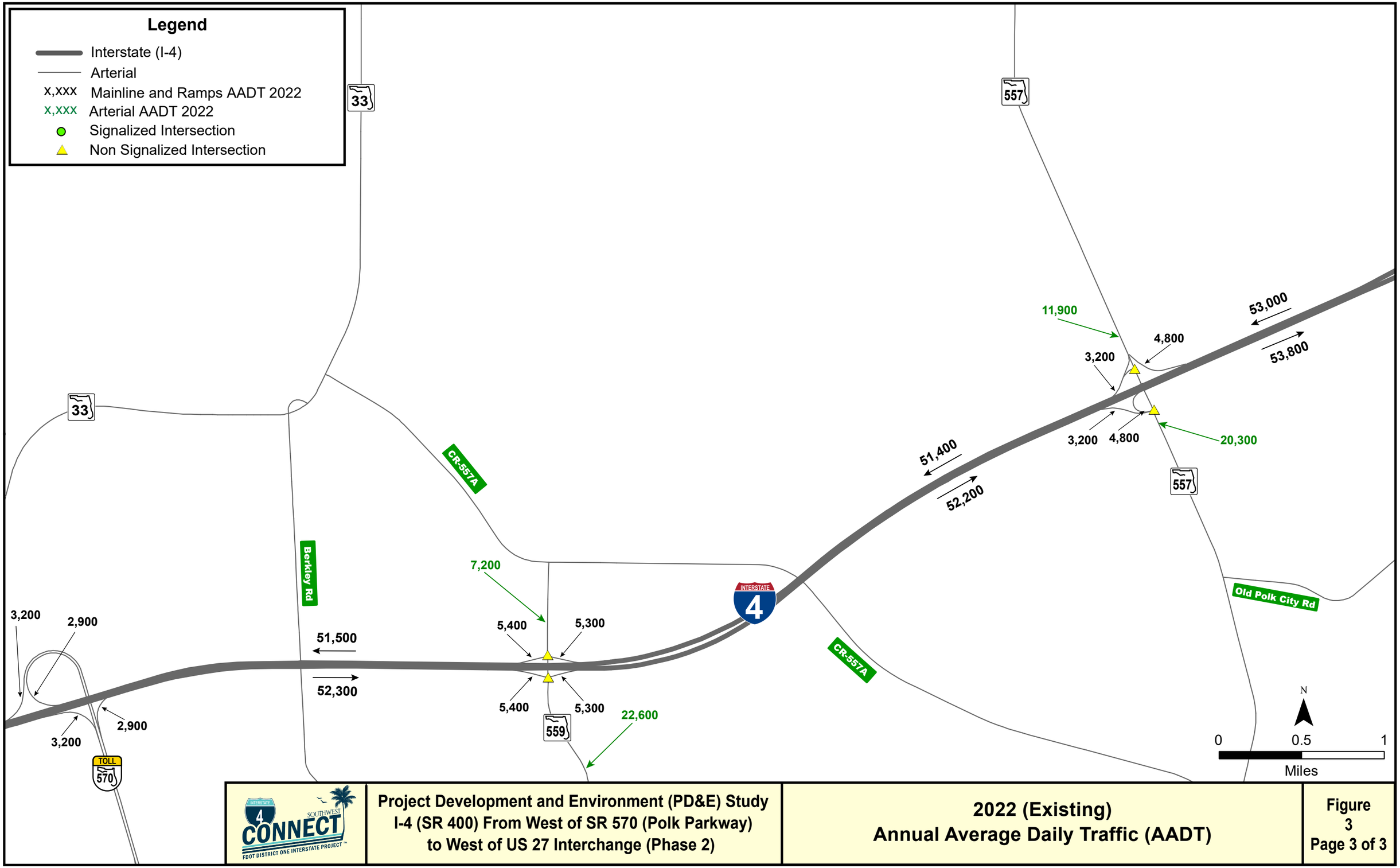


SOUTHWEST INTERSTATE 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study** **I-4 (SR 400) From West of SR 570 (Polk Parkway)** **to West of US 27 Interchange (Phase 2)**	**2022 (Existing)** **Annual Average Daily Traffic (AADT)**

Figure 3 Page 1 of 3



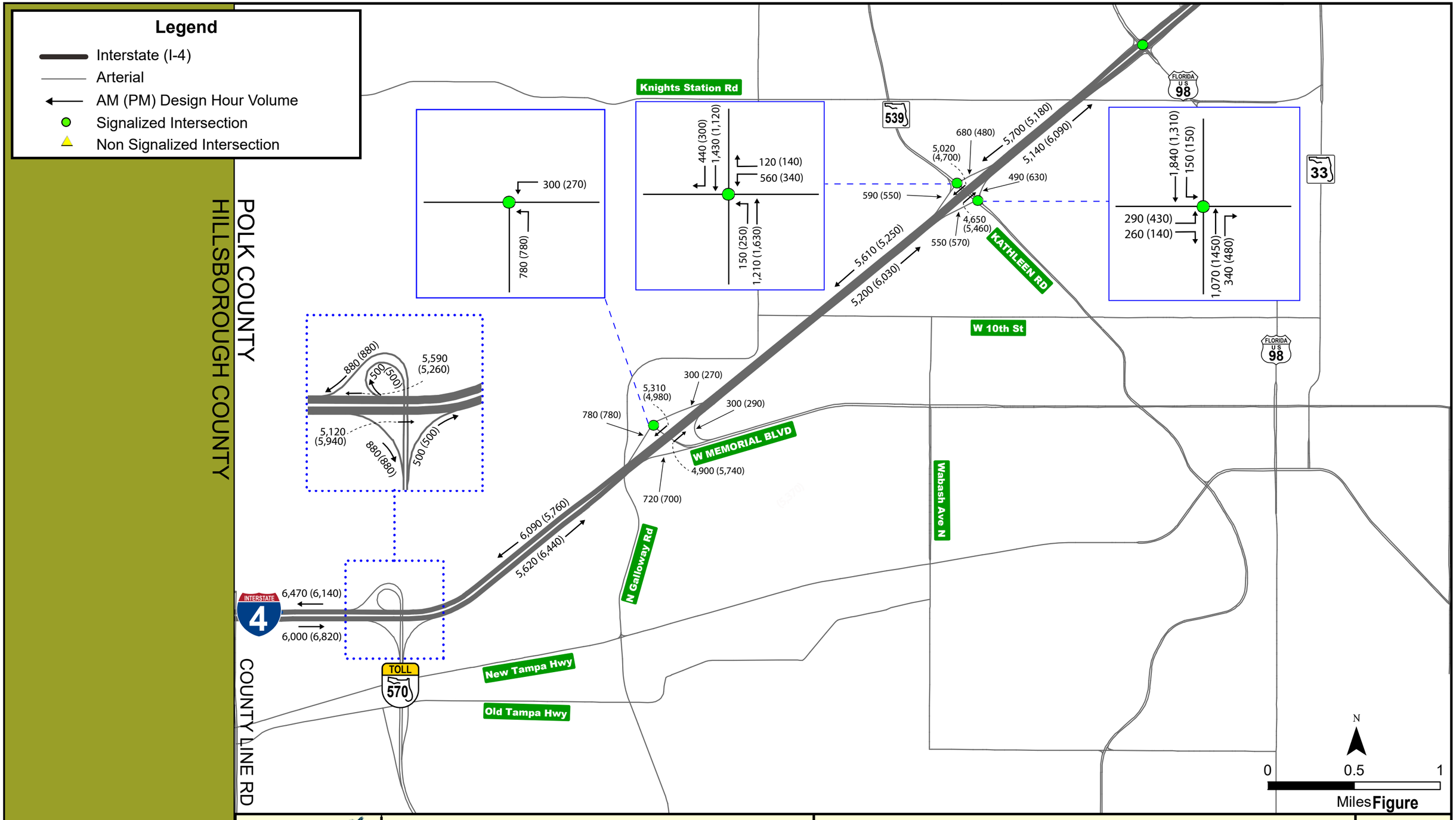
SOUTHWEST I-4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2022 (Existing) Annual Average Daily Traffic (AADT)**	**Figure 3 Page 2 of 3**



Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway)
to West of US 27 Interchange (Phase 2)

2022 (Existing)
Annual Average Daily Traffic (AADT)

Figure
3
Page 3 of 3



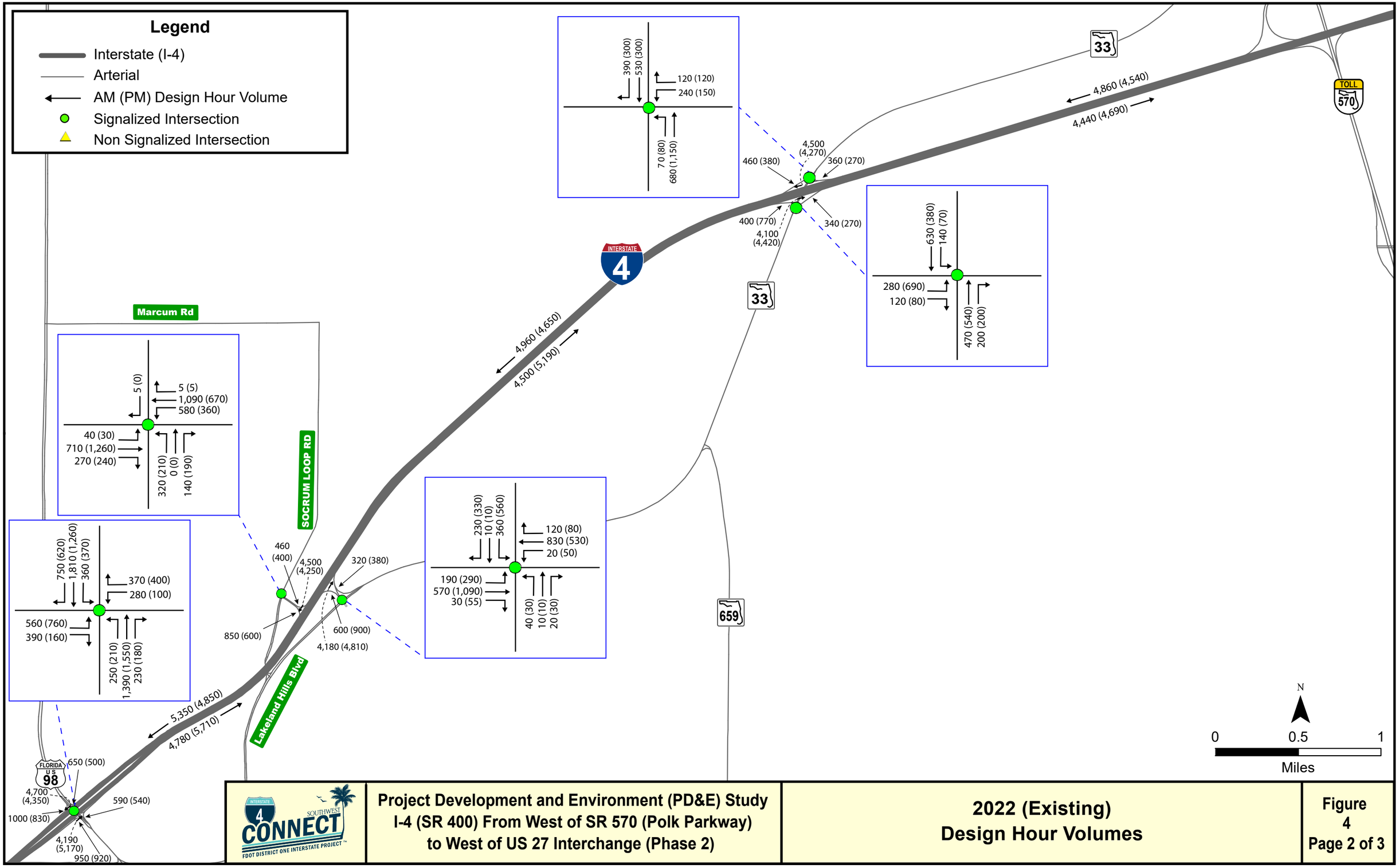
Figure

4 CONNECT SOUTHWEST FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2022 (Existing) Design Hour Volumes**

Figure 4 Page 1 of 3

Legend

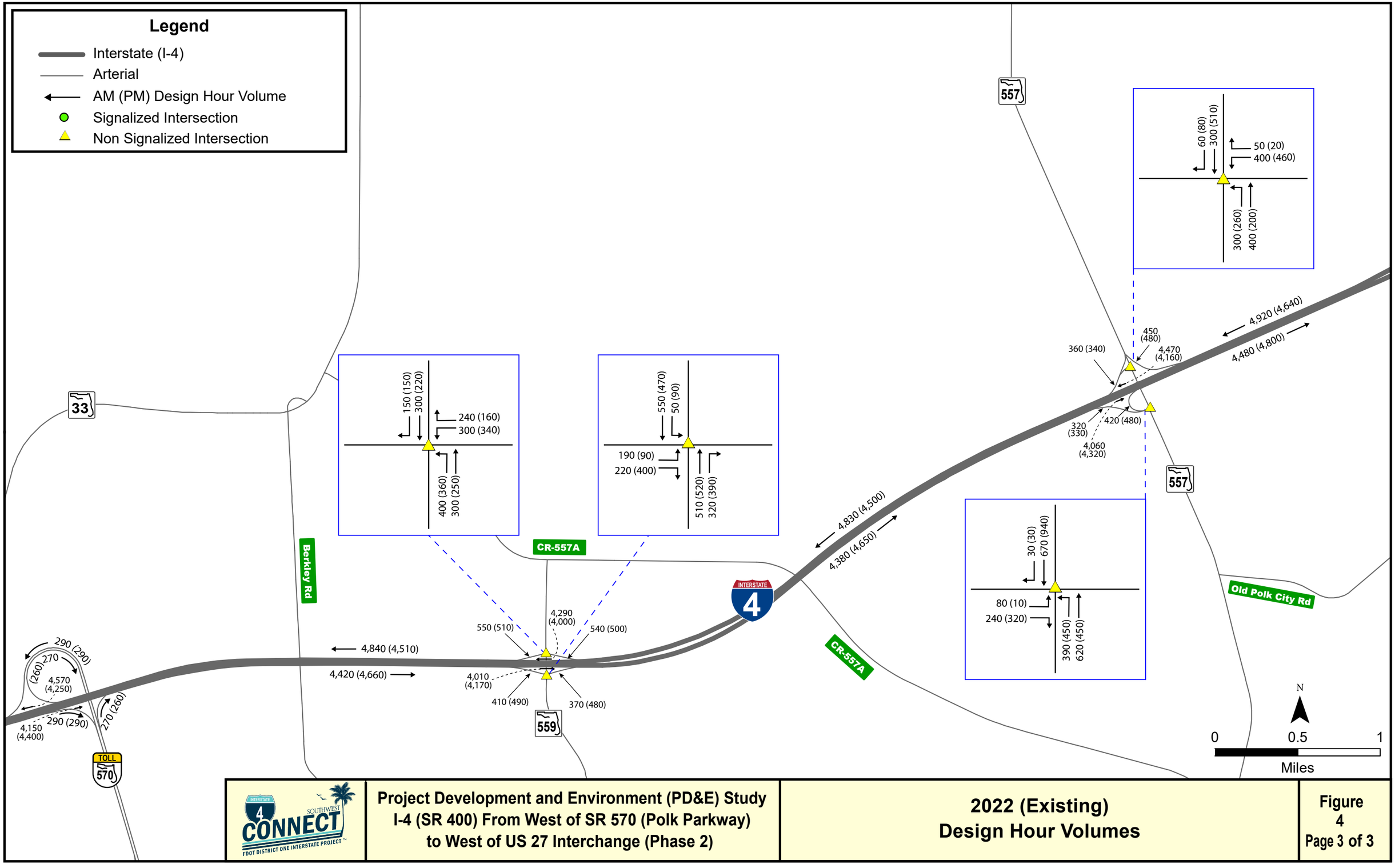
- Interstate (I-4)
- Arterial
- AM (PM) Design Hour Volume
- Signalized Intersection
- Non Signalized Intersection



Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)

2022 (Existing) Design Hour Volumes

Figure 4 Page 2 of 3



SOUTHWEST I-4 CONNECT — FDOT DISTRICT ONE INTERSTATE PROJECT

Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)

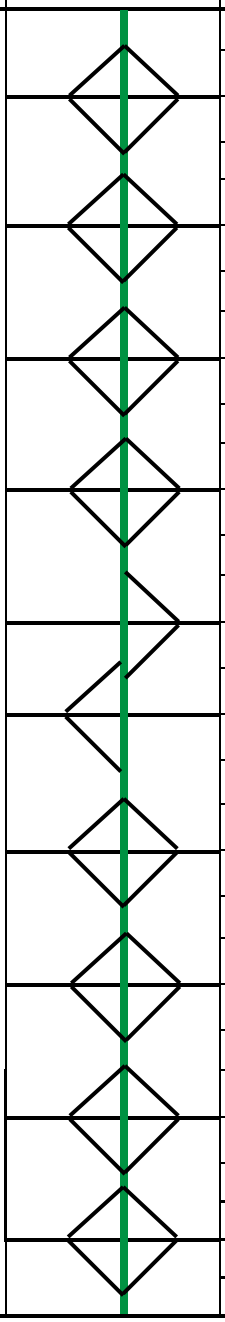
2022 (Existing) Design Hour Volumes

Figure 4 Page 3 of 3

The 2022 AADT volumes along I-4 and ramps are shown in **Table 8.** The daily traffic for I-4 mainline ranges from 103,600 vpd to 135,800 vpd.

Table 8

2022 Existing I-4 Corridor AADTs

Location	Profile	Estimated 2022 AADTs
		**106,800**
		9,600
SR 557		6,400
		103,600
		10,600
SR 559		10,800
		103,800
		5,800
SR 570 (Polk Parkway)		6,400
		104,400
		6,400
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		7,600
		105,600
		3,600
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		3,600
		6,500
CR 582 (North Socrum Loop Road)		6,500
		111,400
		14,900
US 98/SR 35/SR 700		21,100
		117,600
		10,600
SR 539 (Kathleen Road)		10,600
		117,600
		6,000
West Memorial Boulevard		15,600
		127,200
		11,000
SR 570 (Polk Parkway)		19,600
		135,800

2,220 = Mainline volume 2,220 = Combined ramp volume

Note: 2021 FDOT's Florida Traffic Online database multiplied with 5% growth rate and balanced mainline traffic

5.0 Traffic Operations Analysis Methodology

The Highway Capacity Software (HCS7) Version 7.9 was used to identify Level of Service (LOS) along freeway segments. The HCS7 is based on Highway Capacity Manual Sixth Edition (HCM 6th Edition) methodologies. The HCM 6th Edition estimates level of service based on density – a function of flow rate (volumes) and travel speed – for uninterrupted flow facilities such as basic freeway/Collector-Distributor (C-D) roadway segments, merge and diverge segments, and freeway/C-D roadway weaving segments. Density is measured in passenger cars per mile per lane (pcpmpl). For freeway merge and diverge areas, the HCM methodology also includes a capacity check for the influence area and the upstream or downstream ramp roadway. The HCM 6th Edition LOS and density targets for freeway segments are listed in **Table 9**.

Table 9
Freeway Segments HCM 6th Edition Level of Service Criteria

LOS	Basic Density (HCM Exhibit 12-15)	Merge and Diverge Density (HCM Exhibit 14-3)	Weaving Density (HCM Exhibit 13-6)
A	≤ 11	≤ 10	0 – 10
B	> 11 – 18	> 10 – 20	> 10 – 20
C	> 18 – 26	> 20 – 28	> 20 – 28
D	> 26 – 35	> 28 – 35	> 28 – 35
E	> 35 – 45	> 35	> 35 – 43
F	> 45	Demand Exceeds Capacity	Demand Exceeds Capacity

Note: Density measured in passenger cars/mile/lane (pcpmpl). Source: HCM 6th Edition

LOS was used as a primary measure of effectiveness. The LOS target for state roads during peak travel hours is "D" in urban areas, per the State Highway System Policy No. 000-525-006c. The Build Alternative would be designed to meet the established LOS D target to the greatest extent practicable in Design Year 2045.

A capacity and speed adjustment factors were determined based on following factors:

- I-4 Free-Flow Speed (FFS) – 75 mph
- I-4 Ramps Free-Flow Speed (FFS) – Posted or Advisory Speed Limit plus 5 mph
- I-4 peak hour truck percentage – 7%
- Lane width – 12 feet
- Driver Population – Mostly Familiar
- Weather Type – Non-Severe Weather
- Incident Type – No Incident
- Demand Adjustment Factor – 1.000

Signalized intersections were evaluated using Synchro Version 11, with levels of service identified based on the HCM 6th Edition LOS and delay targets presented in **Table 10**. Unlike the HCM, Synchro software has additional procedures for estimating control delay, such as the number of right turns on red and queue delay associated with starvation and spillback. Thus, Synchro delay estimation yields more accurate results than HCM because of these additional refinements.

Table 10
Signalized Intersection HCM 6th Edition Level of Service Criteria

Control Delay (sec/veh)	LOS by Volume-to-Capacity Ratio*	
	≤1.0	>1.0
(HCM Exhibit 19-8)		
≤10	A	F
>10 – 20	B	F
>20 – 35	C	F
>35 – 55	D	F
>55 – 80	E	F
>80	F	F

*For approach-based and intersection-wide assessments, LOS is defined solely by control delay. Delay is measured in seconds per vehicle. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. Source: HCM 6th Edition. Note that Synchro delay has been reported for this study.

Unsignalized intersections were evaluated using the HCS Version 7.9, following the criteria presented in **Table 11**.

Table 11
Unsignalized Intersection HCM 6th Edition Level of Service Criteria

Control Delay (sec/veh)	LOS by Volume-to-Capacity Ratio*	
	≤1.0	>1.0
(HCM Exhibit 20-2)		
≤10	A	F
>10 – 15	B	F
>15 – 25	C	F
>25 – 35	D	F
>35 – 50	E	F
>50	F	F

*For approach-based and intersection-wide assessments, LOS is defined solely by control delay. Delay is measured in seconds per vehicle. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. Source: HCM 6th Edition

Two-Way Stop Controlled intersection

The capacity of a minor-street approach depends on two factors:

- The distribution of available gaps in the major-street traffic stream
- The gap size required by drivers in other traffic streams to execute their desired movements

Selection of Measures of Effectiveness (MOE)

- Signalized/unsignalized Intersections – Volume, control delay, LOS, maximum queue lengths (95th percentile queues)
- Freeway Segments – Volume, density, LOS; demand to capacity ratio, speed
- Ramp Merge/Diverge – Volume, density, LOS, demand to capacity ratio, speed

6.0 Existing Conditions Traffic Operations Analysis

Traffic operations analyses for the AM and PM peak hours were conducted to document the LOS within the study area for the Existing Year (2022). **Figure 5** shows the existing lane configuration of I-4 mainline, ramps and ramp terminals used in the operational analysis.

The 2022 AM and PM peak hour traffic volumes were evaluated in each direction for freeway segments: basic, weave, and merge/diverge influence areas. HCS results are summarized in **Tables 12** and **13** for the eastbound and westbound directions, respectively. Most of the segments along I-4 operate at LOS D or better, except for these locations, which operate at an unacceptable LOS E/LOS F in one or both AM and PM peak hours:

- I-4 eastbound at Polk Parkway off-ramp diverge segment
- I-4 eastbound from Polk Parkway off-ramp to on-ramp basic segment
- I-4 eastbound from Polk Parkway on-ramp merge segment
- I-4 eastbound from Polk Parkway on-ramp to West Memorial Boulevard off-ramp basic segment
- I-4 eastbound at West Memorial Boulevard off-ramp diverge segment
- I-4 westbound from US 98 on-ramp to SR 539 (Kathleen Road) off-ramp basic segment
- I-4 westbound at SR 539 (Kathleen Road) off-ramp diverge segment
- I-4 westbound from SR 539 (Kathleen Road) on-ramp to West Memorial Boulevard off-ramp basic segment
- I-4 westbound at West Memorial Boulevard off-ramp diverge segment
- I-4 westbound from Polk Parkway off-ramp to on-ramp basic segment

Note that current conditions along I-4 may be different than the results listed above due to the calculated

design hour volumes using K-factor of 9% whereas actual the peak to daily ratios along I-4 corridor range from 5.58% to 7.47%.

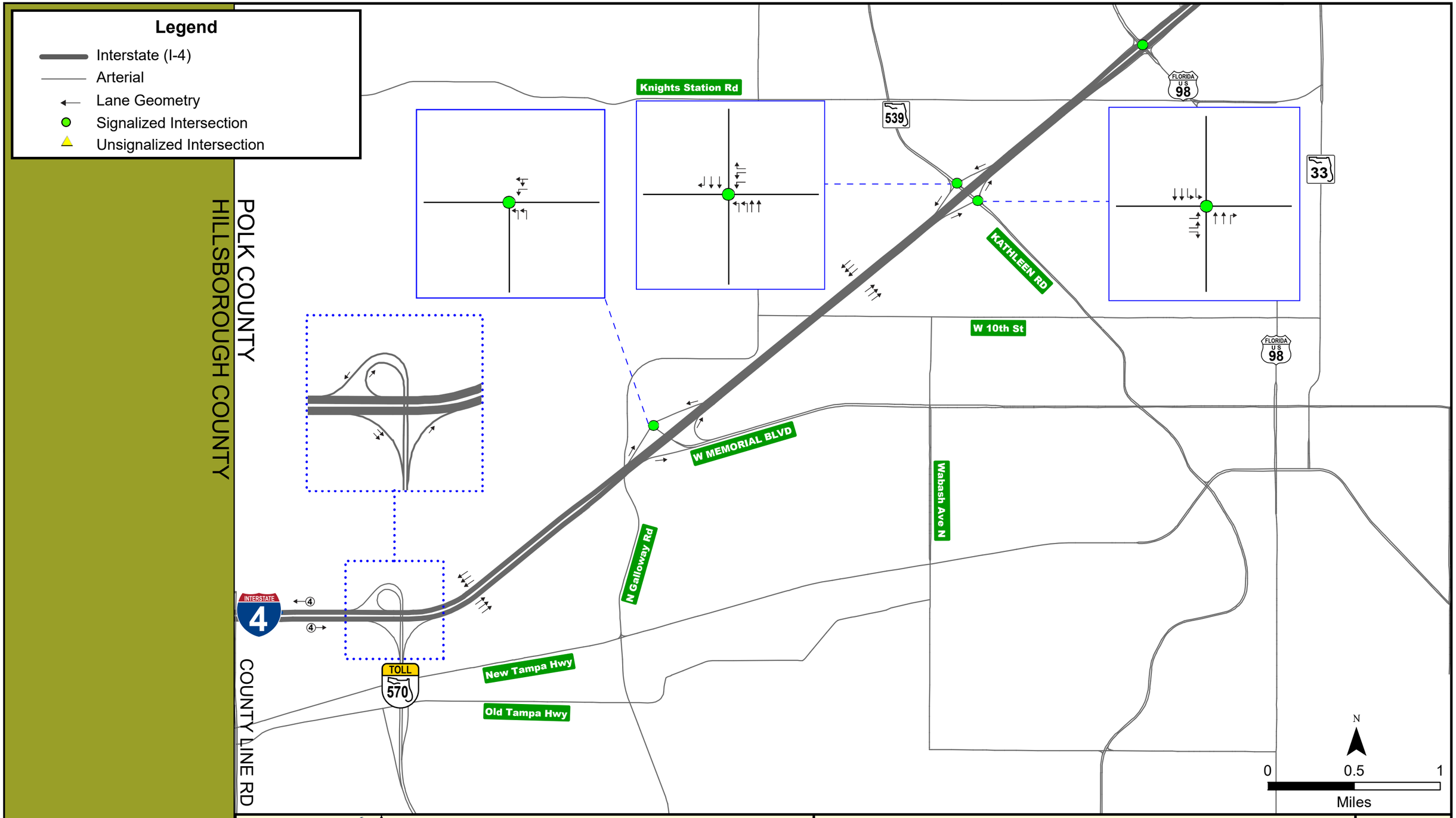
Ramp speed reported under HCS7 is the speed of the ramp influence area and depends on the mainline speed. I-4 free flow speed is 75 mph, and the ramp influence area speeds are below that limit.

Signalized intersections were analyzed using Synchro Version 11. Unsignalized intersections were analyzed using the HCS software Version 7.9. Unsignalized LOS/Delay reported for worst movement. Note that heavy vehicle input for major street through and right movements at Two-Way Stop Control is not required based on HCM.

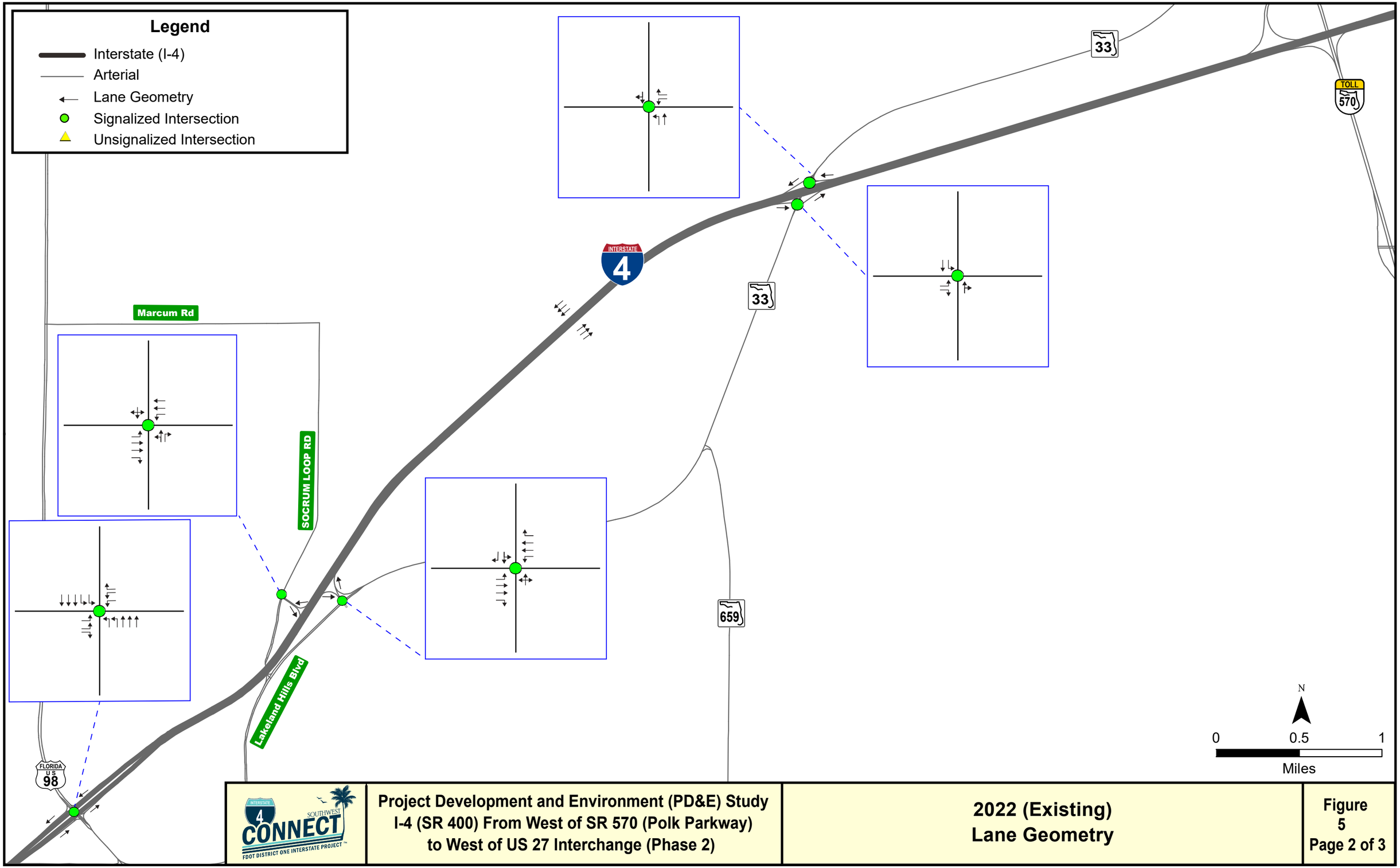
The analysis output summary for AM and PM peak hours are presented in **Table 14**. Several intersections within the study area are operating at LOS E or F in one or both AM and PM peak hours. These intersections include:

- I-4 and US 98 interchange
- I-4 and N Socrum Loop (CR 582) westbound ramp terminal
- I-4 and Lakeland Hills Boulevard eastbound ramp terminal
- I-4 and SR 33 eastbound ramp terminal
- I-4 and SR 559 both ramp terminals (unsignalized)
- I-4 and SR 557 both ramp terminals (unsignalized)

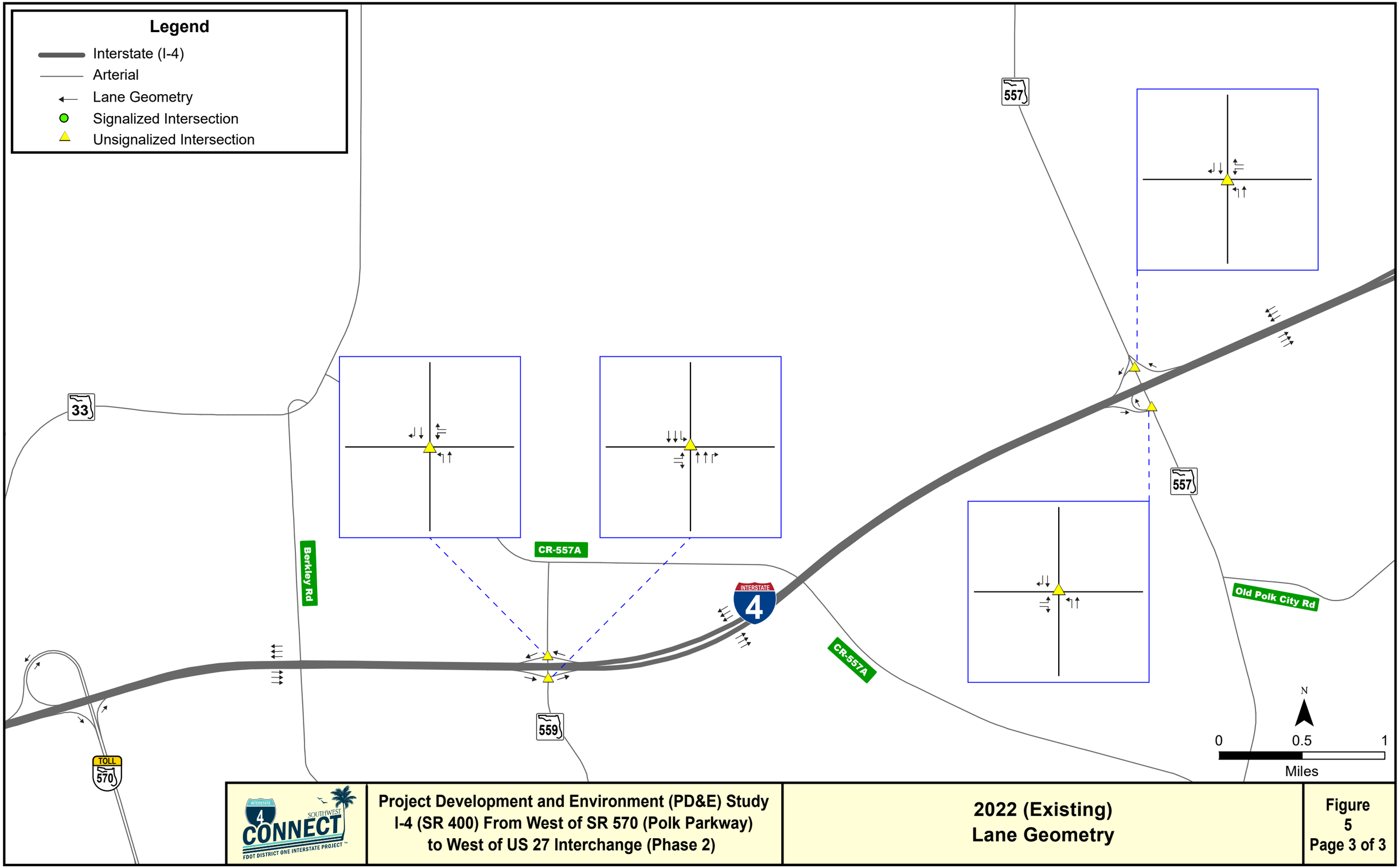
The existing Synchro and HCS output sheets are included in **Appendix D**.



