Existing Conditions & Deficiencies Technical Memorandum

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Attention: William Wharton
Company: Seminole County
Prepared by: Jacobs

Jacobs Engineering Group Inc.
200 S. Orange Avenue
Suite 900
Orlando, FL 32801
United States
T +1.407.903.5001
F +1.407.903.5150
www.jacobs.com

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Acronyms and Abbreviations

ACS	American Community Survey
ADA	Americans with Disabilities Act
ASV	Annual Service Volume
ATSPM	Automated Traffic Signal Performance Measures
AVI	Automatic Vehicle Identification
CAV	Connected and Automated Vehicles
CFRC	Central Florida Rail Corridor
CRA	Community Redevelopment Agency
CSXT	CSX Transportation
DMS	Dynamic Message Sign
DSRC	Dedicated Short-Range Communication
EV	electric vehicle
F.S.	Florida Statute
FAA	Federal Aviation Administration
FDOT	Florida Department of Transportation
FLHSMV	Florida Department of Highway Safety and Motor Vehicles
ft^2	square feet
I-4	Interstate 4
ITS	Intelligent Transportation Systems
LOS	Level of Service
NHTSA	National Highway Traffic Safety Administration
NPIAS	National Plan of Integrated Airport Systems
PCI	Pavement Condition Index
ROW	right of way
SIS	Strategic Intermodal System
SR	State Road
SSC	Seminole State College of Florida
SSO	State Safety Office
SSOGis	State Safety Office Geographic Information System
TNC	Transportation Network Companies
UCC	Urban Centers and Corridors
UCF	University of Central Florida

1. Introduction

This technical memorandum describes and analyzes the existing transportation system in Seminole County (hereinafter, "the County"). This document includes the existing land use, demographics, roadway network, traffic, crashes, active transportation, transit, rail, waterways, the Orlando-Sanford International Airport, transportation network companies, emerging technologies, and Intelligent Transportation Systems infrastructure.

Data sources used to evaluate the existing system and identify deficiencies came from the County, the seven cities within the County, MetroPlan Orlando, Florida Department of Transportation (FDOT), Central Florida Regional Transportation Authority (known as LYNX), SunRail, U.S. Census Bureau, Florida Department of Environmental Protection, Orlando-Sanford International Airport, among other sources that are documented in this memorandum.

While this document reflects the existing conditions of the transportation system within the County, it is not meant to serve as an all-encompassing and comprehensive final assessment. Rather, it is a starting point for discussion with stakeholders, for additional analysis, and to inform the complete development of the Seminole County 2045 Transportation Mobility Plan.

Refer to Map 1 in Appendix A for a base map for an overview of the County.

2. Land Use

This section provides an overview of existing and permitted land uses, buildable lands in Seminole County, and how current land uses are impacting mobility on the existing transportation network. The County's lands were evaluated in detail to identify general land use character, urban and rural areas, urban centers and corridors, and buildable lands. Additional areas covered were the current zoning designations and land use patterns, vacant lands, activity areas identified within the County and neighboring counties, Community Redevelopment Areas, and environmental constraints. Refer to Map 2 in Appendix A for the established zoning designations throughout the County.

2.1 Overview

Development in Seminole County is primarily low-intensity, suburban with open space in the urban areas of the west and center of the County and sparse, low-intensity development in rural areas on the east side of the County within the East Rural Area (refer to Map 3, Existing Land Use, in Appendix A). Unincorporated land use throughout the County is primarily a mixture of agricultural, environmentally managed areas, publicly owned lands, light commercial, light and medium industrial uses, and suburban development with multi- and single-family residential areas.

Urbanized areas within city limits include low- to medium-intensity development with density generally increasing toward the urban centers and along major corridors. The cities mainly exhibit a suburban character, with a trend toward more dense, mixed-use developments, especially near the SunRail stations and in key locations throughout the cities.

Zoning designations with the greatest acreages for unincorporated portions of the County are rural (51,217 acres), agriculture (33,836 acres), planned development (20,351 acres), public lands/institutions (14,198 acres), and single-family residential (13,928 acres). This distribution of zoning designations facilitates low-intensity commercial and residential developments with parks, agriculture, and preserved lands spread throughout remaining County lands. Existing land uses and zoning are generally in conformance with each other, indicating the development intensity is planned to continue in the future.

The designated Urban Areas and U.S. Census Designated Places located within the County include the seven municipalities and nine Census Designated Places listed in Table 2-1. Census Designated Places are the statistical counterparts of incorporated places and provide data for settled concentrations of population that are identifiable by name but are not legally incorporated under state law (U.S. Census Bureau 2022).

Table 2-1. Urban Areas and Census Designated Places

Urban Areas	Census Designated Places
Altamonte Springs	Black Hammock
Casselberry	Chuluota
Lake Mary	Fern Park
Longwood	Forest City
Oviedo	Geneva
Sanford	Goldenrod
Winter Springs	Heathrow
	Midway

Table 2-1. Urban Areas and Census Designated Places

Urban Areas	Census Designated Places
	Wekiwa Springs

Seminole State College of Florida (SSC) is the largest higher education facility within Seminole County serving nearly 26,501 students among all of its campuses and online instruction (Seminole State College 2021). The largest campus in the County by enrollment is the Sanford/Lake Mary campus with 6,361 students. It is important to note that the largest share of enrolled students takes courses exclusively online. In fact, 83% of enrollment at the college are online attendees. The college has a DirectConnect program with the University of Central Florida (UCF), which, in most cases, guarantees graduates admission to the university. They also offer transfer assistance from UCF Success Coaches on the SSC Sanford/Lake Mary Campus. UCF is one of the largest universities in the United States for undergraduate and total enrollment, with a total enrollment of 70,406 students. UCF is located adjacent to the Seminole County line near the City of Oviedo (University of Central Florida 2022).

In addition to educational institutions, there are major local and regional activity areas that are described in Section 2.4. Some of these areas include Historic Downtown Sanford, Interstate 4 (I-4) between Lake Mary and Sanford, the Lake Mary Boulevard corridor, Uptown Altamonte, and Seminole Towne Center.

SunRail Commuter Rail operates throughout Seminole County north and south in the center portion of the County with stations in Sanford, Lake Mary, Longwood, and Altamonte Springs. Land uses in station areas are primarily residential with a mixture of commercial, industrial, and restaurant uses in proximity. Additionally, there are several Transit Oriented Developments that have been completed or planned for the areas near the stations. SunRail service extends to 16 commuter rail stations from DeBary in Volusia County through Seminole and Orange County to Poinciana in Osceola County. A planned northern extension of SunRail will add an additional Volusia County station in DeLand. This extension of service is expected to be operational in 2024.

The County has designated specialized Urban Centers and Corridors (UCC) areas to encourage compact redevelopment, infill development, and energy-conserving land development patterns. The areas also encourage a balance of jobs, housing, and multimodal transportation. These overlay zones are dispersed along transportation corridors in numerous locations countywide and are described in further detail in Section 2.3.

2.2 Urban and Rural Areas

Florida Statute (F.S.) 163.3164(51) defines Urban Service Areas as being "identified in the comprehensive plan where public facilities and services, including, but not limited to, central water and sewer capacity and roads, are already in place or are identified in the capital improvements element. The term includes any areas identified in the comprehensive plan as urban service areas, regardless of local government limitation."

The Seminole County Urban Service Area accommodates higher-intensity urban uses and developments, while the rural area allows larger residential lots, limits commercial and industrial development, and seeks to minimize impacts on environmental resources. Rural areas comprise a large portion of the east side and a designated area of the west side of the County. To support these initiatives, there are the East Rural Area and Wekiva River Protection Area, which are shown as part of Map 1–Basemap (Appendix A).

The County completed the 2006 Rural Character Plan (Seminole County and Glatting Jackson Kercher Anglin Lopez Rinehart, Inc. 2006) to preserve rural areas in eastern Seminole County. Land in the East Rural Area is generally characterized by large-sized residential lots, natural landscapes in environmental managed lands, agricultural uses, and scenic views. Community character in rural areas is defined as land preservation, rural residential, estate residential, suburban residential, and suburban commercial. Transition areas where the Urban Service Area abuts the East Rural Area are located along the western

East Rural Area boundary and consistently contain development pressures from higher-intensity land uses. To maintain a consistent policy within the East Rural Area, the County amended the Home Rule Charter to prevent land use amendments to all land uses within the East Rural Area boundary without approval by the County Board of Commissioners.

Seminole County has the thirteenth largest population in Florida, with an estimated population of 484,054 as of 2021 (BEBR n.d.). The continuing trend of growing populations and increasing land use intensities in neighboring counties are placing development pressures on urbanized and rural areas countywide (Seminole County and Glatting Jackson Kercher Anglin Lopez Rinehart, Inc. 2006).

2.3 Urban Centers and Corridors

The UCC overlay zone designates areas in proximity to major urban activity centers, SunRail stations, and major urban transit corridors (refer to Figure 2-1). Areas designated under the UCC overlay are located in the Dense Urban Land Area. All corridors except International Parkway (just west of I-4) run for a length in the County's designated urban core between I-4 and US 17-92. The purpose of the overlay is to encourage dense redevelopment, energy-conserving development patterns, and a balance of jobs, housing, and multimodal transportation options.

The UCC contains major transportation corridors targeted for land use reinvestment and infill development, which include segments of the following transportation corridors:

- US 17-92
- SR 46
- County Road 46A
- International Parkway
- Lake Mary Boulevard
- SR 434
- SR 436

Approximately 28,300 acres of land (approximately 13%) of the County is located within the UCC overlay zone. This overlay zone is supportive of employment, housing, multimodal transportation, and mixed-use development (Seminole County n.d.).

Vacant lands in the UCC overlay total 4,889 acres (nearly 17%) of vacant areas countywide and slightly more than 2% of total County lands (Seminole County n.d.). Table 2-2 provides more details on vacant lands by zoning designation within the UCC overlay.

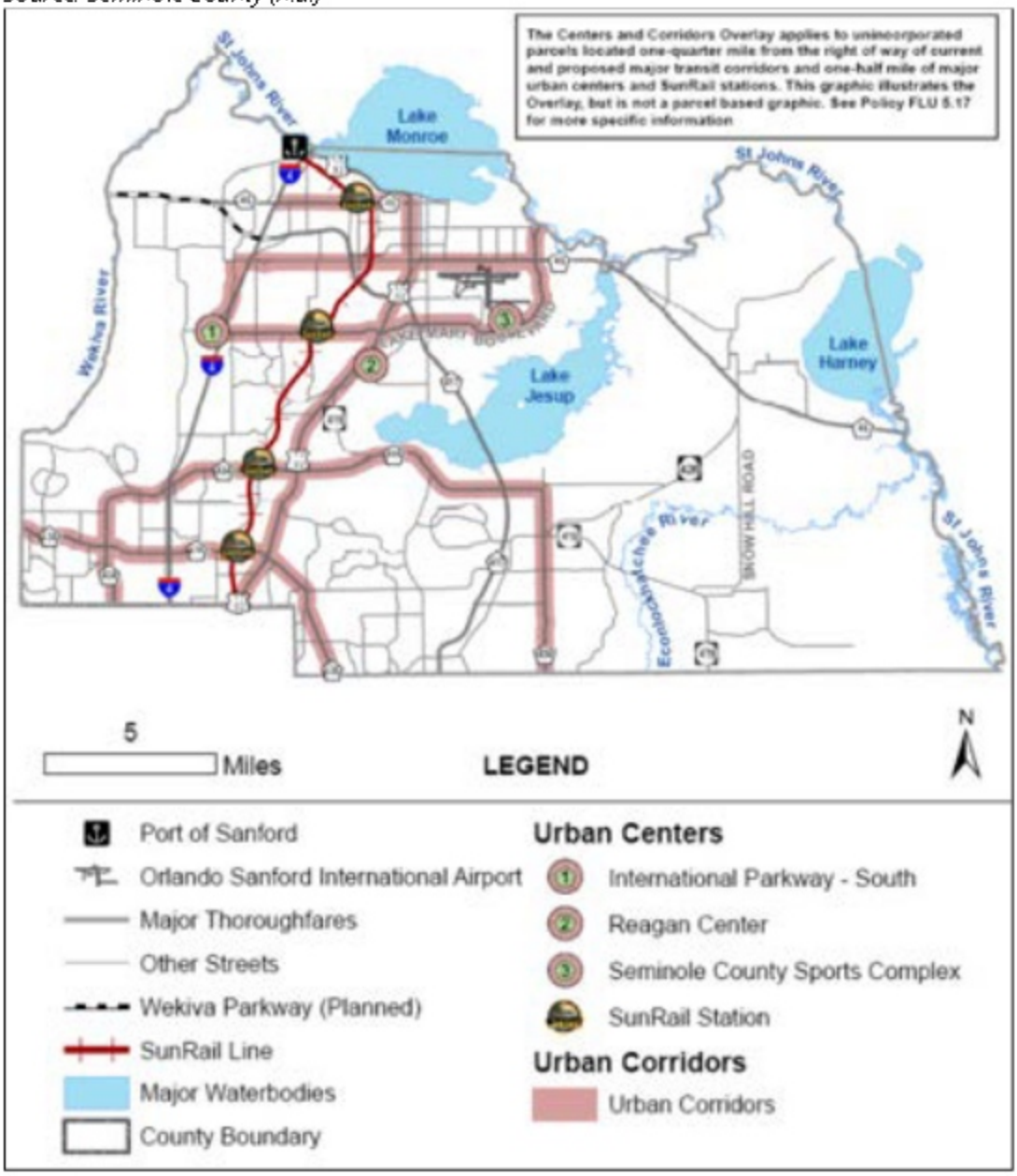
Table 2-2. Vacant Lands within the Urban Centers and Corridors Overlay

Vacant Lands Zoning	Acres	Percent of Vacant Lands Countywide (%)	Percent of County (%)
Commercial	1,114	3.89	0.50
Residential	1,233	4.31	0.55
Industrial	302	1.05	0.14
Institutional	92	0.32	0.04
Other	2,148	7.50	0.97
Total	4,889	17.07	2.20

Source: Seminole County n.d.

Figure 2-1. Urban Centers and Corridors Overlay

Source: Seminole County (n.d.)



2.4 Activity Areas

Seminole County is 309 square miles of land, with an additional 43 square miles of water area within its boundary. The County includes diverse natural areas and built land uses (Seminole County n.d.).

The natural areas include Lower Wekiva River Preserve State Park, Seminole State Forest, Little Big Econ State Forest, and Charles H. Bronson State Forest and attract regional visitors and local residents alike for their natural beauty and recreational opportunities.

The list of activity areas presented in this section focuses on commercial activity areas because of their propensity to influence transportation demand in the County. Activity areas are centralized areas of employment, commerce, or local significance. Many areas are in proximity to multimodal transportation networks including existing transit, commuter rail, and bicycle and pedestrian infrastructure.

Building upon existing bicycle and pedestrian connectivity from the following locations could increase multimodal travel to key activity areas:

- **Historic Downtown Sanford to the Sanford SunRail Station**: SunRail services Sanford with a 40-train weekday-only schedule, primarily in 30- to-60-minute headways between Volusia, Seminole, Orange, and Osceola Counties. LYNX fixed-route bus service supports station areas and residents with last mile service but is limited to the SR 46 (SR 46) and US 17-92 corridors. LYNX has NeighborLink flex-service adjacent to the corridors but those areas are serviced from the Sanford Seminole Centre Superstop near Lake Mary Boulevard. The City of Sanford has operated free trolley service between the Sanford SunRail Station and locations within Historic Downtown with a stop at the Amtrak Auto Train Station. While pedestrian and bicycle infrastructure has improved along the corridor, it is still limited between Historic Downtown Sanford and the SunRail Station. Increased multimodal connectivity to Historic Downtown Sanford and the Sanford Riverwalk could drive increased SunRail ridership along with being a more attractive destination for local and regional visitors.
- **Seminole Towne Center to the Sanford SunRail Station**: The Seminole Towne Center is an activity area with relatively high levels of employment. Residents living near Seminole Towne Center also have lower rates of car ownership and higher utilization of transportation modes other than single-occupancy vehicles. Improved bicycle and pedestrian connectivity between the Sanford SunRail Station and the town center could increase multimodal transportation options in the area that is currently only serviced by LYNX fixed-route bus service via Link 46W. With increased mobility in this area, users can more efficiently access regional employment centers within the County and others connected to the community via SunRail.

