OKEECHOBEE BLVD & SR 7
MULTIMODAL CORRIDOR STUDY

PALM BEACH Transportation Planning Agency

December 2022

Acknowledgements

Thank you to the many professionals who participated in and contributed to this study. From the communities along the corridor to the Study Advisory Working Group (SAWG) members, each professional played a crucial role in forming the vision for State Road 7 and Okeechobee Boulevard.

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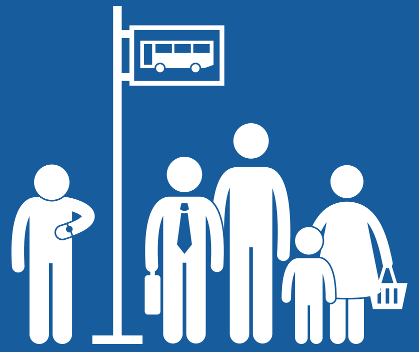


1 INTRODUCTION

Why Okeechobee Boulevard and State Road 7?

The Okeechobee Blvd. and State Road (SR) 7 corridors are rapidly redeveloping in both residential and non-residential uses. The corridor is one of the most traversed corridors in the County but holds the potential to be home to more residences and jobs immediately adjacent to the roadway, while also offering people the opportunity to walk, bike or use transit.

Okeechobee Blvd. plays a vital part in our regional goals because it is a primary east-west corridor linking western and eastern communities, provides access to a variety of destinations that need transportation options, and services transit-dependent riders, such as low income and senior population. This roadway provides connections to Tri-Rail and Brightline, two critical regional transit systems, and this corridor has the potential to support incremental, higher-density and mixed-use redevelopment necessary for premium transit.

Unfortunately, many people who use the corridor feel the current system is failing them and are worried about the future of their ability to conveniently access jobs and their home. On top of this issue, the corridor cannot expand outwards to support new growth and is bounded by the Atlantic Ocean to the east and the Everglades to the west. People will be forced to drive unless safe, convenient and accessible alternatives are developed.

A new vision for mobility must be created to meet the needs of a growing and prosperous community long into the future. This study envisions an Okeechobee Blvd. and SR 7 as a "**transit-first**" roadway, meaning a more efficient growth pattern, supported by mobility choices for all users.

The study corridor is 13.5 miles long and passes through Palm Beach County, the Village of Wellington, the Village of Royal Palm Beach and the City of West Palm Beach. Palm Beach County has several north/south transit lines, but there is still a need for a rapid and reliable east/west line.

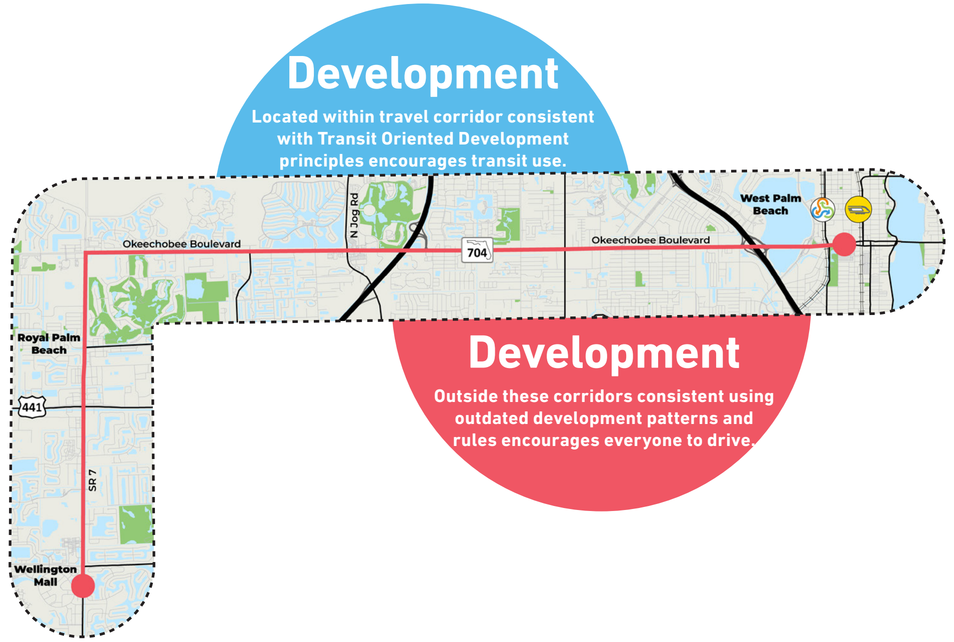
> Ultimately this study aims to rethink the current menu of transportation choices people have in Palm Beach County to get around as the area welcomes new residents and visitors. It's vision aims to open a conversation about how transit will best support a safe, connected and multimodal transportation system.

Why a Multimodal Corridor Study?

Frequent and reliable rapid transit is part of the vision for how people move in the future, being identified in the TPA's 2045 Long Range Transportation Plan (LRTP) and the Palm Tran Accelerate 2031 Transit Development Plan. These plans identify this 13.5-mile stretch of Okeechobee Blvd. and SR 7 as a key opportunity for enhanced transit.

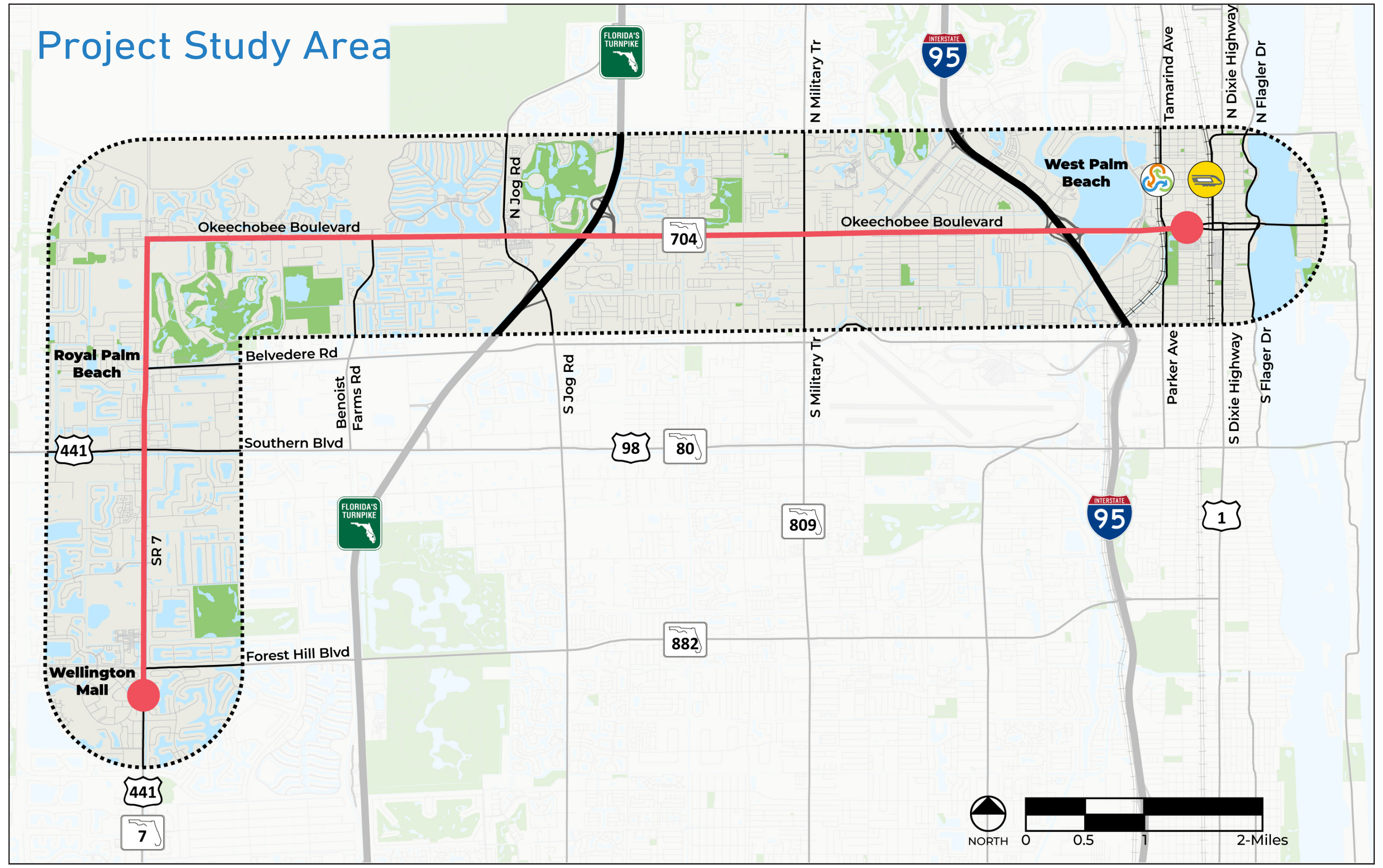
The study corridor passes through parts of Palm Beach County, the Village of Wellington, the Village of Royal Palm Beach, and the City of West Palm Beach. The region has several north/south transit lines, but a rapid and reliable east/west line to connect communities to regional transit systems like Tri-Rail and Brightline is needed. Okeechobee Blvd. and SR 7 play a vital part in the regional goals because it runs east to west and has the potential to support the high-density, mixed-use growth necessary for premium transit.

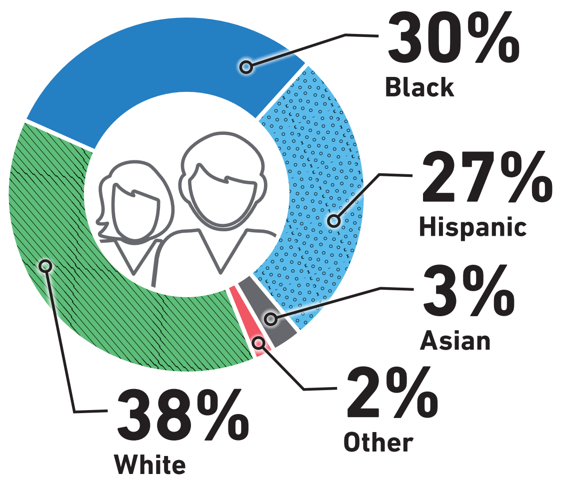
This corridor study takes a new approach to moving people on the transportation system. It first accommodates all modes while envisioning a transit-first vision to meet the needs of current users and new residents and visitors long into the future.

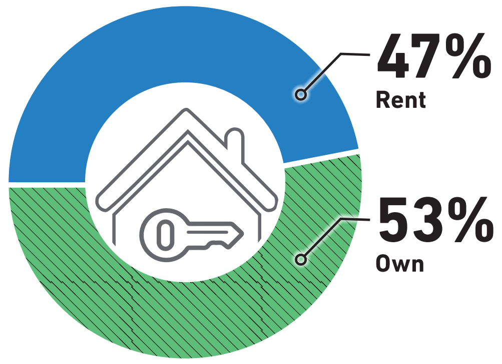


What is a multimodal corridor study?

1. Concentrating redevelopment and new growth around high-frequency, high-quality transit.
2. Ensuring new development prioritizes modes other than vehicles and is sensitive to location, building design, parking, network connectivity, and travel demand management.
3. Creating or redesigning incentives that encourage choices consistent with TPA vision.







35% of the study area's population is under 18 or over 65

37% Single Family Homes

38% Multifamily Homes

4% Mobile Homes

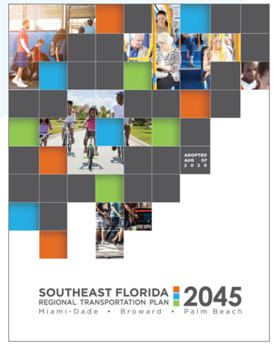
70% of corridor residents do not have a bachelor's degree

Aligning with Other Plans and Projects

This corridor plays an important role in other local and regional planning efforts. To maximize the benefits of this study and future improvement investments, the study analysis was aligned with other transportation plans and programmed projects from the Florida Department of Transportation (FDOT), Palm Beach County, Palm Tran, and the Village of Wellington, the Village of Royal Palm Beach, and the City of West Palm Beach. For a complete list, see appendix A.