SOUTHWEST 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2022 (Existing) Lane Geometry**	**Figure 5 Page 1 of 3**



SOUTHWEST I-4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)	2022 (Existing) Lane Geometry	Figure 5 Page 2 of 3



Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway)
to West of US 27 Interchange (Phase 2)

2022 (Existing)
Lane Geometry

Figure
5
Page 3 of 3

Table **12**: Existing Year 2022 HCS Level of Service and Density for I-4 Eastbound Segments

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	West of Polk Parkway off-ramp	Basic	4	6,000	25.1	-	C	0.7	-	67.3	-	6,820	28.2	-	D	0.8	-	64.8	-
2	Polk Parkway off-ramp	Diverge	4	6,000	24.1	14.0	B	0.7	0.2	70.1	62.6	6,820	58.2	16.6	F	0.8	0.2	30.3	62.7
3	Polk Parkway off-ramp to on-ramp	Basic	3	5,120	30.6	-	D	0.8	-	62.8	-	5,940	63.3	-	F	0.9	-	31.3	-
4	Polk Parkway on-ramp	Merge	3	5,620	34.5	32.5	D	0.9	0.3	61.2	58.5	6,440	35.7	33.2	F	0.9	0.3	60.6	57.8
5	Polk Parkway on-ramp to West Memorial Boulevard off-ramp	Basic	3	5,620	36.3	-	E	0.9	-	58.1	-	6,440	38.3	-	F	1.0	-	56.5	-
6	West Memorial Boulevard off-ramp	Diverge	3	5,620	31.5	35.8	E	0.9	0.4	67.0	63.1	6,440	32.2	36.3	F	0.9	0.4	67.1	63.2
7	West Memorial Boulevard off-ramp to on-ramp	Basic	3	4,900	28.5	-	D	0.8	-	64.5	-	5,740	30.2	-	D	0.9	-	63.1	-
8	West Memorial Boulevard on-ramp	Merge	3	5,200	31.3	30.2	D	0.8	0.2	62.3	59.8	6,030	32.5	31.0	D	0.9	0.2	61.9	59.3
9	West Memorial Boulevard on-ramp to SR 539 off-ramp	Basic	3	5,200	31.4	-	D	0.8	-	62.1	-	6,030	33.2	-	D	1.0	-	60.6	-
10	SR 539 off-ramp	Diverge	3	5,200	28.9	29.4	D	0.8	0.3	67.6	63.6	6,030	29.8	30.1	D	0.9	0.3	67.5	63.6
11	SR 539 off-ramp to on-ramp	Basic	3	4,650	26.3	-	D	0.8	-	66.4	-	5,460	27.7	-	D	0.9	-	65.2	-
12	SR 539 on-ramp	Merge	3	5,140	30.9	30.9	D	0.8	0.3	62.4	59.9	6,090	33.1	32.7	D	0.9	0.3	61.4	58.6
13	SR 539 on-ramp to US 98 off-ramp	Basic	3	5,140	30.8	-	D	0.8	-	62.6	-	6,090	33.9	-	D	1.0	-	60.0	-
14	US 98 off-ramp	Diverge	3	5,140	29.0	33.7	D	0.8	0.5	66.6	62.4	6,090	30.5	34.8	D	0.9	0.5	66.7	62.5
15	US 98 off-ramp to on-ramp	Basic	3	4,190	22.7	-	C	0.7	-	69.2	-	5,170	25.3	-	C	0.8	-	67.2	-
16	US 98 on-ramp	Merge	3	4,780	28.2	28.1	D	0.8	0.3	63.5	61.3	5,710	30.1	29.3	D	0.8	0.3	62.9	60.6
17	US 98 on-ramp to Lakeland Hills Boulevard off-ramp	Basic	3	4,780	27.4	-	D	0.8	-	65.4	-	5,710	29.9	-	D	0.9	-	63.3	-
18	Lakeland Hills Boulevard off-ramp	Diverge	3	4,780	29.1	29.1	D	0.8	0.4	61.6	55.6	5,710	31.2	30.9	D	0.8	0.5	60.8	54.7
19	Lakeland Hills Boulevard off-ramp to on-ramp	Basic	3	4,180	22.7	-	C	0.7	-	69.2	-	4,810	22.6	-	C	0.8	-	69.1	-
20	Lakeland Hills Boulevard on-ramp	Merge	3	4,500	26.5	26.1	C	0.7	0.2	63.7	61.4	5,190	26.8	26.5	C	0.7	0.2	63.7	61.3
21	Lakeland Hills Boulevard on-ramp to SR 33 off-ramp	Basic	3	4,500	25.1	-	C	0.7	-	67.3	-	5,190	25.4	-	C	0.8	-	67.1	-
22	SR 33 off-ramp	Diverge	3	4,500	27.2	30.2	D	0.7	0.2	62.1	56.2	5,190	27.9	31.1	D	0.7	0.5	61.0	55.1
23	SR 33 off-ramp to on-ramp	Basic	3	4,100	22.1	-	C	0.7	-	69.6	-	4,420	20.0	-	C	0.7	-	71.0	-
24	SR 33 on-ramp	Merge	3	4,440	25.8	25.2	C	0.7	0.2	64.6	62.6	4,690	23.3	22.9	C	0.7	0.2	65.2	63.3
25	SR 33 on-ramp to SR 570 off-ramp	Basic	3	4,440	24.6	-	C	0.7	-	67.7	-	4,690	21.8	-	C	0.7	-	69.8	-
26	SR 570 off-ramp	Diverge	3	4,440	23.8	29.9	D	0.7	0.2	69.9	66.4	4,690	21.7	28.0	C	0.7	0.2	70.0	66.4
27	SR 570 off-ramp to on-ramp	Basic	3	4,150	22.4	-	C	0.7	-	69.4	-	4,400	19.9	-	C	0.7	-	71.1	-
28	SR 570 on-ramp	Merge	3	4,420	25.4	22.6	C	0.7	0.2	65.2	63.5	4,660	22.9	20.5	C	0.7	0.1	65.8	64.2
29	SR 570 on-ramp to SR 559 off-ramp	Basic	3	4,420	24.5	-	C	0.7	-	67.8	-	4,660	21.6	-	C	0.7	-	70.0	-
30	SR 559 off-ramp	Diverge	3	4,420	24.3	30.0	D	0.7	0.2	68.2	64.1	4,660	22.2	28.2	D	0.7	0.3	68.0	63.9
31	SR 559 off-ramp to on-ramp	Basic	3	4,010	21.5	-	C	0.7	-	70.0	-	4,170	18.5	-	C	0.7	-	71.8	-
32	SR 559 on-ramp	Merge	3	4,380	25.4	25.2	C	0.7	0.2	64.6	62.5	4,650	23.2	23.6	C	0.7	0.3	65.0	63.0
33	SR 559 on-ramp to SR 557 off-ramp	Basic	3	4,380	24.1	-	C	0.7	-	68.1	-	4,650	21.5	-	C	0.7	-	70.0	-
34	SR 557 off-ramp	Diverge	3	4,380	26.4	29.5	D	0.7	0.2	62.3	56.4	4,650	24.2	27.6	C	0.7	0.2	62.3	56.4
35	SR 557 off-ramp to on-ramp	Basic	3	4,060	21.8	-	C	0.7	-	68.1	-	4,320	19.4	-	C	0.7	-	68.1	-
36	SR 557 on-ramp	Merge	3	4,480	26.0	24.8	C	0.7	0.2	64.6	62.7	4,800	24.0	23.4	C	0.7	0.3	65.0	63.1
37	East of SR 557 on-ramp	Basic	3	4,480	24.9	-	C	0.7	-	67.5	-	4,800	22.5	-	C	0.8	-	69.3	-

Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F
The results are based on the HCS 7.9

Table **13**: Existing Year 2022 HCS Level of Service and Density for I-4 Westbound Segments

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	East of SR 557 off-ramp	Basic	3	4,920	28.7	-	D	0.8	-	64.4	-	4,640	25.4	-	C	0.7	-	67.1	-
2	SR 557 off-ramp	Diverge	3	4,920	29.8	32.7	D	0.8	0.3	62.0	56.0	4,640	27.5	31.0	D	0.7	0.3	62.0	56.0
3	SR 557 off-ramp to on-ramp	Basic	3	4,470	24.8	-	C	0.7	-	66.8	-	4,160	21.9	-	C	0.7	-	66.8	-
4	SR 557 on-ramp	Merge	3	4,830	28.5	27.8	C	0.8	0.2	63.6	61.4	4,500	25.7	25.5	C	0.7	0.2	64.4	62.4
5	SR 557 on-ramp to SR 559 off-ramp	Basic	3	4,830	27.8	-	D	0.8	-	65.1	-	4,500	24.4	-	C	0.7	-	67.9	-
6	SR 559 off-ramp	Diverge	3	4,830	26.7	31.5	D	0.8	0.3	67.8	63.7	4,500	24.4	29.5	D	0.7	0.3	67.9	63.8
7	SR 559 off-ramp to on-ramp	Basic	3	4,290	23.5	-	C	0.7	-	68.6	-	4,000	20.9	-	C	0.6	-	70.5	-
8	SR 559 on-ramp	Merge	3	4,840	28.7	28.9	D	0.8	0.3	63.2	60.9	4,510	25.9	26.5	C	0.7	0.3	64.1	61.9
9	SR 559 on-ramp to SR 570 off-ramp	Basic	3	4,840	27.9	-	D	0.8	-	65.0	-	4,510	24.4	-	C	0.7	-	67.9	-
10	SR 570 off-ramp	Diverge	3	4,840	26.6	31.6	D	0.8	0.2	68.4	64.5	4,510	24.2	29.5	D	0.7	0.1	68.6	64.6
11	SR 570 off-ramp to on-ramp	Basic	3	4,570	25.6	-	C	0.7	-	66.9	-	4,250	22.5	-	C	0.7	-	69.3	-
12	SR 570 on-ramp	Merge	3	4,860	28.7	27.9	C	0.8	0.2	63.6	61.4	4,540	25.9	25.7	C	0.7	0.2	64.4	62.3
13	SR 570 on-ramp to SR 33 off-ramp	Basic	3	4,860	28.1	-	D	0.8	-	64.8	-	4,540	24.7	-	C	0.7	-	67.7	-
14	SR 33 off-ramp	Diverge	3	4,860	26.7	32.1	D	0.8	0.2	68.2	64.2	4,540	24.4	29.9	D	0.7	0.2	68.5	64.5
15	SR 33 off-ramp to on-ramp	Basic	3	4,500	25.1	-	C	0.7	-	67.3	-	4,270	22.7	-	C	0.7	-	69.2	-
16	SR 33 on-ramp	Merge	3	4,960	29.6	29.6	D	0.8	0.3	62.9	60.5	4,650	26.7	27.2	C	0.7	0.2	63.9	61.7
17	SR 33 on-ramp to CR 582 (North Socrum Loop Road) off-ramp	Basic	3	4,960	29.0	-	D	0.8	-	64.1	-	4,650	25.5	-	C	0.7	-	67.0	-
18	CR 582 (North Socrum Loop Road) off-ramp	Diverge	3	4,960	30.0	21.2	C	0.8	0.3	62.0	56.0	4,650	27.5	19.2	B	0.7	0.2	62.2	56.2
19	CR 582 (North Socrum Loop Road) off-ramp to on-ramp	Basic	3	4,500	25.1	-	C	0.7	-	67.3	-	4,250	22.5	-	C	0.7	-	69.3	-
20	CR 582 (North Socrum Loop Road) on-ramp	Merge	3	5,350	32.8	28.7	D	0.9	0.5	61.2	58.4	4,850	28.1	24.7	C	0.8	0.4	63.5	61.3
21	CR 582 (North Socrum Loop Road) on-ramp to US 98 off-ramp	Basic	3	5,350	33.1	-	D	0.9	-	60.7	-	4,850	27.2	-	D	0.8	-	65.6	-
22	US 98 off-ramp	Diverge	3	5,350	29.8	35.0	D	0.9	0.4	67.3	63.3	4,850	26.3	32.0	D	0.8	0.3	67.9	63.8
23	US 98 off-ramp to on-ramp	Basic	3	4,700	26.7	-	D	0.8	-	66.0	-	4,350	23.2	-	C	0.7	-	68.8	-
24	US 98 on-ramp	Merge	3	5,700	35.9	34.6	D	0.9	0.6	59.5	56.3	5,180	30.6	30.7	D	0.8	0.5	62.3	59.7
25	US 98 on-ramp to SR 539 off-ramp	Basic	3	5,700	37.4	-	E	0.9	-	57.2	-	5,180	30.2	-	D	0.8	-	63.1	-
26	SR 539 off-ramp	Diverge	3	5,700	31.9	36.2	E	0.9	0.4	67.1	63.2	5,180	28.0	33.2	D	0.8	0.3	67.9	63.9
27	SR 539 off-ramp to on-ramp	Basic	3	5,020	29.6	-	D	0.8	-	63.6	-	4,700	25.9	-	C	0.7	-	66.7	-
28	SR 539 on-ramp	Merge	3	5,610	34.4	32.1	D	0.9	0.3	61.2	58.5	5,250	30.7	29.5	D	0.8	0.3	62.8	60.5
29	SR 539 on-ramp to West Memorial Boulevard off-ramp	Basic	3	5,610	36.2	-	E	0.9	-	58.2	-	5,250	30.9	-	D	0.8	-	62.5	-
30	West Memorial Boulevard off-ramp	Diverge	3	5,610	31.0	35.3	E	0.9	0.2	68.0	64.4	5,250	28.3	33.2	D	0.8	0.2	68.3	64.5
31	West Memorial Boulevard off-ramp to on-ramp	Basic	3	5,310	32.6	-	D	0.9	-	61.1	-	4,980	28.3	-	D	0.8	-	64.7	-
32	Memorial Boulevard on-ramp to Polk Parkway off-ramp	Weaving	4	6,154	26.0	-	C	0.8	-	66.6	-	5,828	23.2	-	C	0.7	-	68.8	-
33	Polk Parkway off-ramp to on-ramp	Basic	3	5,590	35.9	-	E	0.9	-	58.4	-	5,260	30.9	-	D	0.8	-	62.5	-
34	Polk Parkway on-ramp	Merge	4	6,470	28.1	32.0	D	0.8	0.5	64.9	64.9	6,140	25.1	31.8	C	0.7	0.5	67.3	67.3
35	West of Polk Parkway on-ramp	Basic	4	6,470	28.1	-	D	0.8	-	64.9	-	6,140	25.1	-	C	0.7	-	67.3	-

Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F
The results are based on the HCS 7.9

Table 14: Existing Year 2022 Intersection Level of Service/Delay

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			AM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	West Memorial Boulevard & I-4 Westbound	Volume					300			780						B (13.0)
		LOS (Delay)	Movement				B (16.3)			B (11.7)						
			Approach				B (16.3)			B (11.7)						
		Queue Length 95th (ft)	Movement				71			126						
	Kathleen Road (SR 539) & I-4 Westbound	Volume					560		120	150	1210			1430	440	C (26.9)
		LOS (Delay)	Movement				**E (56.1)**		B (12.2)	**E (70.1)**	A (8.0)			D (35.5)	A (3.4)	
			Approach				D (48.3)			B (14.8)				C (27.9)		
		Queue Length 95th (ft)	Movement				304		66	104	145			#812	59	
	Kathleen Road (SR 539) & I-4 Eastbound	Volume		290		260					1070	340	150	1840		B (18.7)
		LOS (Delay)	Movement	**E (59.5)**		D (44.4)					C (21.2)	A (2.6)	D (43.5)	A (8.1)		
			Approach	D (52.3)							B (16.7)		B (10.8)			
		Queue Length 95th (ft)	Movement	174		214					434	47	m73	326		
	US-98 & I-4	Volume		560			280			250	1390		360	1810		D (51.5)
		LOS (Delay)	Movement	**F (115.4)**			**E (61.6)**			**F (96.4)**	C (21.3)		**F (170.3)**	C (23.5)		
			Approach	**F (115.4)**			**E (61.6)**			C (33.0)			D (47.9)			
		Queue Length 95th (ft)	Movement	#464			191			#240	355		#341	490		
	North Socrum Loop Road (CR 582) & I-4 Westbound	Volume				5	320		140	40	710	270	580	1090	5	**E (61.2)**
		LOS (Delay)	Movement			A (0.2)	D (48.3)		D (37.6)	**E (62.4)**	**F (131.9)**	A (9.8)	**E (63.3)**	C (33.9)		
			Approach	A (0.2)			D (45.0)			**F (96.9)**			D (44.1)			
		Queue Length 95th (ft)	Movement		0		#480		177	71	#512	83	#751	539		
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	Volume		360	10	230	40	10	20	190	570	30	20	830		D (40.3)
		LOS (Delay)	Movement		D (46.7)	A (5.4)	**E (60.7)**		A (1.0)	D (53.0)	C (28.0)	A (0.1)	C (21.1)	**E (55.1)**		
			Approach	C (30.9)			D (35.4)			C (32.9)			D (54.3)			
		Queue Length 95th (ft)	Movement		393	55	72		0	#257	283	0	26	#530		
	SR 33 & I-4 Westbound	Volume					240			70	680			530		C (26.3)
		LOS (Delay)	Movement				**E (62.6)**			A (8.9)	B (15.7)			C (25.8)		
			Approach				**E (62.6)**			B (15.0)			C (25.8)			
		Queue Length 95th (ft)	Movement				#270			m35	343			422		
	SR 33 & I-4 Eastbound	Volume		280		120					470		140	630		C (23.5)
		LOS (Delay)	Movement	D (44.7)		A (4.6)					C (32.8)		B (11.2)	B (13.6)		
			Approach	C (32.7)							C (32.8)		B (13.1)			
		Queue Length 95th (ft)	Movement	255		32					#498		m64	m262		

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			PM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	West Memorial Boulevard & I-4 Westbound	Volume					270			780						B (12.7)
		LOS (Delay)	Movement				B (16.1)			B (11.5)						
			Approach				B (16.1)			B (11.5)						
		Queue Length 95th (ft)	Movement				63			123						
	Kathleen Road (SR 539) & I-4 Westbound	Volume					340		140	250	1630			1120	300	C (22.1)
		LOS (Delay)	Movement				**E (73.3)**		C (31.6)	**F (87.8)**	A (4.0)			C (22.4)	A (2.5)	
			Approach				**E (61.1)**			B (15.1)				B (18.2)		
		Queue Length 95th (ft)	Movement				236		131	m188	247			538	47	
	Kathleen Road (SR 539) & I-4 Eastbound	Volume		430		140					1450	480	150	1310		C (24.8)
		LOS (Delay)	Movement	**E (71.7)**		A (9.9)					C (28.6)	A (5.3)	**E (71.9)**	A (8.5)		
			Approach	**E (56.5)**							C (22.8)			B (15.0)		
		Queue Length 95th (ft)	Movement	292		61					849	139	127	260		
	US-98 & I-4	Volume		760			100			210	1550		370	1260		**E (55.1)**
		LOS (Delay)	Movement	**F (80.4)**			D (50.2)			**E (67.4)**	D (43.0)		**F (88.8)**	D (43.3)		
			Approach	**F (80.4)**			D (50.2)			D (45.9)			D (53.6)			
		Queue Length 95th (ft)	Movement	546			75			172	663		287	478		
	North Socrum Loop Road (CR 582) & I-4 Westbound	Volume					210		190	30	1260	240	360	670	5	D (43.4)
		LOS (Delay)	Movement				**E (67.9)**		**E (70.2)**	**E (71.0)**	D (54.8)	A (4.7)	D (52.7)	B (14.6)		
			Approach				**E (69.0)**			D (47.2)			C (27.9)			
		Queue Length 95th (ft)	Movement				276		256	65	#946	62	#425	268		
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	Volume		560	10	330	30	10	30	290	1090	55	50	530		**F (80.3)**
		LOS (Delay)	Movement		D (53.8)	A (8.5)	**E (69.6)**		A (1.2)	**F (85.9)**	**F (120.9)**	A (0.4)	D (38.8)	**F (85.7)**		
			Approach	D (37.2)			C (30.6)			**F (109.2)**			**F (81.7)**			
		Queue Length 95th (ft)	Movement		#740	121	66		0	#465	#895	0	65	#423		
	SR 33 & I-4 Westbound	Volume					150			80	1150			300		C (27.4)
		LOS (Delay)	Movement				**E (63.7)**			A (4.5)	C (27.7)			B (14.0)		
			Approach				**E (63.7)**			C (26.2)			B (14.0)			
		Queue Length 95th (ft)	Movement				188			m26	m714			209		
	SR 33 & I-4 Eastbound	Volume		690		80					540		70	380		**F (97.6)**
		LOS (Delay)	Movement	**F (206.9)**		A (2.1)					D (39.2)		B (14.7)	B (17.4)		
			Approach	**F (185.7)**							D (39.2)		B (17.0)			
		Queue Length 95th (ft)	Movement	#974		13					#553		44	167		

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LOS notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:

~: Volume exceeds capacity, queue is theoretically infinite

#: 95th percentile volume exceeds capacity

m: Upstream metering is in effect

Table 14: Existing Year 2022 Intersection Level of Service/Delay (Continued)

Interstate	Stop Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection AM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	*SR 559 & I-4 Westbound	Volume					300		240	400	300			300	150	F (>999)
		LOS (Delay)	Movement				F (>999)		B (14.2)	B (10.1)	A (0)			A (0)	A (0)	
			Approach				F (888.9)			A (5.8)				A (0)		
		Queue Length 95th (ft)	Movement				950		75	50	0			0	0	
	*SR 559 & I-4 Eastbound	Volume		190		220					510	320	50	550		E (43.6)
		LOS (Delay)	Movement	E (43.6)		B (13.8)					A (0)	A (0)	A (9.1)	A (0)		
			Approach	D (27.6)							A (0)			A (0.8)		
		Queue Length 95th (ft)	Movement	150		50					0	0	25	0		
	*SR 557 & I-4 Westbound	Volume					400		50	300	400			300	60	F (896.3)
		LOS (Delay)	Movement				F (896.3)		B (11.6)	A (9.5)	A (0)			A (0)	A (0)	
			Approach				F (798.0)			A (4.1)				A (0)		
		Queue Length 95th (ft)	Movement				1025		25	50	0			0	0	
	*SR 557 & I-4 Eastbound	Volume		80		240				390	620			670	30	F (198.1)
		LOS (Delay)	Movement	F (198.1)		D (28.2)				B (14.1)	A (0)			A (0)	A (0)	
			Approach	F (70.7)						A (5.5)				A (0)		
		Queue Length 95th (ft)	Movement	150		125				100	0			0	0	

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection PM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	*SR 559 & I-4 Westbound	Volume					340		160	360	250			220	150	F (732.5)
		LOS (Delay)	Movement				F (732.5)		B (11.3)	A (9.1)	A (0)			A (0)	A (0)	
			Approach				F (501.7)			A (5.3)				A (0)		
		Queue Length 95th (ft)	Movement				825		25	50	0			0	0	
	*SR 559 & I-4 Eastbound	Volume		90		400					520	390	90	470		C (22.4)
		LOS (Delay)	Movement	C (22.4)		C (17.3)					A (0)	A (0)	A (9.2)	A (0)		
			Approach	C (18.2)							A (0)			A (1.5)		
		Queue Length 95th (ft)	Movement	50		125					0	0	25	0		
	*SR 557 & I-4 Westbound	Volume					460		20	260	200			510	80	F (>999)
		LOS (Delay)	Movement				F (>999)		A (9.7)	B (11.2)	A (0)			A (0)	A (0)	
			Approach				F (>999)			A (6.3)				A (0)		
		Queue Length 95th (ft)	Movement				1450		25	50	0			0	0	
	*SR 557 & I-4 Eastbound	Volume		10		320				450	450			940	30	F (185.7)
		LOS (Delay)	Movement	F (121.5)		F (185.7)				D (28.2)	A (0)			A (0)	A (0)	
			Approach	F (183.8)						B (14.1)				A (0)		
		Queue Length 95th (ft)	Movement	25		450				200	0			0	0	

* HCS 7.9 Unsignalized Intersection

*Unsignalized Level of Service/Delay reported for worst movement

LOS notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:

~: Volume exceeds capacity, queue is theoretically infinite

#: 95th percentile volume exceeds capacity

m: Upstream metering is in effect

6.0 Transportation Systems Management and Operations

As part of I-4 Master Plan, the widening of I-4 and improvement of the interchanges within the study area are being evaluated. With long-term solutions several years out, the benefits of near-term Transportation Systems Management and Operations (TSM&O) improvements at the ramp merge/diverge areas were evaluated to assess the effectiveness to eliminate potential unsafe queuing into the mainline lanes and improve overall near-term operational benefits.

TSM&O alternatives are generally low-cost improvements which are designed to maximize the use and efficiency of the existing transportation facilities through improved systems management. The purpose of this study is to identify the existing general problems and recommend low-cost interim improvements which will improve the mobility of users at the existing interchange. The analysis was based on existing year 2022 traffic volumes.

There are several merge/diverge segments within the study area that operate at undesirable LOS of E or F in either of the AM or PM peak hours in year 2022. These ramp junctions along with the deficiencies are listed below:

- I-4 eastbound at Polk Parkway off-ramp diverge segment: Upstream mainline deficiency. Needs widening of thru lanes which is part of the long-term solutions (Master Plan study).
- I-4 eastbound from Polk Parkway on-ramp merge segment: Downstream mainline deficiency. Needs widening of thru lanes which is part of the long-term solutions (Master Plan study).
- I-4 eastbound at West Memorial Boulevard off-ramp diverge segment: Upstream mainline deficiency. Needs widening of thru lanes which is part of the long-term solutions (Master Plan study).
- I-4 westbound at SR 539 (Kathleen Road) off-ramp diverge segment: Extend the deceleration length to maximum 1500 feet if feasible. With the improvement, the diverge segment is anticipated to operate at LOS C during AM and PM, respectively.
- I-4 westbound at West Memorial Boulevard off-ramp diverge segment: Extend the deceleration length to maximum 1500 feet if feasible. With the improvement, the diverge segment is anticipated to operate at LOS C during AM and PM, respectively.

The TSM&O improvements will also enhance safety as it reduces congestion.

8.0 Alternatives

Phase 1 Feasibility Study Summary:

- Alt. 1 – Add 2 general use lanes (GULs) in each direction
- Alt. 2 – Add 2 buffer separated express lanes (ELs) in each direction
- Alt. 3 – Add 2 barrier separated express lanes (ELs) in each direction
- Alt. 4 – Add 1 GUL and 1 HOV lane in each direction

(Note: Buffer/barrier separation does not affect traffic operations, so Alternative 2 and Alternative 3 were analyzed as Alternative 2 at the Feasibility stage. HOV lanes can be accommodated in express lanes, but not vice versa, so Alternative 4 is not recommended to be carried forward.)

Based on operational and safety analyses as well as public input collected, Build Alternative 1 and 2 were recommended to be evaluated further in the Phase 2/Master Plan.

The following alternatives were considered during the preliminary analysis Phase 2 of the project using the Design Year traffic forecasts for I-4 and interchanges within the project limits.

- No-Build Alternative: The No-Build (no action) Alternative will include currently planned and programmed improvements or projects with construction phases identified in cost feasible plans:
    - I-4 interchange improvements at CSX Railroad (bridge replacement)
    - SR 33 interchange modification - roundabout
    - SR 557 interchange modification – roundabout
    - SR 559 interchange ramp terminals – signalized
- Build Alternatives: Addition of General Purpose (GP) lanes and addition of Managed lanes
    - **Build Alternative 1** included I-4 mainline widening from six to ten lanes: addition of two General Purpose Lanes (GPLs) on each direction.
    - **Build Alternative 2** included I-4 mainline widening from six to ten lanes: addition of two Express/High Occupancy Toll (HOT) lanes on each direction.

Build Alternatives were selected based on discussion with FDOT D1 and I-4 Master Plan team.

9.0 Travel Demand Forecasting (No-Build Alternatives)

The District One Regional Planning Model (D1RPM) 2015 Base Year and the 2045 Cost Feasible Model were provided by the Department. Calibration and validation of the D1RPM was completed by the PD&E Team.

The model AADTs from Phase 1 study were reviewed for reasonableness. The National Cooperative Highway Research Project (NCHRP) Report 765, ratio and difference smoothing method was applied to obtain reasonable 2045 AADTs between 2021 and 2045 data. Note that year 2022 data was not utilized to develop the Design Year 2045 AADTs. The future 2045 DDHVs were developed by applying the existing turning movement percentages only to the 2045 approach volumes based on the approved methodology. Detailed tables showing the projected No-Build traffic estimations are provided in **Appendix C**. Growth rates and/or forecasted AADT volumes at the ramps are illustrated in **Table 16**. I-4 mainline corridor AADTs were developed by balancing the traffic in between the interchanges. The average annual growth rate from year 2022 thru 2045 along I-4 corridor within study area is 1.91%. **Table 17** illustrates the 2045 Design Year No-Build AADTs within the study area. Historical and population [Bureau of Economic and Business Research (BEBR)] growth rates in addition to model growth rates were compared.

The Design Hour Volumes (DHVs) for Design Year 2045 was developed by applying the Standard K Factor of 9.0 percent and Directional Factor (D) to the Design Year 2045 AADT volumes. The future year DDHVs were then derived by applying turn percentages obtained from the existing turning movement counts to the DHVs at the ramp terminals and other intersections. A smoothing process was employed to ensure that the resulting design hour traffic volumes comply with the design traffic factors K_{STD}, D, and that traffic flows balance between intersections/interchanges. The initial DDHVs were reviewed for reasonableness and were ensured to be higher than the existing peak hour turning movement volumes. The Design Year 2045 No-Build DDHVS during the PM peak hour were developed first and DDHVs for the AM peak hour were determined using the reciprocal movement of the PM peak hour volumes along mainline and ramps. The supporting future traffic projection documentations are in **Appendix E**. 2045 DDHVs are shown in **Figure 6**.

Table 15 shows the U.S. Census population data and population projections for 2020, 2025, 2035 and 2045 for Polk County based on Bureau of Economic and Business Research Report (BEBR), published by the University of Florida. Between 2021 and 2045, Polk County has an estimated growth rate of approximately 0.33% and 2.57% per year based on BEBR's low and high population estimates, respectively. The 2045 No-Build DDHVs is shown in **Figure 6**.