2.4.1 Historic Downtown Sanford

Sanford's historic downtown business district is located along First Street between French Avenue and Sanford Avenue. The business district is characterized by historic structures with antique shops, mixed-commercial uses, and dining. Directly north of the business district lies the Sanford Riverwalk, a shared-use bicycle and pedestrian path with multiple restaurants and shoreside businesses. This shared-use path is part of the larger Lake Monroe Trail, which is discussed further in Section 7.3, Trail Network. Historic Downtown Sanford represents a significant opportunity for economic growth with retail vacancies, developable parcels, streets in a pedestrian-friendly grip pattern, abundance of parking, and transit with connectivity to commuter rail.

2.4.2 Interstate 4/Lake Mary Boulevard/Seminole Towne Center

The I-4 corridor between Lake Mary Boulevard and SR 46 is an employment and commercial activity area. There are also several single- and multi-family residential developments that are filling some of the surrounding areas of the corridor. Land uses within this corridor are primarily offices, industrial, commercial, and institutional. Development along the corridor is medium intensity in character and contains multimodal access. Roadways serving employment centers are primarily Lake Mary Boulevard,

International Parkway, Rinehart Road, and County Road 46A (H.E. Thomas Jr. Parkway), with access via I-4, SR 46, and SR 417.

Land use character on Lake Mary Boulevard differs on each side of I-4. The west side is characterized by hotels, offices and commercial areas, whereas the east side is primarily retail, restaurants, and shopping centers. There has been significant development of offices, commercial areas, and medical facilities on the east side of I-4 along Rinehart Road. Seminole Towne Center is located on the northeast side of the area, bound by SR 46, Rinehart Road, SR 417, and I-4. The areas surrounding Seminole Towne Center are comprised of mixed commercial strip malls with big box stores, chain food retailers, and several businesses that anchor the area.

2.4.3 Uptown Altamonte

Uptown Altamonte is located on SR 436 (East Altamonte Drive) adjacent to the east side of I-4. Land uses in the area are primarily commercial, multi-family residential, office, and light industrial. Cranes Roost Lake and Park are 45 acres in size and located at the heart of Uptown Altamonte. The lake is surrounded by a 1-mile-long bicycle and pedestrian shared-use pathway with benches and covered seating areas, a European-influenced plaza with choreographed fountain demonstrations, a 62-foot-tall iconic tower, and an amphitheater with stadium seating and a floating stage. Uptown Altamonte straddles the property between SR 436, Cranes Roost Park, and the Altamonte Mall, making it an essential property for redevelopment and multimodal options in Altamonte Springs.

2.4.4 US 17-92

Commercial, industrial, institutional, government, and vacant lands comprise the majority of existing land use within the US 17-92 Community Redevelopment Agency (CRA) Corridor. A large portion of the US 17-92 corridor is located within unincorporated Seminole County, including the Fern Park area south of the City of Casselberry and adjacent to the County's southern boundary. This area contains a mixture of vacant land, single-family residential land, parks, and industrial land. The County has recently installed sanitary and storm sewer lines in the Fern Park area and has also completed significant streetscape and landscape improvements. These improvements have been carried over through the City of Casselberry. There is also a tremendous opportunity for infill development along portions of this corridor from Casselberry through Sanford. Continued support from the cities is crucial to successfully develop this corridor with consistency and create accessibility and mobility to transit, roadways, and commuter rail.

2.4.5 Howell Branch Road at SR 436

This intersection of Howell Branch Road at SR 436 anchors south Seminole County along two major routes in the area. The Howell Branch Road corridor is an east-west roadway that ultimately links the cities of Winter Park and Maitland to Seminole County, the City of Casselberry, and areas of East Orange County. The area nearby area identified is located between North Lakemont Avenue and Eastbrook Boulevard on Howell Branch Road and is surrounded by predominantly multi-family residential and retail activities. Retail uses are primarily located in all four corners of the SR 436 intersection. Large blocks of multi-family residential and retail complexes comprise most of the parcels east of Waumpi Trail and west of Antilles Drive on either end of the corridor. Areas on the extremities of the corridor exhibit parcels that are smaller and are composed of single-family residential land uses. The SR 436 corridor remains consistently commercial throughout Seminole County, with differing intensities but generally consisting of shopping centers, big box retail, and restaurants with some multi-family residential units spread fairly evenly throughout. Most of the corridor is surrounded by single-family residential units away from the main line.

2.4.6 Medical Facilities

Medical facilities, such as hospitals, are employment centers that can support multimodal transportation and should be considered as vital links of the mobility network. There are currently four major hospitals within the County:

- Lake Monroe Hospital in Sanford
- South Seminole Hospital in Longwood
- AdventHealth Altamonte Springs in Altamonte Springs
- Oviedo Medical Center in Oviedo

These medical facilities have bicycle facilities and are located in proximity to multimodal transportation networks. The hospitals located in Sanford, Longwood, and Altamonte Springs are located less than 1 mile from their respective SunRail stations with connectivity via LYNX. These hospitals are also all serviced by LYNX, with three being located on fixed-route service corridors. The Oviedo Medical Center is serviced by LYNX NeighborLink 622.

It is important to note that South Seminole Hospital will be redeveloped into a mixed-use medical facility in 2024 and will no longer operate as full-service hospital. However, the link to this location is still considered to be vital as medical services will continue to anchor the redevelopment of this location. It is also essential to note that there are several existing and proposed medical facilities that support the overall hospital network, such as Emergency Rooms and outpatient facilities that have increased their presence, especially in the Lake Mary/Sanford area along Rinehart Road and International Parkway.

2.5 SunRail Stations

The Central Florida Rail Corridor (CFRC) has four commuter rail passenger stations with park-and-ride lots in Seminole County. The stations are currently operated via Joint Use Agreement between FDOT and Seminole County, in partnership with the cities they reside in. The SunRail service extends to the south to Poinciana in Osceola County and north to DeBary in Volusia County. A northern extension of the service to DeLand in Volusia County is expected to be in operation in 2024. An additional expansion from the existing line to the Orlando International Airport is also in the planning stages. The Sunshine Corridor, a shared rail corridor by way of public-private partnership with Brightline intercity passenger service, is also being considered for possible east-west expansion of the SunRail service.

Seminole County's four SunRail stations are located in Sanford, Lake Mary, Longwood, and Altamonte Springs (refer to Map 4–Community Redevelopment Areas in Appendix A). All commuter rail stations are located within or adjacent to their respective city limits. However, the CFRC traverses several unincorporated areas of the County. Pedestrian and bicycle access is provided on wide, shared-use sidewalks in the vicinity of all stations. Each station also has passenger drop-off zones and bicycle racks for riders. Bicycles are currently permitted onboard SunRail trains. Connectivity is available to LYNX buses at all four stations; however, the Longwood Station does not have a designated bus facility. Refer to Table 2-3 for details on the Seminole County SunRail stations.

Table 2-3. Seminole County SunRail Stations

Station	Location	Land Use	Transportation Access
Sanford	2720 W. SR 46, Sanford, FL 32771	Land uses adjacent to the station are primarily parking, single-family residential, multi-family residential (across SR 46) vacant lands, and industrial uses.	The station is accessed via SR 46 to the south and pedestrian access from residential neighborhoods to the north. The Parking Lot, Drop Off, and Bus Loop are located south of the platform.

Lake Mary	2200 W. Lake Mary Boulevard, Lake Mary, FL 32746	Land uses are primarily restaurants, service, and city center services located primarily around Central Park on N. 4th Street and Country Club Road. The police department, small commercial developments, and multi-family residential units are located north of the station.	Access to the station is provided on Old Lake Mary Road/E. Crystal Lake Avenue via Palmetto Street and W. Lake Mary Boulevard. The Parking Lot, Drop Off, and Bus Loop are located south of the platform. Pedestrian and bicycle access is provided primarily along these roadways but is limited on nearby lower-capacity neighborhood streets.
Longwood	149 E. Church Avenue, Longwood, FL 32750	Land uses are a mixture of commercial, industrial, and residential uses. Industrial areas are located primarily to the north, commercial to the south and west, and residential to the east with an adjacent multi-family residential development. There are also water treatment services near the parking lots.	Access to the station is provided on Church Avenue via Myrtle Street via vehicle. A shared parking garage is accessible via Myrtle Street and surface parking lots are accessible via Warren Avenue. Pedestrian and bicycle access to the station are located along Church Avenue and minor roadways in the area, SR 434 and N. Ronald Reagan Boulevard. The Drop Off area is located to the east of the platform on John Mica Way.
Altamonte Springs	2741 S. Ronald Reagan Boulevard, Altamonte Springs, FL 32701	Land uses within the vicinity of the station are primarily commercial and residential with occasional office and institutional uses. The station is located centrally in a highway-commercial district west of Casselberry Exchange and east of the Altamonte Springs Mall.	Access to the station is provided on S. Ronald Reagan Boulevard and Leonard Street by vehicle. The station is also accessible by pedestrians and bicycle via SR 436. The Parking Lot, Drop Off, and Bus Loop are located west of the platform.

2.6 Community Redevelopment Areas (CRAs)

CRAs are targeted corridors and neighborhoods where land use and transportation are strategically integrated to improve livability and increase economic development. According to Seminole County data, there are several active CRAs within incorporated and unincorporated portions of the County (refer to Map 4–Community Redevelopment Areas in Appendix A). CRAs within the County are targeted for improved multimodal transportation, which includes increased transit, bicycle, pedestrian, and roadway infrastructure. Planned land uses or increased land densities in these areas with increased multimodal infrastructure could result in walkable communities and placemaking (Seminole County n.d).

2.7 Buildable Lands

Buildable lands are either vacant parcels with no development or parcels with no land uses presently operating onsite. These lands may be developed to the maximum permissible densities based on County and municipal zoning and regulations. Buildable lands within the County have the potential to affect the need for future mobility improvements. In contrast, future mobility improvements have the potential to affect land development patterns.

Seminole County and the incorporated cities within the County boundary contain approximately 28,620 acres of undeveloped land, which is almost 13% of lands countywide (refer to Map 5–Buildable

Lands in Appendix A). A large portion of the County's buildable lands are designated as vacant residential lands (42% of buildable lands), with nearly half of those occurring within the East Rural Area boundary. The East Rural Area contains approximately 23% of the total buildable lands in the County, while the Wekiva Protection Area constitutes approximately 9% of the total buildable lands.

The largest percentage of vacant lands are defined as other and are comprised of assorted zoning designations (47% of buildable lands). Vacant commercial, industrial, and assorted zoning designations are concentrated largely within the Urban Service Area. Vacant commercial lands are concentrated along the major corridors of US 17-92, SR 417, SR 434, SR 46, and I-4. Planned transportation and land use improvements may reduce total vacant lands over the planning horizon. Refer to Table 2-4 for further information on vacant lands countywide (Seminole County n.d.).

Table 2-4. Vacant Lands in Seminole County

Vacant Lands in the Wekiva Protection Area			
Vacant Lands Zoning Designation	**Acres**	**Percent of Total Buildable Lands (%)**	**Percent of County (%)**
Commercial	23	0.08	0.01
Residential	767	2.68	0.35
Other	1,810	6.32	0.81
Total	2,600	9.08	1.17
Vacant Lands in the East Rural Area			
Vacant Lands Zoning Designation	**Acres**	**Percent of Total Buildable Lands (%)**	**Percent of County (%)**
Commercial	45	0.16	0.02
Residential	5,454	19.06	2.46
Other	1,054	3.68	0.47
Total	6,553	22.90	2.95
Vacant Lands Countywide			
Vacant Lands Zoning Designation	**Acres**	**Percent of Total Buildable Lands (%)**	**Percent of County (%)**
Commercial	2,013	7.03	0.91
Residential	11,891	41.55	5.35
Industrial	878	3.07	0.40
Institutional	265	0.93	0.12
Other	13,573	47.42	6.11
Total	28,620	100.00	12.89

Source: Seminole County n.d.

2.8 Environmental Constraints

Seminole County has a diverse arrangement of environmentally sensitive features and constraints, which primarily consist of historic districts, cemeteries, preserved lands, Florida Natural Areas Inventory-managed lands, protection areas, wetlands, and pipelines. Five historic districts in the County are located in Sanford, Oviedo, and Longwood. Environmental protection areas are located primarily along the western boundary of the County near Wekiva River Preserve and Wekiwa Springs State Parks, as well as in the southeastern portion of the County near Little Big Econ State Forest and the Little Econlockhatchee River. State forests and protection areas are also located in the southern half of the East Rural Area in the Econ Protection Area, the Little Big Econ State Forest, and the Charles H. Bronson State Forest. Environmentally constrained areas are shown in Map 6–Environmental Constraints in Appendix A.

The County contains two natural gas transmission lines that are owned and operated by the Florida Gas Transmission Company. Both gas pipelines are generally located in the northwest portion of Sanford and in the northwestern portion of the County. The two segments of the pipeline located within County boundaries equal approximately 20.5 miles in length (refer to Map 6–Environmental Constraints in Appendix A).

2.9 Neighboring Activity Areas

Growing populations in Seminole County and the surrounding counties of Orange, Brevard, Volusia, and Lake are continuing to lead to increased development pressures adjacent to the Seminole County boundary. External activity areas located in proximity to the County's boundary include the University of Central Florida, Full Sail University, Maitland Summit/Maitland Park complexes, and three SunRail stations (Winter Park, Maitland & DeBary). These areas are focused in Orange County, with the exception of the DeBary SunRail Station, which is located in Volusia County.

Urbanized areas with more dense development are located to the south of the County boundary in the cities of Maitland, Winter Park, Eatonville, and Apopka. North of the County boundary, much of the land is transitioning from rural to suburban in the cities of DeBary, Deltona, Orange City, and DeLand. Increased development is also expected in the areas around the DeBary and under construction DeLand SunRail stations. DeBary is also planning to relocate and develop its existing city-center into a dense, mixed-use property across Fort Florida Road from the SunRail station.

Lands east and west of the County are primarily low-density, single-family rural residential, state parks, or nature conservation areas. The increased mobility provided by the Wekiva Parkway (SR 429) on the west side of Seminole County, east Lake County, and northern Orange County is expected to drive increased growth in the area, primarily transitioning to suburban residential communities.

Table 2-5 summarizes the major neighboring activity areas.

Table 2-5. Major Neighboring Activity Areas

Activity Area	Location	Land Use	Transportation Access
University of Central Florida	Adjacent to, south of Seminole County on SR 434 at McCulloch Road	Land uses along SR 434 and University Boulevard consist of multi-family residential student housing and mixed service uses, such as grocery stores, restaurants, and gas stations, with vacant vegetated areas along the Little Econlockhatchee River. Campus uses include mixed-use educational facilities and multi-family student housing.	The campus is accessed directly from Seminole County via SR 434, Lockwood Boulevard, and McCulloch Road. Additional access is provided to the campus in Orange County from Corporate Boulevard, Centaurus Boulevard, University Boulevard, Central Florida Boulevard, and Discovery Drive. Bicycle and pedestrian infrastructure is present on campus and its immediate vicinity.
Full Sail University	Approximately 1 mile south of Seminole County on SR 436 at University Boulevard	Land uses along SR 436 and University Boulevard consist of single- and multi-family residential student housing and mixed service uses, such as grocery stores, restaurants, and gas stations. Campus uses include mixed-use educational facilities and multi-family student housing.	The campus is accessed directly from Seminole County via SR 436. University Boulevard is also a primary access point from areas south of the county, among other minor roadways. While this area has significant bicycle and pedestrian infrastructure, there are large rights-of-way to traverse.
Maitland Summit & Maitland Park	Adjacent to, south of Seminole County	Land uses are primarily office park and commercial, restaurants, and hotels, with areas of single, and multi-family residential units just south. There is an RDV Sportsplex supporting professional sports, including basketball and hockey. The complex includes civilian uses of gym and ice rink facilities.	The primary access points locally to this location is Keller Road and Maitland Boulevard. From Seminole County, the access is primarily via I-4 and SR 434. This area has significant bicycle and pedestrian infrastructure.