Plans

- Southeast Florida Transportation Council's 2045 Southeast Florida Regional Transportation Plan
- Palm Beach TPA's 2045 Long Range Transportation Plan (LRTP) + 561 Plan
- Palm Tran's Accelerate 2031 Transit Development Plan
- Village of Royal Palm Beach's SR 7 Master Plan
- Village of Royal Palm Beach Bike Path Trailhead and Signage Plan
- Village of Royal Palm Beach Comprehensive Bicycle and Pedestrian Plan
- City of West Palm Beach downtown redevelopment plans
- Various Village of Wellington redevelopment plans



Programmed Projects

Palm Beach TPA TIP (FY 2021 – FY 2025)

- FM 44004561 – SR-7 at Weisman Way; Intersection Improvement
- FM 2023991 – Belvedere Road at SR-7; Intersection Improvement
- FM 4461771 – SR-7 from north of Southern Blvd. to Okeechobee Blvd.; Resurfacing
- FM 20239910 – Okeechobee Blvd. at Jog Road; Intersection Improvement
- FM 4415711 – Palm Tran bus shelters, various locations; Public Transportation Shelter
- FM 20219917 – Okeechobee Blvd. at Haverhill Road; Intersection Improvement
- FM 4397551 – I-95 at Okeechobee Blvd.; Interchange – Add Lanes
- 4461791 – Okeechobee Blvd. from Tamarind Avenue to West of Lakeview Avenue; Resurfacing

Palm Tran Transit Development Plan (FY 2022 – FY 2031) underscores similar improvements identified within this visioning plan for service and operations :

- Piloting a limited stop bus service on Okeechobee Blvd.
- Working with Transportation Network Companies to deliver first-last mile solutions.
- Developing TOD corridor and stop criteria.
- Expanding on-demand services to complement premium transit fixed route services.
- Continuing to study new technologies and service frameworks that are appropriate for Palm Beach County.

2 STUDY ANALYSIS & PROCESS

Because transportation serves such an important role in the community, a unique opportunity is presented to provide more transportation options to more people—especially those living in underserved and underrepresented communities. Premium transit along the study corridor could help address the intersectional issues of age, race, income, housing, education and health.

Section Contents

Community Engagement

A transportation system designed by one individual or organization, or without collaboration is destined to fail. To understand the communities' needs, the study team spent over a year developing over 2,500 community touchpoints, listening to people who live and travel through the corridor throughout the project process. In a series of public workshops, interviews, virtual surveys and an interactive public map, people who walk, bike, take transit and drive shared their individual and unique struggles when using roadways in the study area.

More than 500 community members shared their perspectives on the study corridor's issues and opportunities. Commissioners, council members, and other stakeholders in the public and private sector shared with us their experiences with who uses the corridor, what traffic is like, what safety challenges they see, and how they would like to see the corridor change and grow in the future. From these interviews, stakeholders shared they would like to see an Okeechobee Blvd that provides the following to those who use it:

- Approximately 80% of survey respondents indicated that they would use an enhanced transit system if one was introduced into the corridor. Over 50% shared they would prefer center-running dedicated service.
- An enhanced transit option that improves rush hour traffic and supports people who solely rely or choose to take transit.
- Station locations and developments that offer safe mobility options for first/last mile connections.
- Redevelopment opportunities of current land along the corridor
- Equitable transportation and socioeconomic outcomes for people with low-incomes or from minoritized backgrounds.

For more on how this project worked with the public, see appendix B.

400 completed surveys

100 interactive mapping comments

900 unique website views

Over **1,400** workshop site views

The study team utilized both direct and indirect engagement techniques to receive feedback directly from people who use the corridor. This included people walking, bicycling, using transit and driving both in the field and at meeting locations along the corridor.

Key Community Metrics

Using information gathered in public input and upon reviewing relevant plans and projects, seven metrics were developed and analyzed against the developed alternatives for the corridor and evaluated each one according to the project goals, how it would impact community health, and the study alternatives. A robust public engagement campaign helped to inform the study throughout all of study and provided key insights into crafting the vision for the corridor.

Mobility Choices

Economic Development

Safety

Land Use

Quality of Life & Environment

Equity

Affordable Housing

Mobility Choices

The transportation options presented to people along the study corridor are few and far between. People must be given the opportunity to choose their preferred means and equity of choice is also an important factor. Systems in place have not empowered all individuals with the economic mobility to safely participate in the existing system. Improving transportation options will improve conditions for all roadway users.

Walking & Bicycling

The study corridor's lack of safe and consistent facilities, limited crossing opportunities, and uninviting built environment create an unsafe and uncomfortable walking and bicycling environment.

Even though there are sidewalks along most of the corridor, people frequently attempt to cross outside of designated crosswalks because marked crossings are few and far between. When intersections are far away from one another, people must go further out of their way to find a crossing. The average distance between marked crossings within the study corridor is 0.5 miles in the western portion and 0.2 miles in the eastern portion, or about a 5 to 12 minute walk for an average person. And when designated crossings are inconvenient or there are many gaps between sidewalks, pedestrians are more likely to attempt a dangerous crossing in the middle of a roadway or people won't consider walking.

Existing non-motorized facilities do not promote walking, bicycling, or transit as transportation options.

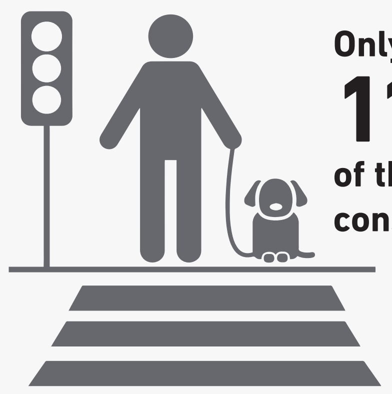
How We Measure

Walking

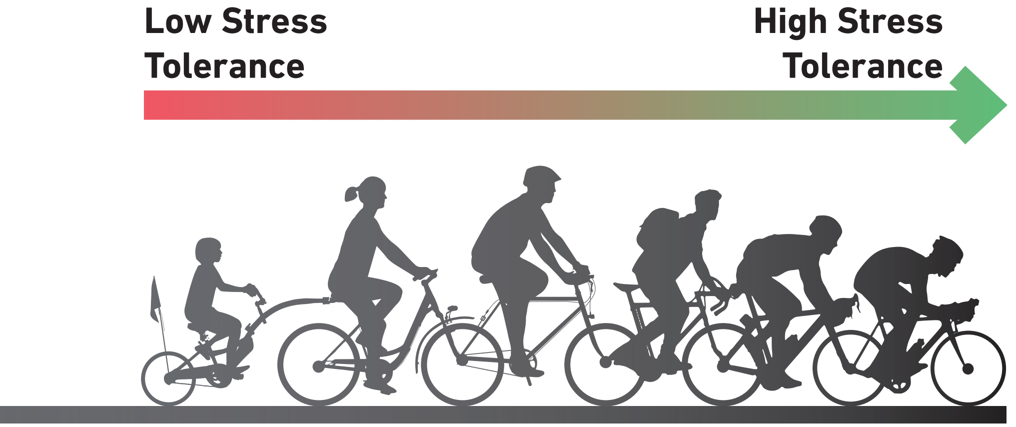
- Number of intersections and crossing opportunities
- Transit service and amenities
- Proximity and number of cultural venues, grocery stores, parks, dining and drinking establishments, schools and retail stores

Bicycling

- Bicycle Lanes
- Terrain and road condition
- Destinations and road connectivity
- Number of people bicycling



Only
11.3%
of the study area is considered walkable



While there are bike lanes along the corridor, they are too narrow for the number of vehicle lanes, traffic volumes and vehicle speeds. These facilities are indicative of an overall trend in the area, with insufficient infrastructure, only a small percent of users would be expected to see bicycling as a transportation option. Those who do bicycle are either used to riding in high-stress situations or have no other choice but to ride their bicycle.

Taking Transit

Many people in the study corridor depend on transit services to get to work and meet their daily transportation needs. The existing bus network provides essential service for captive riders, however, stop amenities, route gaps, and inconsistent reliability discourages or prevents choice ridership.

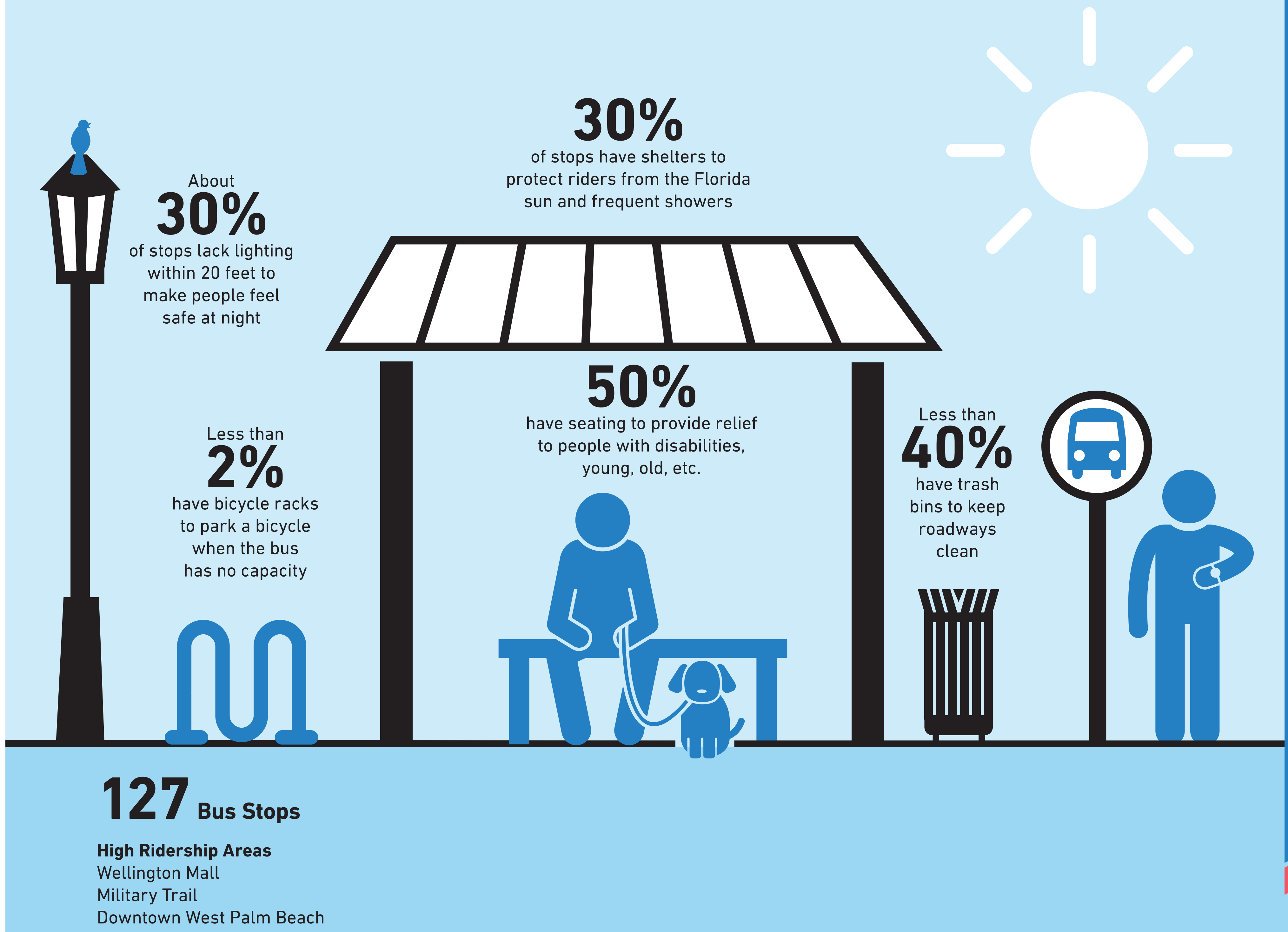
Stops with shade, lighting, seating, trash receptacles, and art or places of interest nearby help transit riders feel safe and comfortable on their journeys. A lack of amenities discourages ridership and creates an undignified circumstance for riders. Many transit stops along the corridor have no amenities at all.

Today, high ridership areas correlate to areas with a high percentage of people who need transit to get to work or meet their daily needs. Areas with low ridership are near large, single family residential neighborhoods that have many households with one or more cars.