Table 15

Historical Population and Growth

Type of Projection	Estimated 2020 Population	Population Projection			Average Annual Growth Rate (2021-2045)
		2025	2035	2045	
Polk County					
Low Population Projection	748,365	762,300	804,500	810,500	0.33%
Medium Population Projection		810,900	932,700	1,019,500	1.45%
High Population Projection		859,600	1,061,000	1,228,500	2.57%

Source: Bureau of Economic and Business Research (BEBR), Florida Population Studies, Bulletin 192

Table 16

2045 No-Build Future I-4 Corridor Ramp AADTs

Ramp Location	2021 AADT	Adjusted 2045 AADT	Average Annual Growth Rate 2021 thru 2045
SR 570 (Polk Parkway) System-to-system Interchange			
Eastbound off-ramp	9,300	15,700	2.87%
Eastbound on-ramp	5,200	8,200	2.40%
Westbound off-ramp	5,200	8,200	2.40%
Westbound on-ramp	9,300	15,700	2.87%
Memorial Boulevard			
Eastbound off-ramp	8,000	13,500	2.86%
Eastbound on-ramp	2,900	5,000	3.02%
Westbound off-ramp	2,900	5,000	3.02%
Westbound on-ramp	6,900	13,500	3.99%
SR 539 (Kathleen Road)			
Eastbound off-ramp	5,000	8,100	2.58%
Eastbound on-ramp	5,000	8,000	2.50%
Westbound off-ramp	5,000	8,000	2.50%
Westbound on-ramp	5,000	8,100	2.58%

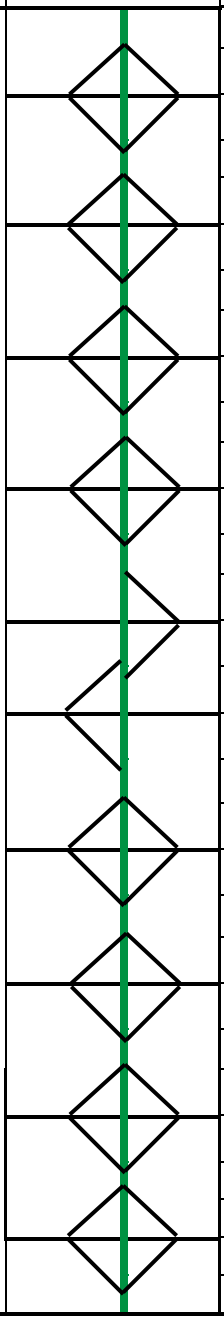
Table 16

2045 No-Build Future I-4 Corridor Ramp AADTs (Continued)

Ramp Location	2021 AADT	Adjusted 2045 AADT	Average Annual Growth Rate 2021 thru 2045
US 98/SR 35/SR 700			
Eastbound off-ramp	10,000	13,500	1.46%
Eastbound on-ramp	7,400	9,800	1.35%
Westbound off-ramp	6,800	9,800	1.84%
Westbound on-ramp	11,000	13,500	0.95%
CR 582 (North Socrum Loop Road)/SR 33 (Lakeland Hills Boulevard)			
Eastbound off-ramp	6,200	7,800	1.08%
Eastbound on-ramp	2,800	5,000	3.27%
Westbound off-ramp	3,400	5,000	1.96%
Westbound on-ramp	5,900	7,800	1.34%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)			
Eastbound off-ramp	3,100	8,600	7.39%
Eastbound on-ramp	2,900	7,500	6.61%
Westbound off-ramp	3,000	7,500	6.25%
Westbound on-ramp	4,100	8,600	4.57%
SR 570 System-to-System Interchange			
Eastbound off-ramp	3,000	6,600	5.00%
Eastbound on-ramp	1,600	12,000	27.08%
Westbound off-ramp	1,600	12,000	27.08%
Westbound on-ramp	3,000	6,600	5.00%
SR 559			
Eastbound off-ramp	4,200	7,300	3.08%
Eastbound on-ramp	4,900	8,900	3.40%
Westbound off-ramp	3,800	8,900	5.59%
Westbound on-ramp	3,300	7,300	5.05%
SR 557			
Eastbound off-ramp	3,000	8,200	7.22%
Eastbound on-ramp	4,400	12,000	7.20%
Westbound off-ramp	4,600	12,000	6.70%
Westbound on-ramp	3,000	8,200	7.22%

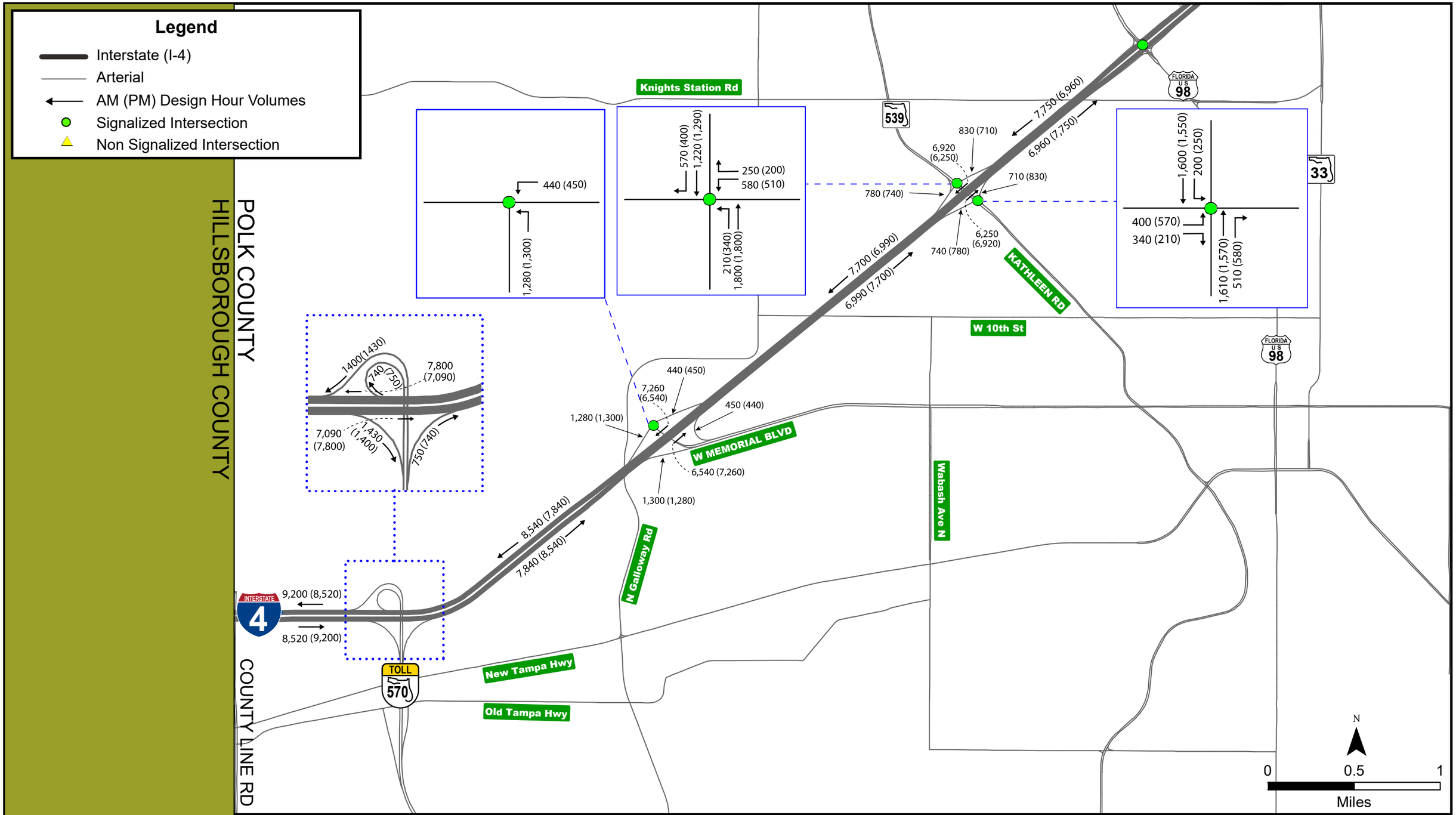
Table 17

2045 No-Build Future I-4 Corridor AADTs

Milepost – Location	Profile	2022 AADT	2045 Adjusted AADT*	Average Annual Growth Rates 2022 - 2045
		**106,800**	**167,800**	**2.48%**
SR 557		9,600	24,000	
		6,400	16,400	
		103,600	**160,200**	**2.38%**
SR 559		10,600	17,800	
		10,800	14,600	
		103,800	**157,000**	**2.23%**
SR 570 (Polk Parkway)		5,800	24,000	
		6,400	13,200	
		104,400	**146,200**	**1.74%**
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		6,400	15,000	
		7,600	17,200	
		105,600	**148,400**	**1.76%**
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		3,600	5,000	
		6,500	7,800	
CR 582 (North Socrum Loop Road)		3,600	5,000	
		6,500	7,800	
		111,400	**154,000**	**1.66%**
US 98/SR 35/SR 700		14,900	19,600	
		21,100	27,000	
		117,600	**161,400**	**1.62%**
SR 539 (Kathleen Road)		10,600	16,000	
		10,600	16,200	
		117,600	**161,200**	**1.61%**
West Memorial Boulevard		6,000	10,000	
		15,600	27,000	
		127,200	**178,200**	**1.74%**
SR 570 (Polk Parkway)		11,000	16,400	
		19,600	31,400	
		135,800	**193,200**	**1.84%**

2,220 = Mainline volume 2,220 = Combined ramp volume ***Average 1.91%***

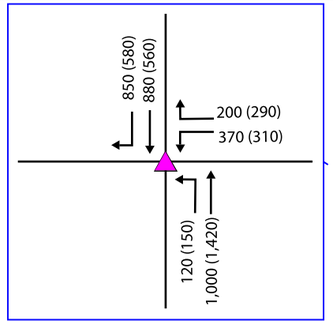
Source: *District One Regional Planning Model (D1RPM)

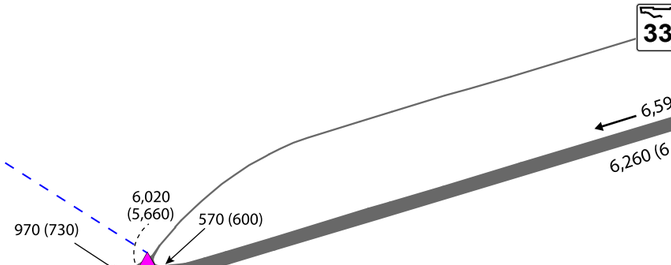


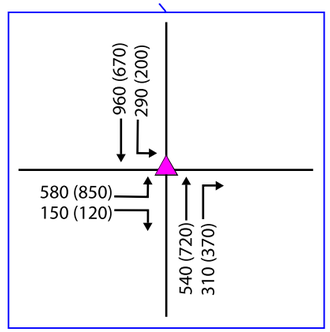
SOUTHWEST I-4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (No-Build) Design Hour Volumes**	**Figure 6 Page 1 of 3**

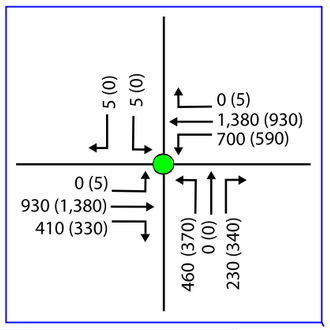
Legend

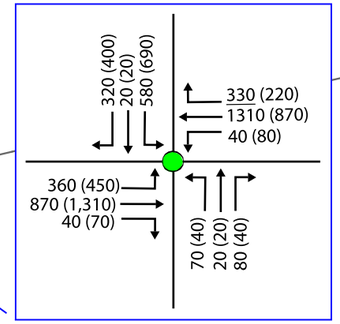
- Interstate (I-4)
- Arterial
- AM (PM) Design Hour Volumes
- Signalized Intersection
- Non Signalized Intersection
- Roundabout

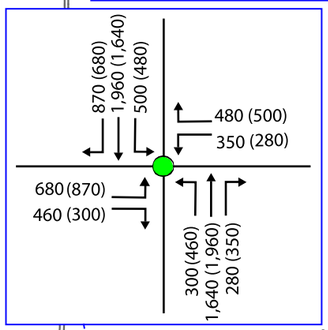






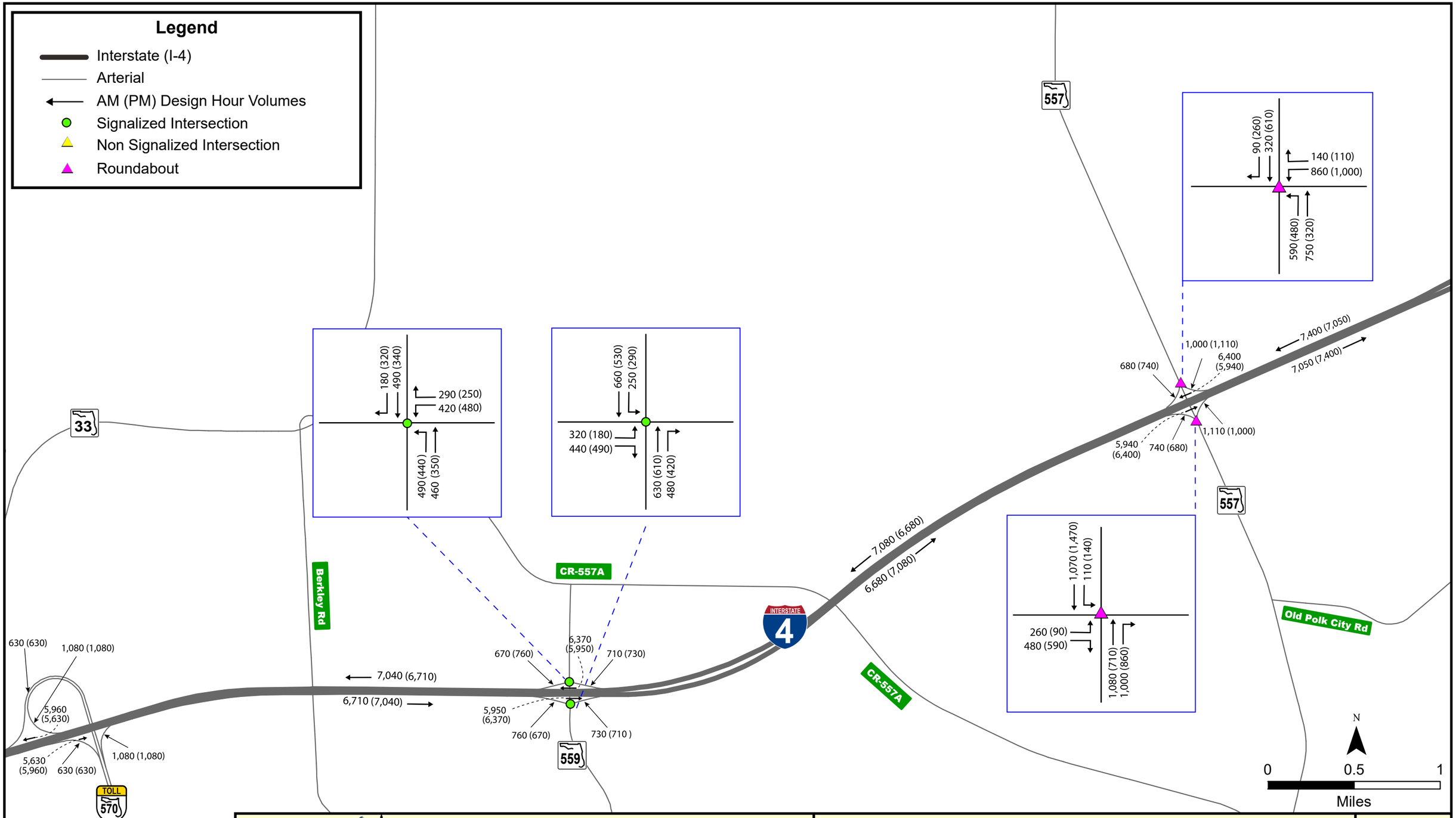






Legend

- Interstate (I-4)
- Arterial
- AM (PM) Design Hour Volumes
- Signalized Intersection
- Non Signalized Intersection
- Roundabout



SOUTHWEST I-4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (No-Build) Design Hour Volumes**

Figure 6 Page 3 of 3

10.0 Travel Demand Forecasting (Build Alternatives)

The following Build Alternatives were considered during the preliminary analysis for Phase 2 of the project using the Design Year traffic forecasts for I-4 and interchanges within the project limits.

- **Build Alternative 1** included I-4 mainline widening from six to ten lanes: addition of two General Purpose Lanes (GPLs) on each direction.
- **Build Alternative 2** included I-4 mainline widening from six to ten lanes: addition of two Express/High Occupancy Toll (HOT) lanes on each direction.

Build Alternatives 1

The Build Alternative 1 model AADTs from Phase 1 study were reviewed for reasonableness. The National Cooperative Highway Research Project (NCHRP) Report 765, ratio and difference smoothing method was applied to obtain reasonable 2045 AADTs. Detailed tables showing the projected Build Alternative 1traffic estimations are provided in **Appendix E**. The smoothing method was performed between 2021 count data and 2045 model AADTs for the mainline and ramps. Ramps and Mainline AADTs for Build Alternative 1 are shown in **Table 18** and **Table 19**, respectively. Build Alternative 1 2045 DDHVs are shown in **Figure 12**.

Table 18
2045 Build Alternative 1 Future I-4 Corridor Ramp AADTs

Ramp Location	2021 AADT	Adjusted 2045 AADT	Average Annual Growth Rate 2021 thru 2045
SR 570 (Polk Parkway) System-to-system Interchange			
Eastbound off-ramp	9,300	15,700	2.87%
Eastbound on-ramp	5,200	8,700	2.80%
Westbound off-ramp	5,200	8,700	2.80%
Westbound on-ramp	9,300	15,700	2.87%
Memorial Boulevard			
Eastbound off-ramp	8,000	13,500	2.86%
Eastbound on-ramp	2,900	5,000	3.02%
Westbound off-ramp	2,900	5,000	3.02%
Westbound on-ramp	6,900	13,500	3.99%
SR 539 (Kathleen Road)			
Eastbound off-ramp	5,000	9,200	3.50%
Eastbound on-ramp	5,000	8,900	3.25%
Westbound off-ramp	5,000	8,900	3.25%
Westbound on-ramp	5,000	9,200	3.50%

Table 18 (Continued)
2045 Build Alternative 1 Future I-4 Corridor Ramp AADTs

Ramp Location	2021 AADT	Adjusted 2045 AADT	Average Annual Growth Rate 2021 thru 2045
US 98/SR 35/SR 700			
Eastbound off-ramp	10,000	14,000	1.67%
Eastbound on-ramp	7,400	10,600	1.80%
Westbound off-ramp	6,800	10,600	2.33%
Westbound on-ramp	11,000	14,000	1.14%
CR 582 (North Socrum Loop Road)/SR 33 (Lakeland Hills Boulevard)			
Eastbound off-ramp	6,200	9,000	1.88%
Eastbound on-ramp	2,800	5,100	2.08%
Westbound off-ramp	3,400	5,100	2.08%
Westbound on-ramp	5,900	9,000	2.19%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)			
Eastbound off-ramp	3,100	9,500	8.60%
Eastbound on-ramp	2,900	7,500	6.61%
Westbound off-ramp	3,000	7,500	6.25%
Westbound on-ramp	4,100	9,500	5.49%
SR 570 System-to-System Interchange			
Eastbound off-ramp	3,000	8,800	8.06%
Eastbound on-ramp	1,600	12,000	27.08%
Westbound off-ramp	1,600	12,000	27.08%
Westbound on-ramp	3,000	8,800	8.06%
SR 559			
Eastbound off-ramp	4,200	8,900	4.66%
Eastbound on-ramp	4,900	8,900	3.40%
Westbound off-ramp	3,800	8,900	5.59%
Westbound on-ramp	3,300	8,900	7.07%
SR 557			
Eastbound off-ramp	3,000	8,200	7.22%
Eastbound on-ramp	4,400	12,500	7.67%
Westbound off-ramp	4,600	12,500	7.16%
Westbound on-ramp	3,000	8,200	7.22%

Table 19

2045 Build Alternative 1 Future I-4 Corridor AADTs

Milepost – Location	Profile	2022 AADT	2045 Adjusted AADT*	Average Annual Growth Rates 2022 - 2045
		106,800	**169,600**	2.56%
SR 557		9,600	25,000	
		6,400	*16,400*	
		103,600	**161,000**	2.41%
SR 559		10,600	17,800	
		10,800	17,800	
		103,800	**161,000**	2.40%
SR 570 (Polk Parkway)		5,800	24,000	
		6,400	17,600	
		104,400	**154,600**	2.09%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		6,400	15,000	
		7,600	19,000	
		105,600	**158,600**	2.18%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		3,600	5,100	
		6,500	9,000	
CR 582 (North Socrum Loop Road)		3,600	*5,100*	
		6,500	9,000	
		111,400	**166,400**	2.15%
US 98/SR 35/SR 700		14,900	21,200	
		21,100	28,000	
		117,600	**173,200**	2.06%
SR 539 (Kathleen Road)		10,600	17,800	
		10,600	18,400	
		117,600	**173,800**	2.08%
West Memorial Boulevard		6,000	*10,000*	
		15,600	*27,000*	
		127,200	**190,800**	2.17%
SR 570 (Polk Parkway)		11,000	*17,400*	
		19,600	31,400	
		135,800	**204,800**	2.21%

2,220 = Mainline volume 2,220 = Combined ramp volume ***Average 2.23%***

Source: *District One Regional Planning Model (D1RPM)

Build Alternatives 2

Build Alternative 2 included I-4 mainline widening from six to ten lanes: addition of two Express/High Occupancy Toll (HOT) lanes on each direction. This section provides information on the development of future traffic daily forecasts, and design hour volumes using Express Lane Time-of-Day (ELToD) Model.

The ELToD Model v2.3 was the primary forecasting tool used to estimate 2045 traffic on the I-4 Managed Lanes (ML) and General Use Lanes (GUL) in the Phase 2 traffic analysis of the I-4 PD&E Study.

The ELToD Model is a forecasting tool developed by the Florida Turnpike Enterprise (FTE) to determine the percent share of traffic that chooses managed lanes during each hour of the day. It estimates the volume of traffic on both general use and managed lanes. In addition, it identifies the managed lanes dynamic toll by hour based on dynamic traffic conditions. The model works in conjunction with Florida's travel demand models which provide the basis for the total corridor traffic.

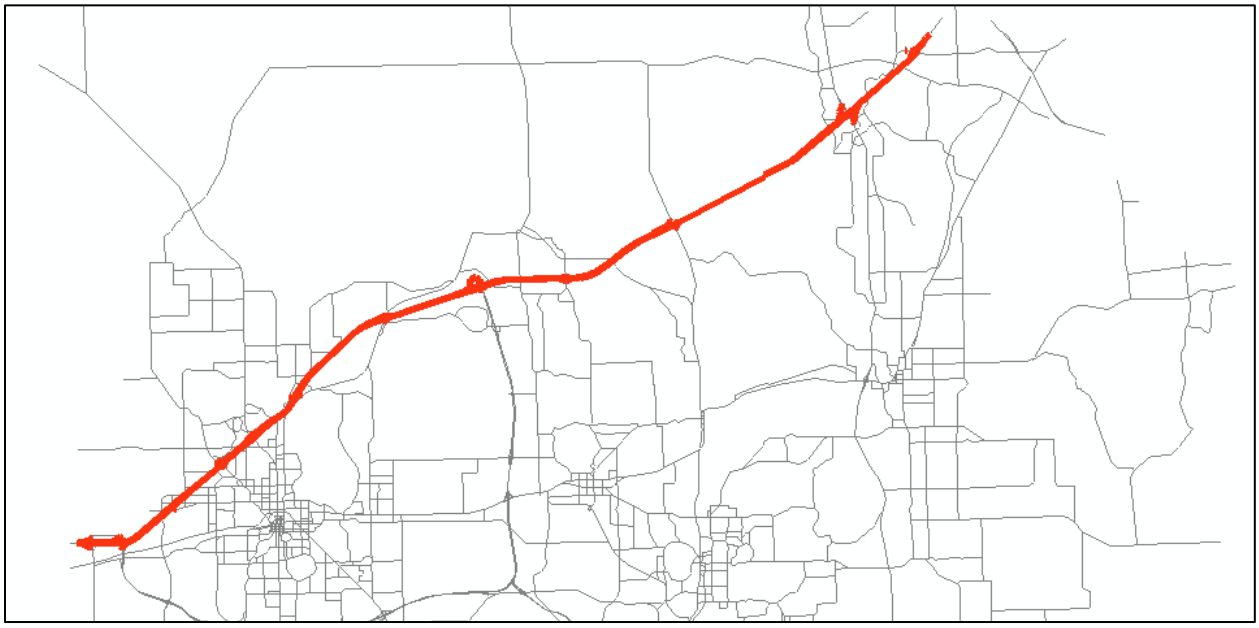
ELToD Setup

Phase 1 of the I-4 PD&E Study developed 2045 forecast AADTs for a Build alternative that included the addition of 4 tolled managed lanes to the existing 6 general use lanes on I-4 from the Polk Parkway (West) to SR 532. The 2045 I-4 No Build D1RPM developed by the IPM (based on the currently adopted 2045 D1RPM v2.0) was the primary travel demand forecasting tool used to model the Build alternative. The D1RPM v2.0 reports highway assignments in AADTs; therefore, the application of a Model Output Conversion Factor was not used. The Phase 1 Managed Lane Build model was the primary input into the ELToD Model used for the Phase 2 analysis. While the overall forecast corridor demand is the same as what was developed in Phase 1, the assignment of trips between the managed lanes and general use lanes is different due to the use of the ELToD model in Phase 2.

The I-4 corridor was extracted from the D1RPM Build model for input into the ELToD Model. When creating a corridor network file from a demand model, it is recommended that the subarea network polygon be designed so that one external node is created for each entrance or exit ramp. The **Figure 7** depicts the extent of the I-4 corridor that was extracted.

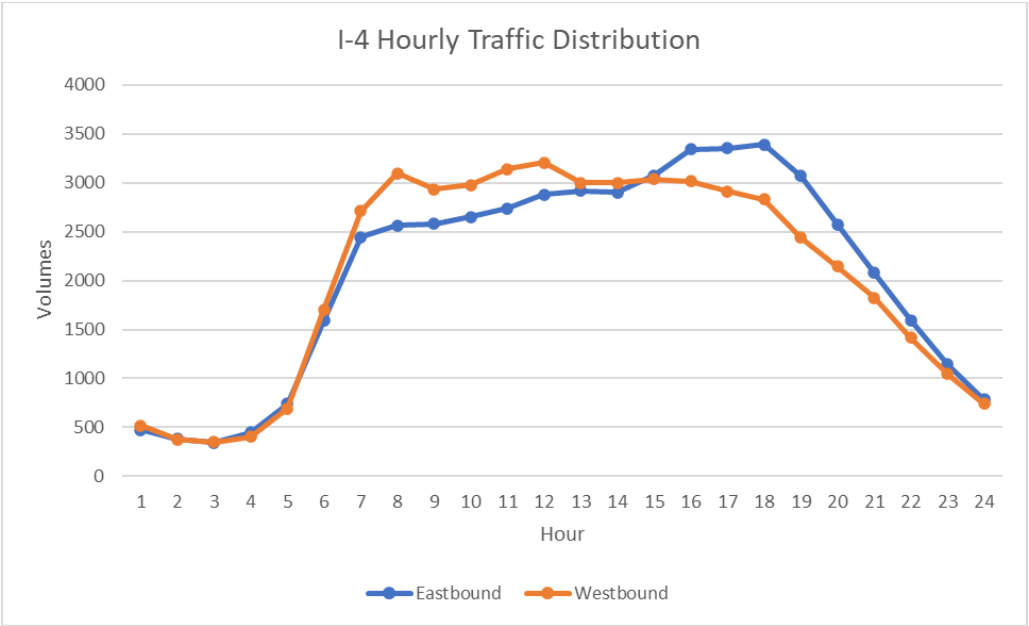
The location of the ingress/egress points for the managed lanes are consistent with those developed for the Phase 1 analysis. In the Phase 1 analysis, Streetlight and D1RPM origin/destination data was analyzed to develop an initial set of managed lanes access points. The D1RPM I-4 model was used to conduct sensitivity tests to determine the impact on managed lane utilization of various access scenarios. These tests along with coordination and direction from the I-4 PD&E Project Team determined the final set of access points that were used.

Figure 7
D1RPM Build Model Extracted Corridor



Hourly traffic counts were the primary data source used to calculate the temporal distribution of traffic. To obtain the necessary continuous traffic count data needed for input into the model, the identification of a FDOT Telemetered Traffic Monitoring Site was conducted and Polk County count station 9951: I-4, 0.6 MI W OF SR-559 was used. **Figure 8** illustrates the hourly traffic distribution that was input into the model.

Figure 8
I-4 Hourly Traffic Distribution



Toll Rates

Minimum toll rates for the managed lane system were input into the ELToD Model at $0.14/mile which is consistent with the Phase 1 analysis.

Model Inputs

Network attributes for Facility Type, Area Type, Free Flow Speed and Per Lane Capacity were used from the D1RPM Phase 1 Build model. Volume Delay Function and Toll Choice Coefficient attributes included in the ELToD Model dataset were used as they have been calibrated by FTE based on observed data from existing managed lane systems in the state.

ELToD Results

The ELToD Model produces 24 one-hour forecasts. For the purposes of the traffic analysis, focus was put on the AM peak hour (8 AM – 9 AM) and the PM peak hour (5PM - 6PM). **Figure 9** illustrates the 2045 AM and PM peak traffic for the GUL and ML system.

Figure 10 illustrates the managed lane utilization by direction for the AM and PM peak hours. As the figure shows the demand for managed lanes during the peak hour varies along different segments of the corridor. For example, for both eastbound and westbound direction, segment 4, from Kathleen Rd to SR 33 W Socrum Loop Rd, has the lowest managed lane demand of total peak hour traffic whereas segment 9, from CR 557 to US 27, has the highest managed lane utilization percent during the AM and PM peak hours. The figure sheds light on geographical distribution of managed lane traffic volume along the corridor and can be used to further refine minimum toll amount for each segment and the location of slip ramps.

Figure 11 provides additional information on toll pricing structure in the model where toll amounts are calculated based on travel demand in the express lanes. The figure presents the minimum toll amount which was input by the modeler and the calculated maximum toll amounts for each segment along the corridor during peak travel periods. The calculated tolls are the maximum amounts that can be charged without deterring road users from using the managed lanes on each segment. This is helpful in deciding setting the toll amounts or adjusting the minimum toll for the segments.

Figure 9

2045 Build Alt 2 Peak Hour Traffic

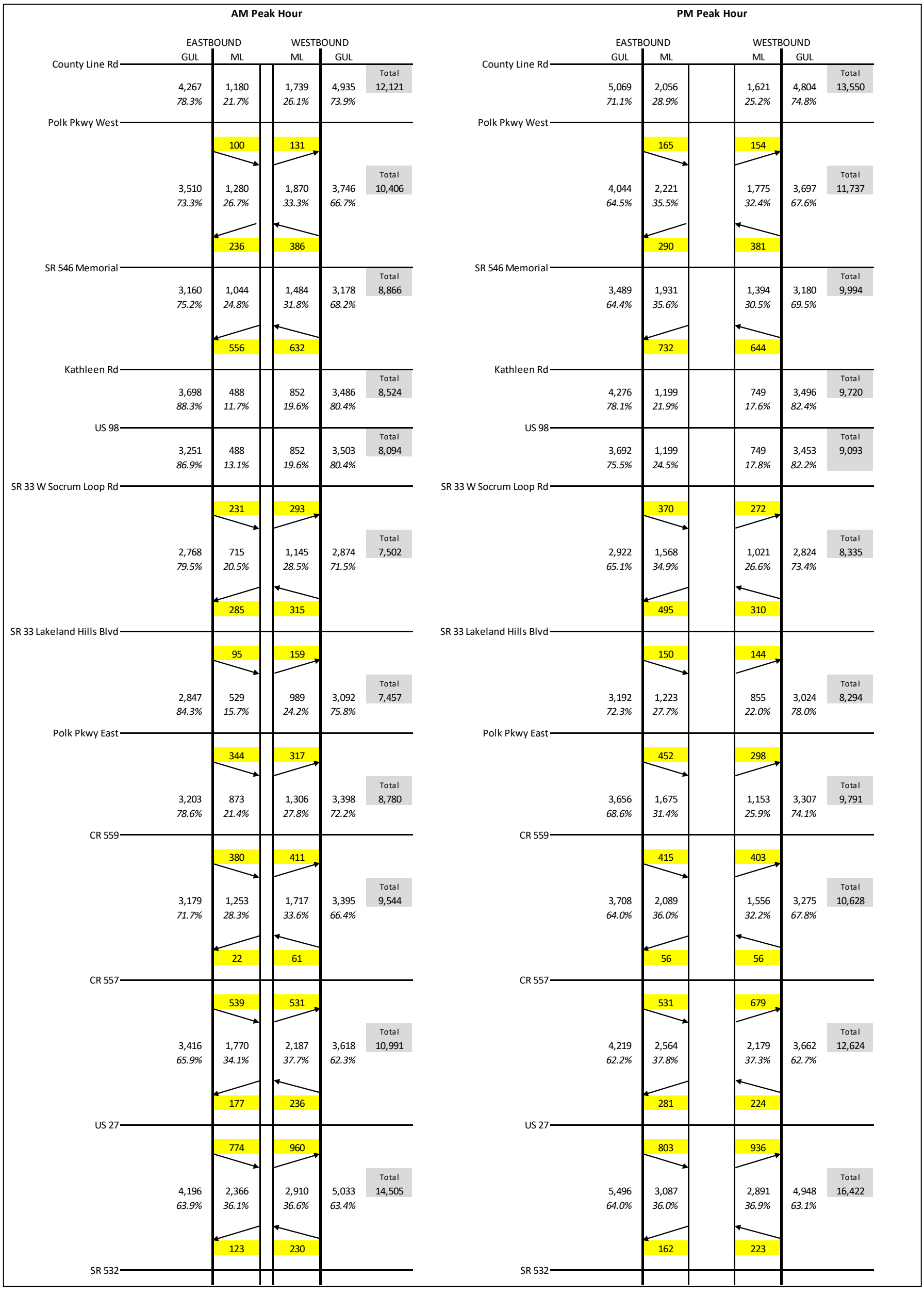
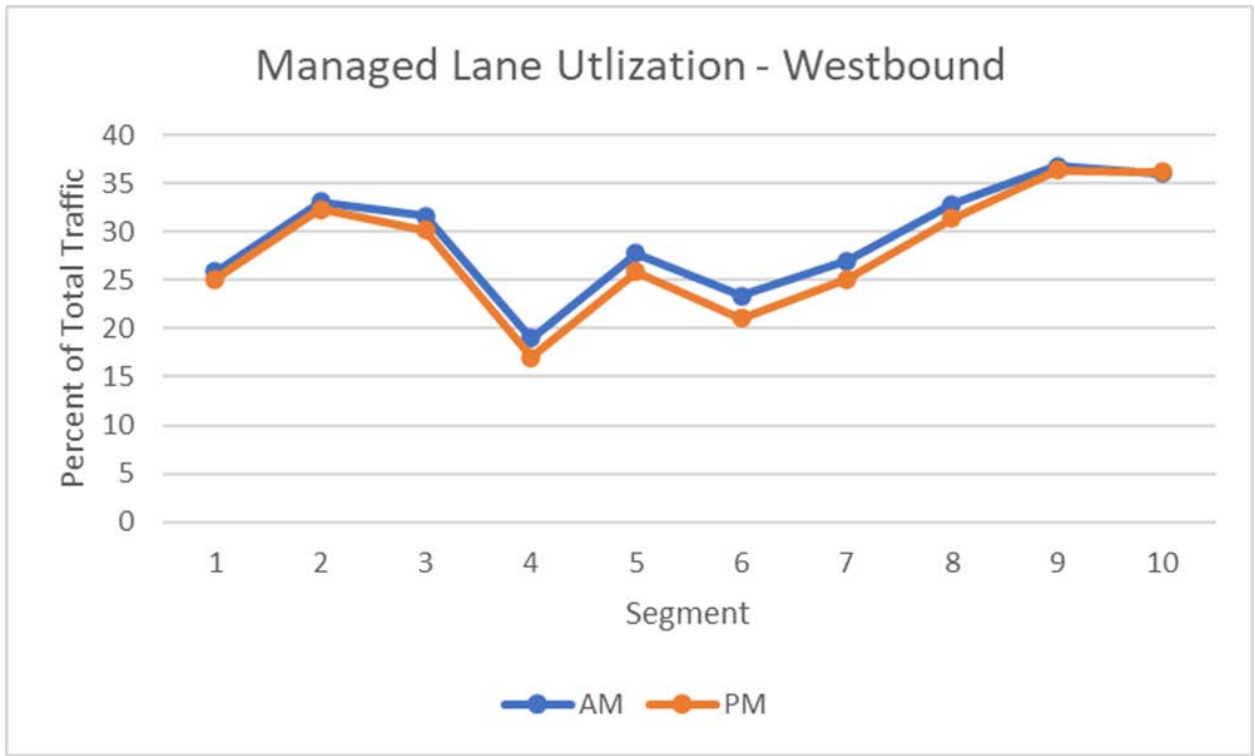
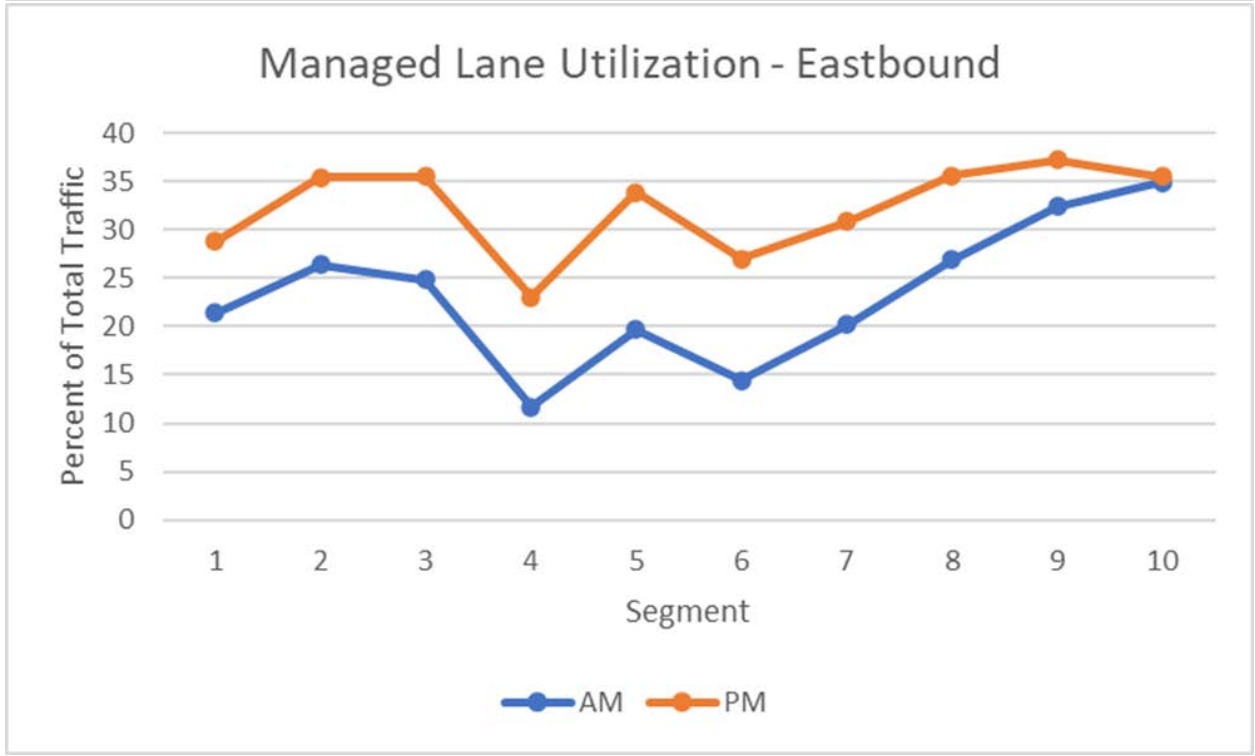