2.10 SunRail Stations

The Maitland, Winter Park, and DeBary SunRail Stations are located in the vicinity of Seminole County; all are located within 1.5 miles of the County line. Table 2-6 provides detailed information on neighboring SunRail stations.

Table 2-6. Neighboring SunRail Stations

Station	Location	Land Use	Transportation Access
Maitland	801 N. Orlando Avenue, Maitland, FL 32751	Land uses in the station's vicinity are single- and multi-family residential (adjacent to the station), service, and light industrial uses along US 17-92.	Parking, pedestrian, bus, and bicycle access at the station is located along its east side from US 17-92. There is pedestrian access from the west to the adjacent single-family residential properties.
Winter Park	148 W. Morse Boulevard, Winter Park, FL 32789	The station is located in downtown Winter Park's Central Park with medium-intensity developments consisting primarily of commercial, institutional, and residential. There is also a station lobby operated by Amtrak.	Parking areas are located along the west side of the station. The parking lots are provided by Amtrak and the City of Winter Park; there is no designated SunRail parking at this location. Pedestrian and bicycle access is available from all directions and within the extended vicinity due to its location in downtown Winter Park. This station also serves Amtrak's intercity passenger service, with a station lobby adjacent to the platform. While there are not designated bus bays at this location, several LYNX routes service the general vicinity nearby the station.
DeBary	630 S. Charles R. Beall Boulevard, DeBary, FL 32713	The station functions primarily as a park-and-ride station with mostly undeveloped lands surrounding the station, along with Florida Power and Light retention facilities. There is a gas station to the northeast and low-intensity industrial land uses nearby the station.	Parking areas are located along the east side of the station with pedestrian and bicycle access from Fort Florida Road and US 17-92 with access to the Spring-to-Spring Trail. The station has a bus loop serviced by Votran buses and a drop-off zone located on the east side of the station. There is planned mixed-use city center and transit-oriented development.

3. Demographics

The University of Florida's Bureau of Economic and Business Research (BEBR) shows the total population within Seminole County (including its seven cities) was 470,856 persons in 2020 with an average household size of 2.50 people. The household size in the County is greater than the statewide average of 2.46 persons per household. Both household size averages declined since 2010 (2.55 and 2.48 persons per household for Seminole County and statewide average, respectively (BEBR n.d.).

3.1 Population

BEBR estimates that the April 1, 2022, population of Seminole County was 484,054 residents, which represents a 2.8% growth since 2020. Based on these estimates, the County is the thirteenth most populated county statewide, containing 2.17% of Florida residents. More than half of the County's population lives within incorporated cities (52.3%). Population growth between 2020 and 2022 within incorporated cities was 2.67%, while growth in unincorporated Seminole County was 2.95%. Between 2010 and 2020, the cities grew at a rate of 2.9% over the 2 years, which has since slowed. Longwood and Casselberry led the way with growth increases with 5.35 and 4.26%, respectively. Table 3-1 lists growth rates for the County and its cities.

Table 3-1. Ranked Seminole County and City Population Growth 2020-2022

City	2022 Population Estimate	2020 Census Population	Growth (%)
1. Longwood	15,894	15,087	5.35%
2. Casselberry	30,020	28,794	4.26%
3. Sanford	63,172	61,051	3.47%
4. Lake Mary	17,333	16,798	3.18%
5. Unincorporated Seminole County	231,106	224,494	2.95%
6. Incorporated Seminole County	252,948	246,362	2.67%
7. Altamonte Springs	47,413	46,231	2.56%
8. Winter Springs	39,038	38,342	1.82%
9. Oviedo	40,078	40,059	0.05%

Source: BEBR n.d.

As of 2021, adjacent counties continue to experience higher annual rates of growth compared to Seminole County's rate of 1.4%. Orange County is growing at a rate of 2.0%, Lake County by 4.2%, Volusia County by 1.8%, and Brevard County by 1.7%. Although Osceola County is not adjacent to Seminole County, it is part of the larger Metropolitan Statistical Area of Orlando-Kissimmee-Sanford; Osceola County's annual growth rate was 4.6%.

The American Community Survey (ACS) is conducted by the U.S. Census Bureau to collect more recent demographic estimates than the decennial Census, which is only collected once every 10 years. The ACS is produced every 5 years and is used for recent demographic analysis. Table 3-2 provides a snapshot of demographic statistics, based on the 2016 to 2020 American Community Survey (U.S. Census Bureau 2022). Compared to the larger Orlando-Kissimmee-Sanford Metro Area and the state of Florida, Seminole County has a generally lower percentage of vulnerable populations, such as limited English proficiency

populations, persons in poverty, minority populations, and those with disabilities. Vulnerable populations countywide are identified in Maps 7 through 12 in Appendix A.

Table 3-2. Demographic Characteristics of Seminole County 2016–2020

	Percent of Total Population		
Demographic Characteristics	**Seminole County**	**Orlando-Kissimmee-Sanford Metro Area**	**Florida**
In Labor Force (Population 16 Years and Older)	66.3%	63.7%	59.1%
Persons Aged 65 Years and Older	16.4%	15.5%	21.1%
Speak a Language other than English at Home	22.9%	32.4%	30.0%
Persons in Poverty	9.0%	12.9%	13.1%
Minority Population (Non-White Alone Population)	38.5%	49.6%	42.3%
Persons with a Disability	10.2%	11.9%	13.5%

Source: U.S. Census Bureau 2022

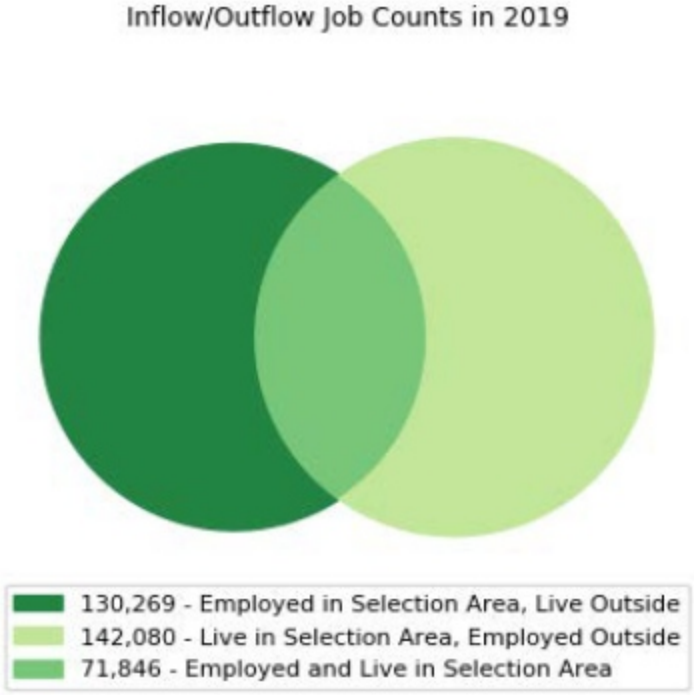
3.2 Commute and Mode Characteristics

Employment inflow and outflow measures the number of residents working in the geographical area where they live or commuting to jobs located outside of their local area. For this Seminole-County-focused analysis, ***inflow*** measures the number of residents living outside of the County boundary and commuting into the County for work. ***Outflow*** measures the residents living within the County and traveling outside of the County for work.

Seminole County has a relatively high rate of inflow and outflow. According to the U.S. Census Bureau, only 33.6% of local workers lived and worked in the County in 2019. Two adjoining counties had more residents living and working within their respective counties as compared to Seminole County. In fact, approximately 68.2% of Orange County residents and 51.2% of Volusia County residents live and work within their respective counties. The large percentage of residents traveling outside Seminole County for work is likely the result of a greater number of employment opportunities in Orlando and other neighboring areas (U.S. Census Bureau 2022). For instance, in 2019 Orange County had approximately 878,241 jobs, whereas Seminole County had approximately 202,115 jobs (US Census Bureau n.d.). Figure 3-1 presents Seminole County's inflow and outflow job counts.

Figure 3-1. Inflow/Outflow Job Counts in 2019

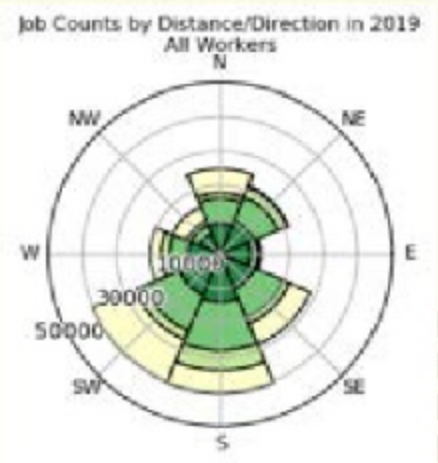
Source: U.S. Census Bureau n.d.



Employment hubs are defined as concentrated areas of employers. Many residents commute locally and regionally for employment opportunities in these areas, which can include commercial, office, institutional, or industrial employers. Employment hubs are primarily concentrated west and south of Lake Jesup within incorporated cities. Corridors and neighborhoods with higher concentrations of employers include the I-4 and US 17-92 corridors, as well as the surrounding areas of UCF along the Seminole-Orange County line. Areas north and south of the County, such as the Orlando Metro Area and the City of Deltona, also employ high concentrations of County residents (U.S. Census Bureau 2022). Figure 3-2 shows the direction and distances that Seminole County residents traveled to reach their employers in 2019.

Figure 3-2. Jobs by Distance/Direction from Home

Source: U.S. Census Bureau n.d.



Jobs by Distance - Work Census Block to Home Census Block

	2019 Count	2019 Share
Total Primary Jobs	202,115	100.0%
Less than 10 miles	81,803	40.5%
10 to 24 miles	59,748	29.6%
25 to 50 miles	19,726	9.8%
Greater than 50 miles	40,838	20.2%

The travel times between home and places of employment can be an indicator of congestion, housing affordability, or higher concentrations of employment opportunities. According to the U.S. Census Bureau ACS, the mean travel time for Seminole County residents is 27.8 minutes, which is nearly identical to the statewide average, but lower than the entire Orlando-Kissimmee-Sanford Metro Area. Travel time in these areas is 27.9 and 29.5 minutes, respectively (U.S. Census Bureau 2022).

Less than half of Seminole County's population (40.5%) works less than 10 miles from their home, and the majority commute alone via single-occupancy vehicle. Approximately 11% of County residents commute to work by walking, biking, carpooling, or public transportation. As a point of comparison, the Orlando-Kissimmee-Sanford Metro Area workers who walk, bike, carpool, or use public transportation to commute to work was approximately 14.4% (U.S. Census Bureau 2022). Table 3-3 lists local, regional, and statewide commute characteristics.

Table 3-3. Seminole County Commute Characteristics

Commuting to Work	Seminole County	Orlando-Kissimmee-Sanford Metro Area	Florida
Car, Truck, or Van: Drove Alone	79.1%	77.8%	77.7%
Car, Truck, or Van: Carpooled	7.7%	9.7%	9.2%
Public Transportation (Excluding Taxicab)	0.7%	1.4%	1.6%
Walked	1.0%	1.1%	1.4%
Bicycle	0.2%	0.4%	0.6%
Other Means	1.5%	1.8%	1.7%
Worked at Home	9.7%	7.8%	7.8%
Mean Travel Time to Work (Minutes)	27.8	29.5	27.9

Source: U.S. Census Bureau, 2020—S0801 (Commuting Characteristics)

4. Roadway Network and Conditions

This section describes the current roadway network within Seminole County, including functional classification, ownership, and conditions. The roadway network is depicted on Map 13–Roadway Functional Classification in Appendix A.

4.1 Functional Classification

F.S. 334.03(10) defines Functional Classification as the "…assignment of roads into systems according to the character of service they provide in relation to the total road network using procedures developed by the Federal Highway Administration." FDOT has legislative authority to functionally classify public roads per F.S. 334.044(11) and discusses classification in the *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways* (commonly known as the "Florida Greenbook") (FDOT 2016).

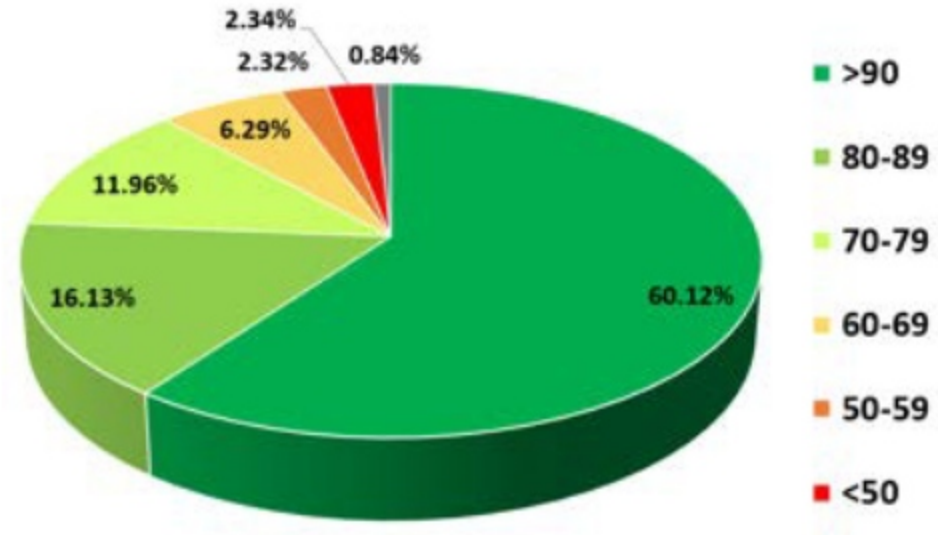
FDOT functional classification categories include arterial, collector, and local roads. These levels can be further subdivided into two additional designations. Urban and Rural classifications consider the design differences and user expectations of the urban environment, such as enhanced multimodal opportunities for all users, additional parking, and more constrained conditions. Streets and highways may be classified as major or minor depending upon traffic volume, trip length and mobility. (FDOT 2016).

FDOT-assigned functional classifications for roadways in Seminole County are listed in Appendix B. Most local roadways are not officially classified. A map of Roadway Functional Classifications is included in Map 13–Roadway Functional Classification in Appendix A.

4.2 Pavement Condition

Pavement management data from Seminole County Public Works was used to determine the distribution of Pavement Condition Index (PCI) scores throughout the County. The total lane miles as part of the analysis was 1,855, and the average PCI was 87 out of 100. Based on the data provided, approximately 60% of the County's maintained roadways have a PCI score of 90 or higher. Less than 5% were assigned a PCI score of 59 or lower. Approximately 1% of roadways did not have a PCI score assigned. Figure 4-1 presents the distribution of PCI scores for the County's entire roadway network.

Figure 4-1. Pavement Condition Index Scores



Pavement age is just one factor that affects pavement condition. Traffic volume, vehicle weight, pavement design, and drainage can all decrease pavement life. Seminole County continues to track the pavement conditions, ensuring that County roadways are adequately maintained.

4.3 Freight and Truck Routes

State freight routes, federally designated truck routes, and intermodal connectors in Seminole County are described in the following section and are shown in Map 14–SIS Facilities and Freight Routes in Appendix A. Florida designates routes serving statewide freight significance as Strategic Intermodal System (SIS) facilities. SIS facilities are designated through the use of objective criteria and thresholds based on quantitative measures of transportation and economic activity that are determined by the state. These facilities move significant levels of people and goods and generally support major flows of interregional, interstate, and international travel and commerce. The state also designates Emerging SIS Facilities as those not yet meeting the established SIS criteria but that are expected to in the future. These facilities move lower levels of people and goods but demonstrate strong potential for future growth and development.

In Florida, SIS facilities include 10 airports, one spaceport, eight seaports, 1,900 miles of rail corridors and connectors, 1,089 miles of waterways, 12 interregional passenger terminals, six rail freight terminals, more than 4,461 miles of highway corridors and connectors, 123 miles of urban fixed guideway transit corridors, and 57 miles of military access facilities (FDOT 2022). The County does not own or maintain any designated freight routes.