Palm Tran Route 43 is the primary route for the study corridor. Route 43 largely runs on time or better, except for one eastbound segment during the evening commute. This delay window is likely caused by commuter traffic trying to reach Florida's Turnpike. Route 43 serves the West Palm Beach Intermodal Transit Center, which includes connections to Tri-Rail and Amtrak. The Tri-Rail commuter service connects West Palm Beach to Mangonia Park and Miami International Airport. This route would remain in place providing local service, along with other Palm Tran Routes 40, 44, 33, and 52.

Many people in the study corridor depend on transit services to get to work and meet their daily transportation needs. The existing bus network provides essential service for captive riders, however, stop amenities, route gaps, and inconsistent travel time tends to discourage attracting choice riders.

> Current transit service is productive but limited and is impacted by traffic and many stops lack amenities that encourage ridership.

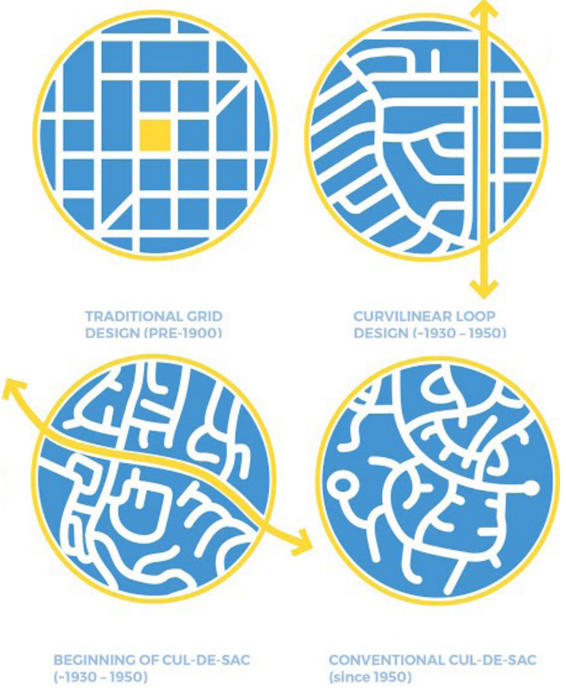


Driving

Balancing the need for development access and long distance mobility for drivers will only grow more challenging in the future. This is further intensified by the lack of parallel local and collector roadway connections along the corridor. People driving themselves have no choice but to become part of the congestion on Okeechobee Blvd.

While the corridor traffic volume and capacity appear sufficient today, the area's roadways will not be able to handle future growth. With 6–8 lanes through much of the corridor, there is little room to expand.

To make sure the transportation system will meet the needs of everyone down the road, more options must be developed to meet the mobility needs of everyone. Each person using rail, transit, walking, bicycling, and micro transit all help to alleviate the strain on vehicle traffic.



Connected street networks and reduces land consumption, provides greater accessibility and crossing opportunity, and increases network efficiency and relaiblility. (Source: Congress for New Urbanism, Street Networks 101)

Top 5 Employment Centers

1 City of West Palm Beach

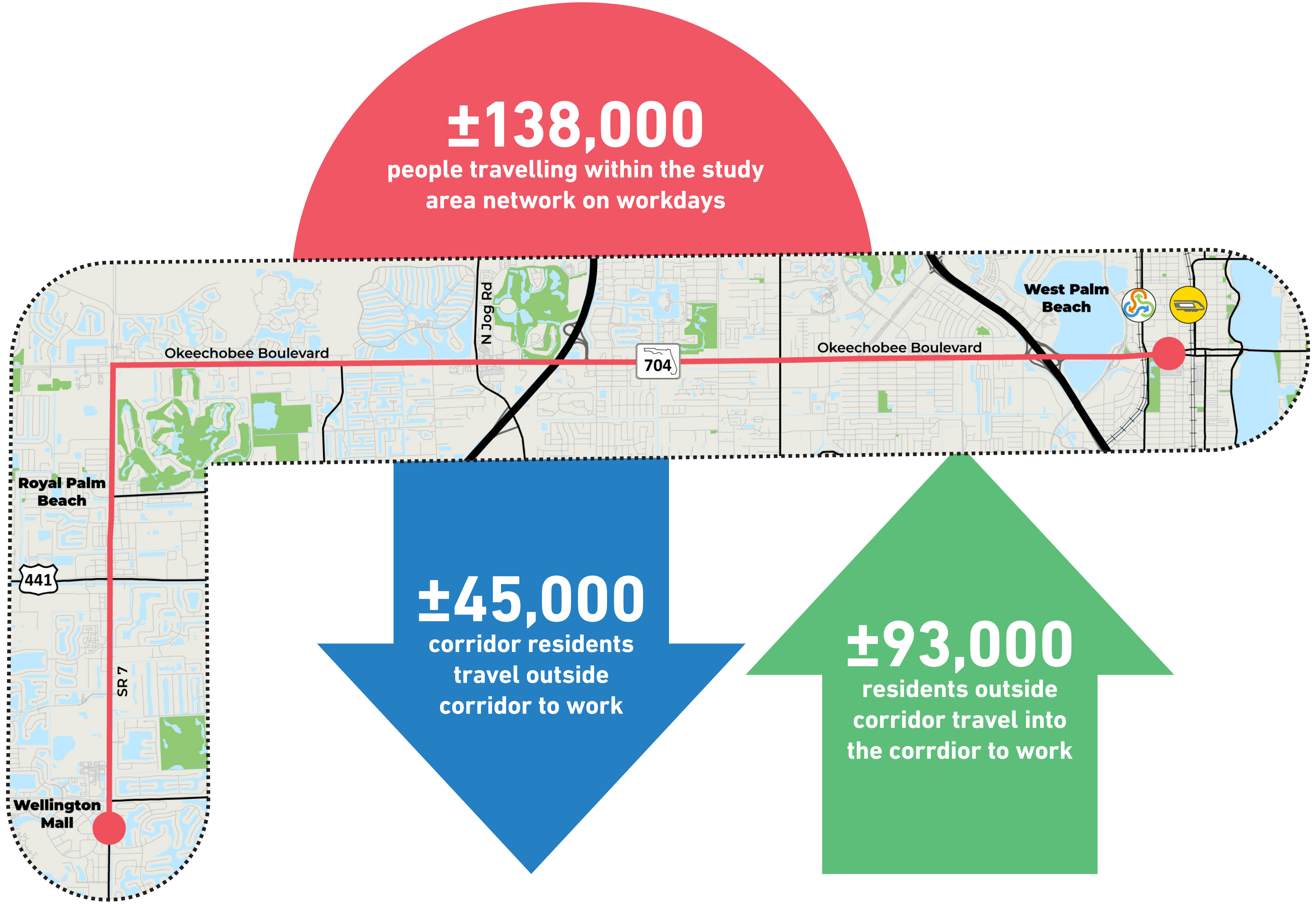
2 Wellington Village

3 Royal Palm Beach Village

4 The Acreage (Census Designated Place)

5 City of Palm Beach Gardens

Most jobs are concentrated in West Palm Beach



United States Census Bureau (2021), https://onthemap.ces.census.gov.

Safety

Okeechobee Blvd. & SR 7 is historically one of the most crash-prone corridors in the county, with a high number of pedestrian crashes occurring between the Florida Turnpike and I-95.

Putting multimodal transportation modes first and creating a safe road for everyone go hand in hand because all people riding transit must use another mode at some point in their journey. To support safe, equitable, and multimodal transportation choices in Palm Beach County, the vulnerable road users who use first and last mile connections to access transit must be prioritized. Because areas with high transit ridership match those with lower walking and bicycling scores, it is that critical people who rely on transit have a safe and connected multimodal network to get where they need to go.

Traffic crashes killed 24 and incapacitated 61 people occurred between 2017 and 2021.

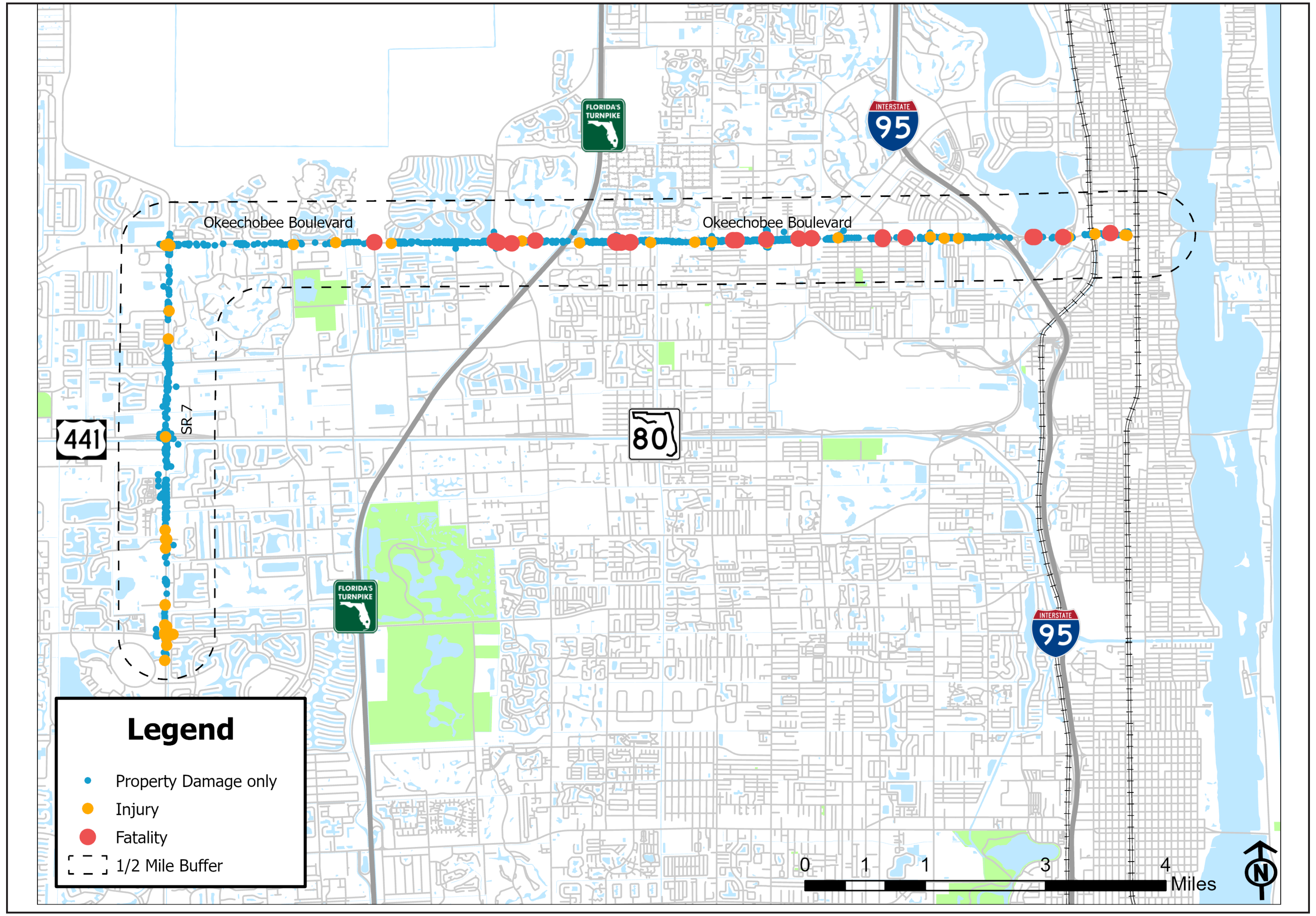
5,122
crashes along the corridor 2017–2021

102
bicycle and pedestrian crashes; many of which resulted in an injury

14
people killed walking or bicycling in the corridor

Source: Signal4Analytics; University of Florida; 2017-2021.
signal4analytics.com/

Vehicular Crashes



Land Use

The existing land uses along the study corridor are primarily suburban neighborhoods and strip development commercial areas. However, almost all of the corridor east of Military Trail is either actively redeveloping or has the potential for higher-density, mixed-use developments, especially near West Palm Beach and the Westgate Community Redevelopment Area (CRA). The suburban areas west of Florida's Turnpike have wide right of ways which can accommodate more mobility options.