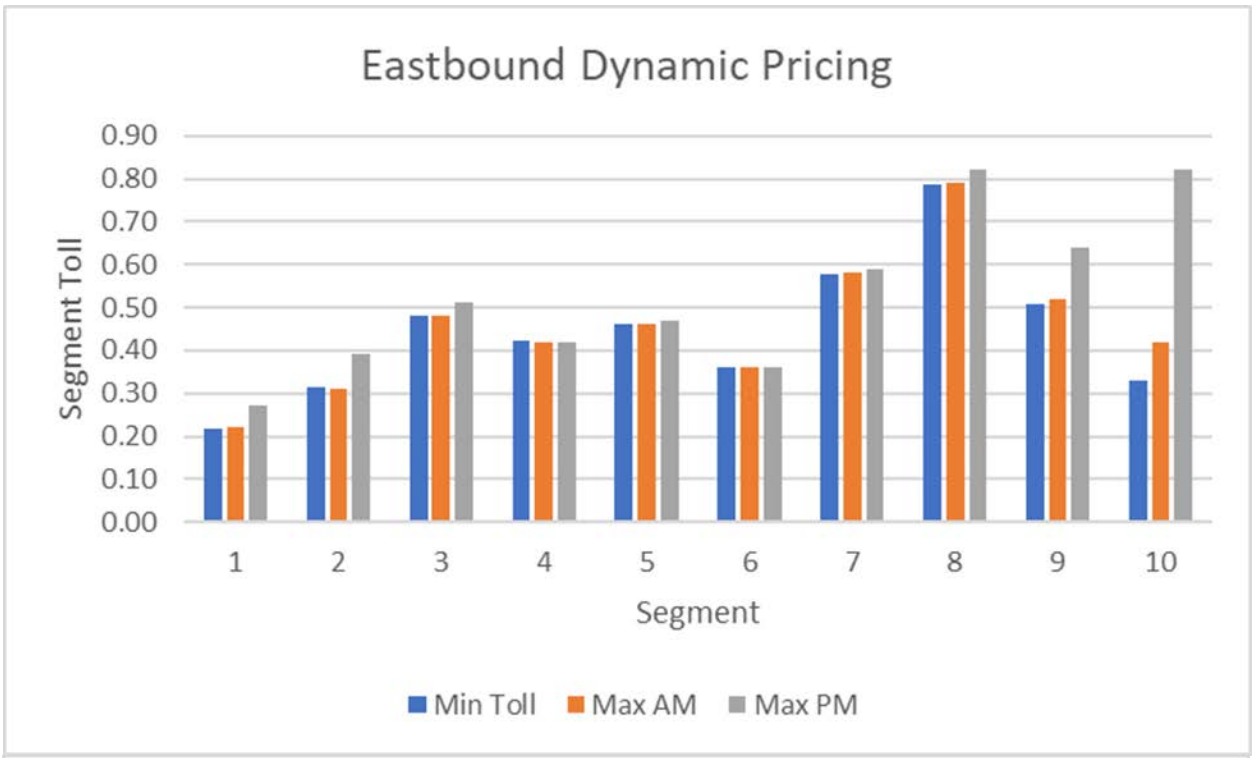
Figure 10
Managed Lane Peak Hour Utilization

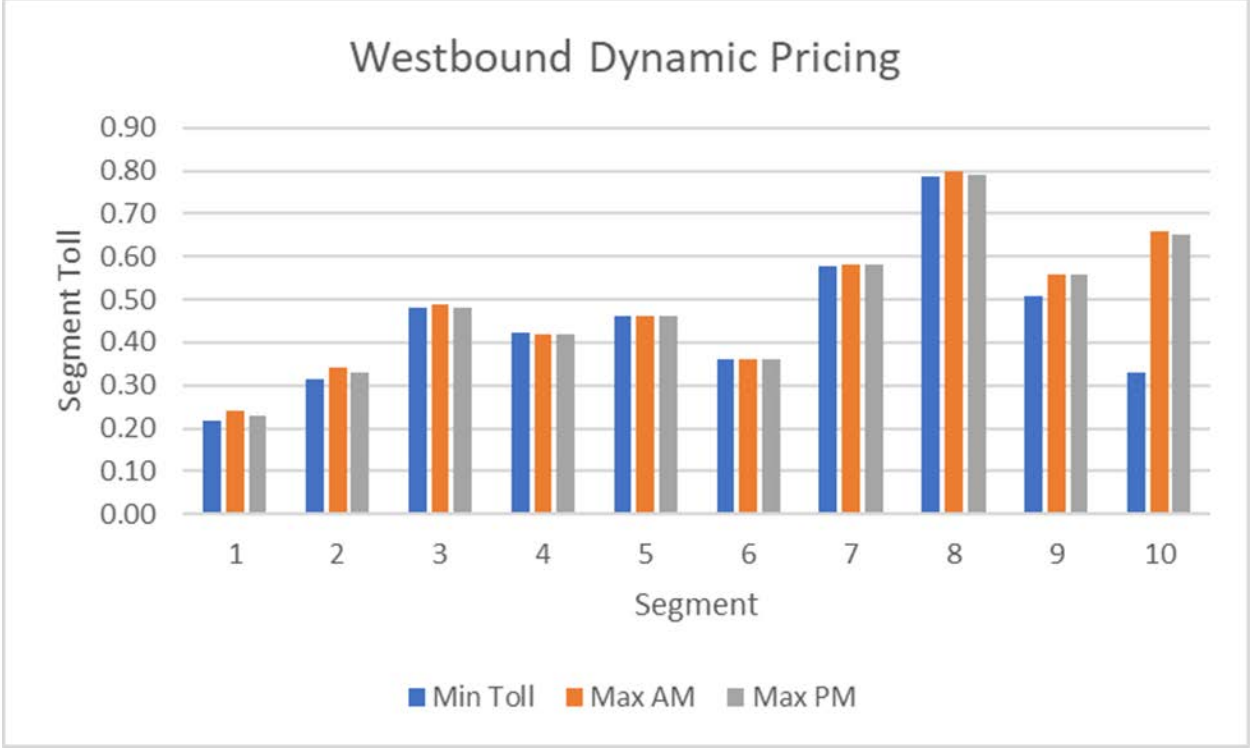




1	County Line Rd	Polk Pkwy West
2	Polk Pkwy West	SR 546 Memorial
3	SR 546 Memorial	Kathleen Rd
4	Kathleen Rd	SR 33 W Socrum Loop Rd
5	SR 33 W Socrum Loop Rd	SR 33 Lakeland Hills
6	SR 33 Lakeland Hills	Polk Pkwy East
7	Polk Pkwy East	CR 559
8	CR 559	CR 557
9	CR 557	US 27
10	US 27	SR 532

Figure 11
Dynamic Pricing Structure





1	County Line Rd	Polk Pkwy West
2	Polk Pkwy West	SR 546 Memorial
3	SR 546 Memorial	Kathleen Rd
4	Kathleen Rd	SR 33 W Socrum Loop Rd
5	SR 33 W Socrum Loop Rd	SR 33 Lakeland Hills
6	SR 33 Lakeland Hills	Polk Pkwy East
7	Polk Pkwy East	CR 559
8	CR 559	CR 557
9	CR 557	US 27
10	US 27	SR 532

Balanced DDHVs for Design Year 2045 Build Alternative 2 figures are shown in **Figure 13**. The smoothing method was performed between 2021 count data and 2045 model AADTs for the mainline and ramps. Ramps and Mainline AADTs for Build Alternative 2 are shown in **Table 20** and **Table 21**, respectively.

Table 20
2045 Build Alternative 2 Future I-4 Corridor Ramp AADTs

Ramp Location	2021 AADT	Adjusted 2045 AADT	Average Annual Growth Rate 2021 thru 2045
SR 570 (Polk Parkway) System-to-system Interchange			
Eastbound off-ramp	9,300	15,700	2.87%
Eastbound on-ramp	5,200	8,400	2.56%
Westbound off-ramp	5,200	8,400	2.56%
Westbound on-ramp	9,300	15,700	2.87%
Memorial Boulevard			
Eastbound off-ramp	8,000	13,500	2.86%
Eastbound on-ramp	2,900	5,000	3.02%
Westbound off-ramp	2,900	5,000	3.02%
Westbound on-ramp	6,900	13,500	3.99%
SR 539 (Kathleen Road)			
Eastbound off-ramp	5,000	8,100	2.58%
Eastbound on-ramp	5,000	8,000	2.50%
Westbound off-ramp	5,000	8,000	2.50%
Westbound on-ramp	5,000	8,100	2.58%
US 98/SR 35/SR 700			
Eastbound off-ramp	10,000	17,000	2.92%
Eastbound on-ramp	7,400	12,200	2.70%
Westbound off-ramp	6,800	12,200	3.31%
Westbound on-ramp	11,000	17,000	2.27%

Table 20 (Continued)

2045 Build Alternative 2 Future I-4 Corridor Ramp AADTs

Ramp Location	2021 AADT	Adjusted 2045 AADT	Average Annual Growth Rate 2021 thru 2045
CR 582 (North Socrum Loop Road)/SR 33 (Lakeland Hills Boulevard)			
Eastbound off-ramp	6,200	8,500	1.55%
Eastbound on-ramp	2,800	5,000	3.27%
Westbound off-ramp	3,400	5,000	1.96%
Westbound on-ramp	5,900	8,500	1.84%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)			
Eastbound off-ramp	3,100	10,000	9.27%
Eastbound on-ramp	2,900	7,500	6.61%
Westbound off-ramp	3,000	7,500	6.25%
Westbound on-ramp	4,100	10,000	6.00%
SR 570 System-to-System Interchange			
Eastbound off-ramp	3,000	6,600	5.00%
Eastbound on-ramp	1,600	12,000	27.08%
Westbound off-ramp	1,600	12,000	27.08%
Westbound on-ramp	3,000	6,600	5.00%
SR 559			
Eastbound off-ramp	4,200	7,900	3.67%
Eastbound on-ramp	4,900	9,200	3.66%
Westbound off-ramp	3,800	9,200	5.92%
Westbound on-ramp	3,300	7,900	5.81%
SR 557			
Eastbound off-ramp	3,000	8,300	7.36%
Eastbound on-ramp	4,400	12,500	7.67%
Westbound off-ramp	4,600	12,500	7.16%
Westbound on-ramp	3,000	8,300	7.36%

Table 21

2045 Build Alternative 2 Future I-4 Corridor AADTs

Milepost – Location	Profile	2022 AADT	2045 Adjusted AADT*	Average Annual Growth Rates 2022 - 2045
		106,800	**169,600**	2.56%
SR 557		9,600	25,000	
		6,400	16,600	
		103,600	**161,200**	2.42%
SR 559		10,600	18,400	
		10,800	15,800	
		103,800	**158,600**	2.30%
SR 570 (Polk Parkway)		5,800	24,000	
		6,400	13,200	
		104,400	**147,800**	1.81%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		6,400	15,000	
		7,600	20,000	
		105,600	**152,800**	1.94%
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		3,600	5,000	
		6,500	8,500	
CR 582 (North Socrum Loop Road)		3,600	5,000	
		6,500	8,500	
		111,400	**159,800**	1.89%
US 98/SR 35/SR 700		14,900	24,400	
		21,100	34,000	
		117,600	**169,400**	1.92%
SR 539 (Kathleen Road)		10,600	16,000	
		10,600	16,200	
		117,600	**169,600**	1.92%
West Memorial Boulevard		6,000	10,000	
		15,600	27,000	
		127,200	**186,600**	2.03%
SR 570 (Polk Parkway)		11,000	16,800	
		19,600	31,400	
		135,800	**201,200**	2.09%

2,220 = Mainline volume 2,220 = Combined ramp volume ***Average 2.09%***

Source: *District One Regional Planning Model (D1RPM)

Legend

- Interstate (I-4)
- Arterial
- AM (PM) Design Hour Volumes
- Signalized Intersection
- Non Signalized Intersection

POLK COUNTY

HILLSBOROUGH COUNTY

COUNTY LINE RD

Knights Station Rd

440 (450)

1,280 (1,300)

640 (400)

1,620 (1,330)

270 (220)

580 (550)

210 (350)

1,800 (1,840)

539

850 (770)

7,450 (6,700)

8,300 (7,470)

7,470 (8,300)

850 (750)

770 (850)

6,700 (7,450)

750 (850)

8,300 (7,450)

7,450 (8,300)

KATHLEEN RD

W 10th St

FLORIDA US 98

1,980 (1,610)

220 (270)

400 (640)

350 (210)

1,610 (1,550)

550 (580)

33

1400(1430)

780 (790)

8,360 (7,510)

7,510 (8,360)

1430 (1400)

790 (780)

440 (450)

7,860 (7,000)

1,280 (1,300)

450 (440)

W MEMORIAL BLVD

7,000 (7,860)

1,300 (1,280)

9,140 (8,300)

8,300 (9,140)

Wabash Ave N

N Galloway Rd

INTERSTATE 4

9,760 (8,940)

8,940 (9,760)

TOLL 570

New Tampa Hwy

Old Tampa Hwy

N

0 0.5 1

Miles

SOUTHWEST INTERSTATE 4 CONNECT

FDOT DISTRICT ONE INTERSTATE PROJECT

Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)

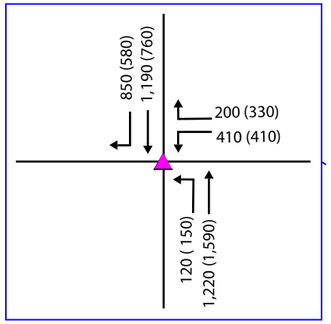
2045 (Build Alternative 1)
Design Hour Volumes

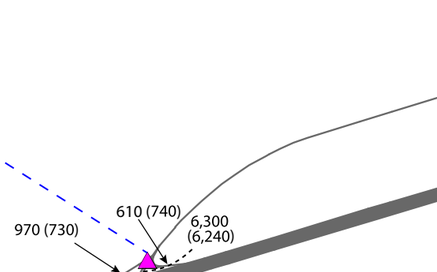
Figure 12

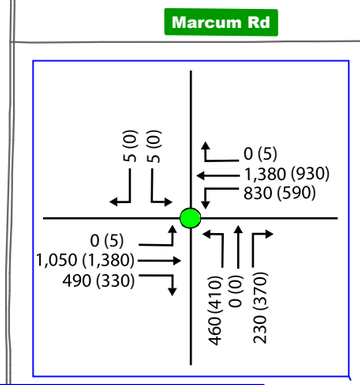
Page 1 of 3

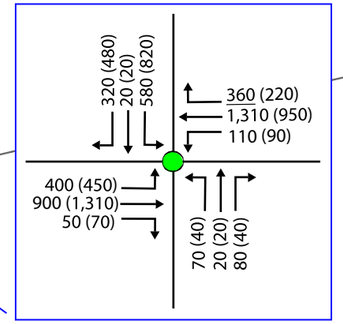
Legend

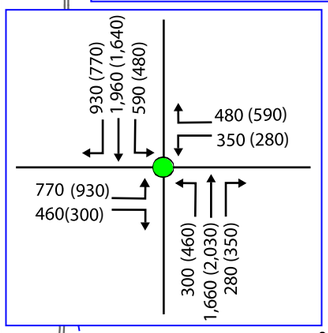
- Interstate (I-4)
- Arterial
- AM (PM) Design Hour Volumes
- Signalized Intersection
- Non Signalized Intersection
- Roundabout











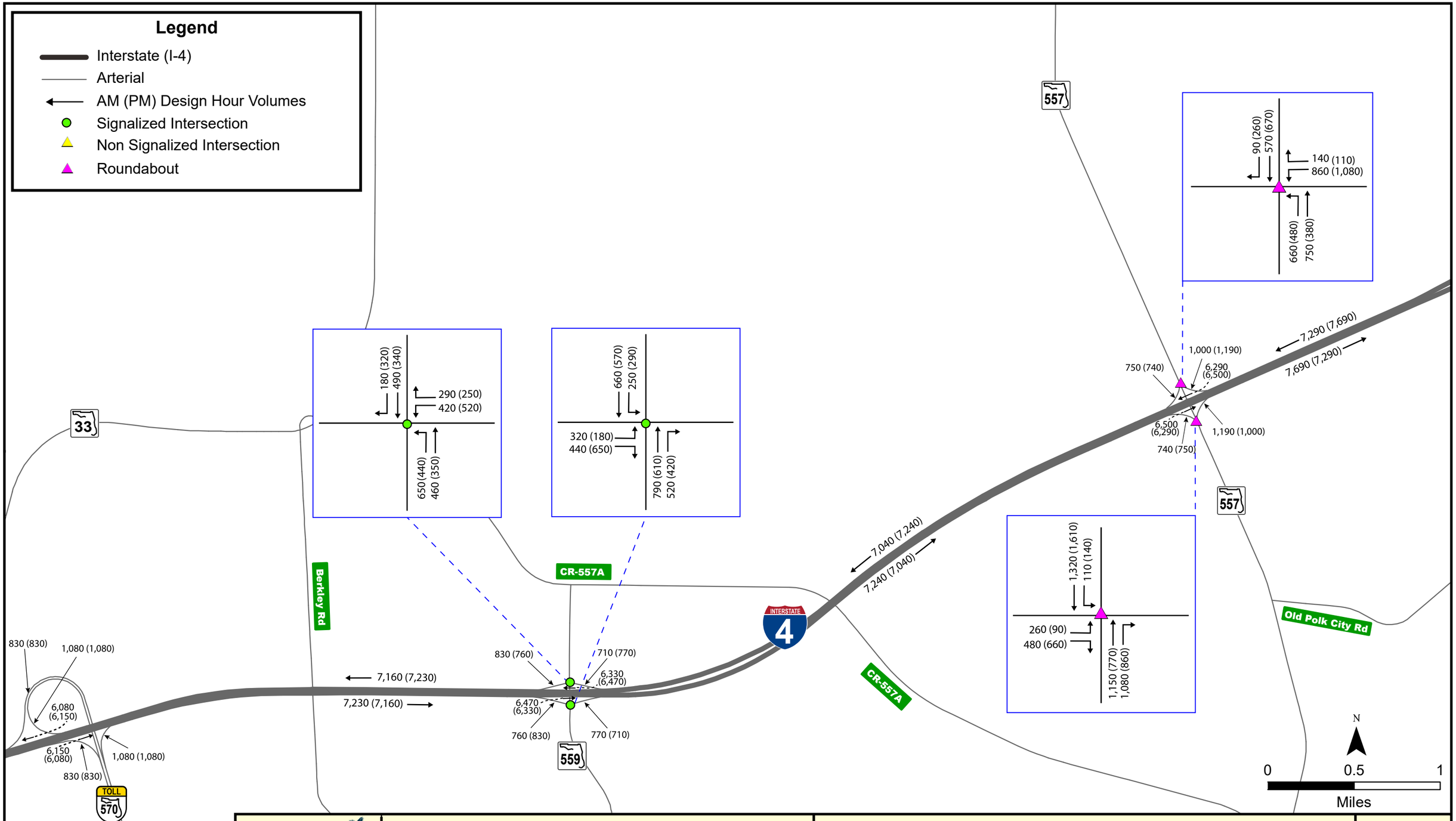
Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)

2045 (Build Alternative 1)
Design Hour Volumes

Figure 12
Page 2 of 3

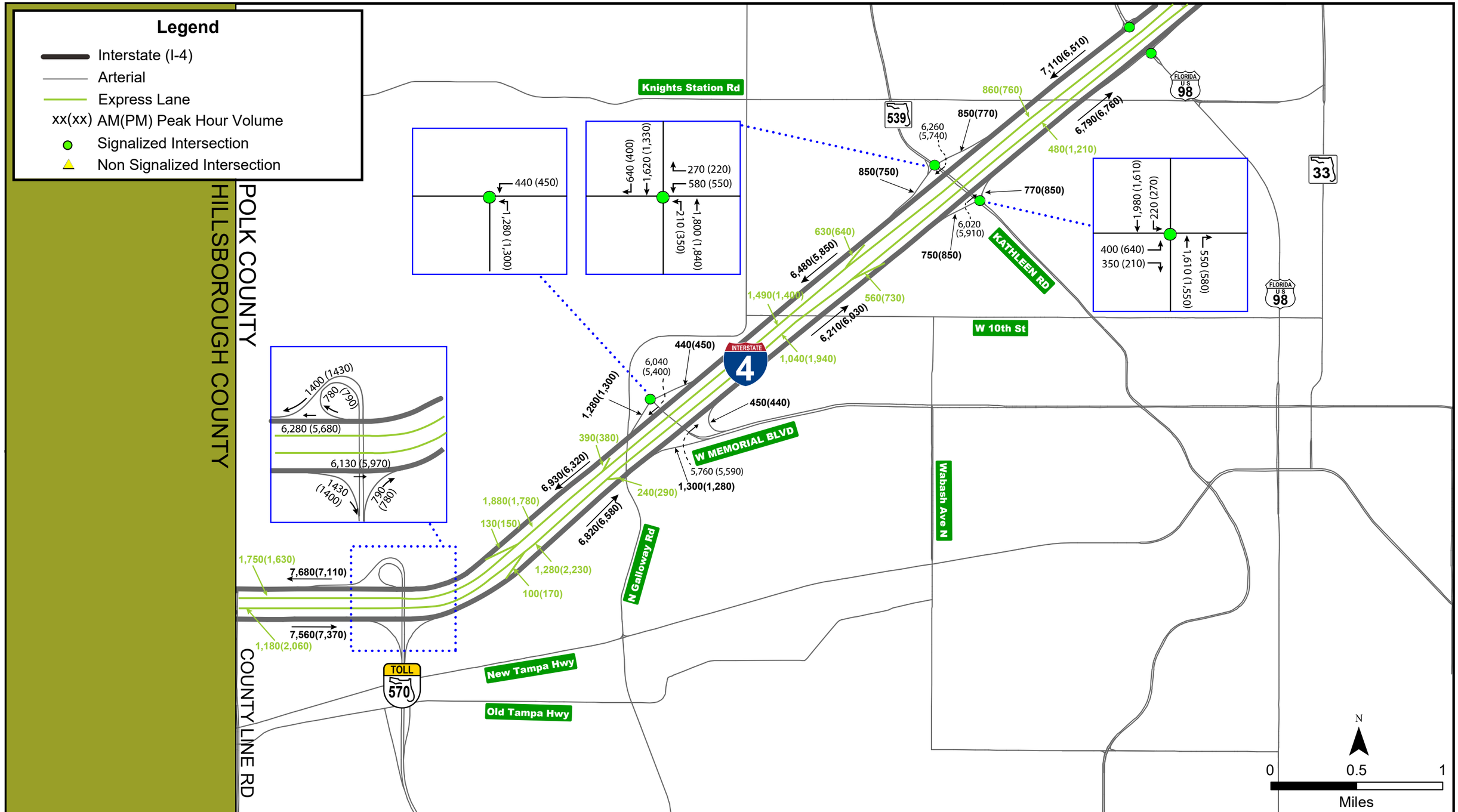
Legend

- Interstate (I-4)
- Arterial
- AM (PM) Design Hour Volumes
- Signalized Intersection
- Non Signalized Intersection
- Roundabout



SOUTHWEST INTERSTATE 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (Build Alternative 1) Design Hour Volumes**

Figure 12 Page 3 of 3



SOUTHWEST 4 CONNECT
FDOT DISTRICT ONE INTERSTATE PROJECT

Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)

2045 (Build Alternative 2) Design Hour Volumes

Figure 13 Page 1 of 3

Legend

- Interstate (I-4)
- Arterial
- Express Lane
- xx(xx) AM(PM) Peak Hour Volume
- Signalized Intersection
- Non Signalized Intersection
- Roundabout

INTERSTATE 4

33

TOLL 570

659

FLORIDA US 98

SOCRUM LOOP RD

Lakeland Hills Blvd

990(860)

520(1,230)

5,870(5,830)

160(140)

6,170(5,630)

100(150)

5,420 (5,230)

610 (740)

970 (730)

320(310)

290(500)

5,530 (5,170)

740 (610)

730 (970)

6,070 (5,650)

5,970 (5,640)

1,150(1,030)

710(1,580)

290(270)

230(370)

450(510)

5,910 (5,410)

510(450)

770(650)

5,690 (5,560)

650(770)

6,680(6,060)

6,340(6,330)

860(760)

1,100(1,050)

5,580 (5,010)

480(1,210)

1,530(1,500)

1,050(1,100)

5,290 (5,230)

1,500(1,530)

850 (580)
1,190 (760)
200 (330)
410 (410)
120 (150)
1,220 (1,590)

5 (0)
5 (0)
0 (5)
1,380 (930)
480 (410)
0 (5)
1,050 (1,380)
290 (240)
300 (260)
0 (0)
150 (250)

1,270 (970)
330 (200)
580 (850)
150 (120)
760 (890)
410 (410)

1,150 (940)
1,960 (1,640)
710 (640)
640 (710)
460 (340)
940 (1,150)
560 (380)
380 (560)
1,660 (2,030)
340 (460)

230 (280)
20 (20)
400 (470)
240 (140)
1,310 (950)
110 (90)
250 (290)
900 (1,310)
50 (70)
70 (40)
20 (20)
80 (40)

N

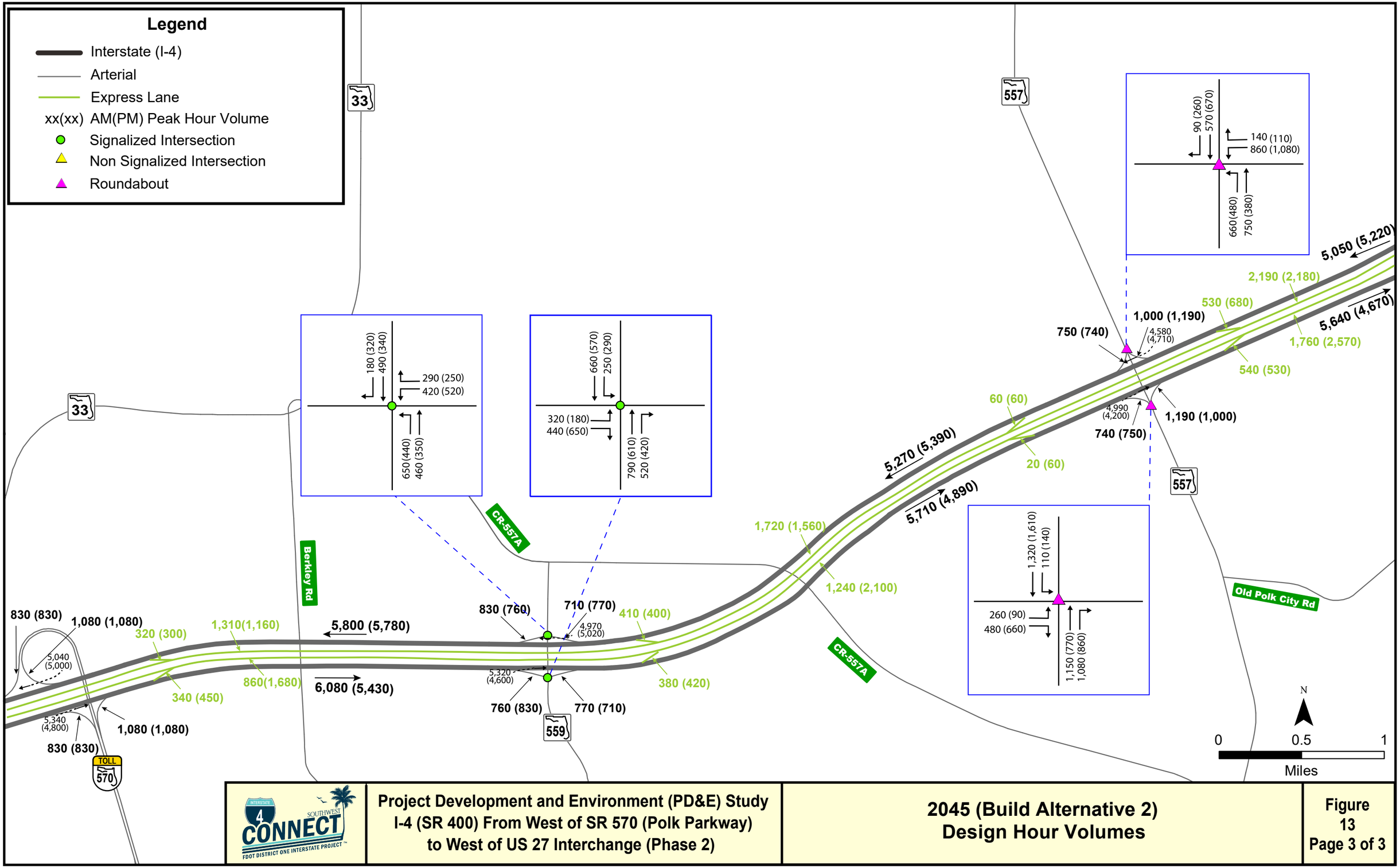
0 0.5 1

Miles

Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)

2045 (Build Alternative 2) Design Hour Volume

Figure 13 Page 2 of 3



SOUTHWEST INTERSTATE 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT

Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway)
to West of US 27 Interchange (Phase 2)

2045 (Build Alternative 2)
Design Hour Volumes

Figure 13
Page 3 of 3

11.0 Consistency with Plans/Projects

Funding for the Project development and Environment (PD&E) study is in the currently adopted Five-Year Work Program as listed below:

- 442512-1 and 442512-2: I-4 (SR 400) west of SR 570 (Polk Parkway) to west of US 27 interchange, PD&E Study, FY 2020/2021
- Florida's SIS Long Range Cost Feasible Plan FY 2029 – 2045 has identified funds for Design and Right of Way

The I-4 PD&E study has maintained consistency with the FDOT Work Program:

- I-4 interchange improvements at CSX Railroad (bridge replacement), Currently under construction.
- SR 33 interchange modification – roundabout, Highways/Preliminary Engineering and Right-of-Way acquisition underway. Fiscal Year 2028 for Construction.
- SR 557 interchange modification – roundabout, under construction.
- SR 559 interchange ramp terminals – signalized, Fiscal Year 2024 for construction.

There is no letting plan till beginning of the Fiscal year.

12.0 No-Build Alternative Traffic Operations Analysis

Traffic operations analyses for the AM and PM peak hours were conducted to document the LOS within the study area for No-Build Design Year 2045. **Figure 14** shows the existing plus committed improvements lane configuration of I-4 mainline, ramps and ramp terminals used in the operational analysis.

The Design Year 2045 AM and PM peak hour traffic volumes were evaluated in each direction for freeway segments: basic, weave, and merge/diverge influence areas. HCS results are summarized in **Tables 22** and **Table 23** for the eastbound and westbound directions, respectively.

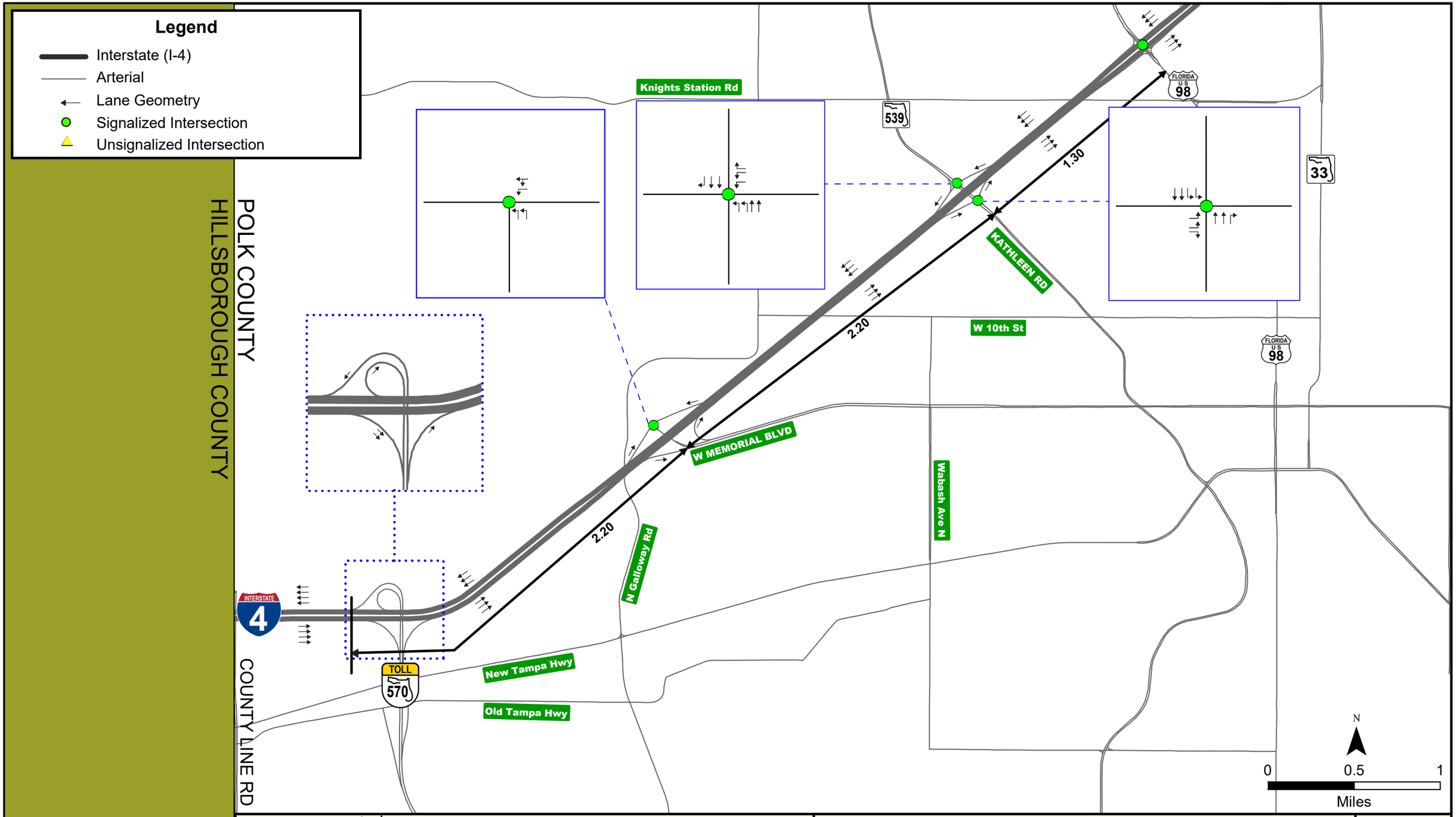
The results of the operation analysis show that most of the segments along I-4 operate at an unacceptable LOS during both the AM and PM peak hours. Capacity deficiencies are present under the existing condition and are expected to increase in the future.

The No-Build Design Year 2045 signalized intersections analysis output summary for AM and PM peak hours are presented in **Table 24**. The signalized intersection operations were optimized for signal splits/offsets. Committed improvements at the SR 33 and SR 557 interchanges (roundabouts) were also coded in the Synchro files and also analyzed using SIDRA (See **Table 25**). SR 559 and I-4 interchange both ramp terminals have been analyzed as signalized intersections. The Synchro, SIDRA and HCS output sheets are included in **Appendix G**. Following intersections are anticipated to operate LOS E or LOS F by No-Build Design Year 2045:

- US 98 and I-4 ramp terminal

- North Socrum Loop Road (CR 582) and I-4 westbound ramp terminal
- Lakeland Hills Boulevard and I-4 eastbound ramp terminal
- SR 559 and I-4 westbound ramp terminal
- SR 557 and I-4 both ramp terminals (roundabout)

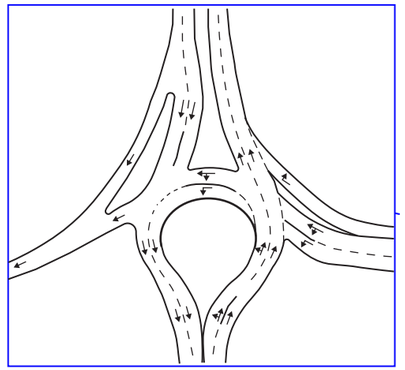
The analysis shows with traffic increasing, levels of service at the intersections above will continue to deteriorate and operate at unacceptable LOS in year 2045.