The Florida SIS Freight System is designated in the *Central Florida Regional Freight Mobility Study* (Cambridge Systematics, Inc., et al. 2014) and includes the following freight routes within Seminole County:

- I-4
- SR 417 (Seminole Expressway)
- Central Florida Rail Corridor – a part of the CSX A-Line freight corridor
- SR 46 (between I-4 and South Persimmon Avenue)

The following additional routes are part of the National Highway System and those on the National Highway Freight Network are noted (FHWA n.d. and 2020):

- I-4 – a part of the National Highway Freight Network
- SR 417 (Seminole Expressway)

- US 17-92
- SR 46
- SR 434
- SR 436
- Lake Mary Boulevard

The difference between freight and truck routes is the agency that is authorized to make changes (such as, mobility standards and construction changes) to the routes and their design standards. Federally designated truck routes need Federal Highway Administration (FHWA) approval while state freight routes need FDOT and/or local government approval. State freight routes have higher mobility standards than other state highways, but these mobility standards apply to freight routes only. The National Highway System Freight Network also has its own Federal standards that must be met.

4.4 Intermodal Connectors and Facilities

Intermodal Connectors are roadways that provide access between designated Intermodal Facilities and the National Highway System. The identified Intermodal Facilities and Intermodal Connectors to the National Highway System within Seminole County are described as follows (FHWA 2022):

- Amtrak Auto Train Station (City of Sanford), serviced by Persimmon Ave. and SR 46
- Orlando-Sanford International Airport (City of Sanford), serviced by Lake Mary Blvd.

SIS Facilities also include passenger rail stations. In addition to the Amtrak Auto Train Station in Sanford, the SunRail stations located within Seminole County are SIS Facilities in the following cities:

- Sanford
- Lake Mary
- Longwood
- Altamonte Springs

5. Traffic Analysis

This section summarizes the traffic analysis with two different methodologies: Travel Time and Delay, and Traffic Counts. There were two available sources of traffic data that were available from Seminole County: a provided travel time and delay study and existing traffic counts. This analysis assumes that the effects of the COVID-19 pandemic have subsided, and 2022 traffic conditions are in line of what to expect moving forward.

5.1 Travel Time and Delay Study

The travel time and delay data were provided by the County in the form of a report that summarizes the 2022 conditions on a directional and peak hour basis (Luke Transportation Engineering Consultants, Inc., 2022).

Determining the Level of Service (LOS) on a roadway segment for the 2022 Seminole County Travel Time and Delay Study followed FDOT guidance of a two-tier, average-travel-speed-based LOS. The tiers define LOS grades based on posted speeds of at least 40 miles per hour and no greater than 35 miles per hour. The study analyzed data for a total of 342.6 miles of roadways in the County. Included in the total mileage were 8 state roads that totaled 134.4 miles and 74 county roads that totaled 208.2 miles (Luke Transportation Engineering Consultants, Inc., 2022).

The study summarized the LOS in a series of directional and peak hour tables. Table 5-1 lists the mileage and percentage of segments at an LOS F.

Table 5-1. Travel Time and Delay Study - LOS F for State and County Roads

Direction/ Peak Hour	State Roads		County Roads	
	Miles	%	Miles	%
NB/EB AM	6.0	5.2	5.5	2.6
SB/WB AM	3.3	2.8	5.3	2.5
NB/EB PM	7.6	6.5	7.6	3.6
SB/WB PM	9.7	8.3	8.0	3.8

AM = morning
EB = eastbound
NB = northbound
PM = afternoon
SB = southbound
WB = westbound

The total roads analyzed experience 20.1 miles of segments operating at LOS F during the AM peak hour. A similar mileage distribution occurs between State and County Roads, with 9.3 and 10.8 miles of LOS F segments, respectively, during the AM peak hour. There were 32.9 miles of segments operating at LOS F during the PM peak hour. The mileage distribution between State and County Roads with, 17.3 and 15.6 miles of LOS F segments during the PM peak hour, respectively.

Overall, the state and county roads perform similar when considering LOS F segments that were part of this analysis. The state roads performed slightly better during the AM peak hour, while county roads performed slightly better during the PM peak hour. There was 64% increase in the segment miles from the AM peak hour to the PM peak hour for the total roads analyzed.

5.2 Capacity Analysis

A traffic-count-based analysis was conducted using the traffic count data available as part of the Traffic Counts GIS layer that is provided on the Seminole County website; the source data is provided as part of Appendix B. The existing condition year for this traffic analysis is 2022. Further analysis of future years of 2030, 2035 and 2045 will be included in the forthcoming Existing Conditions & Future Traffic Forecast Technical Memorandum.

5.2.1 Operating Standards

The Florida Department of Transportation 2020 Quality/Level of Service Handbook (FDOT 2020) was used as a basis for the LOS determinations. The LOS tables are specified per facility type and characteristics of the roadways. The table each have ranges that are ranked in LOS grades of A through F. Adjustments were made for County facility capacities based on the *Seminole County Comprehensive Plan Transportation Element* (Seminole County n.d.), which determined roadway specific thresholds for capacity that were adhered to in determining capacity deficiencies.

5.2.2 Existing Level of Service

The following summarizes the roadways included in the Seminole County Comprehensive Plan Transportation Element with an existing (2022) traffic LOS above the determined threshold by FDOT or the County. The basis for this summary are the Traffic Counts GIS layer provided on the Seminole County website. The Seminole County AADT counts, LOS standard for the facility, and calculated LOS are provided for all facilities within the County as part of Appendix C.

The analysis reveals that 18 roadway segments (12 facilities) are over capacity by current County standards. A total of 12 of these roadway segments (9 facilities) are maintained by the County. Many of the overcapacity roadways have projects identified for future years. Planned or programmed projects for the roadways identified as overcapacity are shown in Tables 5-2 and 5-3. Wekiva Springs Road was identified as constrained facilities per the Transportation Element of the Seminole County Comprehensive Plan (Seminole County n.d.). This identification applies under the clause that the roadway lies within the Wekiva River Protection Area.

Table 5-2. 2022 County Levels of Service – County/City Roads

Roadway	From	To	Exist. Lanes	County LOS	Project	Source
CR 419	SR 434	Reed Ave.	2	F	Widen to four lanes from SR 434 to Lockwood Blvd.	Sales Tax Capital Plan (2015-2025) Seminole County Potential Major Projects
CR 419	Reed Ave.	Lockwood Blvd.	2	F	Widen to four lanes from SR 434 to Lockwood Blvd.	Sales Tax Capital Plan (2015-2025) Seminole County Potential Major Projects
Lake Mary Blvd.	I-4	Lake Emma Rd.	6	F	Transportation Systems Management and Operations and context-sensitive improvements	MetroPlan Orlando Cost Feasible Projects

Table 5-2. 2022 County Levels of Service – County/City Roads

Roadway	From	To	Exist. Lanes	County LOS	Project	Source
Lake Mary Blvd.	Rinehart Rd.	Country Club Rd.	4	F	None	Not Applicable
Lockwood Blvd.	E. Mitchell Hammock Rd.	CR 419	4	F	None	Not Applicable
Longwood Hills Rd.	Rangeline Rd.	Lake Emma Rd.	2	F	Widen to four Lanes from Tollgate Tr. to Lake Emma Rd.	Seminole County 2040 Transportation Plan
McCulloch Road	Lockwood Blvd.	Old Lockwood Rd.	2	F	None	Not Applicable
Mitchell Hammock Rd. (City of Oviedo)	SR 426	SR 434	4	F	Additional turn lanes being added to SR 434 intersection	Sales Tax Capital Plan (2015-2025) Seminole County Potential Major Projects
Red Bug Lake Rd.	SR 436	Eagle Cir	4	F	None	Not Applicable
Sand Lake Rd.	W Lake Brantley Rd.	SR 434	2	F	None	Not Applicable
Wekiva Springs Rd.	Orange County Line	Hunt Club Blvd.	2	F	Policy Constrained Facility	Not Applicable
Wekiva Springs Rd.	Hunt Club Blvd.	Fox Valley Dr	2	F	Policy Constrained Facility	Not Applicable

Table 5-3. 2022 County Levels of Service – State Roads

Roadway	From	To	Exist. Lanes	County LOS	Project	Source
SR 426	Winter Springs Blvd.	SR 434	2	F	None	Not Applicable
SR 434	Rangeline Rd.	Ronald Reagan Blvd.	4	F	Additional turn lanes being added at Ronald Reagan Blvd. intersection	MetroPlan Prioritized

Table 5-3. 2022 County Levels of Service – State Roads

Roadway	From	To	Exist. Lanes	County LOS	Project	Source
SR 434	SR 417	DeLeon St.	2	F	County has an ongoing safety project for this corridor.	Seminole County
SR 434	DeLeon St	SR 426/CR 419	2	F	County has an ongoing safety project for this corridor.	Seminole County
SR 436	Howell Branch Rd.	Red Bug Lake Rd.	6	F	Context-sensitive improvements including active arterial management and adaptive traffic signals	MetroPlan ITS Master Plan
SR 436	Red Bug Lake Rd.	US 17-92	6	F	Context-sensitive improvements including active arterial management	MetroPlan ITS Master Plan

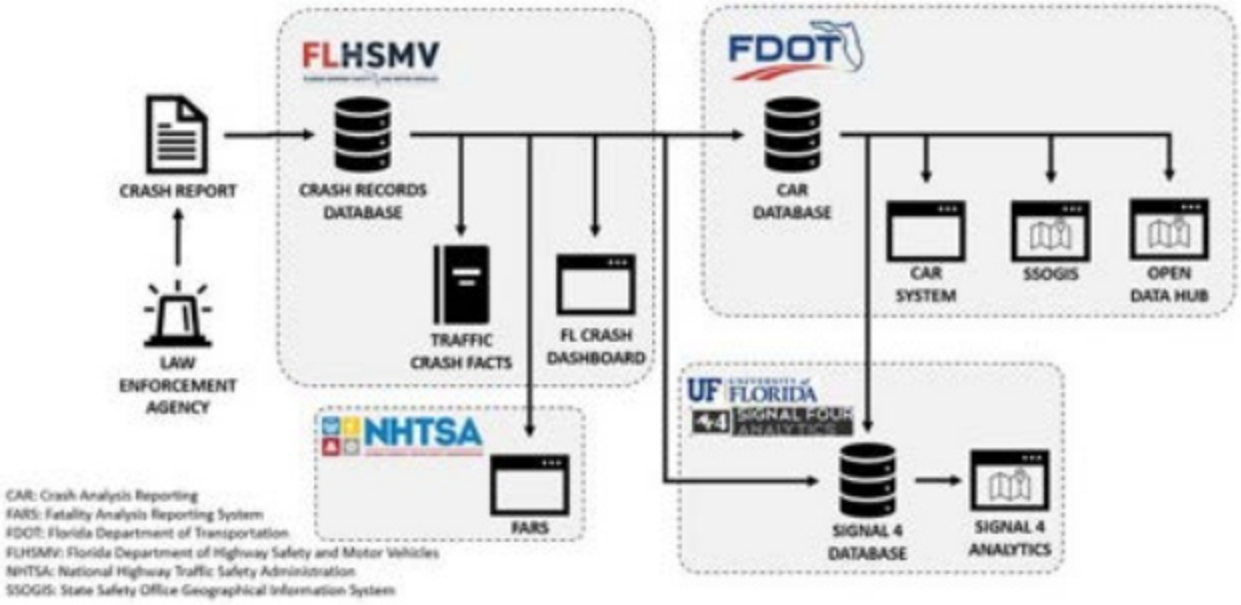
6. Crash Analysis

The following section provides documentation of the most recent 5 years of complete crash history that occurred in Seminole County from January 1, 2016, to December 31, 2020. The crash assessment uses two data sources: Signal4 Analytics and State Safety Office Geographic Information System (SSOGis) and the data was extracted on October 14, 2022, and February 22, 2022, respectively. Describing trends based on two different sources provides greater understanding where potentially problematic areas exist and a more detailed perspective of what proven-effective countermeasures can be recommended to improve traffic safety in Seminole County.

6.1 Crash Data Sources Overview

The Florida Department of Highway Safety and Motor Vehicles (FLHSMV) is the official custodian of the crash records database and provides the necessary information for FDOT and the University of Florida to develop querying tools to support traffic safety analyses across the state. Figure 6-1 shows how crash records are transferred to the various systems that agencies and individuals use to assess roadway safety.

Figure 6-1. Crash Data Systems and Mapping
Source: FDOT n.d.



The Signal4 and SSOGis platforms use the same crash data from FLHSMV. However, the results of querying the same 5-year history in Seminole County yield results that differ slightly. This difference results from the SSOGis' rigorous validation process compared to the Signal4 data. For example, the Signal4 5-year query returned 67,121 crashes while the SSOGis query returned 29,650 crashes. Though SSOGis returned fewer than half as many records, the proportion of fatal crashes for both datasets account for less than 1%.

One of the biggest differences between the two sources is how easily accessible crash data are to the public on the SSOGis platform. This accessibility comes with a trade-off of implementing additional levels of review to protect individual's privacy who were involved in the reported crashes. SSOGis is accessible to anyone, while Signal4 requires login credentials that are granted based on specific protocols to safeguard the use of the system. This results in more crashes being excluded from what is available to query in

SSOGis. However, all records are geolocated, verified by FDOT's State Safety Office (SSO) staff, and only occur on public roads.

In addition to availability differences, only long-form crash reports are available to query in SSOGis, which generally contains more details and the crash usually contains at least one injury compared to short-form reports, which are generally property-damage-only crashes. From the Signal4 database, more than 35% (23,640) of all records are short-form reports of which nearly 98% (23,134) contain no injuries. Table 6-1 provides some of the key differences between the sources and how the results vary when summarizing the data.

Table 6-1. Comparison of Crash Data Sources

Data Source Characteristic	Signal4	SSOGis
Readily Available to the Public		☑
Private Road/Parking Lots Crashes	☑	
Long-Form Crash Report Information	☑	☑
Short-Form Crash Report Information	☑	
Query contains ***only*** located and verified records		☑
Crashes with Emphasis Area Flags	☑	☑

Understanding some of the key differences between the two sources of crash data provides greater detail and opportunity for traffic safety performance improvements to be recommended throughout Seminole County. The remainder of this section provides crash facts and summaries with corresponding documentation to describe the differences in the trends observed.

6.2 Seminole County Crash Overview

The 5 years from January 1, 2016, to December 31, 2020, is the period used for the Seminole County crash analysis. Crash data for 2021-2022 will be added as an addendum to this technical memorandum. During that time, there were 67,121 and 29,650 reported crashes from the Signal4 and SSOGis crash databases, respectively. Figure 6-2 shows the distribution of crashes by the highest injury severity.