Today, most people travel the corridor by single-occupant vehicles and many people feel there are too many cars on the road already. Further, many of these people feel they have no option but to drive due to the community design around the roadways. Without a more efficient mode of transportation along the corridor such as transit and transit supportive investments in walking and bicycling, future redevelopment and growth will only add to the number of vehicles driving every day.

The corridor has many opportunities for both development and re-development to support transit investments. For example, the southeast corner of Okeechobee Blvd. and SR 7 could include in its redevelopment a park-and-ride facility to encourage suburban commuters from the west to take transit instead of driving.

Top Five Area Employment Generators: City of West Palm Beach, Village of Wellington, and Royal Palm Beach Village, the Acreage Census Designated Place (CDP) and the City of Palm Beach Gardens.

What is Context Classification?

FDOT uses context classification to design roadways in an area so people's driving needs are met. Context classification considers land use, development patterns and roadway network. Much of the study area is suburban residential, suburban commercial and urban general. Downtown West Palm Beach is classified as urban core.

C3R—Suburban Residential

Residential uses with large blocks and a disconnected or sparse roadway network.

C3C—Suburban Commercial

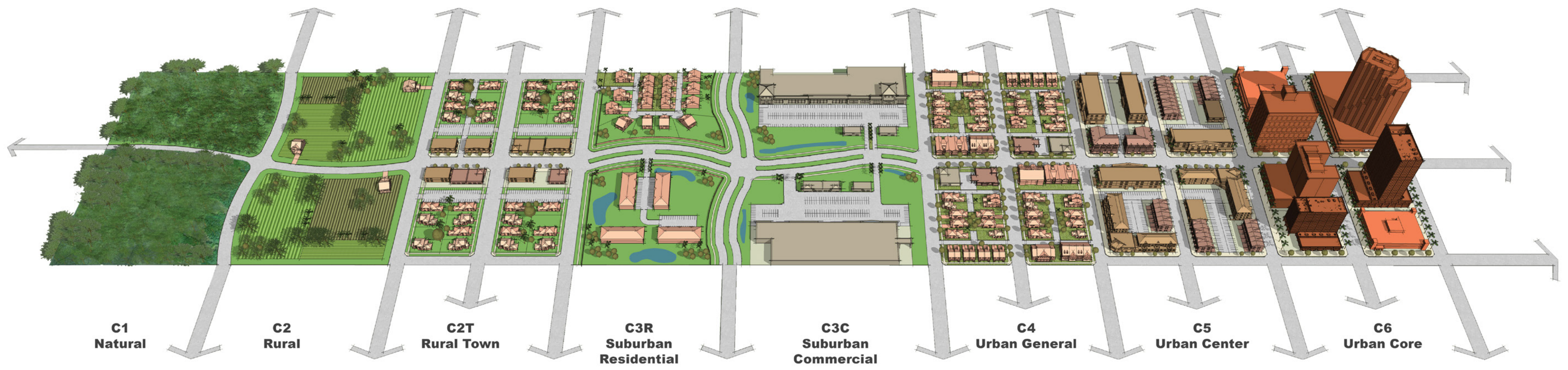
Mostly commercial uses with large buildings and parking lots and a disconnected roadway network.

C4—Urban General

Mixed-uses with a well-connected roadway network.

C6—Urban Core

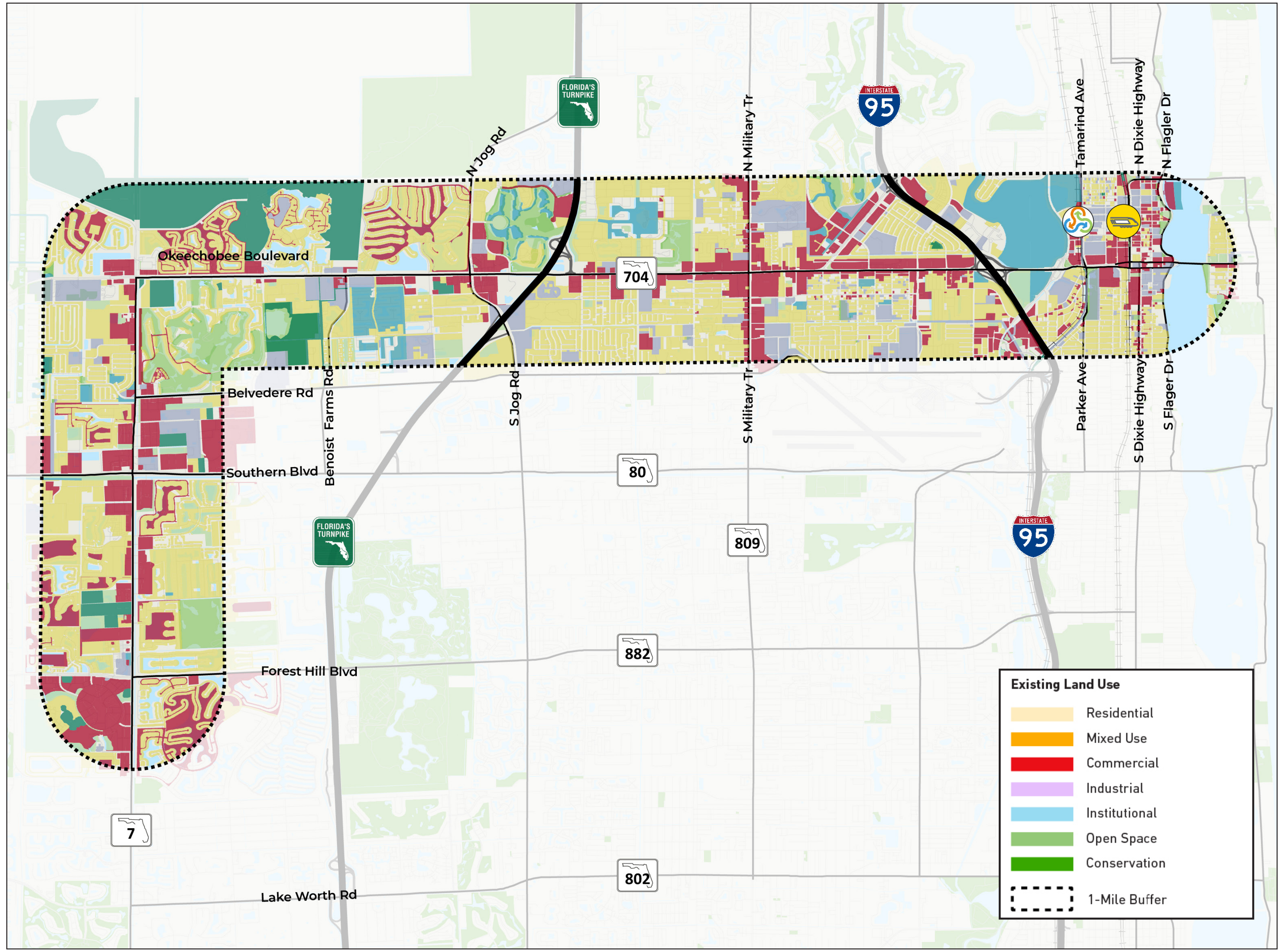
Very high densities and the tallest building heights. A population greater than one million and a well-connected roadway network.



Additionally, neighborhoods with more people living in them and with more jobs have the greatest potential to support enhanced multimodal transportation for people walking, bicycling and using transit. Typically, more mixed-use and medium to higher density residential developments generate the greatest potential for developing a premium transit rider base. Likewise, underused parcels offer spaces to shift the region's built environment toward more walkable, bikeable and transit-friendly transportation.

Pictures from left to right at various locations along Okeechobee Boulevard: SR 7 demonstrating a C3C and C3R Context Classification; Palm Beach Lakes demonstrating a C4 Context Classification; and C6 in downtown West Palm Beach. (Source: Google Earth Pro, 2022 Aerial).

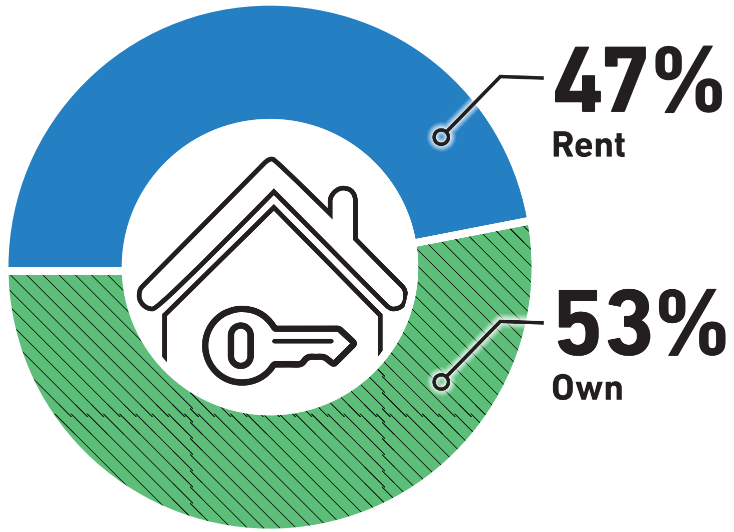
Land Use



Affordable Housing

In Palm Beach County, the combined costs of transportation and housing for the average household is 66%. People whose costs exceed the national average of 45% are at higher risk for displacement or being cost burdened. There are large pockets of families, particularly around Military Trail and I-95, who are experiencing poverty or who do not own or have access to a vehicle.

Housing expenses plus transportation costs for purchasing, insuring, maintaining, and fueling a personal vehicle make simply meeting basic needs in Palm Beach County challenging for many residents. Walking, bicycling and taking transit are more affordable transportation options, but without safer, more connected and more accessible infrastructure, these alternative modes will remain out of reach for many community members.



Indicators of housing and transportation affordability suggest the study area is more likely to be cost-burdened by housing and transportation-related costs.

More than 60% of the corridor falls at or below the Palm Beach County's median family income of $59,943.

More than 20% of people living in the study area are experiencing poverty—that's nearly 10% higher than the countywide average.

Quality of Life & Environment

Health

Reliance on personal vehicles as a primary mode of transportation presents several challenges to health. Nationally, the transportation sector contributes to 29% of the United States' greenhouse gas emissions, passenger cars being one of the main sources of emissions. Increases in greenhouse gases are associated with a multitude of negative health outcomes including heat-related illnesses, lung cancer, asthma, displacement, and increased prevalence of communicable disease. The study corridor sees heart disease, stroke, diabetes and homicide at rates double the county average.

A healthy transportation system helps make a healthy community. But without basic infrastructure that supports active modes like walking, bicycling and taking transit, community members must depend on cars to reach all their destinations. When communities are designed solely around cars, people who do not have access to a car or who cannot afford one lack access to the transportation system. Walking, bicycling, and using transit are all much more sustainable transportation modes than driving alone, which is characteristic of the corridor.

The associations between transportation design and health outcomes are well established in literature. The different design elements impact on various quality of life elements is shown below and was analyzed as part of this study.

The associations between transportation design and health outcomes are well established in literature. The different design elements impact on various quality of life elements is shown below and was analyzed as part of this study.

Study Area Health Conditions that Exceed the County Average

- Asthma
- Heart disease*
- Stroke*
- Nutritional deficiencies*
- Diabetes*
- Disability*
- Cancer
- Life expectancy
- Homicides*

*rates more than double the county

Okeechobee Blvd & SR 7 Corridor Study Design Elements by Transportation-Alternative Health Analysis Categories

Design Element	Air Quality & Resilience	Physical Activity	Road Safety	Accessibility	Health Equity
Sidewalk Width	+	+	+	+	+
Bicycle Lane Width	+	+	+		+
Travel Lane Width			+		
Buffer Zone Width	+	+	+	+	+
Type of Bicycle Lane	+	+	+		+
Median Green Space	+	+	+		
Type of Transit	+			+	+
Construction Impacts	+	+	+		

One example are the health effects resulting from designs that encourage walking or bicycling, as opposed to driving a car. Wider sidewalks and separated bicycle lanes promote pedestrian and bicyclist activity through related mechanisms. Both design features (i.e. broader walkways, and a physical barrier between oncoming traffic and bicyclists) increase the perceived safety of walking or bicycling along such areas, and may in turn promote physical activity. As such, design elements that increase active transportation engagement will also improve rates of physical activity, air quality, and their related diseases. Associated behavioral and health outcomes with transit include:

- Sustainable infrastructure in the form of green technology investments
- Reduction in greenhouse gas emissions
- Improve functional capacity in performing daily activities
- Increase the number of individuals meeting daily exercise requirements
- Lower Body Mass Index
- Increase social interactions within the community
- Reduce vehicle crashes
- Equitable access to employment opportunities, and goods and services, especially for low-income individuals, older adults, or people living with disabilities

Economic Mobility

The economic mobility of the corridor is limited. As documented previously, there is a strong presence of economic disadvantaged communities while also being transportation and housing costs burdened. The potential for premium transit to increase economic mobility could reduce transportation costs by providing new transit options, while also increasing the market rate and affordable housing supply.