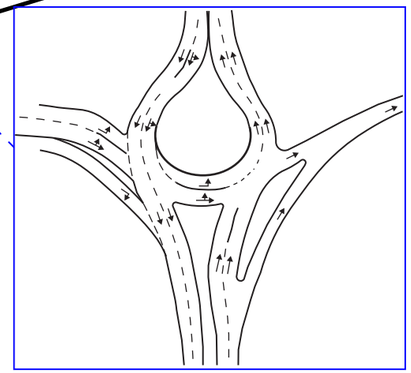


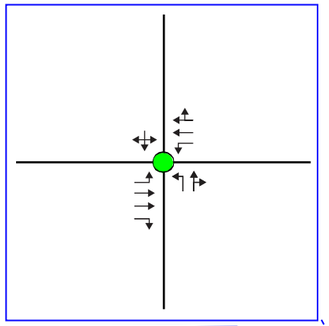
SOUTHWEST 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (No-Build) Lane Geometry**	**Figure 14 Page 1 of 3**

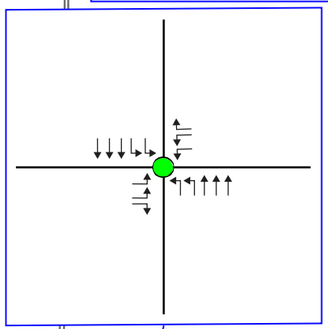
Legend

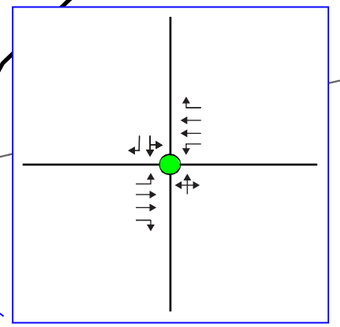
- Interstate (I-4)
- Arterial
- Lane Geometry
- Signalized Intersection
- Unsignalized Intersection
- Roundabout











Marcum Rd

SOCRUM LOOP RD

Lakeland Hills Blvd

INTERSTATE 4

33

33

TOLL 570

659

FLORIDA US 98

3.90

3.20

2.00

N

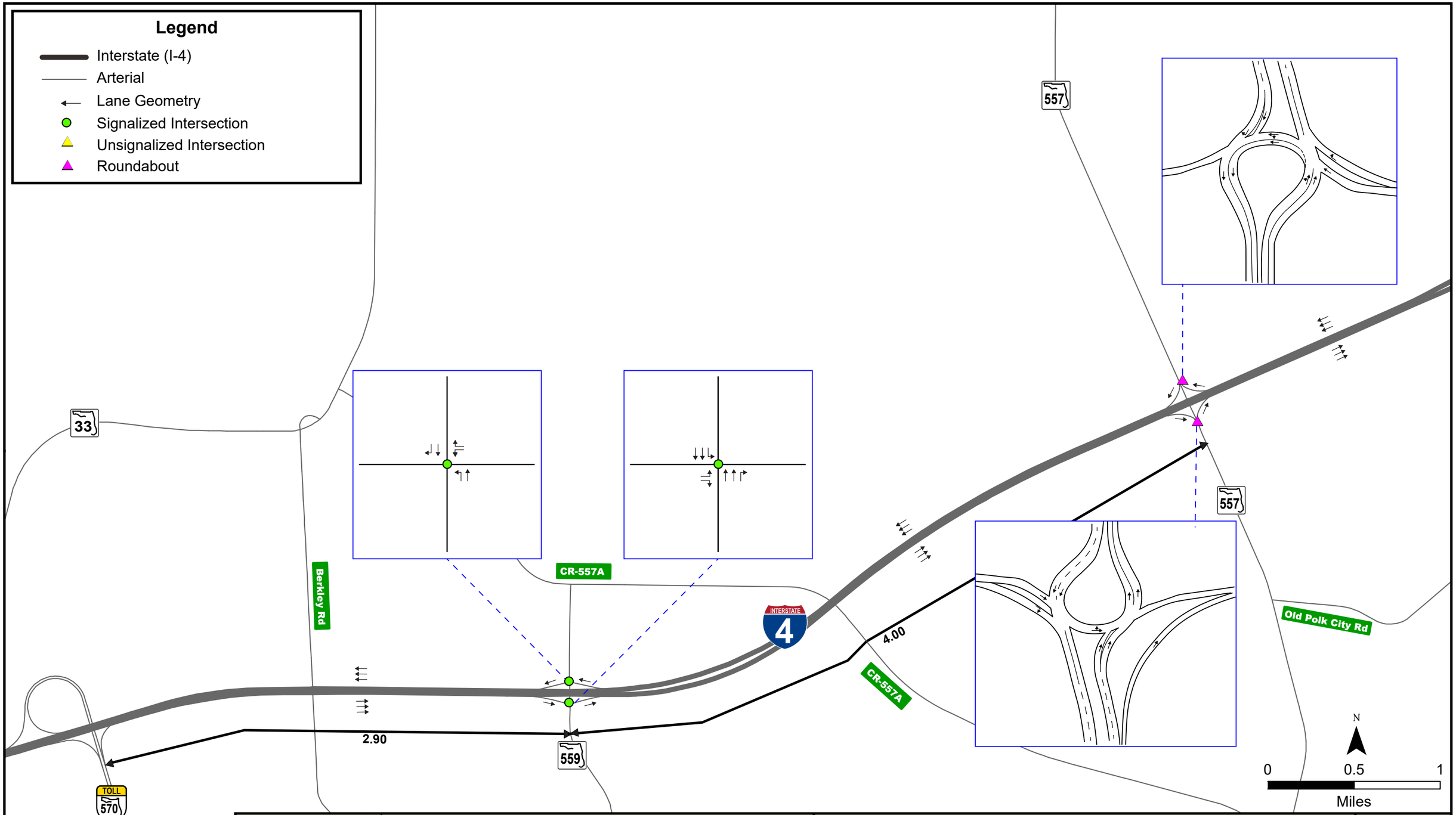
0 0.5 1

Miles

SOUTHWEST I-4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (No-Build) Lane Geometry**	**Figure 14 Page 2 of 3**

Legend

- Interstate (I-4)
- Arterial
- Lane Geometry
- Signalized Intersection
- Unsignalized Intersection
- Roundabout



SOUTHWEST I-4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (No-Build) Lane Geometry**	**Figure 14 Page 3 of 3**

Table **22**: No-Build Year 2045 HCS Level of Service and Density for I-4 Eastbound Segments

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	West of Polk Parkway off-ramp	Basic	4	8,520	72.3	-	F	1.0	-	26.1	-	9,200	72.7	-	F	1.1	-	25.9	-
2	Polk Parkway off-ramp	Diverge	4	8,520	73.8	26.8	F	1.0	0.4	25.0	60.8	9,200	74.2	33.4	F	1.1	0.4	24.8	61.0
3	Polk Parkway off-ramp to on-ramp	Basic	3	7,090	71.3	-	F	1.2	-	26.4	-	7,800	71.1	-	F	1.3	-	26.5	-
4	Polk Parkway on-ramp	Merge	3	7,840	36.1	34.0	F	0.9	0.4	60.0	56.9	8,540	36.1	34.0	F	0.9	0.4	60.0	56.9
5	Polk Parkway on-ramp to West Memorial Boulevard off-ramp	Basic	3	7,840	38.3	-	F	1.3	-	56.5	-	8,540	38.3	-	F	1.4	-	56.5	-
6	West Memorial Boulevard off-ramp	Diverge	3	7,840	33.0	37.5	F	0.9	0.7	65.6	61.3	8,540	33.0	37.5	F	0.9	0.7	65.6	61.3
7	West Memorial Boulevard off-ramp to on-ramp	Basic	3	6,540	24.8	-	F	1.1	-	67.6	-	7,260	25.0	-	F	1.2	-	67.4	-
8	West Memorial Boulevard on-ramp	Merge	3	6,990	29.4	29.2	F	0.8	0.3	62.8	60.3	7,700	29.4	29.2	F	0.8	0.3	62.8	60.3
9	West Memorial Boulevard on-ramp to SR 539 off-ramp	Basic	3	6,990	28.6	-	F	1.1	-	64.4	-	7,700	28.7	-	F	1.2	-	64.3	-
10	SR 539 off-ramp	Diverge	3	6,990	27.4	28.5	F	0.8	0.4	67.2	63.0	7,700	27.5	28.6	F	0.8	0.4	67.1	62.9
11	SR 539 off-ramp to on-ramp	Basic	3	6,250	22.6	-	F	1.0	-	69.2	-	6,920	22.4	-	F	1.1	-	69.4	-
12	SR 539 on-ramp	Merge	3	6,960	29.2	30.2	F	0.8	0.4	62.7	60.2	7,750	30.0	31.1	F	0.8	0.5	62.2	59.6
13	SR 539 on-ramp to US 98 off-ramp	Basic	3	6,960	28.3	-	F	1.1	-	64.7	-	7,750	29.2	-	F	1.3	-	63.9	-
14	US 98 off-ramp	Diverge	3	6,960	27.7	33.0	F	0.8	0.6	66.1	61.8	7,750	28.2	33.5	F	0.8	0.7	66.1	61.7
15	US 98 off-ramp to on-ramp	Basic	3	5,820	19.8	-	C	0.9	-	71.1	-	6,580	20.1	-	F	1.1	-	70.9	-
16	US 98 on-ramp	Merge	3	6,600	26.6	27.4	F	0.7	0.4	63.8	61.6	7,410	27.4	28.1	F	0.8	0.5	63.5	61.2
17	US 98 on-ramp to Lakeland Hills Boulevard off-ramp	Basic	3	6,600	25.3	-	F	1.1	-	67.2	-	7,410	26.2	-	F	1.2	-	66.5	-
18	Lakeland Hills Boulevard off-ramp	Diverge	3	6,600	28.1	28.6	F	0.7	0.6	60.4	54.5	7,410	29.1	29.6	F	0.8	0.7	59.8	53.9
19	Lakeland Hills Boulevard off-ramp to on-ramp	Basic	3	5,680	18.9	-	C	0.9	-	69.0	-	6,300	18.4	-	F	1.0	-	68.8	-
20	Lakeland Hills Boulevard on-ramp	Merge	3	6,390	25.5	26.3	F	0.7	0.4	63.6	61.2	6,990	24.7	25.7	F	0.7	0.4	63.9	61.5
21	Lakeland Hills Boulevard on-ramp to SR 33 off-ramp	Basic	3	6,390	23.6	-	F	1.0	-	68.5	-	6,990	22.9	-	F	1.1	-	69.0	-
22	SR 33 off-ramp	Diverge	3	6,390	24.1	29.9	F	0.7	0.4	67.3	63.1	6,990	26.3	30.0	F	0.7	0.6	60.2	54.4
23	SR 33 off-ramp to on-ramp	Basic	3	5,660	18.8	-	C	0.9	-	71.7	-	6,020	16.8	-	B	1.0	-	70.9	-
24	SR 33 on-ramp	Merge	3	6,260	24.2	24.6	F	0.7	0.3	64.8	62.7	6,590	21.9	22.6	F	0.6	0.3	65.3	63.3
25	SR 33 on-ramp to SR 570 off-ramp	Basic	3	6,260	22.7	-	F	1.0	-	69.2	-	6,590	20.2	-	F	1.1	-	70.9	-
26	SR 570 off-ramp	Diverge	3	6,260	22.8	29.3	F	0.7	0.3	69.0	65.3	6,590	20.7	27.4	F	0.6	0.3	69.1	65.3
27	SR 570 off-ramp to on-ramp	Basic	3	5,630	18.6	-	C	0.9	-	71.8	-	5,960	16.4	-	B	1.0	-	72.6	-
28	SR 570 on-ramp	Merge	3	6,710	27.3	26.1	F	0.8	0.6	63.7	61.6	7,040	24.8	24.2	F	0.7	0.6	64.6	62.7
29	SR 570 on-ramp to SR 559 off-ramp	Basic	3	6,710	26.2	-	F	1.1	-	66.5	-	7,040	23.3	-	F	1.1	-	68.7	-
30	SR 559 off-ramp	Diverge	3	6,710	25.9	31.7	F	0.8	0.4	67.2	63.0	7,040	23.7	29.8	F	0.7	0.4	67.5	63.3
31	SR 559 off-ramp to on-ramp	Basic	3	5,950	20.6	-	C	1.0	-	70.6	-	6,370	18.8	-	F	1.0	-	71.7	-
32	SR 559 on-ramp	Merge	3	6,680	27.1	27.5	F	0.7	0.4	63.7	61.5	7,080	25.1	25.9	F	0.7	0.4	64.3	62.2
33	SR 559 on-ramp to SR 557 off-ramp	Basic	3	6,680	25.9	-	F	1.1	-	66.7	-	7,080	23.6	-	F	1.1	-	68.5	-
34	SR 557 off-ramp	Diverge	3	6,680	25.7	31.3	F	0.7	0.4	67.2	63.0	7,080	26.4	29.8	F	0.7	0.4	61.2	55.3
35	SR 557 off-ramp to on-ramp	Basic	3	5,940	20.5	-	C	1.0	-	70.4	-	6,400	19.0	-	F	1.0	-	67.6	-
36	SR 557 on-ramp	Merge	3	7,050	29.8	29.6	F	0.8	0.6	62.6	60.2	7,400	27.2	27.4	F	0.8	0.6	63.7	61.5
37	East of SR 557 on-ramp	Basic	3	7,050	29.2	-	F	1.1	-	63.9	-	7,400	26.1	-	F	1.2	-	66.5	-

Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F
The results are based on the HCS 7.9

Table **23**: No-Build Year 2045 HCS Level of Service and Density for I-4 Westbound Segments

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	East of SR 557 off-ramp	Basic	3	7,400	49.3	-	F	1.2	-	43.9	-	7,050	49.3	-	F	1.1	-	43.9	-
2	SR 557 off-ramp	Diverge	3	7,400	32.6	37.3	F	0.9	0.6	66.3	62.2	7,050	32.7	37.5	F	0.9	0.6	66.1	61.9
3	SR 557 off-ramp to on-ramp	Basic	3	6,400	27.3	-	F	1.0	-	65.5	-	5,940	26.3	-	D	1.0	-	66.3	-
4	SR 557 on-ramp	Merge	3	7,080	33.3	32.0	F	0.9	0.4	61.4	58.7	6,680	32.9	31.9	F	0.9	0.4	61.5	58.8
5	SR 557 on-ramp to SR 559 off-ramp	Basic	3	7,080	34.2	-	F	1.1	-	59.8	-	6,680	33.6	-	F	1.1	-	60.3	-
6	SR 559 off-ramp	Diverge	3	7,080	30.5	34.6	F	0.9	0.4	67.1	63.1	6,680	30.2	34.4	F	0.9	0.4	67.1	63.1
7	SR 559 off-ramp to on-ramp	Basic	3	6,370	27.0	-	F	1.0	-	65.8	-	5,950	26.4	-	D	1.0	-	66.3	-
8	SR 559 on-ramp	Merge	3	7,040	33.0	32.2	F	0.9	0.4	61.4	58.7	6,710	33.3	32.6	F	0.9	0.4	61.2	58.4
9	SR 559 on-ramp to SR 570 off-ramp	Basic	3	7,040	33.7	-	F	1.1	-	60.2	-	6,710	33.9	-	F	1.1	-	60.0	-
10	SR 570 off-ramp	Diverge	3	7,040	30.6	35.6	F	0.9	0.6	66.3	62.0	6,710	30.7	35.6	F	0.9	0.6	66.3	62.0
11	SR 570 off-ramp to on-ramp	Basic	3	5,960	23.7	-	C	1.0	-	68.4	-	5,630	23.9	-	C	0.9	-	68.3	-
12	SR 570 on-ramp	Merge	3	6,590	29.6	29.4	F	0.8	0.4	62.9	60.5	6,260	29.7	29.5	F	0.8	0.4	62.9	60.5
13	SR 570 on-ramp to SR 33 off-ramp	Basic	3	6,590	29.0	-	F	1.1	-	64.1	-	6,260	29.2	-	F	1.0	-	63.9	-
14	SR 33 off-ramp	Diverge	3	6,590	27.5	32.8	F	0.8	0.3	67.6	63.6	6,260	27.6	33.0	F	0.8	0.3	67.6	63.5
15	SR 33 off-ramp to on-ramp	Basic	3	6,020	24.2	-	C	1.0	-	68.1	-	5,660	24.1	-	C	0.9	-	68.1	-
16	SR 33 on-ramp	Merge	3	6,990	33.0	33.2	F	0.9	0.5	60.8	57.9	6,390	30.8	31.2	F	0.8	0.4	62.1	59.5
17	SR 33 on-ramp to CR 582 (North Socrum Loop Road) off-ramp	Basic	3	6,990	33.1	-	F	1.1	-	60.7	-	6,390	30.5	-	F	1.0	-	62.9	-
18	CR 582 (North Socrum Loop Road) off-ramp	Diverge	3	6,990	32.7	23.4	F	0.9	0.4	61.4	55.3	6,390	31.3	22.3	F	0.8	0.4	61.3	55.2
19	CR 582 (North Socrum Loop Road) off-ramp to on-ramp	Basic	3	6,300	26.4	-	F	1.0	-	66.3	-	5,680	24.3	-	C	0.9	-	68.0	-
20	CR 582 (North Socrum Loop Road) on-ramp	Merge	3	7,410	37.2	31.7	F	0.9	0.7	58.2	54.8	6,600	32.6	28.7	F	0.9	0.6	61.2	58.4
21	CR 582 (North Socrum Loop Road) on-ramp to US 98 off-ramp	Basic	3	7,410	38.4	-	F	1.2	-	56.4	-	6,600	32.7	-	F	1.1	-	61.0	-
22	US 98 off-ramp	Diverge	3	7,410	32.5	37.1	F	0.9	0.5	66.7	62.7	6,600	29.8	35.0	F	0.9	0.4	67.0	62.9
23	US 98 off-ramp to on-ramp	Basic	3	6,580	56.3	-	F	1.1	-	32.0	-	5,820	25.4	-	C	0.9	-	67.1	-
24	US 98 on-ramp	Merge	3	7,750	36.9	35.4	F	0.9	0.7	58.6	55.2	6,960	36.0	34.9	F	0.9	0.6	59.1	55.8
25	US 98 on-ramp to SR 539 off-ramp	Basic	3	7,750	38.3	-	F	1.3	-	56.5	-	6,960	37.0	-	F	1.1	-	57.5	-
26	SR 539 off-ramp	Diverge	3	7,750	32.4	36.8	F	0.9	0.5	66.7	62.7	6,960	31.8	36.2	F	0.9	0.4	67.0	63.1
27	SR 539 off-ramp to on-ramp	Basic	3	6,920	28.8	-	F	1.1	-	64.3	-	6,250	29.1	-	F	1.0	-	64.0	-
28	SR 539 on-ramp	Merge	3	7,700	35.6	33.2	F	0.9	0.4	60.3	57.3	6,990	35.4	33.0	F	0.9	0.4	60.4	57.5
29	SR 539 on-ramp to West Memorial Boulevard off-ramp	Basic	3	7,700	37.6	-	F	1.2	-	57.1	-	6,990	37.4	-	F	1.1	-	57.2	-
30	West Memorial Boulevard off-ramp	Diverge	3	7,700	31.7	35.9	F	0.9	0.2	67.7	64.0	6,990	31.6	35.9	F	0.9	0.3	67.7	64.0
31	West Memorial Boulevard off-ramp to on-ramp	Basic	3	7,260	32.2	-	F	1.2	-	61.4	-	6,540	32.0	-	F	1.1	-	61.6	-
32	Memorial Boulevard on-ramp to Polk Parkway off-ramp	Weaving	4	8,540	46.2	-	F	1.0	-	39.6	-	7,840	28.3	-	D	0.8	-	64.7	-
33	Polk Parkway off-ramp to on-ramp	Basic	3	7,800	38.3	-	F	1.3	-	56.5	-	7,090	38.3	-	F	1.2	-	56.5	-
34	Polk Parkway on-ramp	Merge	4	9,200	32.8	32.8	F	0.9	0.8	61.5	61.5	8,520	33.0	33.0	F	0.9	0.8	61.3	61.3
35	West of Polk Parkway on-ramp	Basic	4	9,200	33.3	-	F	1.1	-	60.5	-	8,520	33.6	-	F	1.0	-	60.3	-

Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F
The results are based on the HCS 7.9

Table 24: 2045 No-Build I-4 Signalized Intersection Analysis

AM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			AM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	West Memorial Boulevard & I-4 Westbound	Volume					440			1280						B (18.5)
		LOS (Delay)	Movement				C (27.4)			B (15.4)						
			Approach				C (27.4)			B (15.4)						
		Queue Length 95th (ft)	Movement				152			304						
	Kathleen Road (SR 539) & I-4 Westbound	Volume					580		250	210	1800			1220	570	C (29.7)
		LOS (Delay)	Movement				**F (93.9)**		D (42.1)	**F (193.5)**	A (4.7)			B (17.9)	A (2.5)	
			Approach				**E (78.3)**			C (24.4)			B (13.0)			
		Queue Length 95th (ft)	Movement				#400		#230	m#166	217			407	46	
	Kathleen Road (SR 539) & I-4 Eastbound	Volume		400		340					1610	510	200	1600		C (27.5)
		LOS (Delay)	Movement	D (49.5)		C (31.3)					C (29.4)	A (2.7)	**F (128.8)**	B (14.5)		
			Approach	D (41.2)						C (23)			C (27.2)			
		Queue Length 95th (ft)	Movement	212		243					771	52	m#158	m535		
	US-98 & I-4	Volume		500			300			680	1640		350	1960		**F (86.1)**
		LOS (Delay)	Movement	**F (338.5)**			**F (173.9)**			**F (209.9)**	C (21.9)		**E (67.5)**	C (22.4)		
			Approach	**F (338.5)**			**F (173.9)**			D (45.4)			**F (86.7)**			
		Queue Length 95th (ft)	Movement	#500			#293			#596	432		236	537		
	North Socrum Loop Road (CR 582) & I-4 Westbound	Volume			930	410	700	1380		460		230	5			**F (99.9)**
		LOS (Delay)	Movement		**F (230.8)**	A (9.2)	**F (185.2)**	C (24.2)		**E (65.4)**	A (0.6)			A (0.2)		
			Approach		**F (162.9)**		**E (78.4)**			D (43.8)			A (0.2)			
		Queue Length 95th (ft)	Movement		#668	94	#919	527		#695	0			0		
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	Volume		360	870	40	40	1310	0	70	20	80	580	20	320	**F (129.5)**
		LOS (Delay)	Movement	**F (274.6)**	C (34.1)	A (0.1)	B (18.5)	**F (146.6)**		**F (88.4)**	A (5.6)			**F (244.6)**	B (17.4)	
			Approach	**F (101.2)**			**F (142.8)**			D (39.9)			**F (165.6)**			
		Queue Length 95th (ft)	Movement	#562	400	0	36	#832		#135	5			#892	170	
	SR 559 & I-4 Westbound	Volume					420		290	490	460			490	180	**E (58.0)**
		LOS (Delay)	Movement				**F (101.4)**		A (7.2)	**F (104.3)**	B (11.0)			**E (67.9)**	A (5.8)	
			Approach				**E (62.9)**			**E (59.1)**			D (51.2)			
		Queue Length 95th (ft)	Movement				#576		73	#673	228			#605	53	
	SR 559 & I-4 Eastbound	Volume		320		440					630	480	250	660		C (28.1)
		LOS (Delay)	Movement	**E (57.4)**		D (37.0)					C (29.7)	A (5.3)	D (50.5)	B (14.7)		
			Approach	D (45.6)						B (19.2)			C (24.5)			
		Queue Length 95th (ft)	Movement	322		298					305	88	m222	m187		

PM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			PM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	West Memorial Boulevard & I-4 Westbound	Volume					450			1300						B (19.3)
		LOS (Delay)	Movement				C (26.4)			B (16.8)						
			Approach				C (26.4)			B (16.8)						
		Queue Length 95th (ft)	Movement				147			345						
	Kathleen Road (SR 539) & I-4 Westbound	Volume					510		200	340	1800			1290	400	C (33.8)
		LOS (Delay)	Movement				**E (71.0)**		D (39.0)	**E (78.7)**	C (21.6)			C (33.0)	A (3.1)	
			Approach				**E (62.0)**			C (30.7)			C (25.9)			
		Queue Length 95th (ft)	Movement				340		205	244	748			701	57	
	Kathleen Road (SR 539) & I-4 Eastbound	Volume		570		210					1570	580	250	1550		C (28.8)
		LOS (Delay)	Movement	**E (65.5)**		B (11.6)					C (34.8)	A (3.3)	**E (71.1)**	B (14.2)		
			Approach	D (51.0)						C (26.3)			C (22.1)			
		Queue Length 95th (ft)	Movement	#343		88					763	56	#167	462		
	US-98 & I-4	Volume		480			460			870	1960		280	1640		**E (66.1)**
		LOS (Delay)	Movement	**F (103.0)**			**E (72.9)**			**F (85.5)**	**E (64.2)**		D (44.7)	D (49.1)		
			Approach	**F (103.0)**			**E (72.9)**			**E (65.9)**			**E (61.3)**			
		Queue Length 95th (ft)	Movement	#380			#315			#617	#858		162	639		
	North Socrum Loop Road (CR 582) & I-4 Westbound	Volume		5	1380	330	590	930	5	370		340				**F (106.4)**
		LOS (Delay)	Movement	**E (56.8)**	**F (196.7)**	A (5.7)	**F (186.2)**	B (16.9)		**E (55.1)**	A (0.6)					
			Approach	**F (159.6)**			**F (82.4)**			C (29.4)						
		Queue Length 95th (ft)	Movement	18	#913	69	#816	346		#437	0		0	0	0	
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	Volume		450	1310	70	80	870		40	20	40	690	20	400	**F (124.4)**
		LOS (Delay)	Movement	**F (260.8)**	**F (98.1)**	A (0.3)	C (28.2)	**F (83.3)**		**E (65.2)**	A (2.3)			**F (233.6)**	B (18.0)	
			Approach	**F (134.3)**			**E (78.6)**			C (27.5)			**F (155.9)**			
		Queue Length 95th (ft)	Movement	#682	#857	0	68	#543		70	0			#1030	219	
	SR 559 & I-4 Westbound	Volume					480		250	440	350			340	320	D (46.2)
		LOS (Delay)	Movement				**E (72.2)**		A (6.4)	**F (86.6)**	B (13.0)			**E (57.1)**	A (7.3)	
			Approach				D (49.7)			D (54.0)			C (32.9)			
		Queue Length 95th (ft)	Movement				#595		67	#576	180			#420	77	
	SR 559 & I-4 Eastbound	Volume		180		490					610	420	290	530		C (26.9)
		LOS (Delay)	Movement	D (43.9)		D (38.2)					C (30.2)	A (5.4)	D (46.6)	B (13.2)		
			Approach	D (39.7)						C (20.1)			C (25.0)			
		Queue Length 95th (ft)	Movement	174		289					309	87	m290	m202		

Synchro Version 11 Build 168.

LOS notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:

~: Volume exceeds capacity, queue is theoretically infinite

#: 95th percentile volume exceeds capacity

m: Upstream metering is in effect

Table **25**: 2045 No-Build I-4 Roundabout Intersection Analysis

AM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection AM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	**SR 557 & I-4 Westbound (Roundabout)	Volume					860		140	590	750			320	90	F (110.4)
		LOS (Delay)	Movement				F (295.5)		F (292.5)	A (0)	A (0)			C (21.3)	C (19.8)	
			Approach				F (295.1)				A (0.1)			C (21.0)		
		V/C	Movement				1.56		1.56	0.41	0.41			0.53	0.53	
			Approach				1.56				0.41			0.53		
		Queue Length 95th (ft)	Movement				1907		1907	0	0			64.4	64.4	
	**SR 557 & I-4 Eastbound (Roundabout)	Volume		260		480					1080	1000	110	1070		C (15.8)
		LOS (Delay)	Movement	D (25.2)		F (87.7)					B (13.5)	A (0)	A (0)	A (0)		
			Approach	F (65.8)							A (7.2)			A (0.1)		
		V/C	Movement	0.64		1.06					0.63	0.67	0.35	0.35		
			Approach	1.06							0.67			0.35		
		Queue Length 95th (ft)	Movement	90		607					165	0	0	0		
	**SR 33 & I-4 Westbound (Roundabout)	Volume					370		200	120	1000			880	850	A (6.2)
		LOS (Delay)	Movement				C (17.7)		B (14.0)	A (0)	A (0)			B (13.6)	A (0)	
			Approach				C (16.4)				A (0)			A (7.0)		
		V/C	Movement				0.46		0.41	0.32	0.32			0.58	0.57	
			Approach				0.46				0.32			0.58		
		Queue Length 95th (ft)	Movement				52		47	0	0			120	0	
	**SR 33 & I-4 Eastbound (Roundabout)	Volume		580		150					540	310	290	960		B (13.8)
		LOS (Delay)	Movement	E (48.5)		B (11.4)					C (16.9)	A (0)	A (0)	A (0)		
			Approach	E (40.9)							B (10.8)			A (0.1)		
		V/C	Movement	0.84		0.30					0.54	0.21	0.37	0.37		
			Approach	0.84							0.54			0.37		
		Queue Length 95th (ft)	Movement	167		29					76	0	0	0		

PM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection PM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	**SR 557 & I-4 Westbound (Roundabout)	Volume					1000		110	480	320			610	260	F (119.8)
		LOS (Delay)	Movement				F (66.3)		F (64.4)	A (0)	A (0)			F (299.7))	F (295.3)	
			Approach				F (66.1)				A (0.1)			F (298.4)		
		V/C	Movement				1.01		1.01	0.30	0.19			1.56	1.56	
			Approach				1.01				0.30			1.56		
		Queue Length 95th (ft)	Movement				610		610	0	0			1683	1683	
	**SR 557 & I-4 Eastbound (Roundabout)	Volume		90		590					710	860	140	1470		F (70.3)
		LOS (Delay)	Movement	C (20.5)		F (448.4)					A (7.1)	A (0)	A (0)	A (0)		
			Approach	F (391.8)							A (3.4)			A (0.2)		
		V/C	Movement	0.33		1.91					0.36	0.58	0.48	0.48		
			Approach	1.91							0.58			0.48		
		Queue Length 95th (ft)	Movement	29		2673					45	0	0	0		
	**SR 33 & I-4 Westbound (Roundabout)	Volume					310		290	150	1420			560	580	B (10.1)
		LOS (Delay)	Movement				D (34.4)		F (60.9)	A (0)	A (0)			A (8.9)	A (0.3)	
			Approach				E (47.2)				A (0.1)			A (4.6)		
		V/C	Movement				0.60		0.90	0.45	0.45			0.38	0.38	
			Approach				0.90				0.45			0.38		
		Queue Length 95th (ft)	Movement				68		194	0	0			44	43	
	**SR 33 & I-4 Eastbound (Roundabout)	Volume		850		120					720	370	200	670		C (21.6)
		LOS (Delay)	Movement	E (36.2)		A (7.3)					E (43.7)	A (0)	A (0)	A (0)		
			Approach	D (32.6)							D (28.9)			A (0)		
		V/C	Movement	0.84		0.18					0.85	0.25	0.26	0.26		
			Approach	0.84							0.85			0.26		
		Queue Length 95th (ft)	Movement	227		17					209	0	0	0		

** SIDRA INTERSECTION 9

[1] LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

[2] The movements with Continuous lane control type have zero second delay time and zero feet queue length.

LOS notes:
Delay is in sec/veh units
:Level Of Service (LOS) E reflecting at capacity operations
:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:
#: 95th percentile volume exceeds capacity
m: Upstream metering is in effect

V/C notes:
: V/C ratio exceeds 0.85

13.0 No-Build Year of Failure Traffic Analysis

The purpose of the Year of Failure analysis is to determine traffic operations for interchanges and I-4 mainline lane requirements within the project's study area for interim years. It is utilized to evaluate if/when (what year) study area interchanges and I-4 corridor mainline segments are projected to become deficient. The Year of Failure for mainline and ramps were determined based on interpolation between year 2021 and year 2045. The Year of Failure for ramp terminals were determined based on growth factor adjustments procedure using Synchro software which is reasonable for the intersection analysis.

Year of Failure for Ramp Terminals

For the No-Build Alternative, the annual growth rate is 1.91% along I-4 corridor from the existing conditions to the design year (2045) conditions. Traffic volumes for interim years were calculated by reducing the design year volumes by 1.91% per year. The growth/reduction factor under Synchro and SIDRA software was used to adjust traffic volumes for each interim year. In the case that traffic operations are anticipated to fail by the design year, an iterative traffic analysis was performed to determine the year when traffic starts to operate below LOS D. The summary of years of failure for ramp terminals are illustrated in **Table 26**. Following ramp terminals are anticipated to operate at an acceptable LOS D or better by Design Year 2045 under No-Build Alternative:

- I-4 and US 92/SR 546 (West Memorial Boulevard)
- I-4 and SR 539 (Kathleen Road)
- I-4 and SR 33 (roundabout)
- I-4 and SR 559 Eastbound Ramp terminal

The list of interchanges with the Year of Failure are stated below:

- I-4 and US 98/SR 35/SR 700 – ***Year 2034***
- I-4 and CR 582 (North Socrum Loop Road)/SR 33 (Lakeland Hills Boulevard) –***Year 2022***
- I-4 and SR 559 Westbound Ramp Terminal – ***Year 2044***
- I-4 and SR 557 westbound ramp terminal roundabout – ***Year 2034*** and eastbound ramp terminal roundabout – ***Year 2035***

Higher growth rates at the ramp terminals will result in lower opening interim years peak hour volumes and could result in operational deficiencies being reported later than expected (See **Appendix H**). Although ramp growth rates varied widely by interchange, ranging between 1% to 7%, it was deemed reasonable to assume a growth rate of 1.91% along the I-4 mainline corridor.

The design year forecasted traffic volumes from SR 557 at I-4 Interchange Modification Report (1/31/2019) was compared and discussed with District One during Phase 1 of the I-4 Master Plan traffic study. The difference was due to post processing and traffic balancing.

Table 26: Year of Failure Analysis - Intersection

Intersection	Existing (2022)			No-Build (2045)			Year of Failure
		Overall LOS (Delay)			Overall LOS (Delay)		
	Intersection Type	AM	PM	Intersection Type	AM	PM	
West Memorial Boulevard & I-4 Westbound	Signalized[1]	B (13.0)	B (12.7)	Signalized[1]	B (18.5)	B (19.3)	NA
Kathleen Road (SR 539) & I-4 Westbound	Signalized[1]	C (26.9)	C (22.1)	Signalized[1]	C (29.7)	C (33.8)	NA
Kathleen Road (SR 539) & I-4 Eastbound	Signalized[1]	B (18.7)	C (24.8)	Signalized[1]	C (27.5)	C (28.8)	NA
US-98 & I-4	Signalized[1]	D (51.5)	E (55.1)	Signalized[1]	F (86.1)	E (66.1)	2034
North Socrum Loop Road (CR 582) & I-4 Westbound	Signalized[1]	E (61.2)	D (43.4)	Signalized[1]	F (99.9)	F (106.4)	2035
Lakeland Hills Boulevard & I-4 Eastbound	Signalized[1]	D (40.3)	F (80.3)	Signalized[1]	F (129.5)	F (124.4)	2022
SR 33 & I-4 Westbound	Signalized[1]	C (26.3)	C (24.7)	Roundabout[3]	A (6.2)	B (10.1)	NA
SR 33 & I-4 Eastbound	Signalized[1]	C (23.5)	F (97.6)	Roundabout[3]	B (13.8)	C (21.6)	NA
SR 559 & I-4 Westbound	Non-Signalized[2]	F (>999)	F (732.5)	Signalized[1]	E (58.0)	D (46.2)	2044
SR 559 & I-4 Eastbound	Non-Signalized[2]	E (43.6)	C (22.4)	Signalized[1]	C (28.1)	C (26.9)	NA
SR 557 & I-4 Westbound	Non-Signalized[2]	F (896.3)	F (>999)	Roundabout[3]	F (110.4)	F (119.8)	2034
SR 557 & I-4 Eastbound	Non-Signalized[2]	F (198.1)	F (185.7)	Roundabout[3]	C (15.8)	F (70.3)	2035

Synchro Version 11 Build 168

LOS Notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

Results

1 :Synchro

2 :HCS

3 :SIDRA

Note: 1. All the signal timings have been optimized for splits and offsets. The signal phase for right turn movements have been maintained based on existing signal phasing

2. Synchro does not account for queue spillover effects. Queue lengths from Synchro would not be realistic, especially for future conditions analysis to account for the spill back. Off-ramp queues based on 2045 No-Build Alternative are documented in **Appendix H**.