Figure 6-2. Crash Summary 2016-2020

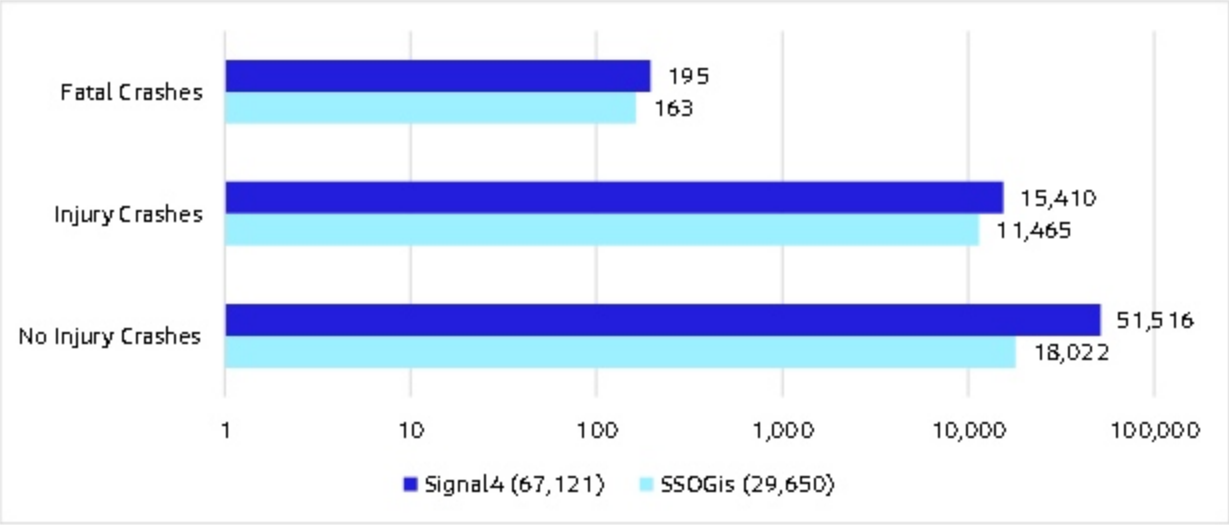
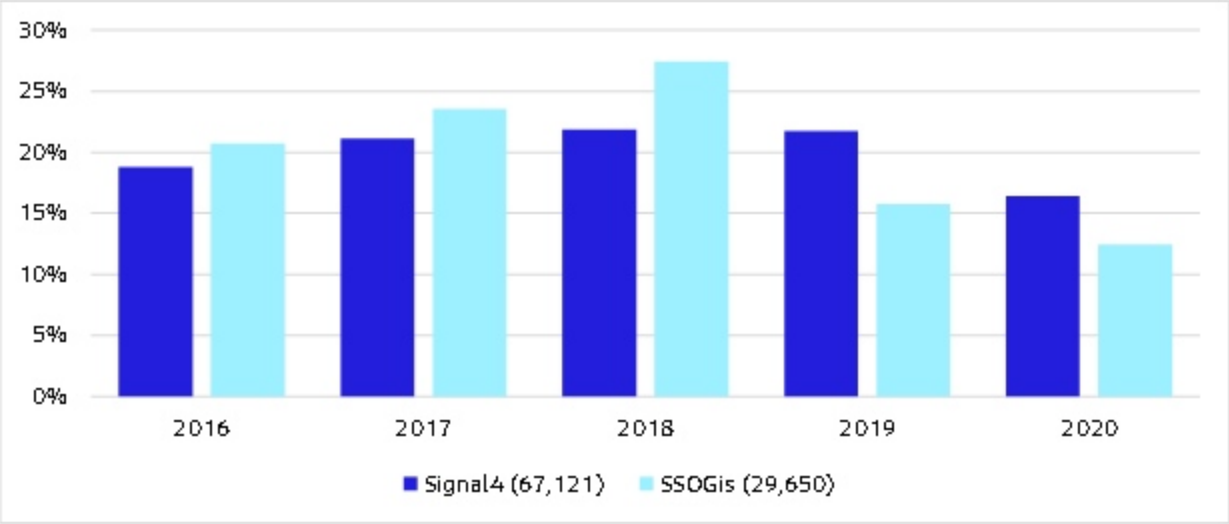


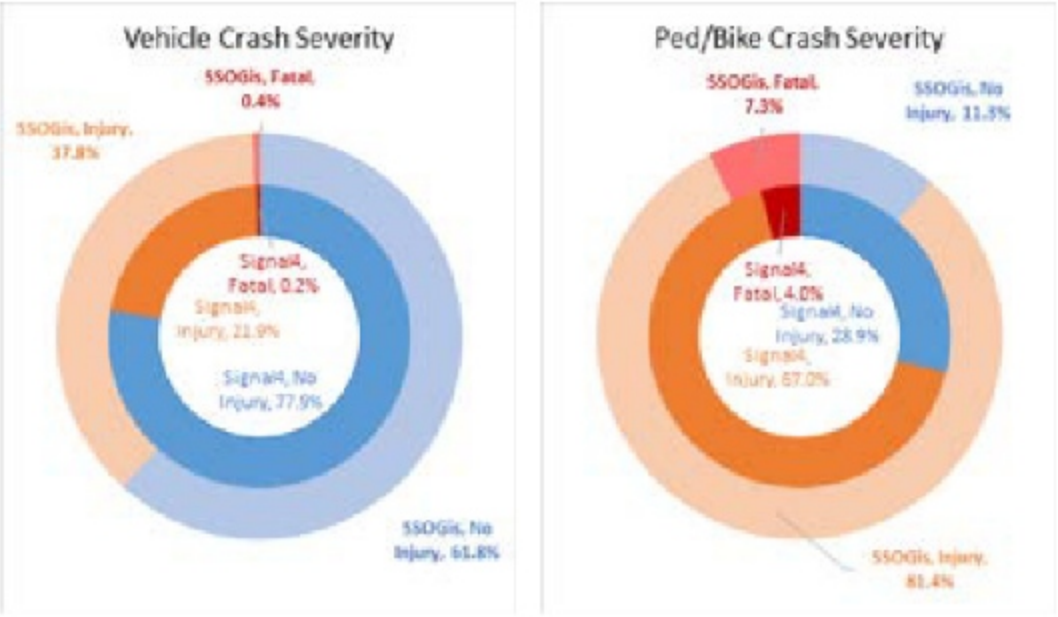
Figure 6-3 shows the trend of crashes as a proportion of each year analyzed. Both sources show an increasing trend from 2016 to 2018, followed by a decreasing trend for 2019 and 2020. The trends are similar, supporting the reliability for each source of what occurred in the County during that time. Additionally, there is a smoother trend for Signal4 data because of a greater sample size as compared to SSOGis.

Figure 6-3. Seminole County Crash Trend (2016 – 2020)



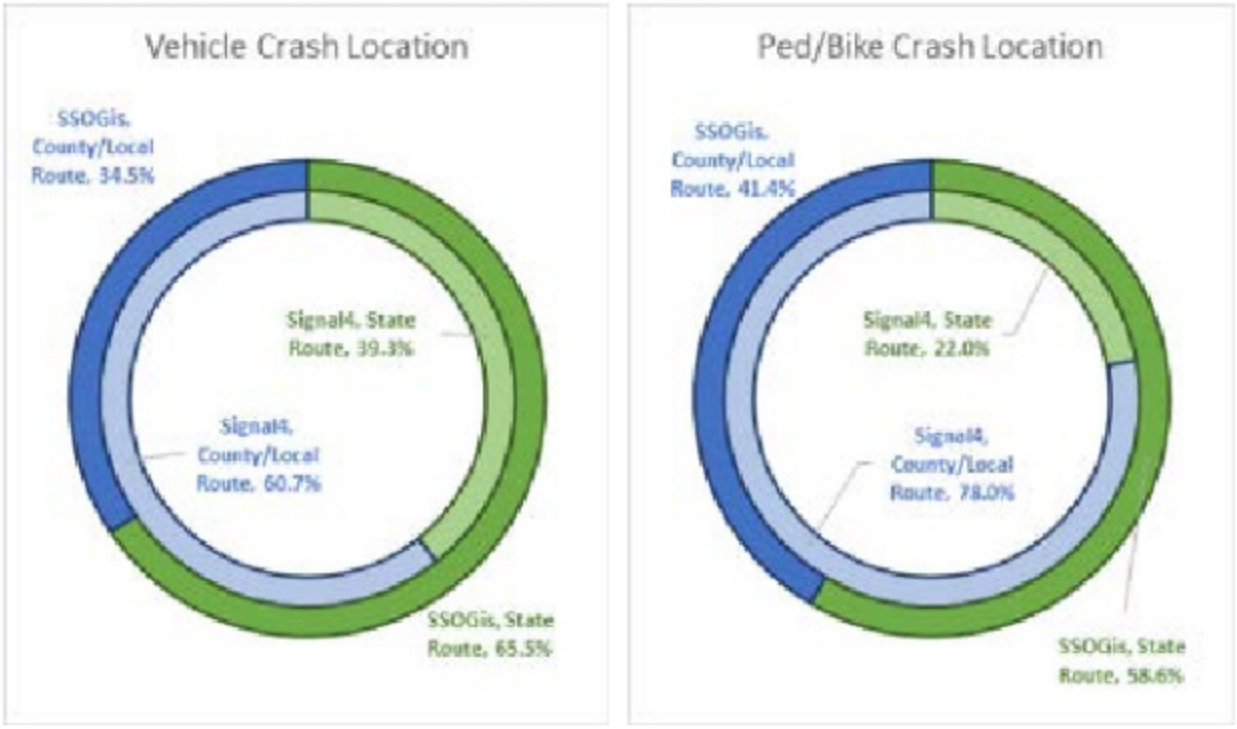
Disaggregating crashes by vehicles and pedestrians/bicyclists, both Signal4 and SSOGis data show less than 3% of crashes involve pedestrians or bicyclists. Figure 6-4 shows the severity distribution for vehicle and pedestrian/bicycle crashes. The inner ring represents the Signal4 data and the outer ring SSOGis data. Pedestrian/bicycle crashes typically result in a greater proportion of injuries and fatalities. Signal4 and SSOGis data show a 20 and 18 times greater likelihood, respectively, that a pedestrian/bicycle crash will result in a fatality compared to a crash only involving vehicles.

Figure 6-4. Crash Severity by Travel Mode (2016 – 2020)



The team reviewed a high-level jurisdictional breakdown of crashes in Seminole County. While the SSOGis data show the majority of both vehicle- and pedestrian/bicycle-related crashes occurs on state roads, the opposite is true for the Signal4 data, as shown on Figure 6-5. Based on the information in source data discussion, the difference between the two sources of crash data stem from how crashes are made available (publicly accessible versus login credentials), how the data are reviewed (SSO vetting), and what format the data is in (short- versus long-form reports), among other factors.

Figure 6-5. Crash Jurisdiction by Travel Mode (2016 – 2020)



6.3 Crashes on State Roads

Though state roads make up approximately 10% of the total centerline miles in Florida, they account for 62% of traffic fatalities (FDOT 2021b). A simplified high-crash analysis was performed for the approximate 118 centerline miles of state roads in Seminole County. The methodology used to identify high-crash intersections was based on a 250-foot-wide buffer around the intersection point where two state roads crossed. Because of the methodology relying on crashes to be located, Signal4 crash data excluded 6,126 from the high-crash analysis because of missing latitude and longitude information. Consistent between the sources, SR 436 contained the highest proportion of state jurisdiction crashes for a single roadway in Seminole County. The high-crash methodology was used for both Signal4 and SSOGis crash databases.

6.3.1 Vehicle-Only Crashes

Using mapping software and spatial analysis, intersection points were created where two state roads crossed. Based on the 250-foot-wide buffer spatial join, crashes were assigned to these locations and intersections with more than 100 crashes are listed in Table 6-2 and Table 6-3. Two primary characteristics of these intersections include at-grade and signalized traffic control. A special representation of the crashes generated from the Signal4 data in the form of a heat map is represented on Map 15 – Vehicle Crash Heat Map on State Roads in Appendix A.

Table 6-2. State, Vehicle, High-Crash Locations 2016 – 2020 (SSOGis)

Major Route	Minor Route	SSOGis Crashes
US 17-92	SR 419	168
SR 436	SR 434	167
US 17-92	SR 434	130
US 17-92	SR 46/W 25th St.	121
SR 46	CR 15/Monroe Rd. (US 17-92)	105

Table 6-3. State, Vehicle, High-Crash Locations 2016 – 2020 (Signal4)

Major Route	Minor Route	Signal4 Crashes
SR 436	SR 434	251
US 17-92	SR 434	213
US 17-92	SR 419	119

6.3.2 Bicycle and Pedestrian Crashes

Using the same methodology for high-crash identification for state roads, there were five unique intersections that had five or more pedestrian/bicycle related crashes as shown in Table 6-4 and Table 6-5. The top three corridors that had the majority of pedestrian/bicycle crashes were US 17-92, SR 436, and SR 434. A special representation of the crashes generated from the Signal4 data in the form of a heat map is represented on Map 16 – Bicycle and Pedestrian Crash Heat Map on State Roads in Appendix A.

Table 6-4. State, Pedestrian/Bicycle High-Crash Locations 2016 – 2020 (SSOGis)

Major Street	Minor Street	Crashes
US 17-92	SR 434	8
US 17-92	SR 436	7
SR 436	SR 434	5
US 17-92	SR 46 / W 25th St	5
US 17-92	SR 46 (French Ave)	5

Table 6-5. State, Pedestrian/Bicycle High-Crash Locations 2016 – 2020 (Signal4)

Major Street	Minor Street	Crashes
US 17-92	SR 436	8
US 17-92	SR 434	7

6.4 Crashes on County or Local Roads

A similar methodology was used to identify high-crash locations on local roadways using both SSOGis and Signal4 crash data. The primary difference between the state high-crash locations and Seminole County and local high-crash locations was based on the roadway network. The top locations were identified based on where local roadways intersected each other and had a high number of crashes.

6.4.1 Vehicle Only Crashes

Table 6-6 shows the top five locations with at least 50 vehicle crashes based on SSOGis data. While Table 6-7 shows the top ten locations with at least 100 crashes, which is based on Signal4 data, the summary tables show a consistent trend between the number of crashes between the data sources and what jurisdiction those crashes are assigned to. A special representation of the crashes generated from the Signal4 data in the form of a heat map is represented on Map 17 – Vehicle Crash Heat Map on County/Local Roads in Appendix A.

Table 6-6. Local, Vehicle High-Crash Locations 2016 – 2020 (SSOGis)

Major Street	Minor Street	Crashes
Lake Mary Blvd.	Primera Blvd./Lake Emma Rd.	94
Red Bug Lake Rd.	Tuskawilla Rd.	71
Rinehart Rd.	HE Thomas Jr. Pkwy.	68
Lake Mary Blvd.	Sanford Ave./Ronald Regan Blvd.	59
Red Bug Lake Rd.	Dodd Rd.	50

Table 6-7. Local, Vehicle High-Crash Locations 2016 – 2020 (Signal4)

Major Street	Minor Street	Crashes
Lake Mary Blvd.	Primera Blvd./Lake Emma Rd.	301
Red Bug Lake Road	Tuskawilla Road	211
Rinehart Road	HE Thomas Jr. Pkwy.	186
Lake Mary Blvd.	Rinehart Road	153
Lake Mary Blvd.	Sanford Ave./Ronald Regan Blvd.	145
CR 419	Lockwood Blvd.	135
Lake Mary Blvd.	Country Club Rd.	134
Lake Mary Blvd.	International Pkwy.	116
Howell Branch Rd.	Lake Howell Rd.	110
Red Bug Lake Rd.	Dodd Rd.	111

6.4.2 Bicycle and Pedestrian Crashes

Crashes involving pedestrians or bicyclists are less frequent and more widely disbursed throughout Seminole County. Table 6-8 and Table 6-9 show locations where two local roadways intersect that have multiple reported pedestrian/bicycle crashes. For SSOGis data, there were six locations with two crashes and seven locations from Signal4 data that have four crashes in a 5-year period. A special representation of the crashes generated from the Signal4 data in the form of a heat map is represented on Map 18 – Bicycle and Pedestrian Crash Heat Map on County/Local Roads in Appendix A.

Table 6-8. Local, Pedestrian/Bicycle High-Crash Locations 2016 – 2020 (SSOGis)

Major Street	Minor Street	Crashes
Red Bug Lake Rd.	Sanford Ave./Ronald Reagan Blvd.	2
Lake Mary Blvd.	International Pkwy.	2
Lake Mary Blvd.	Longwood Lake Mary Rd.	2
Seminola Blvd.	Winter Park Dr.	2
Central Pkwy.	Douglas Ave.	2
Tuskawilla Rd.	Winter Springs Blvd.	2

Table 6-9. Local, Pedestrian/Bicycle High-Crash Locations 2016 – 2020 (Signal4)

Major Street	Minor Street	Crashes
Lake Mary Blvd.	Sun Dr.	4
CR 46A/25th St.	Hartwell Ave.	4
Airport Blvd.	Sanford Ave.	4
Red Bug Lake Rd.	Pine Bark Pt./Citrus Rd.	4
International Pkwy.	Village Oak Ln.	4
Sand Lake Rd.	East Exit of Forest City Elementary School	4
W. 13th St.	Manguostine Ave.	4

6.5 Transportation Safety Vision

The only acceptable number of traffic fatalities is ZERO. In February 2019, the MetroPlan Orlando board unanimously supported FDOT's statewide Vision Zero initiatives and performance targets. Jacobs recommends that Seminole County adopt the same traffic safety goal to "eliminate the rate and occurrence of transportation system fatalities, injuries and crashes with a high emphasis on the most vulnerable users" (Cambridge Systematics, Inc., et al. 2019). This goal also aligns with the Florida's Strategic Highway Safety Plan Target Zero performance goals of eliminating all traffic fatalities.