Combined with air pollution from vehicle exhaust, access issues undermine a community's mental and physical well-being. A transit-first corridor approach will have safer streets for people walking and bicycling, reduce the number of vehicles on the roads and driving speeds, greater opportunities for active recreation, and easier access to medical care, healthy foods and essential services.By developing a premium transit line, more people could live and work closer to options and allows them to consider non-driving options.

Education

Nearly 70% of the study corridor does not have a bachelor's degree. Education is an important factor in a person's employment potential and income opportunities. People with bachelor's degrees experience lower rates of unemployment and earn more than people who have less education.Safer and more reliable multimodal transit in Palm Beach County could help connect students of all ages to educational opportunities.

Range of Development Potential Premium Transit Scenarios

	Low (-10%)	Medium	High (+10%)
New Units and Affordable Units	15,760	17,511	19,262
Non-Residential (square feet)	13,778,478	15,309,420	16,840,362
Parking Spaces	36,558	40,620	44,682
Jobs	64,992	72,214	79,435

Just over **30%** of corridor residents have a bachelor's degree.

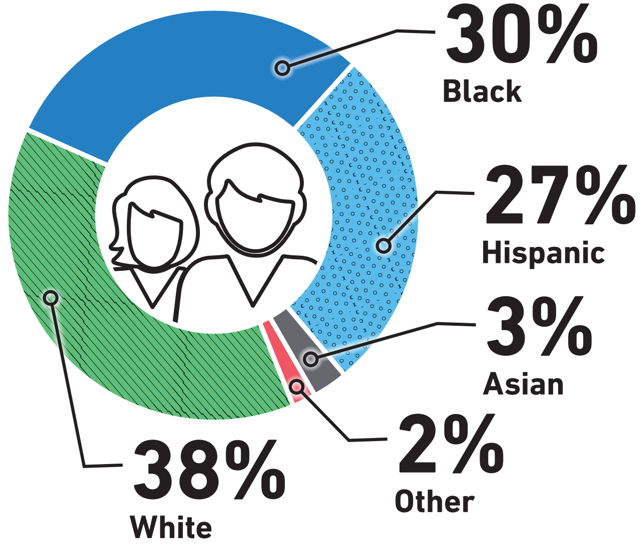
Equity

Several equity related measures were assessed. The transportation-alternative health analysis factors for health equity included:

- Construction impacts
- Aging-in place
- Distribution of diseases
- Social vulnerability

Race

More than 60% of the corridor's population identifies as Black, Hispanic, Asian or other. All communities must be accounted for when designing a transportation system. Premium transit along Okeechobee Blvd. and SR 7 could provide better and safer transit access for these communities.



Age

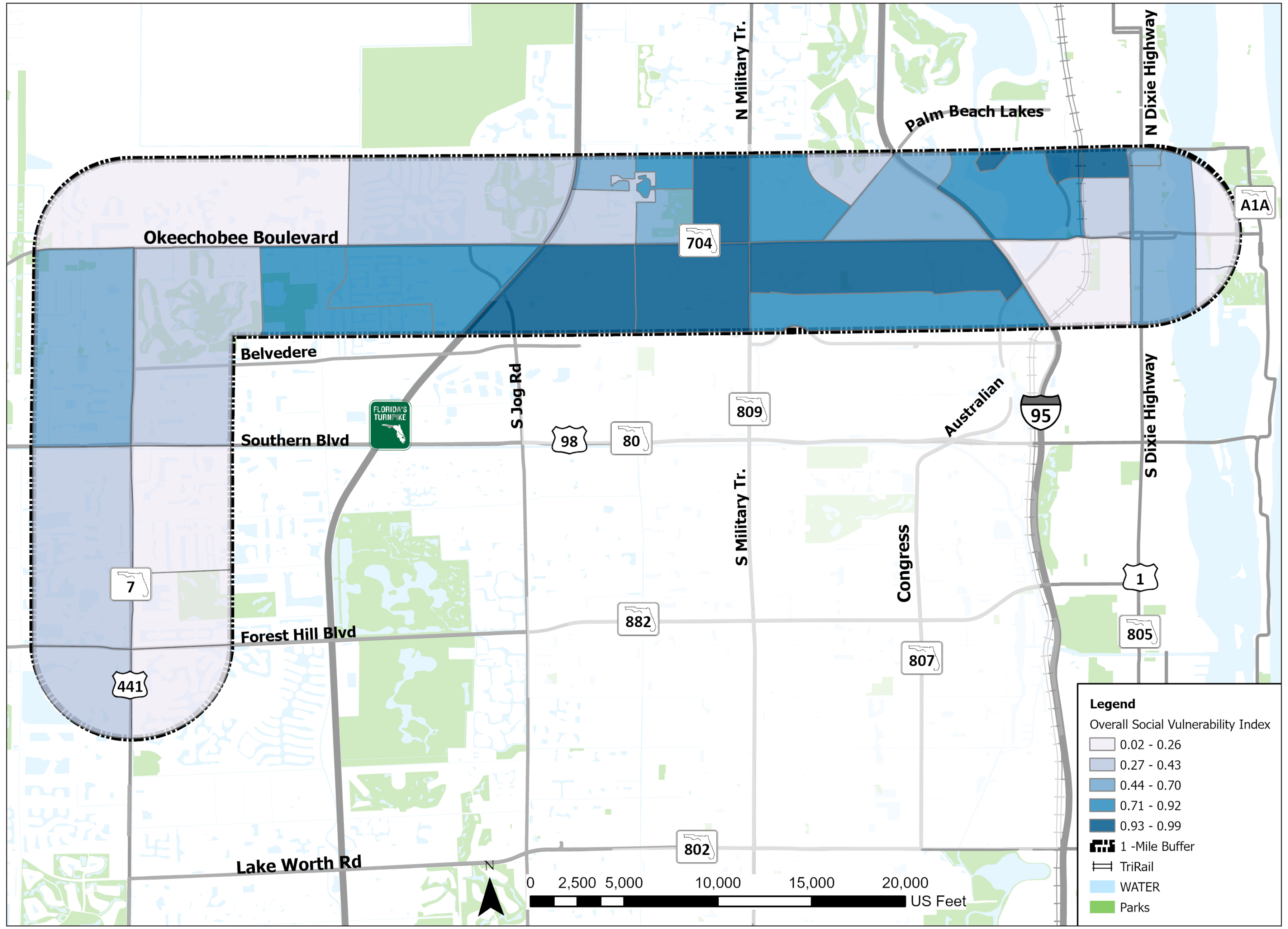
More than one third of the corridor's population is younger than 18 or older than 65. People in these age groups have unique transportation needs. Aging persons higher risk of fatal and severe injuries in car crashes and young drivers' inexperience and tendency to be easily distracted contribute to their higher rate of fatal crashes. As pedestrians, both children and older adults may need more time to cross the street safely.

35% of the study area's population is under 18 or over 65

Social Vulnerability

The CDC and Agency for Toxic Substances and Disease Registry's (ATSDR) Social Vulnerability Index (SVI) measures the impact of external stressors on health during times of emergency. Importantly, social vulnerability is a measure of community resilience. The social vulnerability index is composed of 15 factors from the US Census that identify subsets of a population with increased susceptibility to human suffering and economic losses in event of an emergency. Overall, there are four primary themes that affect social vulnerability, which are: housing and transportation, race/ethnicity/language, socioeconomic status, and household composition. The following map shows the overall social vulnerability in the Okeechobee Blvd. & SR 7 Study Corridor.

Overall Social Vulnerability Index



Alternatives Summary

Transit Alternatives

After careful study of the Okeechobee Blvd. & SR 7 corridor and listening sessions with the public and community stakeholders, the project team developed and evaluated seven transit alternatives.

1

No build alternative: This alternative functions as a control, allowing a baseline measurement against the six other alternatives to test the impacts of different alternatives.

2

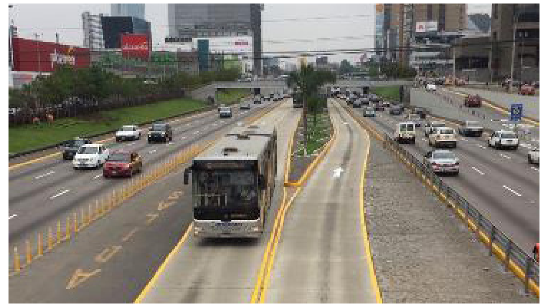
Mixed Traffic Bus with Limited Stops: This alternative would improve transit travel time for long-distance trips by reducing stops at key destinations and transfer points. The buses would run in existing outside or curbside travel lanes shared with other cars and trucks.

3

Business and Access Transit Lanes: Business and access transit (BAT) lanes, which are bus-only lanes with limited access for other vehicles. BAT lanes are created by converting an existing curbside travel lane and marking the pavement as bus-only, sometimes in a different color to visually separate BAT lanes from regular travel lanes. Non-transit vehicles may only use the BAT lane when making a right-turn into or exiting a driveway or side street.

4

Curbside Dedicated-Lane Bus Rapid Transit: Another bus-only lane alternative, this option repurposes an outside or curbside lane for bus rapid transit (BRT). The BRT-only lane would run along more than 50 percent of the corridor length and have additional investments for transit stations. Although this alternative would restrict lane use for other vehicles, it would permit non-transit vehicles to access some adjacent driveways and side streets.



5

Center-Running Dedicated-Lane Bus Rapid Transit: The Bus Rapid Transit (BRT) repurposes an outside or curbside lane for bus exclusive use and would run along more than 50 percent of the corridor length. Although this alternative would restrict lane use for other vehicles, it would permit non-transit vehicles to access some adjacent driveways and side streets.

6

Center-Running Dedicated-Lane Light Rail Transit: The Center-Running BRT alternative would run within in the existing median, with center station platforms accessible from both sides of a street while establishing a refuge area for crossing pedestrians. Implementing this transit alternative requires repurposing one existing inside travel lane in each direction along the length of the corridor, and stations in the medians at major intersections.

7

Elevated Grade-Separated Light Rail Transit: This alternative would construct an elevated guideway above street level for LRT vehicles. For this alternative, support columns would be required along the entire corridor with constructed long segments to span major intersections.

How Alternatives were Evaluated

Each alternative was evaluated by the study team and evaluated to consider whether improvements would improve or degrade over time. This is represented by the graphic from green to red. For instance, the options favored by the public generally during community workshops leaned towards a dedicated space for transit operations. For more information on each assessment, consider reviewing Appendices A through E.