Mainline and Ramp Lane Requirements

Future lane requirements were evaluated to provide an estimated timeline for the onset of capacity deficiencies along the I-4 corridor. Freeway mainline level of service targets were based on the 2023 FDOT Quality/LOS Handbook and adjusted based on 7% truck. Capacity analysis for ramp roadways was based on adjusted targets from the HCM 6th Edition.

Worst-case volumes during AM or PM peak hours were considered for this planning level analysis. Also, the highest volume between on and off ramps were considered.

Freeway capacity was adjusted based on HCM 6th Edition procedure below

The capacity of the freeway was taken from HCM 6th edition document and adjusted based on HCM 6th edition as follow:

Adjusted Demand Volume $v_p = V/ (PHF \times N \times f_{HV})$ (HCM 6th Edition Equation 12-9)

$f_{HV} = 1/(1+P_T(E_T - 1)$ (HCM 6th Edition Equation 12-10)

$E_T = 2$ (HCM 6th Edition Exhibit 12-25)

Table 27

Parameters

Data	
K_{STD}	9.00%
$D^{(1)}$	52.00%
Truck % $(T_f)^{(1)}$	7.00%
$RVs^{(2)}$	0.00%
Peak Hour Factor $(PHF)^{(1)}$	0.95
Population Factor $(P_T)^{(2)}$	1.00
$Grade^{(2)}$	0.00%
$Terrain^{(2)}$	Level
Lane $Width^{(2)}$	12.00 ft

(1) Source: I-4 Master Plan - Traffic Factors

(2) Source: HCM 6th Edition default value.

Capacity of a basic freeway segment for free flow speed of 75 mph is 2,400 pc/h/ln (HCM 6th Edition Exhibit 12-4). **Table 28** showed the adjusted capacity for 6, 8 and 10 lanes. The calculation is attached in **Appendix H.**

Table 28

Freeway Capacity

Lane	Capacity of Basic Freeway Segment (pc/h/ln)	Adjusted Capacity
2	N/A	N/A
3	7200	5800
4	9600	7700
5	12000	9600

Adjusted freeway capacity (reduced 10% for FFS 75 mph LOS D)

HCM 6th Edition: Exhibit 12-4

Ramp capacity was adjusted based on HCM 6th Edition procedure below.

The parameters were considered from **Table 27** and adjustment for demand volume formulas as shown under freeway capacity adjustment. Ramp capacity was adjusted based on above procedure from the base capacity listed below (source HCM 6th Edition). The calculation is attached in **Appendix H.**

Table 29

Ramp Capacity

	Ramp Capacity (pc/hr)		Ramp Capacity (veh/hr) LOS D	
FFS (mi/hr)	1-lane	2-lane	1-lane	2-lane
>50	2200	4400	1760	3520
>40-50	2100	4200	1680	3360
>30-40	2000	4000	1600	3200
>20-30	1900	3800	1520	3040

Adjusted Ramp capacity (reduced 10% for LOS D)

HCM 6th Edition: Exhibit 12-16

Tables 30 shows the detailed color-coded future lane requirements corresponding to LOS D (maximum service volume) for No-Build for the freeway mainline:

- I-4 mainline segments at SR 570 (West Polk Parkway) is projected to operate at deficient levels of service by year 2033 and need for 10-lanes roadway improvement.
- I-4 mainline segments at West Memorial Boulevard is projected to be deficient by year 2039 and need for 10-lanes roadway improvement.
- I-4 mainline segments at US 98/SR 35/SR 700 is projected to be deficient by year 2045 and need for 10-lanes roadway improvement.
- I-4 mainline segments from CR 582 (North Socrum Loop road) to SR 557 (East Polk Parkway) are projected to be deficient and need for 10-lanes roadway beyond year 2045.
- Single lane exit and entry ramps are anticipated to operate at acceptable levels of service up to the Design Year 2045 for No-Build conditions.

Table 30: I-4 Lane Requirements by Year for No-Build Alternative (Total Demand)
Mainline Maximum Service Volume (LOS D) and Ramp Capacity (LOS D)
DDHV - Worst Case AM or PM Peak Hour

Milepost – Location	I-4 Corridor	Traffic Count	Interpolated Volumes																							Design Year
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
		4510	4630	4750	4870	4990	5110	5230	5350	5470	5590	5710	5830	5960	6080	6200	6320	6440	6560	6680	6800	6920	7040	7160	7280	7400
		460	490	510	540	570	600	620	650	680	700	730	760	790	810	840	870	890	920	950	970	1000	1030	1060	1080	1110
SR 557		340	360	370	390	410	420	440	460	470	490	510	520	540	560	570	590	610	620	640	660	670	690	710	720	740
		4420	4530	4640	4750	4860	4970	5090	5200	5310	5420	5530	5640	5750	5860	5970	6080	6190	6300	6420	6530	6640	6750	6860	6970	7080
		510	520	530	540	550	560	570	570	580	590	600	610	620	630	640	650	660	670	680	680	690	700	710	720	730
SR 559		520	530	540	550	560	570	580	590	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760
		4430	4540	4650	4760	4870	4970	5080	5190	5300	5410	5520	5630	5740	5840	5950	6060	6170	6280	6390	6500	6610	6710	6820	6930	7040
		260	290	330	360	400	430	470	500	530	570	600	640	670	700	740	770	810	840	880	910	940	980	1010	1050	1080
SR 570 (Polk Parkway)		280	290	310	320	340	350	370	380	400	410	430	440	460	470	480	500	510	530	540	560	570	590	600	620	630
		4450	4540	4630	4720	4810	4900	4990	5070	5160	5250	5340	5430	5520	5610	5700	5790	5880	5970	6060	6140	6230	6320	6410	6500	6590
		350	360	370	380	390	400	410	420	430	440	450	460	480	490	500	510	520	530	540	550	560	570	580	590	600
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		730	740	750	760	770	780	790	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970
		4540	4640	4740	4850	4950	5050	5150	5250	5360	5460	5560	5660	5770	5870	5970	6070	6170	6280	6380	6480	6580	6680	6790	6890	6990
		360	370	390	400	420	430	450	460	480	490	510	520	540	550	560	580	590	610	620	640	650	670	680	700	710
SR 33 (Lakeland Hills Boulevard/Commonwealth Avenue)		860	870	880	890	900	910	920	930	940	950	960	970	990	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110
		440	450	460	470	490	500	510	520	530	540	550	560	580	590	600	610	620	630	640	650	670	680	690	700	710
CR 582 (North Socrum Loop Road)		810	820	840	850	860	870	890	900	910	920	940	950	960	970	990	1000	1010	1020	1040	1050	1060	1070	1090	1100	1110
		4910	5010	5120	5220	5330	5430	5540	5640	5740	5850	5950	6060	6160	6260	6370	6470	6580	6680	6790	6890	6990	7100	7200	7310	7410
		620	630	640	650	660	660	670	680	690	700	710	720	730	730	740	750	760	770	780	790	800	800	810	820	830
US 98/SR 35/SR 700		950	960	970	980	990	1000	1010	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1120	1130	1140	1150	1160	1170
		5240	5340	5450	5550	5660	5760	5870	5970	6080	6180	6290	6390	6500	6600	6700	6810	6910	7020	7120	7230	7330	7440	7540	7650	7750
		650	660	670	670	680	690	700	700	710	720	730	730	740	750	760	760	770	780	790	790	800	810	820	820	830
SR 539 (Kathleen Road)		560	570	580	590	600	610	620	620	630	640	650	660	670	680	690	700	710	720	730	730	740	750	760	770	780
		5200	5300	5410	5510	5620	5720	5830	5930	6030	6140	6240	6350	6450	6550	6660	6760	6870	6970	7080	7180	7280	7390	7490	7600	7700
		290	300	300	310	320	320	330	340	340	350	360	360	370	380	380	390	400	400	410	420	420	430	440	440	450
West Memorial Boulevard		740	760	790	810	830	860	880	900	930	950	970	1000	1020	1040	1070	1090	1110	1140	1160	1180	1210	1230	1250	1280	1300
		5600	5720	5850	5970	6090	6210	6340	6460	6580	6700	6830	6950	7070	7190	7320	7440	7560	7680	7810	7930	8050	8170	8300	8420	8540
		480	490	500	510	530	540	550	560	570	580	590	600	620	630	640	650	660	670	680	690	710	720	730	740	750
SR 570 (Polk Parkway)		840	860	890	910	940	960	990	1010	1040	1060	1090	1110	1140	1160	1180	1210	1230	1260	1280	1310	1330	1360	1380	1410	1430
		5960	6100	6230	6370	6500	6640	6770	6910	7040	7180	7310	7450	7580	7720	7850	7990	8120	8260	8390	8530	8660	8800	8930	9070	9200

Note: MSV - Maximum Service Volumes

LOS D service volumes were adjusted for 7% Trucks

Number of Mainline Lanes by LOS D Maximum Service Volume (MSV)	
Lanes	LOS D
2	N/A
3	5,800
4	7,700
5	9,600

Source: Adjusted MSV based on HCM 6th Edition

Number of Ramp Lanes by Capacity (LOS D MSV)	
1	1,680
2	3,360

Free Flow Speed 40 mph - 50 mph

Source: Adjusted MSV based on HCM 6th Edition

Number of Ramp Lanes by Capacity (LOS D MSV)	
1	1,520
2	3,040

Free Flow Speed 21 - 30 mph

Source: Adjusted MSV based on HCM 6th Edition

14.0 Build Alternatives Traffic Operational Performance

The Highway Capacity Software (HCS7) Version 7.9 was used to identify Level of Service (LOS) along freeway segments. The HCS7 is based on the Highway Capacity Manual Sixth Edition (HCM 6th Edition) methodologies.

Capacity and speed adjustment factors were determined based on following factors:

- I-4 Free-Flow Speed (FFS) – 75 mph
- I-4 Ramps Free-Flow Speed (FFS) – Posted or Advisory Speed Limit plus 5 mph
- I-4 peak hour truck percentage – 7%
- Lane width – 12 feet
- Driver Population – Mostly Familiar
- Weather Type – Non-Severe Weather
- Incident Type – No Incident
- Demand Adjustment Factor – 1.000

Signalized intersections were evaluated using Synchro Version 11. Roundabout intersection has been analyzed using SIDRA Intersection Version 9 software. The peak hours were determined to be 7:15 AM-8:15 AM for the AM peak hour and 4:45 PM – 5:45 PM for the PM peak hour for this study as stated under the methodology.

Selection of Measures of Effectiveness (MOE)

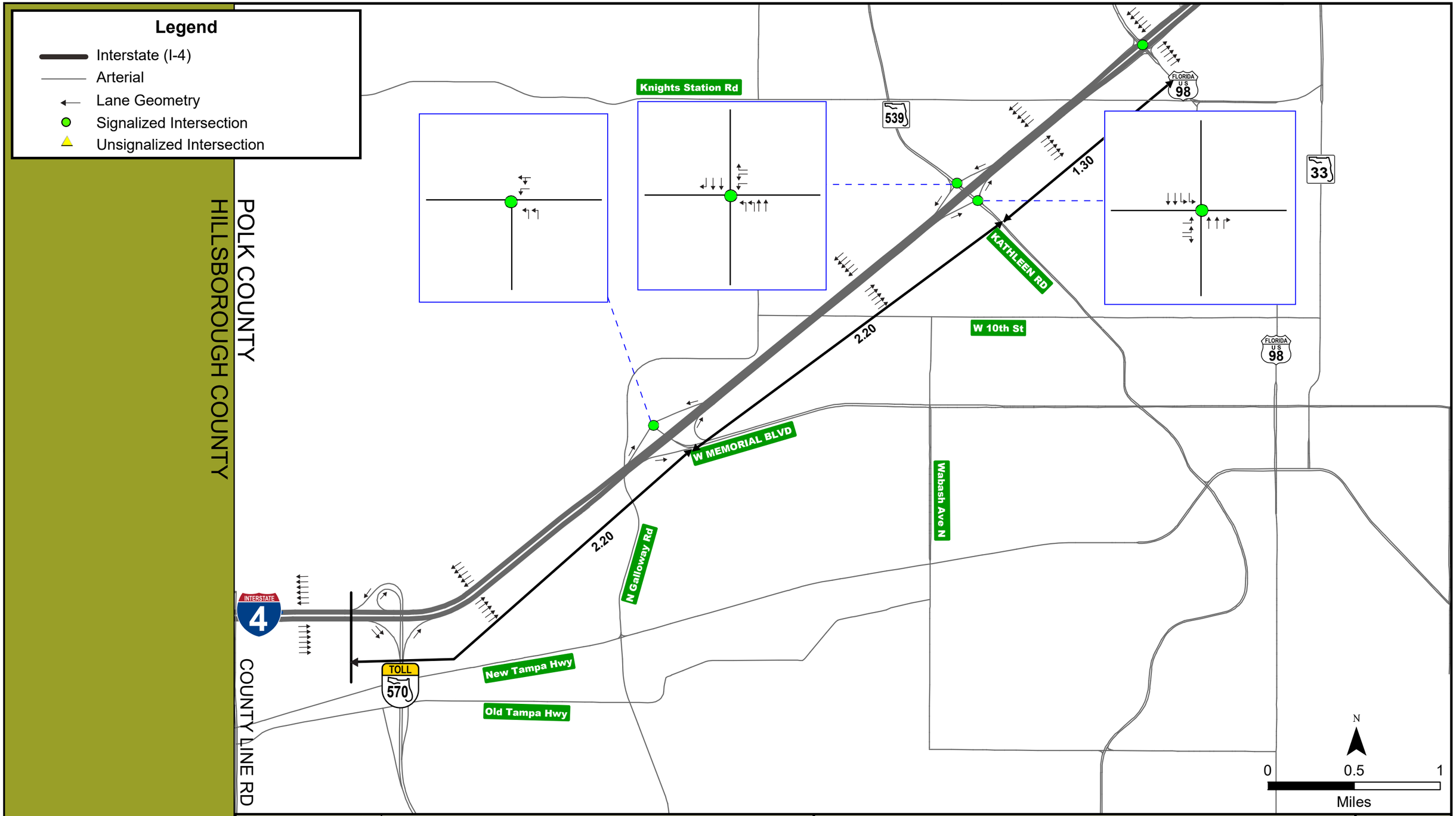
- Signalized/unsignalized Intersections – Volume, control delay, LOS, maximum queue lengths
- Freeway Segments – Volume, density, LOS; demand to capacity ratio, speed
- Ramp Merge/Diverge – Volume, density, LOS, demand to capacity ratio, speed

Build Alternatives

Traffic operations analyses for the AM and PM peak hours were conducted to document the LOS within the study area for Build Design Year (2045). Following two Build Alternatives were considered:

- Build Alternative 1 included I-4 mainline widening from six to ten lanes: addition of two General Purpose Lanes (GPLs) on each direction (See **Figure 15**).
- Build Alternative 2 included I-4 mainline widening from six to ten lanes: addition of two Express/High Occupancy Toll (HOT) lanes on each direction (See **Figure 16**). Capacity of the Express Lanes were adjusted by assuming zero percentage of heavy vehicle. All other parameters were considered based on the approved methodology.

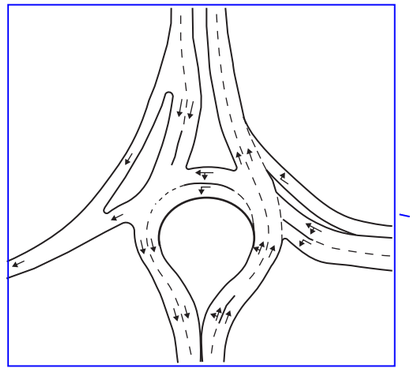
The 2045 AM and PM peak hour traffic volumes were evaluated in each direction for freeway segments: basic, weave, and merge/diverge influence areas. For the managed lane analysis, it was assumed as buffer lane separation (this may subject to change based on upcoming public meeting).

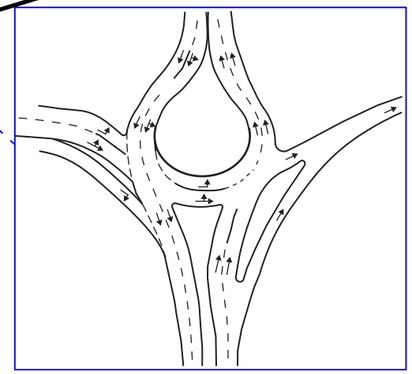


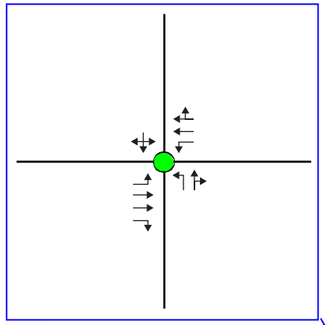
SOUTHWEST 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)	2045 (Build Alternative 1) Lane Geometry	Figure 15 Page 1 of 3

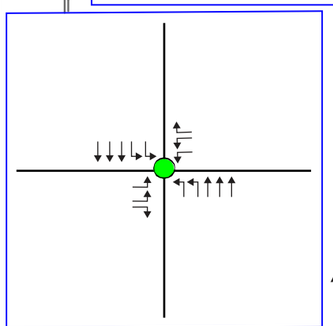
Legend

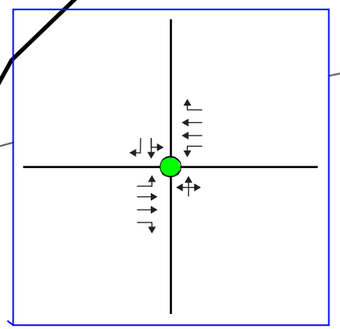
- Interstate (I-4)
- Arterial
- Lane Geometry
- Signalized Intersection
- Unsignalized Intersection
- Roundabout











Marcum Rd

SOCRUM LOOP RD

Lakeland Hills Blvd

INTERSTATE 4

33

33

659

TOLL 570

FLORIDA US 98

3.90

3.20

2.00

N

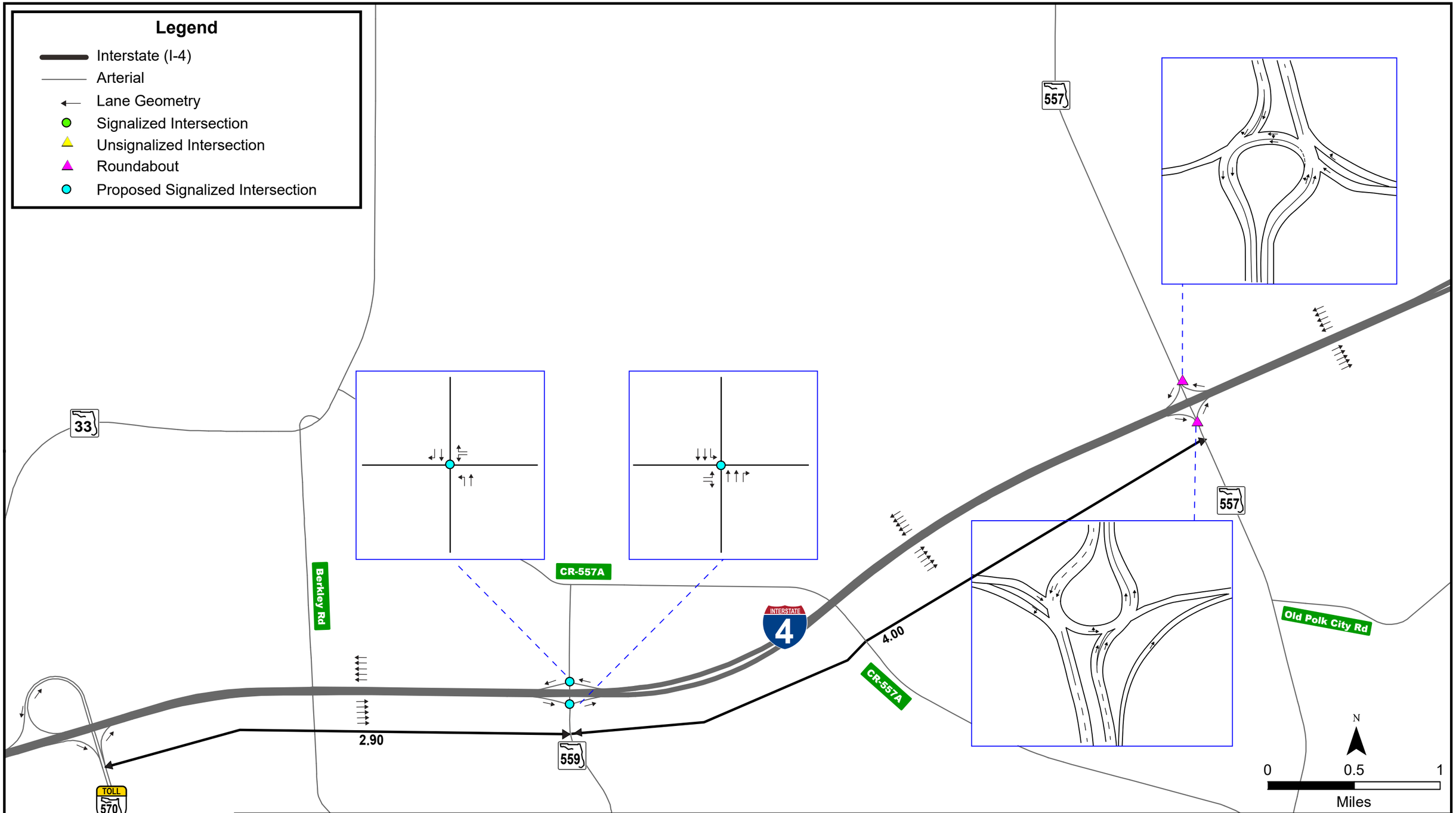
0 0.5 1

Miles

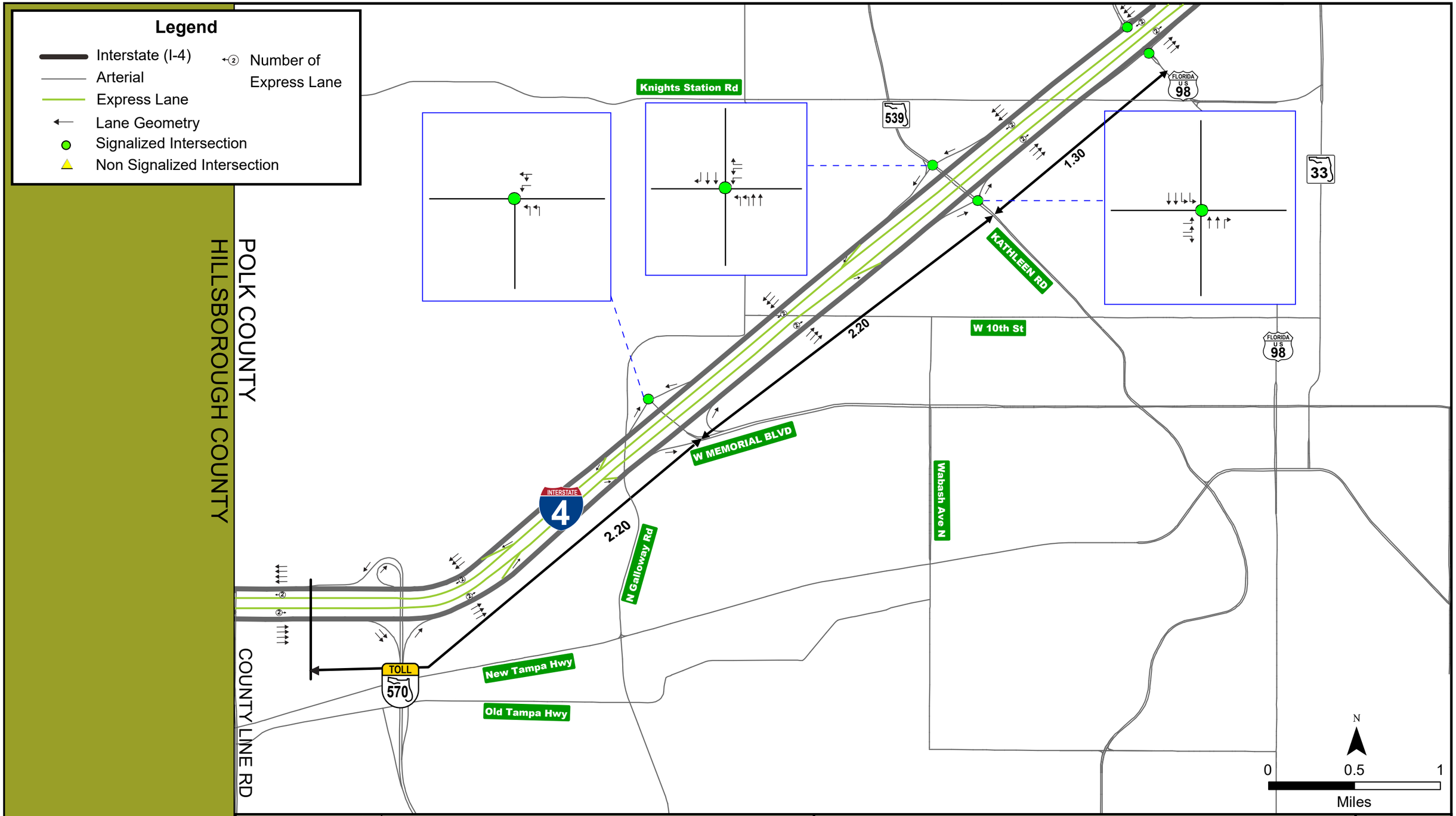
Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)	**2045 (Build Alternative 1)** **Lane Geometry**	Figure 15 Page 2 of 3

Legend

- Interstate (I-4)
- Arterial
- Lane Geometry
- Signalized Intersection
- Unsignalized Intersection
- Roundabout
- Proposed Signalized Intersection



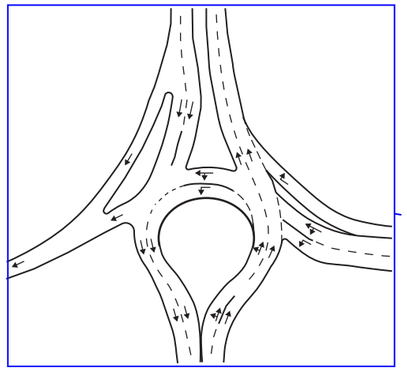
SOUTHWEST INTERSTATE 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	**Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)**	**2045 (Build Alternative 1) Lane Geometry**	**Figure 15 Page 3 of 3**

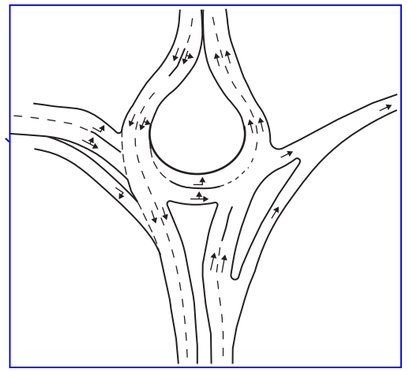


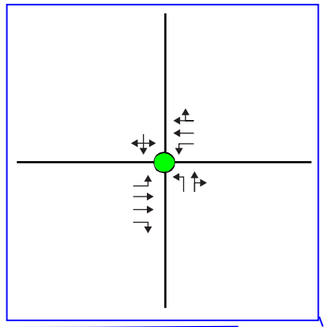
I-4 CONNECT SOUTHWEST FDOT DISTRICT ONE INTERSTATE PROJECT	Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)	2045 (Build Alternative 2) Lane Geometry	Figure 16 Page 1 of 3

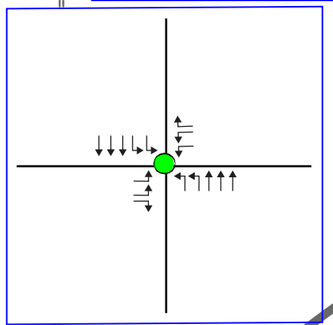
Legend

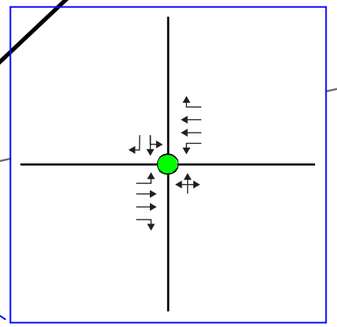
- Interstate (I-4)
- Arterial
- Express Lane
- Lane Geometry
- Signalized Intersection
- Non Signalized Intersection
- Roundabout
- Number of Express Lane











Marcum Rd

SOCRUM LOOP RD

Lakeland Hills Blvd

INTERSTATE 4

33

33

TOLL 570

659

FLORIDA US 98

3.90

3.20

2.00

N

0 0.5 1

Miles

SOUTHWEST INTERSTATE 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT	Project Development and Environment (PD&E) Study I-4 (SR 400) From West of SR 570 (Polk Parkway) to West of US 27 Interchange (Phase 2)	2045 (Build Alternative 2) Lane Geometry	Figure 16 Page 2 of 3

Legend

- Interstate (I-4)
- Arterial
- Express Lane
- Lane Geometry
- Number of Express Lane
- Signalized Intersection
- Non Signalized Intersection
- Roundabout
- Proposed Signalized Intersection

33

33

TOLL 570

Berkley Rd

CR-557A

559

2.90

4.00

CR-557A

557

557

Old Polk City Rd

N

0 0.5 1

Miles

SOUTHWEST INTERSTATE 4 CONNECT FDOT DISTRICT ONE INTERSTATE PROJECT

Project Development and Environment (PD&E) Study
I-4 (SR 400) From West of SR 570 (Polk Parkway)
to West of US 27 Interchange (Phase 2)

2045 (Build Alternative 2)
Lane Geometry

Figure 16
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HCS results are summarized in **Tables 31** and **Table 32** for the eastbound and westbound directions under Alternative 1. Majority of the freeway segments along I-4 are expected to operate LOS D or better with addition of two GPLs on each direction except following locations:

- I-4 eastbound at West Memorial Boulevard off-ramp – upstream mainline deficiency (diverge area)
- I-4 eastbound at US 98 off-ramp – upstream mainline deficiency (diverge area)

Table 33 thru **Table 35** represent the Build Alternative 2 HCS freeway analysis for the GPLs and ELs, respectively. Vehicular congestions were identified along GPLs (three lanes on each direction) under this alternative. However, ELs are anticipated to operate under capacity during peak hours. Addition of auxiliary lanes between falling segments anticipated to improve traffic operation which will be discussed during PD&E study. ***Nevertheless, the Build Alternatives are anticipated to improve traffic operations.***

Note that two-sided weaving analysis will be performed by Vissim after the locations of slip-ramps are determined in the upcoming PD&E study. Vissim is a microscopic traffic flow simulation model based on car following, lane change, and queuing logic. Vissim has the ability to model Express Lane (EL), High Occupancy Vehicle (HOV) lanes, and other transportation strategies that are being implemented within the state. Vissim models each individual vehicle within the network to identify simulated performance measures for freeways, ramps, and intersections.

Further discussion with I-4 Master Plan Teams is required to confirm if that heavy vehicles would be permitted in the inside lane of the ML facilities. Note that HCS software does not have capability to code the inside lanes of ML facilities with heavy vehicles.

Intersection Analysis

The Build Design Year 2045 intersections analysis ***based on existing and committed improvements only*** and output summary for AM and PM peak hours are presented in **Table 36 thru 39,** for Build Alternative 1 and Alternative 2, respectively. The signalized intersection operations were optimized for signal splits/offsets. Committed improvements at the SR 33 and SR 557 interchanges (roundabouts) were also analyzed using SIDRA. The Synchro, SIDRA and HCS output sheets are included in **Appendix I**.

Note that due to the relatively complex traffic operations of the 'Tear Drop' roundabout at SR 557 and SR 33, it is recommended to further analyze the ramp terminal with the microsimulation which is not part of the Phase 2 methodology.

The Facility Enhancement Element memorandum will address long-term improvements for I-4 mainline and interchange(s). Existing conditions Vissim calibration and future analysis using Vissim model for the I-4 at US 98 and I-4 at North Socrum Road/Lakeland Hills Boulevard interchanges along with adjacent arterial intersections will be submitted in a separate memo.

A planning level improvement at the interchanges are discussed here. It should be noted that the intersection improvements illustrated in the memo are for general planning and discussion purposes only and do no determine the engineering and operational acceptability (See **Appendix I**):

- I-4 Eastbound off-ramp and SR 33 -modify the eastbound off ramp right turn lane by adding a

receiving lane instead of merge lane.

- I-4 Eastbound off-ramp and SR 557 - modify the eastbound off ramp right turn lane by adding a receiving lane instead of merge lane.
- I-4 Westbound off-ramp and SR 557 – modify the westbound off ramp right turn lane by adding a receiving lane instead of merge lane.

Detailed Vissim microsimulation analysis is anticipated in the PD&E phase. **Table 40** illustrates the overall delay comparison between No-Build and Build Alternatives and upcoming actions for further traffic analysis.

The benefits of the Build alternative must be looked at from a global perspective due to the extensive nature of the improvements, as opposed to single isolated locations.

Phase 2 traffic analysis is intended for general planning purposes and will not determine the engineering and construction acceptability for the managed lanes and interchange capacity improvements. The ultimate capacity improvement of this project involves the potential construction of managed lanes in each direction of I-4 and interchange improvements which will be analyzed later in PD&E study.

Heavy vehicle restrictions in the future managed lanes (MLs) requires further discussion with the District One.

The Facility Enhancement Element memorandum will address long-term improvements for I-4 mainline and interchange(s). Existing conditions Vissim calibration and future analysis using Vissim model for the I-4 at US 98 and I-4 at North Socrum Road/Lakeland Hills Boulevard interchanges along with adjacent arterial intersections will be submitted in a separate memo.