In addition to the MetroPlan Orlando's and Florida's safety goals and objectives, there are currently 45 communities that have committed to Vision Zero, as shown on Figure 6-6. Seminole County has the

opportunity to increase that number by committing to a nationwide initiative and join a growing community of professionals challenged with reducing traffic fatalities. By joining the Vision Zero network, the County will have access to additional resources to information to help support their safety goals.

Figure 6-6. Vision Zero Communities
Source: Vision Zero Network n.d.

7. Active Transportation

This section describes the existing active transportation infrastructure in Seminole County. Active transportation is considered any transportation mode that is non-motorized. For the purposes of Seminole County, the modes that are being directly being expanded upon are pedestrian and bicycle with a discussion of the County's extensive trail network.

7.1 Pedestrian

Pedestrian facilities in the County are commonplace alongside major roadways and arterials but can be limited along side streets and within neighborhoods. Shared-use paths are also considered pedestrian facilities but are discussed in Section 7.3.

Pedestrian infrastructure countywide is maintained by the same agency maintaining the adjacent roadway, with the exception of shared-use paths in FDOT right-of-way (ROW). Limited data was available on city-maintained pedestrian infrastructure, so the focus of this section is on County-maintained facilities.

The data collected for existing pedestrian facilities includes sidewalk facilities in Seminole County's ROW, as well as pedestrian facilities within private subdivisions. Additional pedestrian facilities located within incorporated areas are not included in these data. Based on a review of existing pedestrian facilities, the County contains approximately 901 miles of pedestrian sidewalks. Approximately 175 miles of those facilities are located within the County's maintained ROW. The remaining facilities are located within incorporated areas or private subdivisions. Many private and gated residential subdivisions have sidewalk connections to the County's maintained pedestrian facilities. Refer to Map 19–Existing Multimodal Facilities in Appendix A for the location of existing pedestrian facilities.

Gaps in the County sidewalk network continue to be a challenge for pedestrian facilities. As referenced in Section 7.3, there is a significant effort to reduce the number of gaps for the larger shared-use path network. This effort amplifies the need to improve sidewalk connectivity so that pedestrian users can utilize the entire network. The sidewalk maintenance program is also important to sustain accessibility and compliance with the Americans with Disabilities Act (ADA).

7.2 Bicycle

Although newer County roadways have bicycle lanes, many older roadways do not. The County's extensive trail network provides an alternative to the traditional bicycle lane that shares the road with vehicular traffic. Many bicyclists use the separated shared-use facilities provided by the trail network. These separated facilities are located along many higher-capacity roadways and provide users with longitudinal separation for motorists. Shared-use facilities are described in more detail in Section 7.3 but in general run parallel to roadways, separated by landscaping, offering a lower stress bicycling experience.

Existing bicycle lanes in Seminole County have evolved from being limited primarily to state roads to a wide distribution of bicycle lanes on the roadway network. Most bicycle lanes are concentrated in the center of the County, with less connectivity away from the urban centers. Refer to Map 19–Existing Multimodal Facilities in Appendix A for bicycle lane and shared-use path locations.

7.3 Trail Network

Seminole County continues to transform its trail network. In 2021, the County updated its Trails Master Plan and now includes a distinct hierarchy of its trail network (S&ME 2021). According to the plan, the County has defined the following hierarchy that includes five types of trails:

- **Signature Trails**: paved 12- to 14-foot-wide urban and unpaved rural multipurpose trails with county-wide and regional connections

- **Pathways**: paved 8- to 10-foot-wide urban and unpaved rural multipurpose trails for travel between and within cities and major activity centers; connect to Signature trails
- **Connectors**: paved 8-foot-wide sidewalks (urban and rural) linking shorter distances, such as neighborhoods
- **Wilderness Trails**: unpaved paths for pedestrian, mountain bike, and equestrian usage within and between Preserved Lands and Natural Greenways
- **Destination Trails**: paved 12- to 14-foot-wide multipurpose trails with public gathering spaces that loop within a property and are connected to neighborhoods through other trails

For the purposes of transportation mobility, three trail types are relevant: Signature Trails, Pathways, and Connectors. These trails account for 249.3 miles of trail infrastructure, both paved and unpaved. As part of the Trails Master Plan, there are 151.5 additional miles of these trail types proposed. Wilderness Trails and Destination Trails provide the community recreational opportunity and are crucial to the quality of life of the area, however, their integration into an active transportation mode is limited. Refer to Map 19–Existing Multimodal Facilities in Appendix A for existing trail locations.

The purpose of the Signature Trails are to provide connectivity across the County and the region including the neighboring Volusia, Lake, and Orange Counties. Some characteristics of this trail type are dedicated ROWs, grade separation (over/under major roadways, highways and intersections), shade, and a mile marker system. These trails do not always follow alongside a roadway ROW. There are 62.4 miles of Signature Trails, with an additional 13.3 miles proposed to be built as part of the Trails Master Plan. There are currently four existing signature trails: Seminole Wekiva Trail, Cross Seminole Trail, Flagler Trail, and Lake Monroe Loop Trail. One Signature Trail is currently proposed, the Central Seminole Trail. This trail is proposed from Big Tree Park in the north to the Cross Seminole Trail in the south near the Orange County line.

The Pathways network has been developed to feed the Signature Trails. These also provide connectivity between the seven cities and major activity centers within the County. These trails are narrower than Signature Trails and use existing space within roadway ROW with at-grade crossings and typically have minimal shade protection. There are 133.4 miles of Pathways, with an additional 86.3 miles proposed to be built as part of the Trails Master Plan. There are currently 14 designated Pathways and four additional alignments proposed throughout the County.

The Connectors system is comprised of 8-foot-wide paved sidewalks. These trails are intended to fill the gaps in pedestrian facilities between short distance locations and neighborhoods. Connectors also join to the Pathways network and traditional sidewalks. These trails, like Pathways, use existing space within roadway ROW with at-grade crossings and typically have minimal shade protection. There are 53.5 miles of Connectors, with an additional 51.9 miles proposed to be built as part of the Trails Master Plan. There are currently 16 designated Connectors and 27 additional alignments proposed throughout the County.

Regionally, Seminole County is part of the larger regional and statewide trail network. Ultimately, the Florida Department of Environmental Protection Office of Greenways and Trails has established the following trail connections that traverse the County:

- **The Heart of Florida Loop**: circling multiple counties in Central Florida west of Seminole County.
- **Coast to Coast Trail**: connecting locations from St. Petersburg on the West Coast, through Central Florida including Seminole County, to the Space Coast.
- **Florida National Scenic Trail**: connecting South Florida, from Big Cypress Preserve to the Florida Panhandle, Fort Pickens State Park and South Alabama, Conecuh National Forest. The Central Florida portion traverses Seminole County from the southeast to the northwest.

Although the St. Johns River-To-Sea Loop Trail does not enter Seminole County, its traverses the southern boundary of Volusia County and is a critical part of completing the Lake Monroe Loop Trail. The Lake Monroe Loop Trail is ultimately intended to span the perimeter of Lake Monroe in Seminole and Volusia

Counties. In addition to the existing and proposed portions of the Lake Monroe Loop Trail, the ultimate loop includes a portion of the Cross Seminole Trail in Seminole County, the Spring-to-Spring Trail, and East Central Regional Rail Trail in Volusia County.

8. Transit

Public transportation is provided by two operators in Seminole County: Central Florida Regional Transit Authority (LYNX) and SunRail (refer to Map 19–Existing Multimodal Facilities in Appendix A). SunRail is described in detail in Section 9. LYNX offers traditional fixed-route bus service, NeighborLink flexible-route service, and ACCESS LYNX paratransit services in the County. All services are operated in compliance with ADA requirements.

The NeighborLink service provides a flexible-route service within an established boundary that can either feed into a designated fixed-route portion of the service or directly to a destination station to provide connectivity to points of interest and multimodal options. Paratransit services are a door-to-door transportation service provided for disabled residents unable to use flexible or fixed-route bus service. The program previously had geographic limitations requiring each trip be within three-quarters of a mile from existing fixed-route service. Local funding has allowed LYNX to provide this service to all origins and destinations within the three-county service area of Orange, Osceola, and Seminole Counties.

In Seminole County, LYNX services 510 bus stops via 12 fixed routes. Approximately, 12% of all LYNX bus stops are located in the County. A total of 5 of the 12 fixed routes are exclusively within Seminole County. All routes that cross the county line provide connectivity to Orange County (LYNX n.d.). There is currently no LYNX connectivity directly to any other adjacent Counties. However, connectivity from LYNX to Votran (Volusia County's Bus Transit provider) can be achieved via SunRail.

LYNX provides connectivity to all four SunRail stations in the County. The SunRail stations are located within the Sanford, Lake Mary, Longwood, and Altamonte Springs city limits. In Sanford, Lake Mary, and Altamonte Springs, the commuter rail stations have bus loops and shelters onsite.

According to the American Public Transportation Association, intercity bus service is not currently available in Seminole County (APTA n.d.). Those traveling from Seminole County must use alternative transportation opportunities to reach intercity bus services from Orlando. Currently, LYNX offers routes to intercity bus stations where passengers may transfer to Greyhound, Megabus, or RedCoach. These routes are most simply accessible to Seminole County via SunRail transfer to LYNX.

9. Rail

Railroad operators are categorized into three classifications based on annual operating revenues: Class I, II, and III. CSX Transportation (CSXT) is a Class I railroad operator within Seminole County and owner of the Aloma Spur. The Aloma Spur runs from the Amtrak Auto Train facility in Sanford traversing through areas of downtown approximately 7 miles south, terminating near Winter Springs. The Central Florida Rail Corridor is the main rail line that runs through the County, servicing commuter rail, intercity passenger rail, and freight rail services. The Central Florida Rail Corridor (CFRC) is approximately 62 miles, from DeLand in Volusia County to Poinciana in Osceola County. Approximately 18 miles of the CFRC are within Seminole County and nearly the entire line is double-track territory. The only single-track portion of the corridor lies at the County boundary where the corridor crosses Lake Monroe. The Lake Monroe Drawbridge is a single-track railroad drawbridge that is operated in cooperation with the U.S. Coast Guard. The CFRC is owned by FDOT per bill of sale dated November 3, 2011 (SunRail 2011). All railroad lines in the County are in Urban Service Area west of the designated Rural Area. The SunRail Commuter Rail service runs on the CFRC from DeBary in Volusia County to Poinciana in Osceola County and is also owned and operated by FDOT and its operating contractors.

9.1.1 Commuter Rail

Seminole County is located just north of the Orlando urban area. SunRail operates on the CFRC north-to-south through the Urban Service Area. The commuter rail service currently operates a 40-train weekday-only schedule, primarily in 30- to 60-minute headways. SunRail connects the County to major employment opportunities in the south to the City of Orlando and Orange and Osceola Counties and in the north to Volusia County. Within the County, SunRail has four passenger stations in the cities of Sanford, Lake Mary, Longwood, and Altamonte Springs. All four stations also have park-and-ride facilities and have LYNX connectivity, with three stations having bus loops on the station sites.

FDOT developed sketchbooks for the intended transit-oriented development in proximity to each station. Each sketchbook includes urban design for the vacant land and existing transportation systems in the immediate station vicinity. The sketchbooks include multimodal transportation improvements in station areas to increase access to commuter rail system. The sketchbooks demonstrate the regional significance and goals for the SunRail stations. Development has already occurred at the Lake Mary and Longwood Stations, with proposed developments planned at the Altamonte Springs Station.

According to the FRA's Grade Crossing database (FRA n.d.), the CFRC has 35 grade crossings, including private and pedestrian crossings, on its main line. This line is allows passenger trains to operate at a maximum operating speed of 79 miles per hour in many areas of the County. There are currently plans to implement a Countywide quiet zone on the CFRC, which is consistent with quiet zones south of Seminole County in the cities of Maitland, Winter Park, Orlando, and Edgewood in Orange County. Quiet zones allow train engineers to not activate their horns at grade crossings, unless entering a station or during an emergency. The train engineer always has discretion to error on the side of caution in any situation, even with a quiet zone implemented.

9.1.2 Intercity Passenger Rail and Auto Train

Seminole County does not have long-distance, intercity-passenger-only rail service. Amtrak intercity passenger rail service runs through the County on the CFRC; however, the nearest passenger stations are DeLand in Volusia County and Winter Park in Orange County. There are currently four trains that operate in this manner in the County that terminate in New York and Miami. The Amtrak Auto Train serves the County with one station located in Sanford. There are two trains that operate in this manner within the County from Sanford to the Volusia County line. The Amtrak Auto Train requires passengers be accompanied by an automobile or motorcycle to use the service. The service is a limited direct service between Sanford and Lorton, Virginia.

Intercity passenger rail can be accessed via transfer from SunRail. Joint station facilities are located south of Seminole County in Winter Park, Orlando, and Kissimmee. Once the north extension of SunRail service is completed (scheduled for 2024), there will be a joint station facility in DeLand.

9.1.3 Freight Rail

CSXT is the sole freight rail provider operating in Seminole County (refer to Map 14–SIS Facilities and Freight Routes in Appendix A). CSXT is a Class I provider and operates on existing SIS railroad tracks located in both unincorporated County lands and municipal boundaries, including the Aloma Spur and CFRC. The freight operator maintains ownership of the Aloma Spur and operates over the CFRC per agreement with FDOT.

According to the FRA's Grade Crossing database (FRA n.d.), the Aloma Spur has 33 grade crossings on its main and branch lines. This line is a low speed, infrequent serviced line with approximately four trains per week in operation. There are currently no plans to implement quiet zones on the Aloma Spur. CSXT also operates, primarily overnight, on the CFRC and runs approximately four trains per day.

Seminole County and the surrounding region has relatively limited rail service, which presents several concerns and challenges for the region's rail network:

- Operational changes occurred recently with a portion of the current rail freight traffic re-routed to the CSX S-line to accommodate the SunRail Commuter Rail Service on the CFRC.
- Freight rail operations have shifted significant resources from Taft to Winter Haven, shifting more freight westerly out of the Orlando area.
- Limited capacity and operating windows on the CSX A-line to service freight customers due to the SunRail Commuter Rail Service on the CFRC.
- Several regional stakeholders indicate reliability concerns with rail. One ongoing obstacle to making rail freight more competitive with highway is the lack of significant backhaul out of Florida.

10. Waterways

Waterways provide transportation opportunities in Seminole County. Map 14–SIS Facilities and Freight Routes in Appendix A depicts waterways within the County.

10.1 Navigable Waterways

By definition, navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (CFR 1986). The St. Johns River is the only navigable waterway within County boundaries. The navigable portion of the St. Johns River in Seminole County is from Sanford to the north.

The river is one of the only waterways in the United States that flows in a northern direction. It runs from the St. Johns Marsh in portions of Okeechobee, St. Lucie, Osceola, and Brevard Counties in Central Florida to the Atlantic Ocean in Duval County in the Jacksonville area. Entering Seminole County in the far southeast, the river forms the eastern and northern boundary of the County and forms Lake Harney and Lake Monroe before traversing into Volusia County on the northwest side of the County. The Econlockhatchee River also feeds the river via Lake Jesup.

10.2 Water Trails

Seminole County has three recreationally accessible river systems with park, recreation, and trail areas. These rivers include the St. Johns River, Econlockhatchee River, and Wekiva River (FDEP n.d.). All of these rivers flow north in the County and eventually into Volusia County. The Florida State Designated Paddling Trails have designated two trails within Seminole County, which are described as follows.

The St. Johns River has a paddling trail designation on entire Seminole County segment of the river between the Orange and Volusia County lines. Initial access to full traverse the length of the Seminole County portion of the river is from east side of the river at Hatbill Park in Brevard County. Exit access would be on the east side of the river at Blue Springs State Park in Volusia County. This segment is approximately 55 miles long, with Seminole County's portion being approximately 47 miles long. This paddling trail traverses the eastern and northern boundary of Seminole County. There are several access points in Seminole County.