Alternatives Project Goal Performance Rating

Alternative/Project Goal	Mobility	Public Feedback	Safety	Health	Return on Investment
No Build					
Mixed Traffic Bus Stops					
Business and Access Transit Lanes					
Curbside Dedicated-Lane Bus Rapid Transit					
Center-Running Dedicated-Lane Bus Rapid Transit					
Center-Running Dedicated-Lane Light Rail Transit					
Elevated Grade-Separated Light Rail Transit					

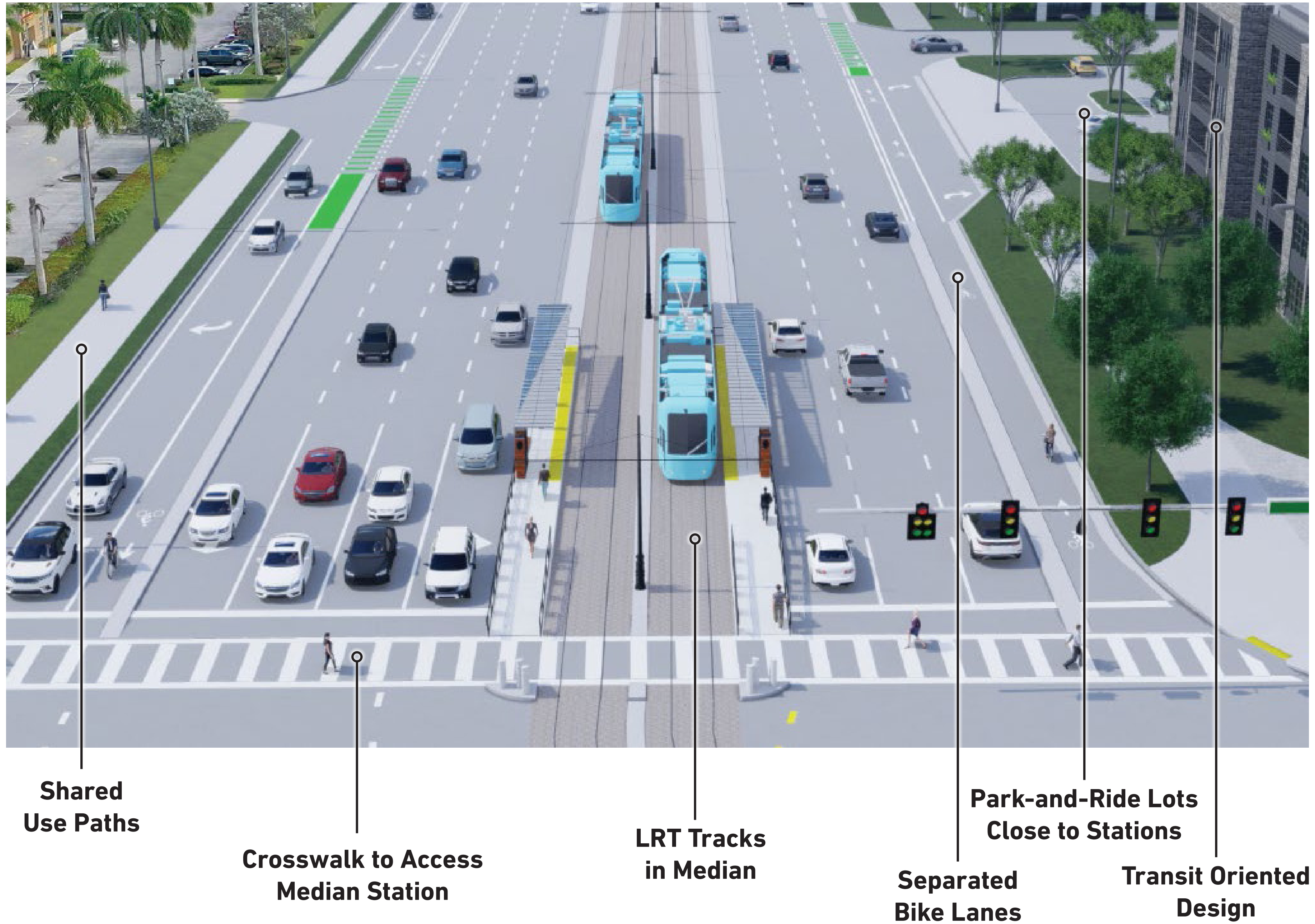
3

DESIRED CONCEPT

Center-Running Dedicated-Lane LRT

Based on a preliminary analysis of the corridor, center-running dedicated-lane light rail transit (LRT) will best serve Palm Beach County and the Okeechobee Blvd. & SR 7 corridor. Because of the more permanent nature of light rail investment, this type of transit has the potential to transform the corridor into the mixed-use, compact, and dense urban context necessary to support the area's projected population and economic growth. Transit-oriented development creates concentrated nodes; these mixed-use developments encourage people to walk, bike and use transit. By moving people with trains, bicycles and their own two feet, light rail and its surrounding development will help relieve additional congestion that will occur without additional transportation options along Okeechobee Blvd. & SR 7 and improve air quality along the way. The community enthusiasm generated by LRT will also help contribute to its long-term success, both in terms of ridership and funding.

Rendering of Center-Running LRT on Okeechobee Blvd.



Before and After Station Area Renderings

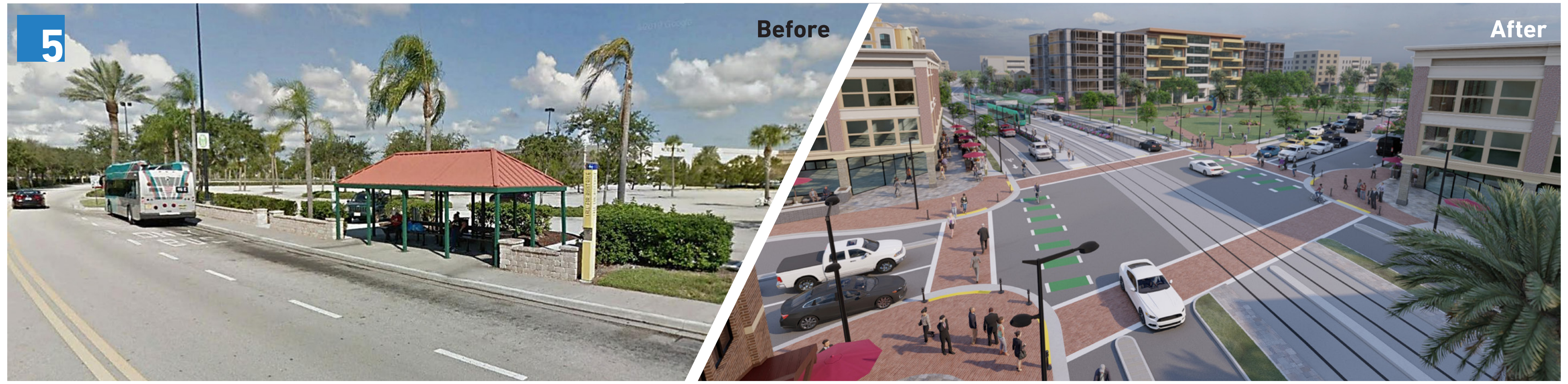
1 Congress Avenue Station Area

2 Military Trail Station Area

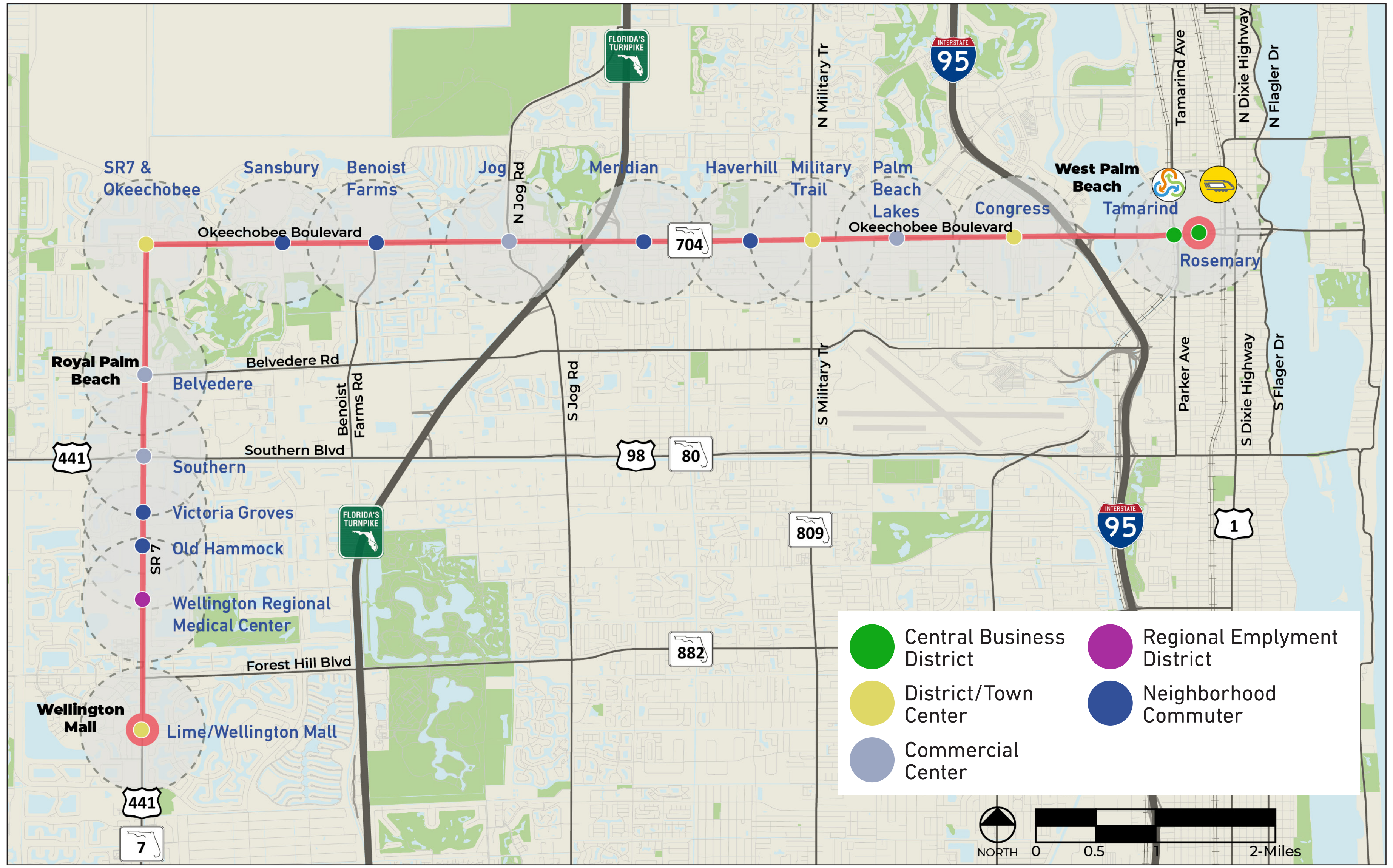
3 Jog Road Station Area

4 State Road 7 Station Area

5 Forest Hill Blvd. Station Area



Proposed Stations



LRT Benefits

- **The Okeechobee Blvd. corridor is the most centrally situated east-west corridor in the 561 Plan that connects to Downtown West Palm Beach.** Not only does it provide a direct east-west connection to Downtown West Palm Beach, but Okeechobee Blvd. is also the only east-west corridor in Palm Beach County to connect to both north-south passenger rail corridors (Tri-Rail/SFRC and Brightline/Coastal Link).
- **Highest potential for ridership and transit-supportive development.** Compared to driving and riding a bus, rail offers users smoother rides and less stress. Users are often more excited about and more eager to ride rail transit systems because of their modern design and future-oriented appeal. Like BRT, LRT allows the ability to increase capacity as ridership grows. As ridership increases, so too will the attractiveness and economic and residential benefits of transit-supportive development and redevelopment along the corridor.
- **More permanent infrastructure.** When paired with station-area and transit-oriented development, the permanence of LRT infrastructure helps to attract and focus development along the transit line.
- **The ability to choose transit over other modes.** Future residents, employees, and visitors along the corridor would be able to choose a reliable transit option that is competitive with other modes for their daily trips or commutes. This would also reduce the reliance on motor vehicles as a primary form of transportation. TPA data show that one in ten households located along the corridor are zero-car households.
- **Improvements to the corridor's tax-base.** Concentrating development near transit stations would improve infrastructure and increase property values.
- **Expanded affordable housing opportunities.** An LRT transit line along the corridor would provide safe and reliable transportation for people without access to cars. Development along this line would offer more locations for building much-needed affordable housing and many new jobs. Approximately 17,500 new homes and 72,200 new jobs could be created.
- **Reduce development pressure and create quality open spaces.** A higher-concentration of development through up-zoning or infilling around station areas may ease pressures on development in the western portion of Palm Beach County. Through redevelopment, more quality open spaces could be planned for increasing the overall amount of and access to open space.