Table 31: 2045 Build Alternative 1, HCS Level of Service and Density for I-4 Eastbound Segments, General Purpose Lane (GPL) only

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	West of Polk Parkway off-ramp	Basic	6	8,940	24.9	-	C	0.72	-	67.5	-	9,760	28.3	-	D	0.79	-	64.7	-
2	Polk Parkway off-ramp*	Diverge	6	8,940	24.5	17.9	B	0.72	0.4	68.6	60.8	9,760	26.8	19.2	B	0.79	0.39	68.4	61
3	Polk Parkway off-ramp to on-ramp	Basic	5	7,510	25.1	-	C	0.73	-	67.3	-	8,360	29.6	-	D	0.81	-	63.6	-
4	Polk Parkway on-ramp	Merge	5	7,510	28.8	27	C	0.8	0.44	65	61.7	8,360	32.2	29.6	D	0.89	0.43	63.9	60.4
5	Polk Parkway on-ramp to West Memorial Boulevard off-ramp	Basic	5	8,300	29.2	-	D	0.8	-	63.9	-	9,140	34.6	-	D	0.89	-	59.4	-
6	West Memorial Boulevard off-ramp	Diverge	5	8,300	27.6	37.1	E	0.8	0.72	67.7	61.3	9,140	30.4	39.9	E	0.89	0.71	67.6	61.3
7	West Memorial Boulevard off-ramp to on-ramp	Basic	5	7,000	22.8	-	C	0.68	-	69.1	-	7,860	26.9	-	D	0.76	-	65.9	-
8	West Memorial Boulevard on-ramp	Merge	5	7,000	25.5	23.6	C	0.72	0.26	65.7	62.3	7,860	28.7	25.7	C	0.8	0.26	65.1	61.7
9	West Memorial Boulevard on-ramp to SR 539 off-ramp	Basic	5	7,450	24.8	-	C	0.72	-	67.5	-	8,300	29.2	-	D	0.8	-	63.9	-
10	SR 539 off-ramp	Diverge	5	7,450	24.2	27	C	0.72	0.42	69.4	63	8,300	27.1	30.4	D	0.8	0.47	69	62.7
11	SR 539 off-ramp to on-ramp	Basic	5	6,700	21.6	-	C	0.65	-	70	-	7,450	24.8	-	C	0.72	-	67.5	-
12	SR 539 on-ramp	Merge	5	6,700	25.7	25.9	C	0.72	0.43	65.5	62	7,450	28.9	28.5	D	0.8	0.47	64.6	61
13	SR 539 on-ramp to US 98 off-ramp	Basic	5	7,470	24.9	-	C	0.72	-	67.5	-	8,300	29.2	-	D	0.8	-	63.9	-
14	US 98 off-ramp	Diverge	5	7,470	24.7	33.5	D	0.72	0.68	68	61.5	8,300	27.5	36.3	E	0.8	0.68	67.9	61.5
15	US 98 off-ramp to on-ramp	Basic	5	6,240	19.8	-	C	0.6	-	71.1	-	7,070	23.1	-	C	0.69	-	68.9	-
16	US 98 on-ramp	Merge	5	6,240	24.3	24.5	C	0.69	0.48	65.9	62.7	7,070	27.2	25.9	C	0.77	0.46	65.4	62.2
17	US 98 on-ramp to Lakeland Hills Boulevard off-ramp	Basic	5	7,110	23.3	-	C	0.69	-	68.7	-	7,900	27.1	-	D	0.77	-	65.7	-
18	Lakeland Hills Boulevard off-ramp	Diverge	5	7,110	25.2	28.3	D	0.69	0.56	63.6	54.5	7,900	28.7	33.2	D	0.77	0.81	62	53.3
19	Lakeland Hills Boulevard off-ramp to on-ramp	Basic	5	6,190	19.6	-	C	0.6	-	70	-	6,580	21.1	-	C	0.64	-	69.5	-
20	Lakeland Hills Boulevard on-ramp	Merge	5	6,190	23.9	23.9	C	0.68	0.48	65.6	62	6,580	25	24.2	C	0.7	0.42	65.5	62
21	Lakeland Hills Boulevard on-ramp to SR 33 off-ramp	Basic	5	6,970	22.7	-	C	0.68	-	69.2	-	7,270	24	-	C	0.7	-	68.2	-
22	SR 33 off-ramp	Diverge	5	6,970	22.5	29.5	D	0.68	0.4	69.7	63.1	7,270	25.8	31.9	D	0.7	0.59	63.4	54.4
23	SR 33 off-ramp to on-ramp	Basic	5	6,240	19.8	-	C	0.6	-	71.1	-	6,300	20	-	C	0.61	-	71	-
24	SR 33 on-ramp	Merge	5	6,240	23.7	23	C	0.68	0.41	66.3	63.2	6,300	23.4	22	C	0.67	0.34	66.4	63.5
25	SR 33 on-ramp to SR 570 off-ramp	Basic	5	6,980	22.7	-	C	0.68	-	69.2	-	6,910	22.4	-	C	0.67	-	69.4	-
26	SR 570 off-ramp	Diverge	5	6,980	22.3	30.3	D	0.68	0.44	70.5	64.7	6,910	22	30.1	D	0.67	0.44	70.6	64.7
27	SR 570 off-ramp to on-ramp	Basic	5	6,150	19.4	-	C	0.6	-	71.3	-	6,080	19.1	-	C	0.59	-	71.5	-
28	SR 570 on-ramp	Merge	5	6,150	24.6	22.9	C	0.7	0.6	66.1	63.2	6,080	24.4	22.7	C	0.69	0.6	66.1	63.3
29	SR 570 on-ramp to SR 559 off-ramp	Basic	5	7,230	23.8	-	C	0.7	-	68.3	-	7,160	23.5	-	C	0.69	-	68.6	-
30	SR 559 off-ramp	Diverge	5	7,230	23.4	30.8	D	0.7	0.42	69.5	63	7,160	23.3	30.9	D	0.69	0.46	69.3	62.7
31	SR 559 off-ramp to on-ramp	Basic	5	6,470	20.6	-	C	0.63	-	70.6	-	6,330	20.1	-	C	0.61	-	70.9	-
32	SR 559 on-ramp	Merge	5	6,470	24.7	24.1	C	0.7	0.43	65.9	62.8	6,330	23.9	23.3	C	0.68	0.39	66.2	63.1
33	SR 559 on-ramp to SR 557 off-ramp	Basic	5	7,240	23.9	-	C	0.7	-	68.3	-	7,040	23	-	C	0.68	-	69	-
34	SR 557 off-ramp	Diverge	5	7,240	23.5	30.5	D	0.7	0.41	69.5	63	7,040	24.7	29.9	D	0.68	0.46	64.3	55.1
35	SR 557 off-ramp to on-ramp	Basic	5	6,500	20.8	-	C	0.63	-	70.5	-	6,290	19.9	-	C	0.61	-	69	-
36	SR 557 on-ramp	Merge	5	6,500	26.7	27.5	C	0.75	0.66	64.9	61.4	6,290	25	25.4	C	0.71	0.55	65.6	62.4
37	East of SR 557 on-ramp	Basic	5	7,690	26	-	C	0.75	-	66.6	-	7,290	24.1	-	C	0.71	-	68.1	-

*Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F; * Lane Add/Drop or Acceleration/Deceleration Lane>1,500 feet HCM Methodology is limited to 1,500 feet*
The results are based on the HCS 7.9

Table 32: 2045 Build Alternative 1, HCS Level of Service and Density for I-4 Westbound Segments, General Purpose Lane (GPL) only (Continued)

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	East of SR 557 off-ramp	Basic	5	7,290	24.1	-	C	0.71	-	68.1	-	7,690	26	-	C	0.75	-	66.6	-
2	SR 557 off-ramp	Diverge	5	7,290	23.9	32.5	D	0.71	0.55	68.7	62.2	7,690	25.4	34.9	D	0.75	0.66	68.1	61.6
3	SR 557 off-ramp to on-ramp	Basic	5	6,290	19.9	-	C	0.61	-	70.6	-	6,500	20.8	-	C	0.63	-	70.3	-
4	SR 557 on-ramp	Merge	5	6,290	24	23.8	C	0.68	0.42	66	62.9	6,500	24.7	24.3	C	0.7	0.41	65.9	62.7
5	SR 557 on-ramp to SR 559 off-ramp	Basic	5	7,040	23	-	C	0.68	-	69	-	7,240	23.9	-	C	0.7	-	68.3	-
6	SR 559 off-ramp	Diverge	5	7,040	22.7	29.2	D	0.68	0.39	69.7	63.1	7,240	23.5	30.2	D	0.7	0.43	69.4	62.9
7	SR 559 off-ramp to on-ramp	Basic	5	6,330	20.1	-	C	0.61	-	70.9	-	6,470	20.6	-	C	0.63	-	70.6	-
8	SR 559 on-ramp	Merge	5	6,330	24.5	25	C	0.69	0.46	65.7	62.4	6,470	24.7	24.8	C	0.7	0.42	65.8	62.5
9	SR 559 on-ramp to SR 570 off-ramp	Basic	5	7,160	23.5	-	C	0.69	-	68.6	-	7,230	23.8	-	C	0.7	-	68.3	-
10	SR 570 off-ramp	Diverge	5	7,160	23.5	32.1	D	0.69	0.6	68.5	62	7,230	23.8	32.3	D	0.7	0.6	68.5	62
11	SR 570 off-ramp to on-ramp	Basic	5	6,080	19.1	-	C	0.59	-	71.5	-	6,150	19.4	-	C	0.6	-	71.3	-
12	SR 570 on-ramp	Merge	5	6,080	23.6	24.1	C	0.67	0.46	66	62.7	6,150	23.8	24.3	C	0.68	0.46	65.9	62.7
13	SR 570 on-ramp to SR 33 off-ramp	Basic	5	6,910	22.4	-	C	0.67	-	69.4	-	6,980	22.7	-	C	0.68	-	69.2	-
14	SR 33 off-ramp	Diverge	5	6,910	22.2	28.9	D	0.67	0.34	70	63.5	6,980	22.6	29.8	D	0.68	0.41	69.6	63
15	SR 33 off-ramp to on-ramp	Basic	5	6,300	20	-	C	0.61	-	71	-	6,240	19.8	-	C	0.6	-	71.1	-
16	SR 33 on-ramp	Merge	5	6,300	25.1	26.6	C	0.7	0.54	65.3	61.8	6,240	23.8	24.4	C	0.68	0.4	65.9	62.5
17	SR 33 on-ramp to CR 582 (North Socrum Loop Road) off-ramp	Basic	5	7,270	24	-	C	0.7	-	68.2	-	6,970	22.7	-	C	0.68	-	69.2	-
18	CR 582 (North Socrum Loop Road) off-ramp	Diverge	5	7,270	25.3	19.1	B	0.7	0.42	64.6	55.3	6,970	24.4	18.5	B	0.68	0.48	64.2	55
19	CR 582 (North Socrum Loop Road) off-ramp to on-ramp	Basic	5	6,580	21.1	-	C	0.64	-	70.3	-	6,190	19.6	-	C	0.6	-	71.3	-
20	CR 582 (North Socrum Loop Road) on-ramp	Merge	5	6,580	27.6	25.2	C	0.77	0.81	64.4	60.8	6,190	24.3	20.9	C	0.69	0.56	66	62.9
21	CR 582 (North Socrum Loop Road) on-ramp to US 98 off-ramp	Basic	5	7,900	27.1	-	D	0.77	-	65.7	-	7,110	23.3	-	C	0.69	-	68.7	-
22	US 98 off-ramp	Diverge	5	7,900	25.7	33.7	D	0.77	0.46	69.1	62.7	7,110	23.1	31.2	D	0.69	0.48	69.2	62.6
23	US 98 off-ramp to on-ramp	Basic	5	7,070	23.1	-	C	0.69	-	68.9	-	6,240	19.8	-	C	0.6	-	71.1	-
24	US 98 on-ramp	Merge	5	7,070	29.2	29.7	D	0.8	0.68	64.1	60.2	6,240	26	27.9	C	0.72	0.68	64.8	61.2
25	US 98 on-ramp to SR 539 off-ramp	Basic	5	8,300	29.2	-	D	0.8	-	63.9	-	7,470	24.9	-	C	0.72	-	67.5	-
26	SR 539 off-ramp	Diverge	5	8,300	27.1	34.9	D	0.8	0.47	69	62.7	7,470	24.2	31.7	D	0.72	0.43	69.4	62.9
27	SR 539 off-ramp to on-ramp	Basic	5	7,450	24.8	-	C	0.72	-	67.5	-	6,700	21.6	-	C	0.65	-	70	-
28	SR 539 on-ramp	Merge	5	7,450	28.7	26.6	C	0.8	0.47	65.1	61.9	6,700	25.4	23.9	C	0.72	0.42	66	63
29	SR 539 on-ramp to West Memorial Boulevard off-ramp	Basic	5	8,300	29.2	-	D	0.8	-	63.9	-	7,450	24.8	-	C	0.72	-	67.5	-
30	West Memorial Boulevard off-ramp	Diverge	5	8,300	26.7	32.7	D	0.8	0.24	70	64	7,450	23.9	29.8	D	0.72	0.25	70.3	64
31	West Memorial Boulevard off-ramp to on-ramp	Basic	5	7,860	26.9	-	D	0.76	-	65.9	-	7,000	22.8	-	C	0.68	-	69.1	-
32	Memorial Boulevard on-ramp to Polk Parkway off-ramp	Weaving	6	7,860	25.6	-	C	0.74	-	66.9	-	7,000	22.4	-	C	0.67	-	69.4	-
33	Polk Parkway off-ramp to on-ramp	Basic	5	8,360	29.6	-	D	0.81	-	63.6	-	7,510	25.1	-	C	0.73	-	67.3	-
34	Polk Parkway on-ramp*	Merge	6	8,360	28.3	28.3	D	0.79	0.81	64.7	64.7	7,510	24.9	24.9	C	0.72	0.83	67.5	67.5
35	West of Polk Parkway on-ramp	Basic	6	9,760	28.3	-	D	0.79	-	64.7	-	8,940	24.9	-	C	0.72	-	67.5	-

*Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F; * Lane Add/Drop or Acceleration/Deceleration Lane>1,500 feet HCM Methodology is limited to 1,500 feet*
The results are based on the HCS 7.9

Table **33**: 2045 Build Alternative 2, HCS Level of Service and Density for I-4 Eastbound Segments, General Purpose Lane (GPL) only

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	West of Polk Parkway off-ramp	Basic	4	7,560	71.8	-	F	0.92	-	26.4	-	7,370	70.9	-	F	0.89	-	26.7	-
2	Polk Parkway off-ramp*	Diverge	4	7,560	68.6	20	F	0.92	0.4	26.8	60.8	7,370	66.4	19.3	F	0.89	0.39	27.7	61
3	Polk Parkway off-ramp to on-ramp	Basic	3	6,130	72	-	F	0.99	-	25.9	-	5,970	71.1	-	F	0.96	-	26.3	-
4	Polk Parkway on-ramp	Merge	3	6,130	36.2	34.2	F	0.93	0.44	59.8	56.7	5,970	36.1	34.1	F	0.93	0.43	59.9	56.8
5	Polk Parkway on-ramp to West Memorial Boulevard off-ramp	Basic	3	6,920	38.3	-	F	1.12	-	56.5	-	6,750	38.3	-	F	1.09	-	56.5	-
6	West Memorial Boulevard off-ramp	Diverge	3	7,060	33	37.5	F	0.93	0.72	65.6	61.3	6,870	33	37.5	F	0.93	0.71	65.6	61.3
7	West Memorial Boulevard off-ramp to on-ramp	Basic	3	5,760	24.8	-	C	0.93	-	67.6	-	5,590	25	-	C	0.9	-	67.4	-
8	West Memorial Boulevard on-ramp	Merge	3	5,760	29.4	29.2	D	0.79	0.26	62.8	60.3	5,590	29.4	29.2	D	0.8	0.26	62.8	60.3
9	West Memorial Boulevard on-ramp to SR 539 off-ramp	Basic	3	6,210	28.6	-	F	1	-	64.4	-	6,030	28.7	-	D	0.97	-	64.3	-
10	SR 539 off-ramp	Diverge	3	6,770	27.4	28.5	F	0.79	0.42	67.2	63	6,760	27.6	28.7	F	0.8	0.47	66.9	62.7
11	SR 539 off-ramp to on-ramp	Basic	3	6,020	22.6	-	C	0.97	-	69.3	-	5,910	21.9	-	C	0.95	-	69.7	-
12	SR 539 on-ramp	Merge	3	6,020	29.6	30.7	F	0.8	0.43	62.5	59.9	5,910	29.6	30.9	F	0.8	0.47	62.4	59.8
13	SR 539 on-ramp to US 98 off-ramp	Basic	3	6,790	28.8	-	F	1.1	-	64.3	-	6,760	28.7	-	F	1.09	-	64.3	-
14	US 98 off-ramp	Diverge	3	6,790	28.5	34.1	F	0.8	0.83	65	60.6	6,760	28.4	34.2	F	0.8	0.85	65	60.5
15	US 98 off-ramp to on-ramp	Basic	3	5,290	17.9	-	B	0.85	-	72.1	-	5,230	17.6	-	B	0.84	-	72.2	-
16	US 98 on-ramp	Merge	3	5,290	26.5	28	F	0.72	0.58	63.5	61.2	5,230	26.6	28.2	F	0.73	0.61	63.4	61.1
17	US 98 on-ramp to Lakeland Hills Boulevard off-ramp	Basic	3	6,340	25	-	F	1.02	-	67.4	-	6,330	25	-	F	1.02	-	67.4	-
18	Lakeland Hills Boulevard off-ramp	Diverge	3	6,340	27.4	27.9	F	0.72	0.4	61.4	55.4	6,330	27.7	28.2	F	0.73	0.47	61	55
19	Lakeland Hills Boulevard off-ramp to on-ramp	Basic	3	5,690	20.3	-	C	0.92	-	69.3	-	5,560	19.6	-	C	0.9	-	69.2	-
20	Lakeland Hills Boulevard on-ramp	Merge	3	5,690	25.6	25.9	C	0.7	0.31	63.8	61.4	5,560	24.4	24.8	C	0.67	0.28	64.2	61.8
21	Lakeland Hills Boulevard on-ramp to SR 33 off-ramp	Basic	3	6,200	23.9	-	F	1	-	68.3	-	6,010	22.6	-	C	0.97	-	69.2	-
22	SR 33 off-ramp	Diverge	3	6,260	26.7	30.1	F	0.7	0.45	61.1	55.2	6,140	26	29.8	D	0.67	0.59	60.2	54.4
23	SR 33 off-ramp to on-ramp	Basic	3	5,530	18.9	-	C	0.89	-	71	-	5,170	16.6	-	B	0.84	-	70.9	-
24	SR 33 on-ramp	Merge	3	5,530	25.4	25.9	F	0.7	0.41	64.3	62.2	5,170	21.9	22.7	C	0.62	0.34	65.3	63.3
25	SR 33 on-ramp to SR 570 off-ramp	Basic	3	6,270	24	-	F	1.01	-	68.2	-	5,780	20.2	-	C	0.93	-	70.9	-
26	SR 570 off-ramp	Diverge	3	6,170	23.9	30.5	D	0.7	0.44	68.5	64.7	5,630	20.9	27.9	C	0.62	0.44	68.5	64.7
27	SR 570 off-ramp to on-ramp	Basic	3	5,340	18.4	-	C	0.86	-	71.9	-	4,800	15.4	-	B	0.78	-	72.5	-
28	SR 570 on-ramp	Merge	3	5,340	27.1	26	F	0.74	0.6	63.8	61.7	4,800	23.5	23.1	C	0.66	0.6	65	63.1
29	SR 570 on-ramp to SR 559 off-ramp	Basic	3	6,420	25.9	-	F	1.04	-	66.7	-	5,880	21.9	-	C	0.95	-	69.8	-
30	SR 559 off-ramp	Diverge	3	6,080	25.7	31.6	D	0.74	0.42	67.2	63	5,430	22.8	29.2	D	0.66	0.46	67	62.7
31	SR 559 off-ramp to on-ramp	Basic	3	5,320	20.4	-	C	0.86	-	70.8	-	4,600	16.7	-	B	0.74	-	72.1	-
32	SR 559 on-ramp	Merge	3	5,320	27.2	27.7	C	0.75	0.43	63.6	61.4	4,600	22.8	24	C	0.64	0.39	65	62.9
33	SR 559 on-ramp to SR 557 off-ramp	Basic	3	6,090	26	-	D	0.98	-	66.6	-	5,310	21.1	-	C	0.86	-	70.3	-
34	SR 557 off-ramp	Diverge	3	5,730	25.8	31.4	D	0.75	0.41	67.2	63	4,950	22	28.1	D	0.64	0.42	67.2	63
35	SR 557 off-ramp to on-ramp	Basic	3	4,990	20.6	-	C	0.81	-	70.4	-	4,200	16.5	-	B	0.68	-	70.4	-
36	SR 557 on-ramp	Merge	3	4,990	30.6	30.3	D	0.82	0.66	62.2	59.7	4,200	24.4	25.3	C	0.68	0.55	64.5	62.4
37	East of SR 557 on-ramp	Basic	3	6,180	30.1	-	D	1	-	63.2	-	5,200	22.8	-	C	0.84	-	69.1	-

Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F;
The results are based on the HCS 7.9

Table 34: 2045 Build Alternative 2, HCS Level of Service and Density for I-4 Westbound Segments, General Purpose Lane (GPL) only (Continued)

No.	Segment	Segment Type	Number of Lanes	AM Peak Hour								PM Peak Hour							
				Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)	Demand (veh/h)	Density Freeway (pc/mi/ln)	Density Ramp (pc/mi/ln)	LOS	Freeway Demand to Capacity Ratio	Ramp Demand to Capacity Ratio	Speed Freeway (mph)	Speed Ramp (mph)
1	East of SR 557 off-ramp	Basic	3	5,050	29.9	-	D	0.82	-	63.3	-	5,220	31.6	-	D	0.84	-	61.9	-
2	SR 557 off-ramp	Diverge	3	5,580	28.5	34.3	D	0.82	0.55	66.5	62.2	5,900	29.7	35.5	E	0.84	0.66	66	61.6
3	SR 557 off-ramp to on-ramp	Basic	3	4,580	21.8	-	C	0.74	-	69.4	-	4,710	21.6	-	C	0.76	-	69.1	-
4	SR 557 on-ramp	Merge	3	4,580	28.5	28.9	D	0.78	0.42	63.2	60.8	4,710	28.3	28.7	D	0.77	0.41	63.2	60.9
5	SR 557 on-ramp to SR 559 off-ramp	Basic	3	5,330	27.6	-	D	0.86	-	65.3	-	5,450	27.3	-	D	0.88	-	65.5	-
6	SR 559 off-ramp	Diverge	3	5,680	26.8	31.7	D	0.78	0.39	67.3	63.1	5,790	26.7	31.7	D	0.77	0.43	67.1	62.9
7	SR 559 off-ramp to on-ramp	Basic	3	4,970	22	-	C	0.8	-	69.7	-	5,020	21.4	-	C	0.81	-	70.1	-
8	SR 559 on-ramp	Merge	3	4,970	29.5	30.1	D	0.79	0.46	62.6	60.1	5,020	28.3	29.1	D	0.77	0.42	63.1	60.7
9	SR 559 on-ramp to SR 570 off-ramp	Basic	3	5,800	28.7	-	D	0.94	-	64.4	-	5,780	27.2	-	D	0.93	-	65.6	-
10	SR 570 off-ramp	Diverge	3	6,120	27.8	33.5	D	0.79	0.6	66.3	62	6,080	26.9	32.8	D	0.77	0.6	66.3	62
11	SR 570 off-ramp to on-ramp	Basic	3	5,040	20.3	-	C	0.81	-	70.8	-	5,000	19.3	-	C	0.81	-	71.4	-
12	SR 570 on-ramp	Merge	3	5,040	27.7	28.5	D	0.75	0.46	63.3	61	5,000	26.6	27.7	C	0.73	0.46	63.7	61.4
13	SR 570 on-ramp to SR 33 off-ramp	Basic	3	5,870	26.5	-	D	0.95	-	66.2	-	5,830	25.1	-	C	0.94	-	67.3	-
14	SR 33 off-ramp	Diverge	3	6,030	25.9	31.6	D	0.75	0.34	67.6	63.5	5,970	25.2	31.1	D	0.73	0.41	67.2	63
15	SR 33 off-ramp to on-ramp	Basic	3	5,420	21.8	-	C	0.88	-	69.8	-	5,230	19.9	-	C	0.84	-	71	-
16	SR 33 on-ramp	Merge	3	5,420	30.5	31.5	F	0.81	0.54	61.9	59.2	5,230	26.6	28	C	0.73	0.4	63.6	61.2
17	SR 33 on-ramp to CR 582 (North Socrum Loop Road) off-ramp	Basic	3	6,390	29.7	-	F	1.03	-	63.5	-	5,960	25.1	-	C	0.96	-	67.3	-
18	CR 582 (North Socrum Loop Road) off-ramp	Diverge	3	6,360	30.4	21.5	F	0.81	0.28	62	56	5,920	27.3	19.1	B	0.73	0.31	61.8	55.8
19	CR 582 (North Socrum Loop Road) off-ramp to on-ramp	Basic	3	5,910	25.7	-	C	0.95	-	66.8	-	5,410	21.4	-	C	0.87	-	70.1	-
20	CR 582 (North Socrum Loop Road) on-ramp	Merge	3	5,910	32.7	28.4	F	0.86	0.47	61.3	58.6	5,410	27.3	24.3	C	0.75	0.4	63.7	61.5
21	CR 582 (North Socrum Loop Road) on-ramp to US 98 off-ramp	Basic	3	6,680	33.1	-	F	1.08	-	60.7	-	6,060	26.2	-	D	0.98	-	66.4	-
22	US 98 off-ramp	Diverge	3	6,680	30.3	35.8	F	0.86	0.61	66.2	61.9	6,060	26.2	32.6	D	0.75	0.58	66.4	62.1
23	US 98 off-ramp to on-ramp	Basic	3	5,580	23.2	-	C	0.9	-	68.8	-	5,010	18.8	-	C	0.81	-	71.7	-
24	US 98 on-ramp	Merge	3	5,580	38	36.6	F	0.93	0.85	57	53.3	5,010	31.6	32.9	F	0.82	0.83	60.5	57.7
25	US 98 on-ramp to SR 539 off-ramp	Basic	3	7,110	38.4	-	F	1.15	-	56.4	-	6,510	30.3	-	F	1.05	-	63	-
26	SR 539 off-ramp	Diverge	3	7,110	32.5	36.8	F	0.93	0.47	66.7	62.7	6,510	28.5	33.8	F	0.82	0.43	67.1	62.9
27	SR 539 off-ramp to on-ramp	Basic	3	6,260	28.8	-	F	1.01	-	64.3	-	5,740	23.7	-	C	0.93	-	68.4	-
28	SR 539 on-ramp	Merge	3	6,260	36.3	33.7	F	0.93	0.47	59.8	56.7	5,740	30.4	29.7	F	0.82	0.42	62.6	60.2
29	SR 539 on-ramp to West Memorial Boulevard off-ramp	Basic	3	7,110	38.4	-	F	1.15	-	56.4	-	6,490	30.1	-	F	1.05	-	63.2	-
30	West Memorial Boulevard off-ramp	Diverge	3	6,480	32.1	36.2	F	0.93	0.24	67.6	64	5,850	28	33.2	D	0.82	0.25	67.9	64
31	West Memorial Boulevard off-ramp to on-ramp	Basic	3	6,040	32.9	-	D	0.98	-	60.8	-	5,400	26	-	D	0.87	-	66.6	-
32	Memorial Boulevard on-ramp to Polk Parkway off-ramp	Weaving	4	6,040	29.1	-	D	0.8	-	64	-	5,400	24.6	-	C	0.72	-	67.7	-
33	Polk Parkway off-ramp to on-ramp	Basic	3	6,280	39.3	-	F	1.01	-	55.7	-	5,680	30.7	-	D	0.92	-	62.7	-
34	Polk Parkway on-ramp*	Merge	4	6,280	33.2	33.2	D	0.88	0.81	61.3	61.3	5,680	29.4	29.4	D	0.79	0.83	62.8	62.8
35	West of Polk Parkway on-ramp	Basic	4	7,680	34	-	D	0.93	-	59.9	-	7,110	28.7	-	D	0.86	-	64.4	-

*Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F; * Lane Add/Drop or Acceleration/Deceleration Lane>1,500 feet HCM Methodology is limited to 1,500 feet*
The results are based on the HCS 7.9

Table 35: 2045 Build Alternative 2, HCS Level of Service and Density for Express Lane (EL) only

Segment	Segment Type	Number of Express Lanes	AM Peak Hour					PM Peak Hour				
			Demand (veh/h)	Density EL (pc/mi/ln)	LOS	EL Demand to Capacity Ratio	Speed EL (mph)	Demand (veh/h)	Density EL (pc/mi/ln)	LOS	EL Demand to Capacity Ratio	Speed EL (mph)
Eastbound Direction												
Polk Parkway	Basic	2	1,180	8.6	A	0.35	72.6	2,060	16.7	B	0.61	65
Polk Parkway on-ramp to West Memorial Boulevard off-ramp	Basic	2	1,180	8.5	A	0.36	72.7	2,060	16.4	B	0.63	65.9
Memorial Boulevard	Basic	2	1,040	7.5	A	0.31	73	1,940	15.4	B	0.58	66.5
West Memorial Boulevard on-ramp to SR 539 off-ramp	Basic	2	1,040	7.5	A	0.32	73	1,940	15.1	B	0.59	67.4
SR 539 (Kathleen Road)	Basic	2	480	3.5	A	0.14	73.1	1,210	8.8	A	0.36	72.5
US 98	Basic	2	480	3.5	A	0.14	73.1	1,210	8.8	A	0.36	72.5
Lakeland Hills Boulevard	Basic	2	480	3.5	A	0.14	73.1	1,210	8.9	A	0.36	72.4
Lakeland Hills Boulevard on-ramp to SR 33 off-ramp	Basic	2	480	3.5	A	0.15	73.1	1,210	8.8	A	0.37	72.7
SR 33	Basic	2	420	3	A	0.12	73.1	1,080	7.8	A	0.32	72.9
SR 33 on-ramp to SR 570 off-ramp	Basic	2	420	3	A	0.13	73.1	1,080	7.8	A	0.33	73
SR 570	Basic	2	520	3.7	A	0.15	73.1	1,230	8.9	A	0.37	72.4
SR 570 on-ramp to SR 559 off-ramp	Basic	2	520	3.7	A	0.16	73.1	1,230	8.9	A	0.38	72.6
SR 559	Basic	2	860	6.2	A	0.26	73.1	1,680	12.8	B	0.5	69.3
SR 559 on-ramp to SR 557 off-ramp	Basic	2	860	6.2	A	0.26	73.1	1,680	12.3	B	0.51	72.1
SR 557	Basic	2	1,220	8.9	A	0.36	72.4	2,040	16.4	B	0.61	65.3
East of SR 557 on-ramp	Basic	2	1,220	8.8	A	0.36	72.4	2,040	15.2	B	0.62	70.6
Westbound Direction												
East of SR 557 off-ramp	Basic	2	2,190	16.5	B	0.67	69.7	2,180	16.5	B	0.67	69.7
SR 557	Basic	2	1,660	12.6	B	0.49	69.5	1,500	11.2	B	0.45	70.8
SR 557 on-ramp to SR 559 off-ramp	Basic	2	1,660	12.1	B	0.51	72.2	1,500	10.9	A	0.46	72.6
SR 559	Basic	2	1,310	9.6	A	0.39	72	1,160	8.4	A	0.34	72.7
SR 559 on-ramp to SR 570 off-ramp	Basic	2	1,310	9.5	A	0.4	72.3	1,160	8.4	A	0.35	72.8
SR 570	Basic	2	990	7.1	A	0.29	73.1	860	6.2	A	0.26	73.1
SR 570 on-ramp to SR 33 off-ramp	Basic	2	990	7.1	A	0.3	73.1	860	6.2	A	0.26	73.1
SR 33	Basic	2	830	6	A	0.25	73.1	720	5.2	A	0.21	73.1
SR 33 on-ramp to CR 582 (North Socrum Loop Road) off-ramp	Basic	2	830	6	A	0.25	73.1	720	5.2	A	0.22	73.1
CR 582 (North Socrum Loop Road)	Basic	2	860	6.2	A	0.26	73.1	760	5.5	A	0.23	73.1
US 98	Basic	2	860	6.2	A	0.26	73.1	760	5.5	A	0.23	73.1
SR 539 (Kathleen Road)	Basic	2	860	6.2	A	0.26	73.1	760	5.5	A	0.23	73.1
SR 539 on-ramp to West Memorial Boulevard off-ramp	Basic	2	860	6.2	A	0.26	73.1	760	5.5	A	0.23	73.1
West Memorial Boulevard	Basic	2	1,490	11.1	B	0.44	70.9	1,400	10.3	A	0.42	71.5
Memorial Boulevard on-ramp to Polk Parkway off-ramp	Weaving	2	1,490	10.8	A	0.45	72.6	1,400	10.1	A	0.43	72.8
Polk Parkway	Basic	2	1,750	13.4	B	0.52	68.6	1,630	12.3	B	0.48	69.8

Density – passenger cars/mile/lane; Highlighted – LOS E/LOS F
The results are based on the HCS 7.9

Table 36: 2045 Build Alt 1 I-4 Signalized Intersection Analysis

AM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			AM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	West Memorial Boulevard & I-4 Westbound	Volume					440			1280						B (18.5)
		LOS (Delay)	Movement				C (27.4)			B (15.4)						
			Approach				C (27.4)			B (15.4)						
		Queue Length 95th (ft)	Movement				152			304						
	Kathleen Road (SR 539) & I-4 Westbound	Volume					580		270	210	1800			1620	640	C (26.4)
		LOS (Delay)	Movement				**E (62.7)**		D (38.8)	**F (82.6)**	A (6.0)			D (35.7)	A (3.4)	
			Approach				**E (55.1)**			B (14.0)				C (26.6)		
		Queue Length 95th (ft)	Movement				#343		244	m126	226			790	56	
	Kathleen Road (SR 539) & I-4 Eastbound	Volume		400		350					1610	550	220	1980		C (24.5)
		LOS (Delay)	Movement	**E (56.8)**		**E (62.0)**					C (26.7)	A (2.8)	**E (74.6)**	B (10.0)		
			Approach	**E (59.2)**							C (20.6)			B (16.5)		
		Queue Length 95th (ft)	Movement	219		#342					761	55	m#121	312		
	US-98 & I-4	Volume		590			300			770	1660		350	1960		**E (57.6)**
		LOS (Delay)	Movement	**F (83.8)**			**F (90.2)**			**E (75.7)**	D (54.6)		D (48.4)	D (41.6)		
			Approach	**F (338.5)**			**F (173.9)**			**E (60.1)**			D (51.4)			
		Queue Length 95th (ft)	Movement	#426			#242			#525	#688		206	732		
	North Socrum Loop Road (CR 582) & I-4 Westbound	Volume			1050	490	830	1380		460		230	5		5	**F (111.4)**
		LOS (Delay)	Movement		**F (167.5)**	A (7.8)	**F (294.4)**	C (20.4)		**F (94.5)**	A (0.7)			A (0.2)		
			Approach	**F (116.6)**			**F (123.3)**			**E (63.3)**			A (0.2)			
		Queue Length 95th (ft)	Movement		#702	96	#1156	482		#742	0			0		
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	Volume		400	900	50	110	1310	0	70	20	80	580	20	320	**F (126.1)**
		LOS (Delay)	Movement	**F (277.3)**	D (35.6)	A (0.2)	C (22.6)	**F (124.6)**		**E (70.0)**	A (5.9)			**F (278.0)**	B (18.0)	
			Approach	**F (105.9)**			**F (116.7)**			C (32.4)			**F (187.6)**			
		Queue Length 95th (ft)	Movement	#615	412	0	79	#814		107	12			#913	170	
	SR 559 & I-4 Westbound	Volume					420		290	650	460			490	180	**F (81.5)**
		LOS (Delay)	Movement				**F (141.4)**		A (9.0)	**F (134.0)**	A (9.1)			**F (99.0)**	A (6.6)	
			Approach				**F (87.3)**			**F (82.2)**			**E (74.2)**			
		Queue Length 95th (ft)	Movement				#610		85	#888	224			#653	56	
	SR 559 & I-4 Eastbound	Volume		320		440					790	520	250	660		C (28.2)
		LOS (Delay)	Movement	**E (60.7)**		D (35.3)					C (31.0)	A (5.2)	D (45.3)	B (16.0)		
			Approach	D (46.0)							C (20.8)			C (24.0)		
		Queue Length 95th (ft)	Movement	334		296					380	87	m198	m172		

PM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			PM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	West Memorial Boulevard & I-4 Westbound	Volume					450			1300						B (18.8)
		LOS (Delay)	Movement				C (28.2)			B (15.5)						
			Approach				C (28.2)			B (15.5)						
		Queue Length 95th (ft)	Movement				156			311						
	Kathleen Road (SR 539) & I-4 Westbound	Volume					550		220	350	1840			1330	400	D (47.3)
		LOS (Delay)	Movement				**F (123.1)**		D (41.4)	**E (58.1)**	D (41.2)			D (35.7)	A (3.2)	
			Approach				**F (99.8)**			D (43.9)				C (28.2)		
		Queue Length 95th (ft)	Movement				367		232	m221	880			746	57	
	Kathleen Road (SR 539) & I-4 Eastbound	Volume		640		210					1550	580	270	1610		D (54.3)
		LOS (Delay)	Movement	**E (74.2)**		C (22.9)					D (42.2)	A (5.0)	**F (94.2)**	**E (73.2)**		
			Approach	**E (61.6)**							C (32.1)			**E (76.2)**		
		Queue Length 95th (ft)	Movement	428		157					897	120	m#211	935		
	US-98 & I-4	Volume		480			460			930	2030		280	1640		**E (75.7)**
		LOS (Delay)	Movement	**F (119.1)**			**F (86.3)**			**F (95.9)**	**E (74.1)**		D (50.9)	D (54.7)		
			Approach	**F (103.0)**			**E (72.9)**			**E (76.4)**			**E (69.3)**			
		Queue Length 95th (ft)	Movement	#447			#374			#767	#1051		186	742		
	North Socrum Loop Road (CR 582) & I-4 Westbound	Volume		5	1380	330	590	930	5	410		370				**F (99.5)**
		LOS (Delay)	Movement	**E (67.4)**	**F (164.2)**	A (5.5)	**F (212.4)**	B (18.4)		**E (66.5)**	A (3.9)					
			Approach	**F (133.4)**			**F (93.5)**			D (36.9)						
		Queue Length 95th (ft)	Movement	20	#1012	70	#935	380		#563	37		0	0	0	
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	Volume		450	1310	70	90	950		40	20	40	820	20	480	**F (143.0)**
		LOS (Delay)	Movement	**F (261.2)**	**F (119.9)**	A (0.6)	D (38.1)	**F (112.3)**		**E (72.7)**	A (1.8)			**F (253.9)**	C (26.2)	
			Approach	**F (150.1)**			**F (105.9)**			C (30.2)			**F (171.1)**			
		Queue Length 95th (ft)	Movement	#776	#952	2	92	#697		78	0			#1374	364	
	SR 559 & I-4 Westbound	Volume					520		250	440	350			340	320	D (50.8)
		LOS (Delay)	Movement				**E (72.6)**		A (7.0)	**F (96.0)**	B (18.2)			**E (65.1)**	A (7.8)	
			Approach				D (51.3)			**E (61.5)**			D (37.3)			
		Queue Length 95th (ft)	Movement				#646		75	#588	207			#432	78	
	SR 559 & I-4 Eastbound	Volume		180		650					610	420	290	570		D (37.6)
		LOS (Delay)	Movement	C (26.4)		D (50.0)					D (46.8)	A (7.6)	**E (64.0)**	C (26.0)		
			Approach	D (44.9)							C (30.8)			D (38.8)		
		Queue Length 95th (ft)	Movement	153		#626					#342	93	m274	m212		

Synchro Version 11 Build 168.