The Econlockhatchee River has a paddling trail on a 19-mile-long segment between CR 419 and SR 46. This paddling trail traverses the east areas of Seminole County. There are four access points between the start and end of the water trail. The access points also provide connectivity to the bicycle and pedestrian trail system via the Florida National Scenic Trail and Flagler Trail.

The Wekiva River has a paddling trail on a 27-mile-long segment between King's Landing in Orange County and High Banks Landing in Volusia County. Seminole County's portion of the trail is an 11.5-mile-long segment between the Wekiwa River State Park and Katie's Landing in Lower Wekiva River Preserve State Park. This paddling trail traverses the western boundary of Seminole County. There are four access points between the start and end of the water trail.

11. Orlando-Sanford International Airport

The Orlando-Sanford International Airport (also known as SFB by its International Air Transport Association Airport Code) is within the Sanford city limits north of Lake Jesup (refer to Map 14–SIS Facilities and Freight Routes in Appendix A). Located on the southeast side of the City, the airport has four primary runways and is approximately 2,400 acres in size. The property is bound by SR 46, Sanford Avenue, and Lake Mary Boulevard with primary access points off of Red Cleveland Boulevard on the south side and Airport Boulevard on the west side of the airport property. Other major highways that serve the vicinity of the airport are I-4 and SR 417 (Seminole Expressway).

SFB is billed as being an alternative option to the Orlando International Airport (MCO) for tourists and locals alike. The airport is significantly farther from the main tourist corridor of the Orlando area, which presents a challenge for ground transportation. The airport does have an advantage of being smaller with a simpler layout, while being less busy and easy access to major highways in the area.

The airport served more than 2 million passengers in 2021, with less than 1% of passengers being international travelers. The effects of the COVID-19 pandemic have dramatically impacted the airport's passenger operations, especially international travel. In contrast to 2021 data, SFB served more than 3 million passengers in 2019, with approximately 7.5% being international travelers. Even with the current passenger data, SFB ranks among the 100 busiest airports nationally. There are currently three passenger airlines that service the airport. The airport also services cargo needs and the general aviation market.

11.1 Services and Usage

Currently, four airlines serve commercial operations daily at SFB, which include Allegiant, Flair Airlines, Swoop Airlines, and Sun Country Airlines. Sun Country Airlines currently provides chartered service only at this time from SFB. The three other airlines service 75 domestic and Canadian destinations.

Total aircraft operations in 2019 and 2020 were 343,847 and 235,554 passengers, respectively. These aircraft operations served 3,291,112 and 1,545,041 passengers in 2019 and 2020, respectively. In 2021, total passengers rebounded by more than 800,000 passengers.

SFB serves privately operated aviation, commuter/air taxi services, and limited military aviation in addition to commercial and charter operations. The airport also provides cargo operations but as of 2021, they have been effectively eliminated after years of decline at SFB. However, according to the *Orlando Sanford International Airport Master Plan Update*, cargo is expected to make a modest rebound in future years (WS Atkins, Inc. 2021). Cargo services at the airport are typically "belly" cargo that operates with commercial aircraft operations and is transferred to the onsite cargo facility. There is currently no all-cargo carrier for the airport.

11.2 Airport Master Plan Update

The *Orlando Sanford International Airport Master Plan Update* identified existing and detailed the deficiencies of the airport facilities. The planning horizon of 2037 was established by this update with a baseline of 2017 and 5-year periods to complete the 20-year horizon. Deficient facilities are identified as part of the remaining sections as part of the airport facility descriptions. Existing and anticipated deficiencies are described in detail as part of the analysis.

11.3 Facilities

SFB is identified by the Federal Aviation Administration (FAA) as a Small Hub Primary Commercial Service airport facility in their National Plan of Integrated Airport Systems (NPIAS).

Annual Service Volume (ASV) is a measure of reference as a guide for planning infrastructure and capacity improvements at airports. Per FAA Order 5090.5, Formulation of NPIAS and ACIP, planning for capacity enhancing projects such as runway enhancements and other airfield configurations should begin once the airport's demand reaches 60% of the ASV (WS Atkins, Inc. 2021). SFB as of 2019 is at approximately 79% of the ASV.

11.3.1 Runways

The airport has four active bidirectional runways, three of which are east-west oriented and one north-south oriented. A total of 99.5% of runway use occurs on the three east-west (9/27) runways. These runways are identified as 9R/27L, 9C/27C, 9L/27R, and 18/36. Runway lengths and widths were identified as deficient on three of the four runways at SFB. All runways have pavement conditions that need to be addressed, as follows:

- Runway 9R/27L extension to 7,200 feet, widening to 150 feet, and pavement rehabilitation
- Runway 9C/27C extension to 4,200 feet and pavement rehabilitation
- Runway 9L/27R pavement rehabilitation
- Runway 18/36 extension to 7,200 feet and pavement rehabilitation

11.3.2 Taxiways

There are 11 main taxiways and several supporting taxiways linking the runways and several parking aprons and hangar facilities located around the airfield. All taxiway pavements are asphalt surfaces. The overall pavement conditions of the taxiway system was identified as fair. The deficiencies were identified by SFB based on 2012 design standards. However, federal taxiway design requirements were updated in 2022. These updates, at this time, do not require action by the airport. However, they should be considered while making enhancements to other airport facilities.

Two taxiways were identified as not meeting current or future design standards based on the parameters of the aircraft that they serve, as follows:

- Taxiway M was identified as having non-standard fillet geometry as aligned with the required standards for the connector.
- Taxiway P was identified as having non-standard fillet geometry as aligned with the required standards for the connector. In addition, Taxiway P has a non-standard compass calibration pad located on the connector that is recommended for relocation.

11.3.3 Airfield Geometry

There are several identified inadvisable airfield geometry deficiencies by the *Orlando Sanford International Airport Master Plan Update* that are in need of upgrades. These recommendations are as follows:

- Taxiway P provides direct access from Runway 9C/27C onto the Terminal Apron.
- Taxiway B2 provides direct access from Runway 9L/27R into an apron area.
- Taxiway L (north of Runway 9L/27R) provides direct access from Runway 9L/27R into an apron area.
- Taxiway A3 provides direct access from Runway 9L/27R into an apron area.
- Taxiway S3 provides direct access from Runway 9R/27L onto the South East Ramp.
- Taxiway S4 provides direct access from Runway 9R/27L onto the General Administration Services Apron.
- The eastern portion of Taxiway C is aligned with Runway 9C/27C.
- Taxiway K1 is aligned with Runway 9C/27C.

- The FAA has identified the area between the Runway 9C approach holding positions on Taxiway K as Hot Spot-1 (HS1). The holding position markings and signage in this area are intended to ensure that aircraft operators do not enter the Runway 9C approach environment when the runway is actively being used. HS1 was identified because of the area's atypical and complex layout that creates a higher potential for runway incursions.

SFB's air traffic control tower does not meet all of the requirements of the FAA and does not give controllers positive visual control over all movement areas.

11.3.4 Commercial Terminal and Gate Operations

The Passenger Terminal onsite was consolidated from their previous designations of Terminal A and Terminal B. The designations were warranted as obsolete as both terminals are capable of accommodating international operations. The combined space is 387,000 square feet (ft^2) of air-conditioned facilities with 16 gates to accommodate commercial operations.

As of 2019, the number of gates was also identified as deficient, with the airport needing an additional three gates needed to meet the that demand. There are also many areas within the passenger terminal facility that are currently in need of expansion to meet demand standards. Several ancillary facilities onsite are recommended for improvements or expansion.

11.3.5 Cargo Facility

SFB has a 53,000-ft^2 cargo facility, with a refrigeration capacity of 6,600 ft^2. While there have been new locations on the property for expansion, cargo services would need to be evaluated in more detail to establish future needs based on the business goals of the airport. Rail access on the west side of the property would provide future multimodal options for the planned non-aeronautical developments on the northwest side of the airport property to support the cargo services that the airport provides.

11.4 Ground Transportation

11.4.1 Access Roads and Curbside

Two primary roadways provide access to the airport, Red Cleveland Boulevard and Airport Boulevard. The *Orlando Sanford International Airport Master Plan Update* indicates that Red Cleveland Boulevard will be able to handle the expected demand of the roadway through its planning horizon of 2037. However, Airport Boulevard demand is expected to exceed capacity between 2022 and 2027, warranting capacity improvements to the roadway. The curbside capacity is effectively obsolete now and needs to be improved. Extensions of the curbside areas with both one- and two-lane zones are needed as well as additional capacity at the ground transportation pickup areas.

11.4.2 Parking Lots

SFB has five surface parking lots and one parking structure on the property. One of the surface lots is unpaved. The parking is categorized into hourly, long-term, economy, and cell phone lots. Hourly parking capacity was determined to be sufficient through 2037, with 230 parking spaces of capacity. For long-term parking, seasonal demand at the airport is significant and a challenge to accommodate. Design standards require SFB to accommodate the 19th busiest day in terms of long-term parking. The current capacity is 2,244 parking spaces without the use of overflow lots. Overflow lots can accommodate 1,060 additional parking spaces. The baseline year of 2017 has SFB as deficient without using overflow lots and effectively is currently over capacity for the expected 2022 demand. Employees of the airport use terminal parking areas; however, the current capacity of 250 parking spaces is expected to be sufficient through 2032.

11.4.3 Rental Car Facilities

Rental car facilities on the airport site are currently sufficient at 652 parking spaces. However, rental car facilities are expected to exceed capacity between 2022 and 2027. To accommodate 2037 expected capacity, the parking capacity would need to nearly double.

11.4.4 Transit

Direct transit service is not currently offered at SFB. The nearest LYNX fixed-service routes are Link 34, located on US 17-92 and Link 46E, located on SR 46 (25th Street). Neither one of these links provide adequate access to the airport. The nearest SunRail stations are in Lake Mary and Sanford, each approximately 4.5 miles away from the airport terminal. There are currently no transfer options from these stations to SFB.

12. Transportation Network Companies

In 2017, legislation (Florida Senate House Bill 221) was passed that permits Transportation Network Companies (TNCs) such as Uber and Lyft to provide their services within the state of Florida. This opened significant opportunity for increased mobility, especially to locations where traditional transit is not available or implementation is not feasible. The advent of these companies has provided users with an on-demand service that is customizable to the user needs.

According to the bill, a TNC is an "entity operating in this state pursuant to this section using a digital network to connect a rider to a TNC driver, who provides prearranged rides. A TNC is not deemed to own, control, operate, direct, or manage the TNC vehicles or TNC drivers that connect to its digital network, except where agreed to by written contract, and is not a taxicab association or for-hire vehicle owner."

The door-to-door service offers extensive mobility; however, this increase of mobility comes at an increased cost to the user. While these services can provide greater mobility, they may not be a feasible alternative to other mobility options for all users. These solutions supplement the transportation system and are typically more effective for less frequent trips to major points of interest.

13. Intelligent Transportation Systems Infrastructure & Emerging Technologies

13.1 Existing ITS Infrastructure

Seminole County Traffic Engineering is a division of the Public Works Department. As part of their responsibilities, the team operates and maintains an inventory of ITS and traffic signal system devices throughout the County.

Table 13-1 lists inventories of the existing ITS assets that Seminole County currently maintains and operates.

Table 13-1. Seminole County ITS Assets

Type	Quantity
Bluetooth Readers (BlueTOAD / TrafficCast)	117
Cameras (Bosch)	224
Dynamic Message Signs (DMS)	29
Roadside Units	126
Intersection Movement Count Cameras (IMCs)	100
UPS Backup systems	240

Seminole County also maintains all traffic signals in the County. This includes the maintenance of city and state signals as well. Private and school board signals are also the responsibility of the County. In total, the County maintains and operates 400 traffic signals, most of which are connected to fiber and four of them are on wireless radio communication. Table 13-2 summarizes key details about the County traffic signals.

Table 13-2. Seminole County Traffic Signals Attributes

System	Detail
System Manufacturer	Trafficware Advanced Transportation Controller controllers and central software (ATMS.Now)
Detection Type	Loops and some thermal and detection cameras
Preemption equipment	GTT (mostly infrared for emergency vehicle preemption)
Advanced Systems-Automated Traffic Signal Performance Measures (ATSPM)	Most signals on Utah ATSPM platform managed by FDOT
Adaptive Traffic Control Systems (ATCS) Deployments	Trafficware's SynchroGreen and Rhythm's InSync systems
CAV Applications	None
AV Strategies	None

13.2 ITS Infrastructure Recommendations

The County has one of the most robust ITS infrastructure in the state. Jacobs recommends the continued installation of these and other new emerging technologies to create a smart transportation system. This will include the expansion of fiberoptic cable communication, closed-circuit television cameras, arterial DMS, vehicle detection systems, and smart traffic signals.

13.3 Emerging Technologies

Emerging technologies can improve the safety and operations of the County's transportation system. New technologies such as connected and automated vehicles (CAV) and electric vehicles (EV) have the potential to dramatically change the way cities and counties are planned and developed.

The applications of these systems can range from small, on-demand automated transport shuttles replacing underserved and underutilized traditional bus routes to large-scale transformations of vehicle ownership. There is an implication of improvements can be significant to multiple aspects of a jurisdiction's infrastructure, such as energy grids and parking infrastructure.

CAVs enable safe, interoperable networked wireless communications among vehicles, the infrastructure, and passengers' personal communications devices. A National Highway Traffic Safety Administration study of connected vehicle technologies showed that they have the potential to reduce up to 80% of crashes where drivers are not impaired (NHTSA n.d.). CAV benefits include crash elimination through crash-free driving and improved vehicle safety that allows a vehicle to monitor the environment continuously if there is a lapse in driver attention. There is reduced need for new roadway infrastructure as self-driving vehicles can reduce the need for building new infrastructure and reduce maintenance costs. There is also reduced energy consumption in at least three ways: more efficient driving; lighter, more fuel-efficient vehicles; and efficient infrastructure.

CAV applications and EV infrastructure are two areas that the County can consider improving mobility and enhancing the quality of life of the County's road network users.

13.3.1 Electrification

The U.S. Department of Energy has a goal of providing Americans with greater access to EV chargers by 2030. The $7.5 billion Bipartisan Infrastructure Bill includes funding support for this type of infrastructure improvement to the transportation system. The installation of EV charging stations are one way that electrification can improve mobility by giving EV users the ability to charge at key locations throughout the area. FDOT has established an Electric Vehicle Master Plan that also highlights funding resources that may be available for local jurisdictions (FDOT 2021). To encourage the use of EVs, Seminole County can expand its EV network by installing more charging stations through the development of a County EV implementation plan that will mirror FDOT's plan. When planning the placement of EV infrastructure, mobility data can help. Mobility data provides policy makers, advocates, and planners with anonymous, privacy-protective analytics that can easily show behavioral patterns for all kinds of people in the community. For example, mobility data can be used to identify and prioritize charging investments in areas where low- to-middle income individuals drive, work, and shop, effectively closing the existing accessibility gap.

13.3.2 Connected and Automated Vehicles

Metropolitan areas across the country and around the world are facing a technological revolution that could fundamentally change the mobility of people and goods. This dramatic shift in transportation brings new opportunities and challenges. Seminole County can use the available resources from FDOT's CAV initiative. One CAV application that the County can consider implementing is an Autonomous Shuttle Bus program to transport travelers between major activity hubs and major transit stops and commuter rail stations in the County and beyond. Partnerships with other entities can be explored as a joint venture.

Potential stakeholders could include FDOT, the City of Oviedo, and the City of Altamonte Springs, who are all in the planning stage of this technology. Lake Nona, in the City of Orlando, has a similar program that can be replicated by the County through Beep. Beep provides Lake Nona residents with an efficient and energy-clean self-driving shuttle to transport riders between different fixed routes throughout the community (refer to Figure 13-1).