Prioritizing Corridor Segments

Using premium transit to address the safety and congestion issues of Okeechobee Blvd between SR 7 and Downtown West Palm Beach should be a priority. The needs of SR 7 south of Okeechobee Blvd toward the Mall at Wellington Green are more uncertain. While the Mall and the Wellington Regional Medical Center may generate ridership as employment or commercial centers, the current land use patterns along SR 7 would likely limit the project's initial success. Moreover, advancing only the Okeechobee Blvd portion of the corridor will likely improve cost effectiveness metrics for Federal funding. (For more on segment priorities, see appendix C.)

Examples of Upcoming Development in the Downtown West Palm Beach Study Area

Tamrind Avenue Streetscape

Anchor Site

Additional Considerations

Transit-Oriented Development

Transit-oriented development (TOD) is pedestrian-oriented, compact, mixed-use development that is centered on quality public transit. It typically includes a mix of housing, office, retail, neighborhood amenities and other uses within walking distance of a transit station. TOD's are fundamental to both increasing the housing stock of both affordable and market rate homes, and to providing new transportation options to the area. TOD for this study area would increase ridership by creating:

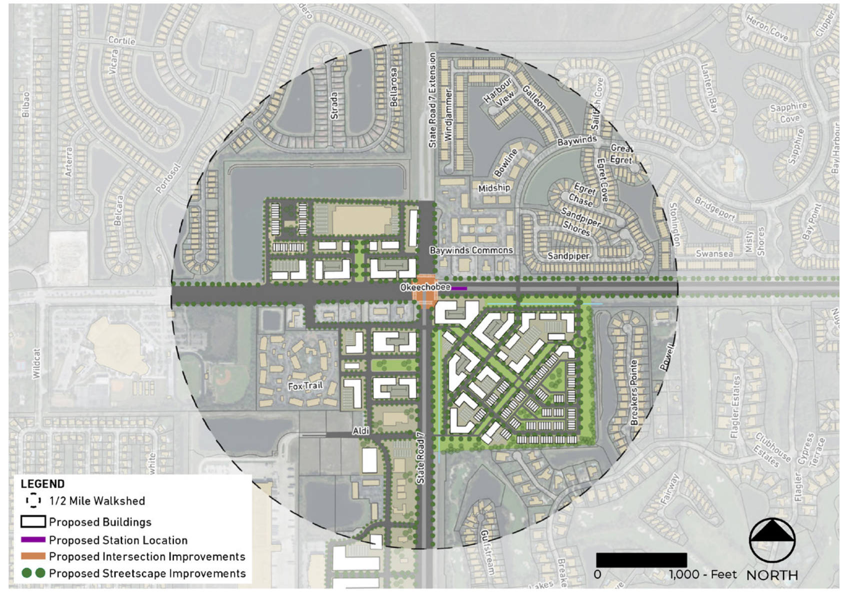
- **Mixed uses** create density that attracts destinations and provides quick and easy access to goods and services. Such closeness supports quick trips by foot or bike, which reduces car dependency and increases transit ridership.
- **Mobility and circulation** help people move safely and comfortably and supports more walking and bicycling trips.
- **Improved access to premium transit** supports more equitable access to jobs, services, and affordable housing.

Station Area Plans

The redevelopment potential of station areas that would be served by LRT along Okeechobee Blvd and SR 7 was identified for stations along the proposed route. By concentrating intentional, transit-supportive development around transit stations, vibrant community spaces and neighborhoods could develop that people want to live in and visit around LRT stations. In these areas, walkable, mixed-use development patterns convert car-centric spaces into compact and engaging places that welcome pedestrians and cyclists.

To visualize how these stations might look, 17 station area conceptual plans were created along the study corridor. These plans use context-sensitive design to make sure the right amenities are in the right place for a particular station type. Land use scenarios for each station area reflect infrastructure and development necessary to support transit ridership and opportunities for economic development or redevelopment. (For the complete list of and more details on the station area plans, see appendix E.)

Sample Station Area Plan at SR 7



Station Area Projections

Potential New Residential
1,291 Homes
194 Affordable Units*

Potential New Commercial
1,027,694 SF

Estimated Ad Valorem Tax Revenue
$632,017,500

Potential New Employment
5,568 Jobs

Potential New Parking
1,028 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

Transit Supportive Neighborhood Elements

The neighborhood is safe, connected, and supports walking and bicycling.

- People feel like getting around by foot or bicycle is convenient, safe, and comfortable.
- Public spaces are active and vibrant
- Bicycle parking and storage is ample and secure.

There is a complete network of streets and paths.

- Walking and bicyling routes are short, direct, and varied.
- Motor vehicles can utilize a network rather than relying on major arterials

Opportunities for people of different backgrounds and incomes.

- Access to goods in services are within a short walking or bicycling distance
- Public space is active for much of the day.
- Transit routes are seen as a reliable means of movement.

There is nearby, high-quality public transportation.

- High-quality transit is accessible by foot or by bike.
- Reliability of frequent transit vehicles.

The community is accessible by a short transit ride.

- The development is in or near an existing urban area.
- Traveling through the area or city is convenient.

Transportation Demand Management.

- Use of the land is not tied to standardized parking requirements and is separate from leases.
- Property developers and managers are required to provide transportation demand management solutions.

4 WHAT'S NEXT?

Transit Over Time

The development of premium transit services does not happen overnight, and more frequently takes at least of decade of proofing to ensure the concept is feasible. Improvements to the corridors to service existing riders is one key

Many service enhancements are already planned or have occurred along these roadways and include both operations and capital investments. These enhancements include:

- Transit Signal Priority
- Enhanced Bus Shelters
- Service Enhancements consistent with the Palm Tran Transit Development Plan

Example Transformation Success Story – Phoenix, AZ

In the report, Building Communities and Enhancing Lives: A Quality of Life Report Valley Metro shares the changes light rail has supported in local communities across the Phoenix region since beginning service on December 27, 2008. The myriad benefits that light rail catalyzes in their communities is realized with more than $11 billion in economic investment along light rail since 2008, providing a greater access to jobs, schools and entertainment. Additional acceptance of transit was confirmed when city of Phoenix voters passed Proposition 104, a sales tax extension and increase known as Transportation 2050 (T2050), resulting in a $31.5 billion funding mechanism to significantly enhance bus service, improve streets and advance rail projects.

"The Maricopa Association of Governments applauds the success of the first decade of light rail service in our region. The system benefits all communities, whether they have light rail or not. It reduces overall traffic and improves our quality of life by providing important regional connections."

—Gail Barney, Queen Creek Mayor, Chair of the Maricopa Association of Governments

Park-and-Rides

Convenient park-and-ride lots support people who want to avoid the congested arterial system, but prefer to have the convenience of their personal automobile for a short distance. Commuters can drive to the transit station and park their cars while understanding that first mile and last mile connections will support the end of their journey. These facilities make LRT an attractive and convenient service, and would help remove people driving from the corridor. Additionally, park-and-rides can be a key tenant of land development requirements to ensure that development does not hinder neighboring communities access to the system.

5 REALIZING THE VISION

Establishing a desired concept is only a small step towards implementing any enhancements towards a much larger series of steps in the transit development process. Many different stakeholders are currently engaged but their attention must be retained throughout a series of projects, analysis, and key questions are answered between now and implementation. The goal before establishing a desired date for launch is to work collaboratively to enhance existing service for current riders, which will generate greater ridership and demand for enhanced transit service.

Different alternatives could be realized as the community works towards accomplishing the desired concept. As service and operational enhancements generate additional ridership. There are three key steps to accomplishing the first major step towards an enhanced, dedicated service in the study area. Further, developing a reliable and rapid transit service requires enhancements be made over time and alterations to systems and operations to guarentee the vision is realized and maintained. Some projects may require further alterations to the roadway after completion such as transit shelter placement and relocation.

Finally, the development of new transit systems typically require significant capital investment. This capital investment typically requires stringient federal level environmental screening and clearances to implement a new system. The development of a locally preferred alternative beyond this vision requires a collaborative and coordinated design between right-of-way owners, operators, jurisdictions and the TPA.

Implement Projects

- Transit Signal Priority and Enhanced Transit Shelters
- Service Enhancements consistent with the Palm Tran Transit Development Plan

Land Use & Economic Dev.

- Share Recommendations with Local Stakeholders
- Re-orient land use and zoning configurations to align with TOD station areas

Further Analyze & Refine

- FDOT to conduct detailed analysis of transit vision and alternatives
- Increase safe, convenient and connected walking, bicycling, and transit options along the corridor

Funding the Vision

Funding is necessary for the vision to ultimately become a reality. Several different funding sources will be explored moving forward, to include a variety of federal, state, and local options for transit capital investments.

Federal Resources

- Federal Transit Administration (FTA) Capital Investment Grants (CIG) Program, which provides funding for transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and BRT.Federal transit law requires transit agencies seeking CIG funding to complete a series of steps over several years.For New Starts and Core Capacity projects, the law requires completion of two phases in advance of receipt of a construction grant agreement – Project Development and Engineering.For Small Starts projects, the law requires completion of one phase in advance of receipt of a construction grant agreement – Project Development.The law also requires projects to be rated by FTA at various points in the process according to statutory criteria evaluating project justification and local financial commitment (For more on the requirements for this program, see Appendix C.)
- Discretionary Grants Program:There are several discretionary grants that are applicable for funding transit investments to include:
  - Rebuilding America Infrastructure with Sustainability and Equity (RAISE).The eligibility requirements of RAISE allow project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs.RAISE can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional Federal programs which provide funding to very specific groups of applicants (mostly State DOTs and transit agencies).This flexibility allows USDOT and partners at the State and local levels to work directly with a host of entities that own, operate, and maintain transportation infrastructure, but otherwise cannot turn to the Federal government for support.
  - Strengthening Mobility and Revolutionizing Transportation (SMART).The SMART program was established to provide grants to eligible public sector agencies to conduct demonstration projects focused on advanced smart community technologies and systems in order to improve transportation efficiency and safety.

State Resources

- State New Starts Funding:Provides up to 50% of the non-federal match for projects that successfully obtain FTA CIG funding
- State Transportation Trust Fund
- FDOT District 4 Dedicated Revenue Funding for Transit Operations
- Other Capital Sources
- Legislative Earmarks

Local Revenues

- Bonds
- Surtaxes
- Other

PALM BEACH
Transportation
Planning Agency

A: Existing Conditions Report

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List of Acronyms

AADT	Annual Average Daily Traffic
BAT	Business Access and Transit lanes
BRT	Bus Rapid Transit
CMF	Crash Modification Factor
DOT	Department of Transportation
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
HCM	Highway Capacity Manual
LOS	Level of Service
LRT	Light Rail Transit
LRTP	Long Range Transportation Plan
LRV	Light Rail Vehicle
MMLOS	Multimodal Level of Service
Q/LOS	Quality/Level of Service
SERPM	Southeast Florida Regional Planning Model
SOV	Single Occupant Vehicle
TCRP	Transit Cooperative Research Program
TDP	Transit Development Plan
TIP	Transportation Improvement Program
TPA	Palm Beach Transportation Planning Agency
TSP	Transit Signal Priority
UBR	Unified Basemap Repository

Introduction

The *Okeechobee Boulevard Multimodal Corridor Study* (MCS) evaluates transportation alternatives and transit supportive land uses to move people in a safe, efficient, and connected way, regardless of income, age, ability, or mode of travel across approximately 13.8 miles of Okeechobee Blvd/SR-704 and SR-7 as shown in **Figure 1**.