LOS notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:

~: Volume exceeds capacity, queue is theoretically infinite

#: 95th percentile volume exceeds capacity

m: Upstream metering is in effect

Table 37: 2045 Build Alt 1 I-4 Roundabout Intersection Analysis

AM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection AM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	**SR 557 & I-4 Westbound (Roundabout)	Volume					860		140	660	750			570	90	F (164.6)
		LOS (Delay)	Movement				F (460.4)		F (458.6)	A (0.2)	A (0.1)			F (68.5)	F (66.3)	
			Approach				F (460.1)				A (0.2)			F (68.2)		
		V/C	Movement				1.93		1.93	0.43	0.43			0.95	0.95	
			Approach				1.93				0.43			0.95		
		Queue Length 95th (ft)	Movement				2303		2303	0	0			241	241	
	**SR 557 & I-4 Eastbound (Roundabout)	Volume		260		480					1150	1080	110	1320		E (44.7)
		LOS (Delay)	Movement	F (79.7)		F (326.8)					C (15.8)	A (0.5)	A (0.1)	A (0.1)		
			Approach	F (240.0)							A (8.4)			A (0.1)		
		V/C	Movement	0.96		1.64					0.69	0.73	0.43	0.43		
			Approach	1.64							0.73			0.43		
		Queue Length 95th (ft)	Movement	206		1727					209	0	0	0		
	**SR 33 & I-4 Westbound (Roundabout)	Volume					410		200	120	1220			1190	850	C (15.4)
		LOS (Delay)	Movement				E (44.2)		D (28.2)	A (0.1)	A (0.1)			D (31.5)	A (0.1)	
			Approach				E (38.9)				A (0.1)			C (18.4)		
		V/C	Movement				0.75		0.61	0.38	0.38			0.87	0.57	
			Approach				0.75				0.38			0.87		
		Queue Length 95th (ft)	Movement				94		67	0	0			348	0	
	**SR 33 & I-4 Eastbound (Roundabout)	Volume		580		150					760	410	330	1270		E (41.2)
		LOS (Delay)	Movement	F (205.3)		C (24.4)					D (28.1)	A (0)	A (0.1)	A (0.1)		
			Approach	F (168.1)							C (18.2)			A (0.1)		
		V/C	Movement	1.31		0.50					0.75	0.28	0.47	0.47		
			Approach	1.31							0.75			0.47		
		Queue Length 95th (ft)	Movement	760		46					148	0	0	0		

PM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection PM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	**SR 557 & I-4 Westbound (Roundabout)	Volume					1080		110	480	380			670	260	F (179.7)
		LOS (Delay)	Movement				F (158.7)		F (157.3)	A (0.1)	A (0.1)			F (373.3)	F (371.1)	
			Approach				F (158.6)				A (0.1)			F (372.7)		
		V/C	Movement				1.27		1.27	0.30	0.23			1.73	1.73	
			Approach				1.27				0.30			1.73		
		Queue Length 95th (ft)	Movement				1373		1373	0	0			1895	1895	
	**SR 557 & I-4 Eastbound (Roundabout)	Volume		90		660					770	860	140	1610		F (135.2)
		LOS (Delay)	Movement	D (34.6)		F (831.6)					A (7.7)	A (0.3)	A (0.2)	A (0.2)		
			Approach	F (735.9)							A (3.8)			A (0.2)		
		V/C	Movement	0.47		2.77					0.40	0.58	0.52	0.52		
			Approach	2.77							0.58			0.52		
		Queue Length 95th (ft)	Movement	35		3731					52	0	0	0		
	**SR 33 & I-4 Westbound (Roundabout)	Volume					410		330	150	1590			760	580	D (33.6)
		LOS (Delay)	Movement				F (109.1)		F (220.2)	A (0.1)	A (0.1)			B (14.2)	A (0.1)	
			Approach				F (158.6)				A (0.1)			A (8.1)		
		V/C	Movement				1.01		1.36	0.50	0.50			0.57	0.39	
			Approach				1.36				0.50			0.57		
		Queue Length 95th (ft)	Movement				236		878	0	0			97	0	
	**SR 33 & I-4 Eastbound (Roundabout)	Volume		850		120					890	410	200	970		F (63.8)
		LOS (Delay)	Movement	F (192.7)		B (12.4)					F (60.7)	A (0)	A (0)	A (0)		
			Approach	F (170.4)							E (41.6)			A (0)		
		V/C	Movement	1.32		0.28					0.97	0.28	0.34	0.34		
			Approach	1.32							0.97			0.34		
		Queue Length 95th (ft)	Movement	1096		23					345	0	0	0		

** SIDRA INTERSECTION 9.1

[1] LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

[2] The movements with Continuous lane control type have zero second delay time and zero feet queue length.

LOS notes:
Delay is in sec/veh units
:Level Of Service (LOS) E reflecting at capacity operations
:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:
#: 95th percentile volume exceeds capacity
m: Upstream metering is in effect

V/C notes:
: V/C ratio exceeds 0.85

Table 38: 2045 Build Alt 2 I-4 Signalized Intersection Analysis

AM Peak

Arterial	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			AM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	W Memorial Blvd & I-4 Westbound	LOS (Delay)	Movement				C (27.4)			B (15.4)						B (18.5)
			Approach				C (27.4)			B (15.4)						
		Queue Length 95th (ft)	Movement				152			304						
	Kathleen Rd (SR 539) & I-4 Westbound	LOS (Delay)	Movement				**E (66.1)**		D (40.0)	**E (78.6)**	A (5.7)			D (35.8)	A (3.4)	C (26.6)
			Approach				**E (57.8)**			B (13.3)				C (26.6)		
		Queue Length 95th (ft)	Movement				#354		247	m124	224			790	56	
	Kathleen Rd (SR 539) & I-4 Eastbound	LOS (Delay)	Movement	**E (56.8)**		**E (62.0)**					C (26.7)	A (2.8)	**E (74.1)**	B (10.0)		C (24.5)
			Approach	**E (59.2)**						C (20.6)			B (16.5)			
		Queue Length 95th (ft)	Movement	219		#342					761	55	m#118	312		
	US-98 & I-4	LOS (Delay)	Movement	**F (115.8)**			**F (105.5)**			**F (98.0)**	**E (74.6)**		D (47.8)	D (52.6)		**E (75.8)**
			Approach	**F (338.5)**			**F (173.9)**			**F (80.4)**			**E (69.4)**			
		Queue Length 95th (ft)	Movement	#550			#314			#681	#755		264	#794		
	N Sorcrum Loop (CR 582) & I-4 Westbound	LOS (Delay)	Movement		**E (72.5)**	A (5.6)	**F (105.2)**	B (19.3)		D (50.5)	A (0.5)			A (0.2)		D (46.5)
			Approach	**E (58.0)**			D (41.4)			C (33.9)			A (0.2)			
		Queue Length 95th (ft)	Movement		#615	64	#595	472		#453	0			0		
	Lakeland Hills Blvd & Lakeland Harbor Blvd/I-4 Eastbound	LOS (Delay)	Movement	**F (157.7)**	C (34.4)	A (0.2)	C (21.1)	**E (73.6)**		**E (70.0)**	A (5.9)			**F (117.1)**	A (8.5)	**E (65.6)**
			Approach	**E (58.6)**			**E (69.5)**			C (32.4)			**E (78.7)**			
		Queue Length 95th (ft)	Movement	#374	406	0	77	#752		107	12			#593	74	
	SR 559 & I-4 Westbound	LOS (Delay)	Movement				**F (141.4)**		A (9.0)	**F (134.0)**	A (9.1)			**F (99.0)**	A (6.6)	**F (81.5)**
			Approach				**F (87.3)**			**F (82.2)**			**E (74.2)**			
		Queue Length 95th (ft)	Movement				#610		85	#888	224			#653	56	
	SR 559 & I-4 Eastbound	LOS (Delay)	Movement	**E (60.7)**		D (35.3)					C (31.0)	A (5.2)	D (45.3)	B (16.0)		C (28.2)
			Approach	D (46.0)						C (20.8)			C (24.0)			
		Queue Length 95th (ft)	Movement	334		296					380	87	m198	m172		

PM Peak

Arterial	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection
				Eastbound			Westbound			Northbound			Southbound			PM LOS (Delay)
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
I-4	W Memorial Blvd & I-4 Westbound	LOS (Delay)	Movement				C (28.2)			B (15.5)						B (18.8)
			Approach				C (28.2)			B (15.5)						
		Queue Length 95th (ft)	Movement				156			311						
	Kathleen Rd (SR 539) & I-4 Westbound	LOS (Delay)	Movement				**F (123.1)**		D (41.4)	**E (58.1)**	D (41.2)			D (35.7)	A (3.2)	D (47.3)
			Approach				**F (99.8)**			D (43.9)				C (28.2)		
		Queue Length 95th (ft)	Movement				367		232	m221	880			746	57	
	Kathleen Rd (SR 539) & I-4 Eastbound	LOS (Delay)	Movement	**E (74.2)**		C (22.9)					D (42.2)	A (5.0)	**F (94.2)**	**E (73.2)**		D (54.3)
			Approach	**E (61.6)**						C (32.1)			**E (76.2)**			
		Queue Length 95th (ft)	Movement	428		157					897	120	m#211	935		
	US-98 & I-4	LOS (Delay)	Movement	**F (158.7)**			**F (102.5)**			**F (141.5)**	**F (117.9)**		D (48.9)	**E (64.3)**		**F (107.4)**
			Approach	**F (103.0)**			**E (72.9)**			**F (114.6)**			**F (90.8)**			
		Queue Length 95th (ft)	Movement	#621			#488			#1013	#1152		218	785		
	N Sorcrum Loop (CR 582) & I-4 Westbound	LOS (Delay)	Movement	**E (67.4)**	**E (69.0)**	A (4.1)	**F (116.6)**	B (14.9)		**E (55.4)**	A (2.5)					D (49.8)
			Approach	**E (59.4)**			D (45.9)			C (29.5)						
		Queue Length 95th (ft)	Movement	20	#873	54	#611	344		327	6					
	Lakeland Hills Blvd & Lakeland Harbor Blvd/I-4 Eastbound	LOS (Delay)	Movement	**E (76.4)**	**E (57.9)**	A (0.4)	D (36.2)	**E (56.0)**		**E (72.5)**	A (1.8)			**F (99.8)**	B (13.7)	**E (58.7)**
			Approach	**E (58.7)**			D (54.3)			C (30.1)			**E (68.5)**			
		Queue Length 95th (ft)	Movement	#421	#838	2	90	#584		78	0			#751	138	
	SR 559 & I-4 Westbound	LOS (Delay)	Movement				**E (72.6)**		A (7.0)	**F (96.0)**	B (18.2)			**E (65.1)**	A (7.8)	D (50.8)
			Approach				D (51.3)			**E (61.5)**				D (37.3)		
		Queue Length 95th (ft)	Movement				#646		75	#588	207			#432	78	
	SR 559 & I-4 Eastbound	LOS (Delay)	Movement	C (26.4)		D (50.0)					D (46.8)	A (7.6)	**E (64.0)**	C (26.0)		D (37.6)
			Approach	D (44.9)						C (30.8)			D (38.8)			
		Queue Length 95th (ft)	Movement	153		#626					#342	93	m274	m212		

Synchro Version 11 Build 168. *HCM6 output used for unsignalized intersections due to limitations in Synchro.

LOS notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:

~: Volume exceeds capacity, queue is theoretically infinite

#: 95th percentile volume exceeds capacity

m: Upstream metering is in effect

Table 39: 2045 Build Alt 2 I-4 Roundabout Intersection Analysis

AM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	AM Movement/Approach LOS (Delay)												Intersection AM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	**SR 557 & I-4 Westbound (Roundabout)	Volume					860		140	660	750			570	90	F (164.6)
		LOS (Delay)	Movement				F (460.4)		F (458.6)	A (0.2)	A (0.1)			F (68.5)	F (66.3)	
			Approach				F (460.1)				A (0.2)			F (68.2)		
		V/C	Movement				1.93		1.93	0.43	0.43			0.95	0.95	
			Approach				1.93				0.43			0.95		
		Queue Length 95th (ft)	Movement				2303		2303	0	0			241	241	
	**SR 557 & I-4 Eastbound (Roundabout)	Volume		260		480					1150	1080	110	1320		E (44.7)
		LOS (Delay)	Movement	F (79.7)		F (326.8)					C (15.8)	A (0.5)	A (0.1)	A (0.1)		
			Approach	F (240.0)							A (8.4)			A (0.1)		
		V/C	Movement	0.96		1.64					0.69	0.73	0.43	0.43		
			Approach	1.64							0.73			0.43		
		Queue Length 95th (ft)	Movement	206		1727					209	0	0	0		
	**SR 33 & I-4 Westbound (Roundabout)	Volume					410		200	120	1220			1190	850	C (15.4)
		LOS (Delay)	Movement				E (44.2)		D (28.2)	A (0.1)	A (0.1)			D (31.5)	A (0.1)	
			Approach				E (38.9)				A (0.1)			C (18.4)		
		V/C	Movement				0.75		0.61	0.38	0.38			0.87	0.57	
			Approach				0.75				0.38			0.87		
		Queue Length 95th (ft)	Movement				94		67	0	0			348	0	
	**SR 33 & I-4 Eastbound (Roundabout)	Volume		580		150					760	410	330	1270		E (41.2)
		LOS (Delay)	Movement	F (205.3)		C (24.4)					D (28.1)	A (0)	A (0.1)	A (0.1)		
			Approach	F (168.1)							C (18.2)			A (0.1)		
		V/C	Movement	1.31		0.50					0.75	0.28	0.47	0.47		
			Approach	1.31							0.75			0.47		
		Queue Length 95th (ft)	Movement	760		46					148	0	0	0		

PM Peak

Interstate	Signal Controlled Intersections	Measure of Effectiveness (MOE)	Location	PM Movement/Approach LOS (Delay)												Intersection PM LOS (Delay)
				Eastbound			Westbound			Northbound			Southbound			
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	**SR 557 & I-4 Westbound (Roundabout)	Volume					1080		110	480	380			670	260	F (179.7)
		LOS (Delay)	Movement				F (158.7)		F (157.3)	A (0.1)	A (0.1)			F (373.3)	F (371.1)	
			Approach				F (158.6)				A (0.1)			F (372.7)		
		V/C	Movement				1.27		1.27	0.30	0.23			1.73	1.73	
			Approach				1.27				0.30			1.73		
		Queue Length 95th (ft)	Movement				1373		1373	0	0			1895	1895	
	**SR 557 & I-4 Eastbound (Roundabout)	Volume		90		660					770	860	140	1610		F (135.2)
		LOS (Delay)	Movement	D (34.6)		F (831.6)					A (7.7)	A (0.3)	A (0.2)	A (0.2)		
			Approach	F (735.9)							A (3.8)			A (0.2)		
		V/C	Movement	0.47		2.77					0.40	0.58	0.52	0.52		
			Approach	2.77							0.58			0.52		
		Queue Length 95th (ft)	Movement	35		3731					52	0	0	0		
	**SR 33 & I-4 Westbound (Roundabout)	Volume					410		330	150	1590			760	580	D (33.6)
		LOS (Delay)	Movement				F (109.1)		F (220.2)	A (0.1)	A (0.1)			B (14.2)	A (0.1)	
			Approach				F (158.6)				A (0.1)			A (8.1)		
		V/C	Movement				1.01		1.36	0.50	0.50			0.57	0.39	
			Approach				1.36				0.50			0.57		
		Queue Length 95th (ft)	Movement				236		878	0	0			97	0	
	**SR 33 & I-4 Eastbound (Roundabout)	Volume		850		120					890	410	200	970		F (63.8)
		LOS (Delay)	Movement	F (192.7)		B (12.4)					F (60.7)	A (0)	A (0)	A (0)		
			Approach	F (170.4)							E (41.6)			A (0)		
		V/C	Movement	1.32		0.28					0.97	0.28	0.34	0.34		
			Approach	1.32							0.97			0.34		
		Queue Length 95th (ft)	Movement	1096		23					345	0	0	0		

** SIDRA INTERSECTION 9.1

[1] LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

[2] The movements with Continuous lane control type have zero second delay time and zero feet queue length.

LOS notes:
Delay is in sec/veh units
:Level Of Service (LOS) E reflecting at capacity operations
:Level Of Service (LOS) F reflecting over capacity operations

Queue notes:
#: 95th percentile volume exceeds capacity
m: Upstream metering is in effect

V/C notes:
: V/C ratio exceeds 0.85

Table 37: Comparison of LOS and Delay

Interstate	Intersections	AM Peak				PM Peak			
		No-Build	Build Alt 1	Build Alt 2	Notes	No-Build	Build Alt 1	Build Alt 2	Notes
I-4	West Memorial Boulevard & I-4 Westbound	B (18.5)	B (18.5)	B (18.5)	Operating at an acceptable LOS	B (19.3)	B (18.8)	B (18.8)	Operating at an acceptable LOS
	Kathleen Road (SR 539) & I-4 Westbound	C (29.7)	C (26.4)	C (26.6)	Operating at an acceptable LOS	C (33.8)	D (47.3)	D (47.3)	Operating at an acceptable LOS
	Kathleen Road (SR 539) & I-4 Eastbound	C (27.5)	C (24.5)	C (24.5)	Operating at an acceptable LOS	C (28.8)	D (54.3)	D (54.3)	Operating at an acceptable LOS
	US-98 & I-4	F (86.1)	E (57.6)	E (75.8)	This interchange will be evaluated using Vissim with improvement(s)	E (66.1)	E (75.7)	F (107.4)	This interchange will be evaluated using Vissim with improvement(s)
	North Socrum Loop Road (CR 582) & I-4 Westbound	F (99.9)	F (111.4)	D (46.5)	This interchange will be evaluated using Vissim with improvement(s)	F (106.4)	F (99.5)	D (49.8)	This interchange will be evaluated using Vissim with improvement(s)
	Lakeland Hills Boulevard & Lakeland Harbor Boulevard/I-4 Eastbound	F (129.5)	F (126.1)	E (65.6)	This interchange will be evaluated using Vissim with improvement(s)	F (124.4)	F (143.0)	E (58.7)	This interchange will be evaluated using Vissim with improvement(s)
	*SR 33 & I-4 Westbound	A (6.2)	C (15.4)	C (15.4)	Operating at an acceptable LOS	B (10.1)	D (33.6)	D (33.6)	Operating at an acceptable LOS
	*SR 33 & I-4 Eastbound	B (13.8)	E (41.2)	E (41.2)	Volumes increased under Build Alternatives. Interchange will be evaluated using improvement(s) in upcoming traffic memo	C (21.6)	F (63.8)	F (63.8)	Volumes increased under Build Alternatives. Modify the eastbound off ramp right turn lane by adding a receiving lane instead of merge lane. See Appendix I
	SR 559 & I-4 Westbound	E (58.0)	F (81.5)	F (81.5)	Volumes increased under Build Alternatives. Interchange will be evaluated using improvement(s) in upcoming traffic memo	D (46.2)	D (50.8)	D (50.8)	Operating at an acceptable LOS
	SR 559 & I-4 Eastbound	C (28.1)	C (28.2)	C (28.2)	Operating at an acceptable LOS	C (26.9)	D (37.6)	D (37.6)	Operating at an acceptable LOS
	*SR 557 & I-4 Westbound	F (110.4)	F (164.6)	F (164.6)	Volumes increased under Build Alternatives. Interchange will be evaluated using improvement(s) in upcoming traffic memo	F (119.8)	F (179.7)	F (179.7)	Volumes increased under Build Alternatives. Modify the westbound off ramp right turn lane by adding a receiving lane instead of merge lane. See Appendix I
	*SR 557 & I-4 Eastbound	C (15.8)	E (44.7)	E (44.7)	Volumes increased under Build Alternatives. Interchange will be evaluated using improvement(s) in upcoming traffic memo	F (70.3)	F (135.2)	F (135.2)	Volumes increased under Build Alternatives. Modify the eastbound off ramp right turn lane by adding a receiving lane instead of merge lane. See Appendix I

Synchro Version 11 Build 168. *:Roundabout

LOS notes:

Delay is in sec/veh units

:Level Of Service (LOS) E reflecting at capacity operations

:Level Of Service (LOS) F reflecting over capacity operations

14.0 I-4 Master Plan – Qualitative Measures

A.` ELs provide improved travel time reliability

1. Transit - Express buses using ELs offer faster, more reliable service than buses in GULs

2. Emergency vehicles - Improved and more predictable response times in ELs vs. GUL

B. ELs provide users with travel options

1. No one is required to use/pay toll for ELs

2. Users have the option to use ELs for time-sensitive trips and can choose ELs when they believe the value of their time savings exceeds the toll cost

C. ELs address driver expectancy and consistency with adjacent I-4 BTU and TBNext EL systems

1. ELs provide more systemwide continuity for regional trips between Tampa and Orlando and ensure regional travel time reliability

D. ELs reduce fuel consumption and air pollution

1. Stop-and-go conditions in GULs produce more emissions and increase wear and tear on vehicles

2. ELs encourage carpooling (shared tolls, HOT lanes), further reducing congestion and emissions

E. Consistent vehicle speeds in ELs may reduce crashes vs. variable speeds in congested GULs

F. ELs provide revenue to support future maintenance, roadside services, enforcement

Build Alternative 2 is proposed as the recommend mainline strategy because of improvements to traffic operations, safety, regional travel time reliability, user options, systemwide continuity and environmental benefits with small ROW impacts combined

Appendix D

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Version

Project: WDUI68-U-25-BB **Letting Date:** 01/2099

Description: Widen 6 Lane Urban Interstate with Closed Median to 8 Lanes (Outside); Mill & Resurface Existing; 10' Shoulders Outside

District: 09 **County:** 99 DISTRICT/STATE WIDE

Project Manager: Cost-Per-Mile Model

Version 17-P Project Grand Total **$12,418,655.33**

Description: October 2022 Update

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
102-1	MAINTENANCE OF TRAFFIC	10.00			$1,016,173.42
101-1	MOBILIZATION	10.00			$1,117,790.76
104-10-3	SEDIMENT BARRIER	12,144.00	LF	$1.70	$20,644.80
104-11	FLOATING TURBIDITY BARRIER	100.00	LF	$12.00	$1,200.00
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	100.00	LF	$6.70	$670.00
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,600.00	$2,600.00
107-1	LITTER REMOVAL	3.40	AC	$30.00	$102.00
107-2	MOWING	3.40	AC	$46.00	$156.40
110-1-1	CLEARING & GRUBBING	15.53	AC	$23,000.00	$357,190.00
120-1	REGULAR EXCAVATION	4,840.00	CY	$9.50	$45,980.00
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	17,498.31	CY	$22.00	$384,962.82
160-4	TYPE B STABILIZATION	25,813.33	SY	$5.90	$152,298.65
285-704	OPTIONAL BASE,BASE GROUP 04	12,120.53	SY	$17.00	$206,049.01
285-709	OPTIONAL BASE,BASE GROUP 09	14,467.20	SY	$20.00	$289,344.00
327-70-1	MILLING EXIST ASPH PAVT, 1" AVG DEPTH	11,733.33	SY	$2.70	$31,679.99
327-70-7	MILLING EXIST ASPH PAVT, 4" AVG DEPTH	42,240.00	SY	$2.70	$114,048.00
334-1-53	SUPERPAVE ASPH CONC, TRAF C, PG76-22	1,936.00	TN	$120.00	$232,320.00
334-1-55	SUPERPAVE ASPH CONC, TRAF E, PG76-22	12,003.20	TN	$120.00	$1,440,384.00
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	2,314.76	TN	$160.00	$370,361.60
425-1-541	INLETS, DT BOT, TYPE D,	1.00	EA	$6,200.00	$6,200.00
425-1-921	INLETS, ADJACENT BARRIER, <=10'	30.00	EA	$8,000.00	$240,000.00
425-2-71	MANHOLES, J-7,	1.00	EA	$10,000.00	$10,000.00
430-174-142	PIPE CULV, OPT MATL, ROUND,42"SD	504.00	LF	$300.00	$151,200.00

FDOT Long Range Estimating System - Production					
R4: Project Details Composite Report					
By Version					
Project: WDUI68-U-25-BB				**Letting Date:** 01/2099	
Description: Widen 6 Lane Urban Interstate with Closed Median to 8 Lanes (Outside); Mill & Resurface Existing; 10' Shoulders Outside					
District: 09	**County:** 99 DISTRICT/STATE WIDE				
Project Manager: Cost-Per-Mile Model					
Version 17-P Project Grand Total					**$12,418,655.33**
Description: October 2022 Update					
Pay Items					
Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
430-174-154	PIPE CULV, OPT MATL, ROUND,54"SD	360.00	LF	$470.00	$169,200.00
430-175-130	PIPE CULV, OPT MATL, ROUND, 30"S/CD	5,280.00	LF	$180.00	$950,400.00
430-175-142	PIPE CULV, OPT MATL, ROUND, 42"S/CD	56.00	LF	$280.00	$15,680.00
430-175-154	PIPE CULV, OPT MATL, ROUND, 54"S/CD	200.00	LF	$470.00	$94,000.00
430-530-100	STRAIGHT CONC ENDW 30", SINGLE, 0 ROUND	8.00	EA	$6,400.00	$51,200.00
430-542-100	STRAIGHT CONC ENDW 42", SINGLE, 0 ROUND	4.00	EA	$10,000.00	$40,000.00
430-554-100	STRAIGHT CONC ENDW 54", SINGLE, 0 ROUND	2.00	EA	$10,000.00	$20,000.00
521-72-40	SHLDR CONC BARRIER,38" OR 44" HEIGHT	10,560.00	LF	$290.00	$3,062,400.00
546-72-1	GROUND-IN RUMBLE STRIPS, 16"	2.00	GM	$1,200.00	$2,400.00
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD	11,160.00	LF	$30.00	$334,800.00
550-60-234	FENCE GATE,TYP B,SLIDE/CANT,18.1-20'OPEN	1.00	EA	$5,700.00	$5,700.00
570-1-2	PERFORMANCE TURF, SOD	33,513.00	SY	$2.30	$77,079.90
700-1-11	SINGLE POST SIGN, F&I GM,	2.00	AS	$440.00	$880.00
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	24.00	AS	$1,400.00	$33,600.00
700-1-50	SINGLE POST SIGN, RELOCATE	2.00	AS	$260.00	$520.00
700-1-60	SINGLE POST SIGN, REMOVE	24.00	AS	$43.00	$1,032.00
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	$5,800.00	$11,600.00
700-2-60	MULTI- POST SIGN, REMOVE	2.00	AS	$910.00	$1,820.00
700-4-113	OH STATIC SIGN STR, F&I, C 31-40 FT	1.00	EA	$120,000.00	$120,000.00
700-4-126	OH STATIC SIGN STR, F&I, S 101-150 FT	1.00	EA	$250,000.00	$250,000.00

FDOT Long Range Estimating System - Production					
R4: Project Details Composite Report					
By Version					
Project: WDUI68-U-25-BB				**Letting Date:** 01/2099	
Description: Widen 6 Lane Urban Interstate with Closed Median to 8 Lanes (Outside); Mill & Resurface Existing; 10' Shoulders Outside					
District: 09	**County:** 99 DISTRICT/STATE WIDE				
Project Manager: Cost-Per-Mile Model					
Version 17-P Project Grand Total					**$12,418,655.33**
Description: October 2022 Update					
Pay Items					
Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
700-4-612	OH STATIC SIGN STR, DEEP REMOVE, CANT	1.00	EA	$13,000.00	$13,000.00
700-4-622	OH STATIC SIGN STR, DEEP REMOVE, SPAN	1.00	EA	$19,000.00	$19,000.00
706-1-3	RAISED PAVMT MARK, TYPE B	945.00	EA	$3.80	$3,591.00
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	8.00	GM	$1,100.00	$8,800.00
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	12.00	GM	$520.00	$6,240.00
711-15-101	THERMOPLASTIC, STD-OP, WHITE, SOLID, 6"	4.00	GM	$5,300.00	$21,200.00
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	6.00	GM	$1,700.00	$10,200.00
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	1.00	LS	$122,956.98	$122,956.98
LIGHT-RURAL	RURAL LIGHT POLES - 52 AT $15,000.00	1.00	LS	$780,000.00	$780,000.00
Project Unknowns			0.00	%	$0.00
Design/Build			0.00	%	$0.00
Version 17-P Project Grand Total					**$12,418,655.33**

Appendix E

Quantity Breakdown: I-4 Master Plan Alt. 2

Cost Estimate:

Bridge ID	Bridge Number	Bridge Identifier	Bridge Type	Bridge Disposition	Phase Constructed[1]	Superstructure Type	Existing Bridge Demo			Proposed Bridge[2]			Total Cost ($)
							Unit Cost ($ / SF)	Quantity (SF)	Cost ($)	Unit Cost ($ / SF)	Quantity (SF)	Cost ($)	
1	160234	Eastbound 570 over I-4 (Western Polk Pkwy Interchange)	Overpass	Replacement	Yes	PS Concrete	$ 72.00	9540.00	$ 686,880.00	$ 212.04	9540	$ 2,022,861.60	$ 2,709,741.60
2	160235	Westbound 570 over I-4 (Western Polk Pkwy Interchange)	Overpass	Replacement	Yes	PS Concrete	$ 72.00	13660.00	$ 983,520.00	$ 212.04	13660	$ 2,896,466.40	$ 3,879,986.40
3	160236	Clark Road over I-4	Overpass	Replacement	Yes	PS Concrete	$ 72.00	14930.00	$ 1,074,960.00	$ 212.04	14930	$ 3,165,757.20	$ 4,240,717.20
4	160298	North Galloway Road over I-4	Overpass	Replacement	Yes	Steel	$ 72.00	22080.00	$ 1,589,760.00	$ 246.24	22080	$ 5,436,979.20	$ 7,026,739.20
5	160330	Memorial Blvd Ramp over I-4	Overpass	Replacement	Yes	Steel	$ 72.00	32650.00	$ 2,350,800.00	$ 246.24	32650	$ 8,039,736.00	$ 10,390,536.00
12	160310	Westbound I-4 over US 98	Mainline	Widening	No	Steel	$ 150.00	1833.90	$ 275,085.09	$ 279.30	12850	$ 3,589,005.00	$ 3,864,090.09
13	160311	Eastbound I-4 over US 98	Mainline	Widening	No	Steel	$ 150.00	1833.90	$ 275,085.09	$ 279.30	11420	$ 3,189,606.00	$ 3,464,691.09
15	160177	Westbound I-4 over CR 582	Mainline	Replacement	Yes	PS Concrete	$ 72.00	9540.00	$ 686,880.00	$ 212.04	18280	$ 3,876,091.20	$ 4,562,971.20
16	160178	Eastbound I-4 over CR 582	Mainline	Replacement	Yes	PS Concrete	$ 72.00	9400.00	$ 676,800.00	$ 212.04	17050	$ 3,615,282.00	$ 4,292,082.00
18	160181	Westbound I-4 over SR 33	Mainline	Replacement	Yes	PS Concrete	$ 72.00	13510.00	$ 972,720.00	$ 212.04	24210	$ 5,133,488.40	$ 6,106,208.40
19	160182	Eastbound I-4 over SR 33	Mainline	Replacement	Yes	PS Concrete	$ 72.00	13510.00	$ 972,720.00	$ 212.04	25100	$ 5,322,204.00	$ 6,294,924.00
20	160281	Westbound 570 over I-4 (Eastern Polk Pkwy Interchange)	Overpass	Replacement	Yes	PS Concrete	$ 72.00	9630.00	$ 693,360.00	$ 212.04	9630	$ 2,041,945.20	$ 2,735,305.20
21	160282	Eastbound 570 over I-4 (Eastern Polk Pkwy Interchange)	Overpass	Replacement	Yes	PS Concrete	$ 72.00	13790.00	$ 992,880.00	$ 212.04	13790	$ 2,924,031.60	$ 3,916,911.60
23	160184	Westbound I-4 over Berkley Road	Mainline	Replacement	Yes	PS Concrete	$ 72.00	14990.00	$ 1,079,280.00	$ 212.04	27850	$ 5,905,314.00	$ 6,984,594.00
24	160185	Eastbound I-4 over Berkley Road	Mainline	Replacement	Yes	PS Concrete	$ 72.00	14990.00	$ 1,079,280.00	$ 212.04	26860	$ 5,695,394.40	$ 6,774,674.40

1. Phase constructed bridges include a 20% increase in the unit cost.

2. Unit Cost is based on 14% increase over the average SDG cost estimate to account for market increases.