Figure 13-1. Autonomous Shuttle Bus in Lake Nona

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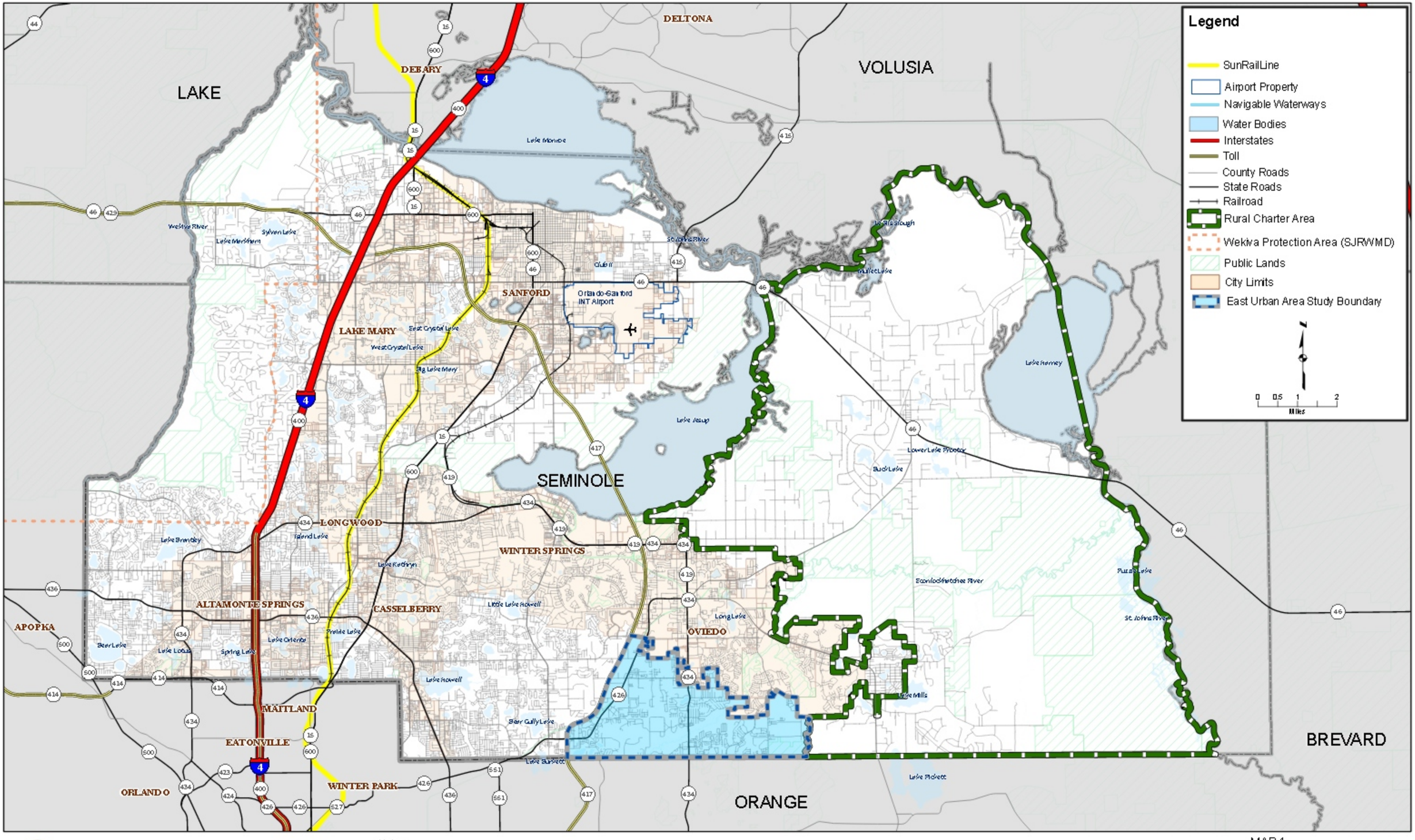
Appendix A. Existing Conditions Maps

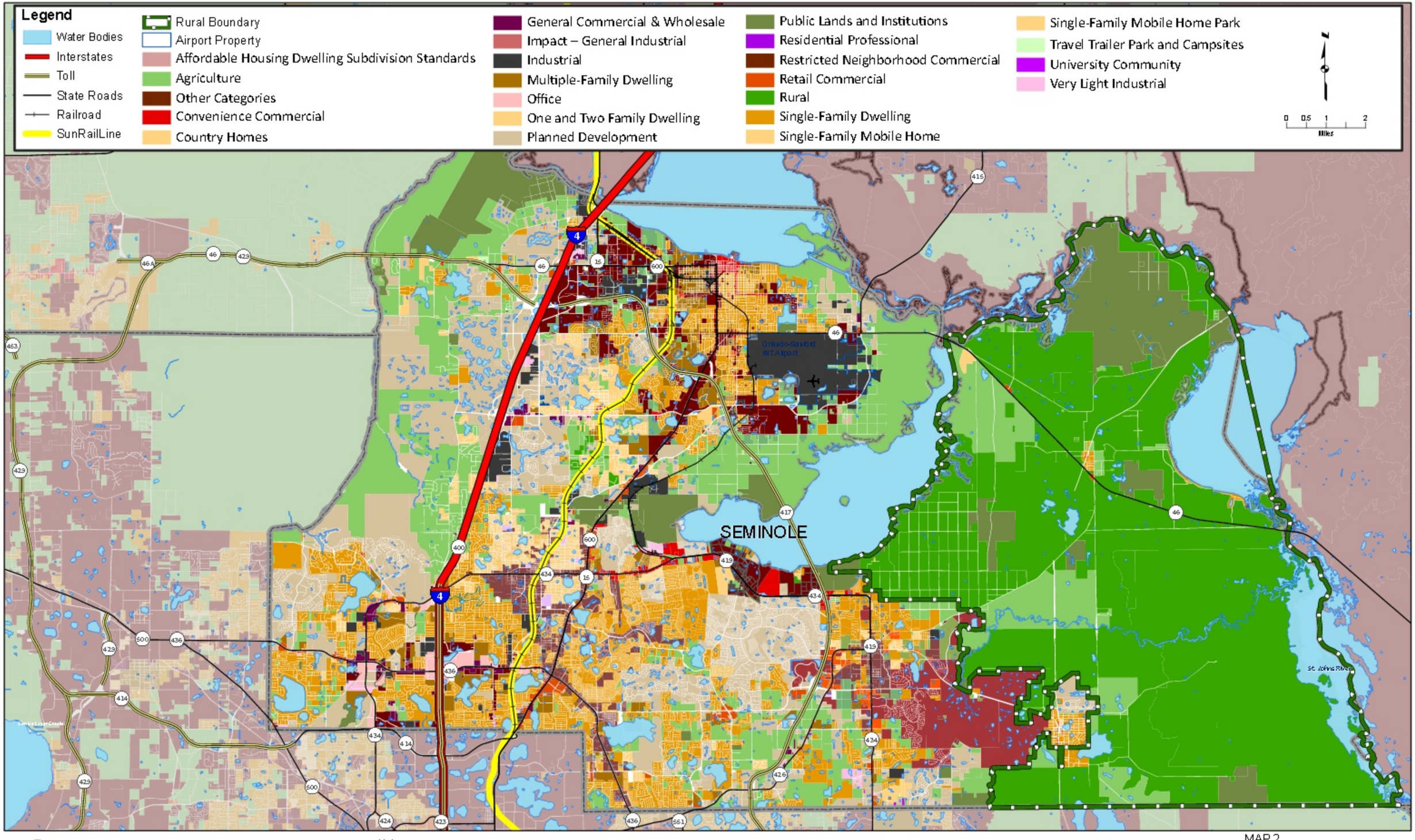
Appendix A. Existing Conditions Maps

Map Number	Title
1	Basemap
2	Zoning
3	Existing Land Use
4	Community Redevelopment Areas
5	Buildable Lands
6	Environmental Constraints
7	Disability of Population
8	Limited English Proficiency Populations
9	Median Age of Population
10	Population Commuting by Automobile Alternative
11	Population Below or at Poverty Level
12	Non-White Racial Density by Block Group
13	Roadway Functional Classification
14	SIS Facilities and Freight Routes
15	Vehicle Crash Heat Map on State Roads (2016–2020)
16	Bicycle and Pedestrian Crash Heat Map on State Roads (2016–2020)
17	Vehicle Crash Heat Map on County/Local Roads (2016–2020)
18	Bicycle and Pedestrian Crash Heat Map on County/Local Roads (2016–2020)
19	Existing Multimodal Facilities



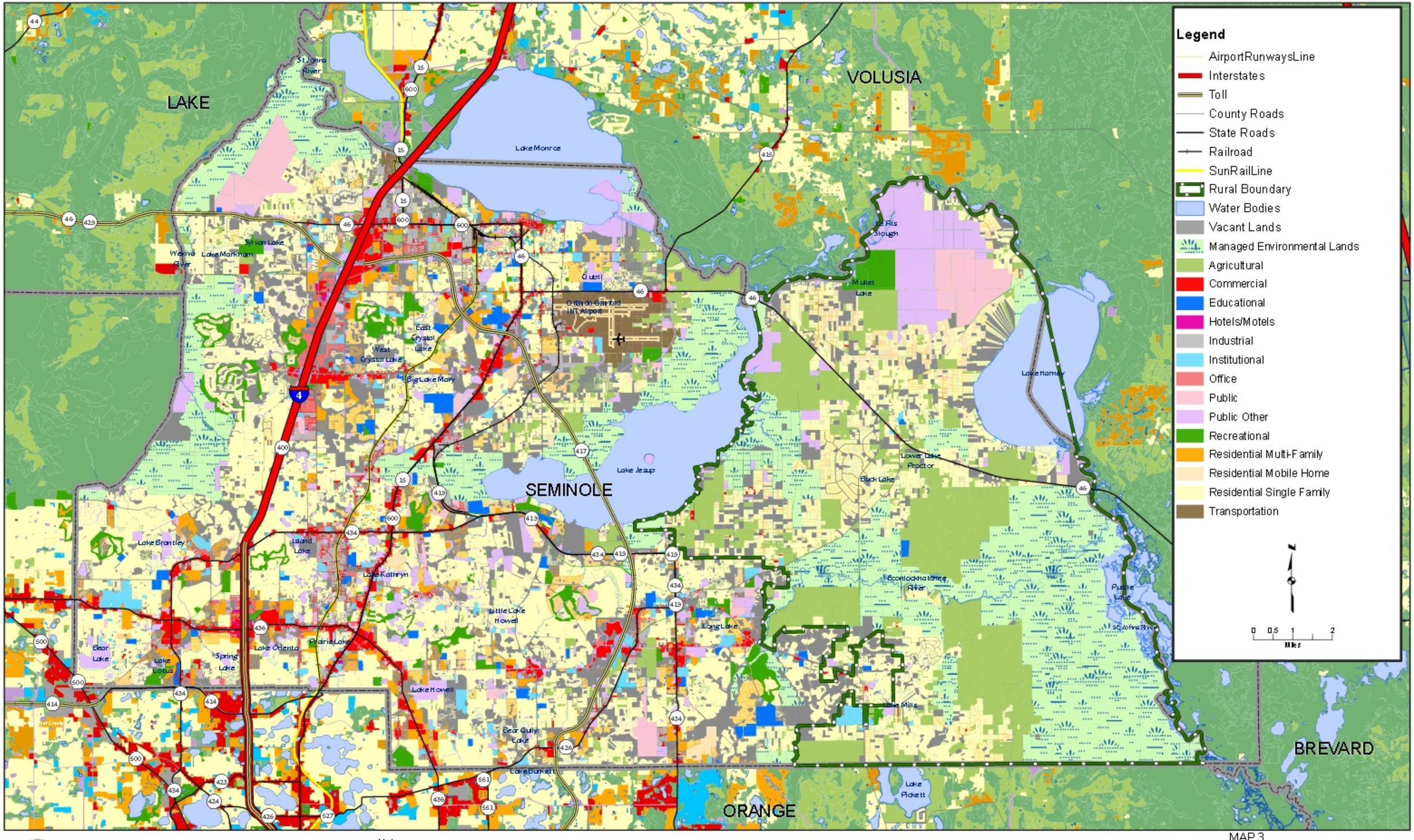
Notes:
1. Data Source: Seminole County 2022
2. Census 2020
3. FDOT 2022

MAP 1
Basemap
Seminole County 2045
Transportation Mobility Plan



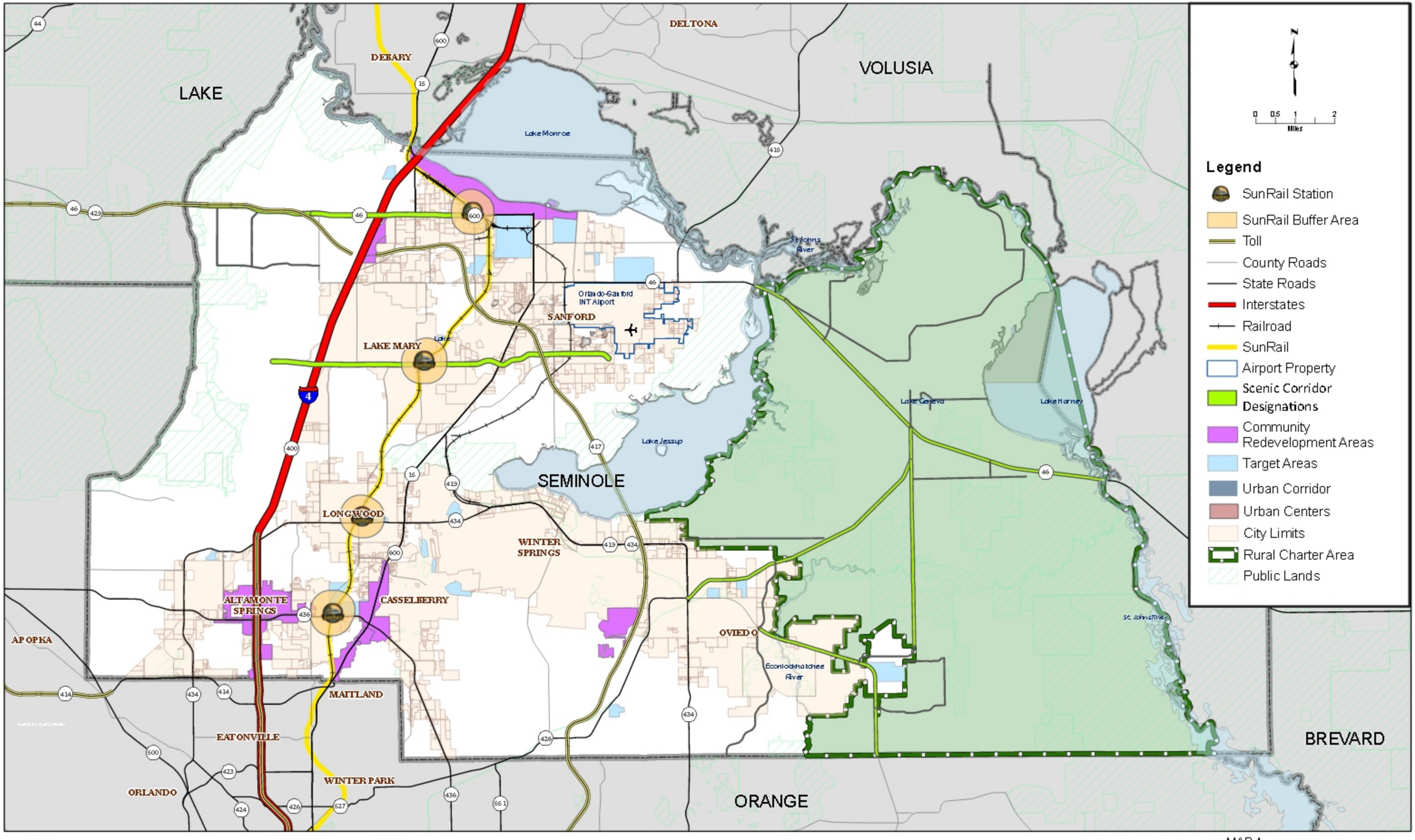
Notes:
1. Data Source: Seminole County, 2022

MAP 2
Zoning
Seminole County 2045
Transportation Mobility Plan



Notes:
1. Data Source: Seminole County, 2022
2. SJRWMD FLUCCS, 2014

MAP 3
Existing Land Use
Seminole County 2045
Transportation Mobility Plan



Notes:
1. Data Source: Seminole County, 2022

MAP 4
Community Redevelopment Areas
Seminole County
2045 Transportation Mobility Plan