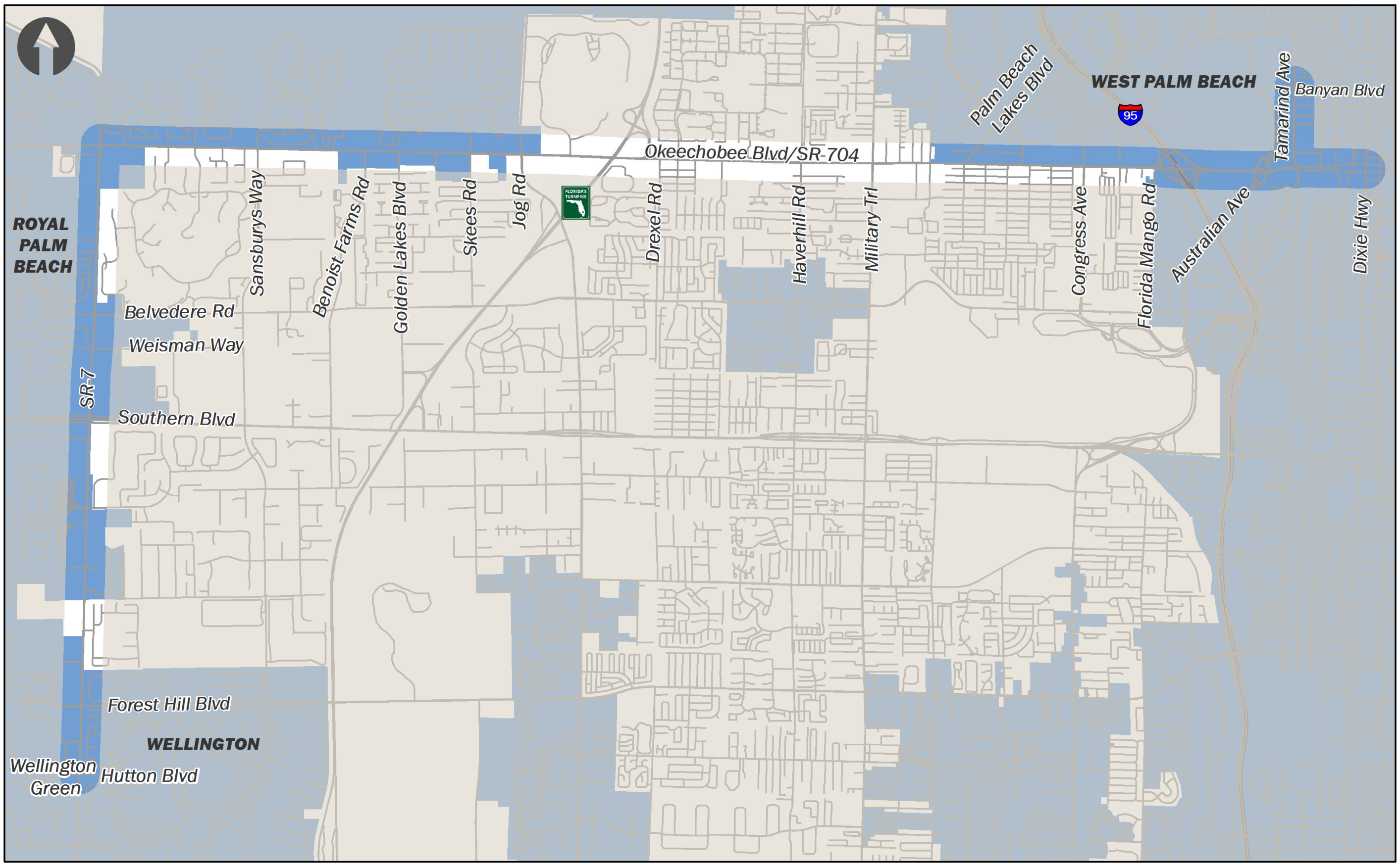


Figure 1. Study Corridors

Okeechobee Blvd/SR-704 and SR-7 are key corridors in central Palm Beach County, connecting two (2) transit hubs (The Mall at Wellington Green and the West Palm Beach Intermodal Center), while serving numerous residential communities and commercial developments across three (3) municipalities: Village of Wellington, Village of Royal Palm Beach, and City of West Palm Beach. Okeechobee Blvd/SR-704 provides a direct connection from suburban areas to downtown West Palm Beach and regional transit connections. SR-7 is a regional north-south corridor that connects to Okeechobee Blvd/SR-704 just before its northern terminus. In terms of the importance to the local transit network, Okeechobee Blvd/SR-704 and SR-7 intersect with sixteen of Palm Tran's 32 local fixed-routes and account for approximately 15 percent (15%) of system ridership.

There are dedicated bicycle and pedestrian facilities along a majority of the study corridors. However, the existing non-motorized facilities are basic and do not support the land use in promoting alternate modes of transportation.

The *Okeechobee Blvd Multimodal Corridor Study* is consistent with the Palm Beach Transportation Planning Agency's (TPA) *2045 Long Range Transportation Plan (LRTP)* and *Palm Tran's 2020 – 2029 Transit Development Plan (TDP),* which identify a network of enhanced transit corridors referred to as the "561 Plan." The 561 Plan was developed as part of the 2045 LRTP update based upon population and employment density, transit propensity, social equity, and existing and projected highest transit ridership routes. *Okeechobee Blvd/SR-704 and SR-7* are also identified in the 2045 LRTP Tier 1 Bicycle and Pedestrian Network Desires.

The *Okeechobee Blvd Multimodal Corridor Study* will develop a comprehensive plan to implement multimodal facilities that connect communities along the corridor through the development of a recommended enhanced transit strategy. This report identifies roadway alternatives and design options to support the advancement of enhanced transit strategies into the next phase of the *Okeechobee Blvd Multimodal Corridor Study* project development.

Corridor Vision

Purpose and Need

The purpose of the *Okeechobee Blvd Multimodal Corridor Study* is to evaluate and identify a locally preferred alternative for **Safe, Efficient, Connected, and Multimodal** transportation facilities along Okeechobee Blvd/SR-704 to SR-7. The study aims to implement continuous and safe facilities for all modes of travel, regardless of age and to maximize the efficient movement of people by allocating corridor space appropriately to pedestrians, bicyclists, transit vehicles, and motor vehicles, including freight, and single occupant vehicles (SOVs).

The TPA has adopted the Target of Zero traffic related fatalities and serious injuries. The TPA's *Vision Zero Action Plan* identifies Okeechobee Blvd/SR-704 and SR-7 as high crash corridors for pedestrians and Okeechobee Blvd/SR-704 as a high crash corridor for both pedestrians and bicyclists, with the intersection of Okeechobee Blvd/SR-704 and Military Trail as a hot spot for pedestrian and bicycle fatalities and serious injuries.

Future travel demand is also projected to increase with population growth and more development happening in the western communities as well as increased transportation demand in downtown West Palm Beach to regional connections. These issues will need to be addressed in order to provide a corridor that meets the two (2) purposes above.

Goals and Objectives

Goals and objectives help provide direction in defining a vision as well as seek to measure the desired outcome. The development of goals and objectives for the *Okeechobee Blvd Multimodal Corridor Study* began with an understanding of the Palm Beach TPA's Mission statement and Vision to assure consistency as well as Palm Tran's Mission statement. Shown below are the goals and objectives. As the *Okeechobee Blvd Multimodal Corridor Study* advances through collaborative efforts, further refinements to the goals and objectives may be made.

A DETERMINE APPROPRIATE ALLOCATION OF SPACE FOR NON-MOTORIZED USERS, TRANSIT, AND SOVS.

I. Provide safe facilities for the most vulnerable users first to create a comfortable experience.
II. Maximize the corridor throughout with emphasis on shared mobility.
III. Minimize travel time and delay for all users.
IV. Increase access to education, health care, and economic opportunity to improve community health.

B MAXIMIZE RETURN ON ANY INVESTMENT IN ENHANCED TRANSIT SERVICE AREA.

I. Locate transit stops at major existing and/or projected trip activity centers.
II. Provide enhanced amenities at enhanced transit areas.
III. Provide walkable and bikeable environments for first and last mile connection to improve access to transit.
IV. Promote transit-oriented land use patterns at transit stations
V. Promote redevelopment/infill development and capital improvement investments that support transit.

Palm Beach TPA Mission	To collaboratively plan, prioritize, and fund the transportation system.
Palm Beach TPA Vision	A safe, efficient, and connected multimodal transportation system.
Palm Tran Mission	Provide access to opportunity for everyone; safely, efficiently and courteously.

Roadway Analysis

Roadway analysis was performed to identify and document existing conditions, right-of-way availability, surrounding land uses, and define roadway alternatives to support potential enhanced transit strategies along the study corridors.

Field Audit

Field audits were conducted during July and September of 2020 to understand the study corridors and document existing conditions. Observations on how motor vehicles and vulnerable users interacted were taken into account and how the existing land use fit with the transportation characteristics. **Appendix A** includes photos taken along the study corridors that illustrate key corridor conditions.

Data Inventory and Mapping

The existing conditions data were gathered from a variety of different sources in order to understand the multimodal elements along Okeechobee Blvd/SR-704 and SR-7. A series of 8.5"x11" corridor maps illustrating the characteristics of the study corridors can be found in **Appendix B.** Figures shown below display key existing conditions data.

- **Figure 2.** Number of Lanes
- **Figure 3.** Existing Multimodal Facilities (bicycle and sidewalk facilities)
- **Figure 4.** Palm Tran's System
- **Figure 5.** Palm Beach TPA's Transportation Improvement Program (TIP) Projects Fiscal Year 2021-2025 projects (programmed for construction)

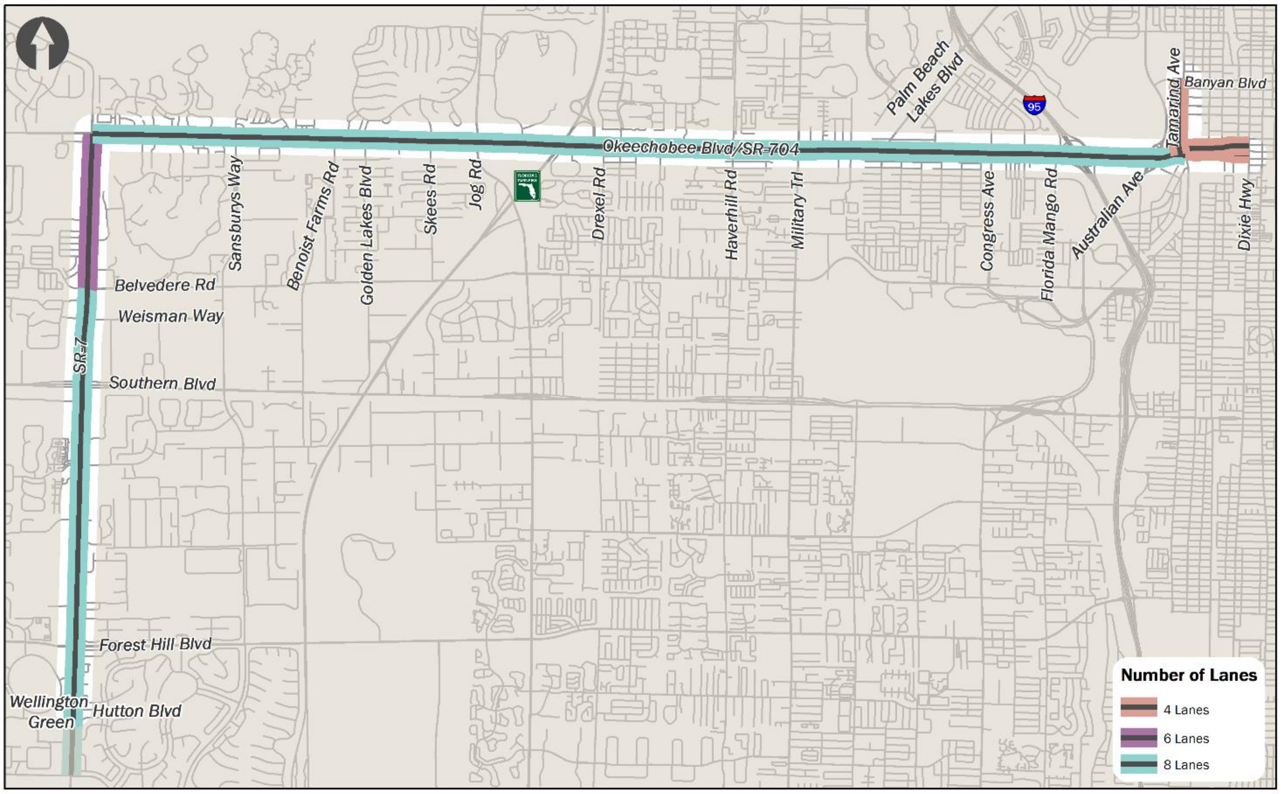


Figure 2. Number of Lanes

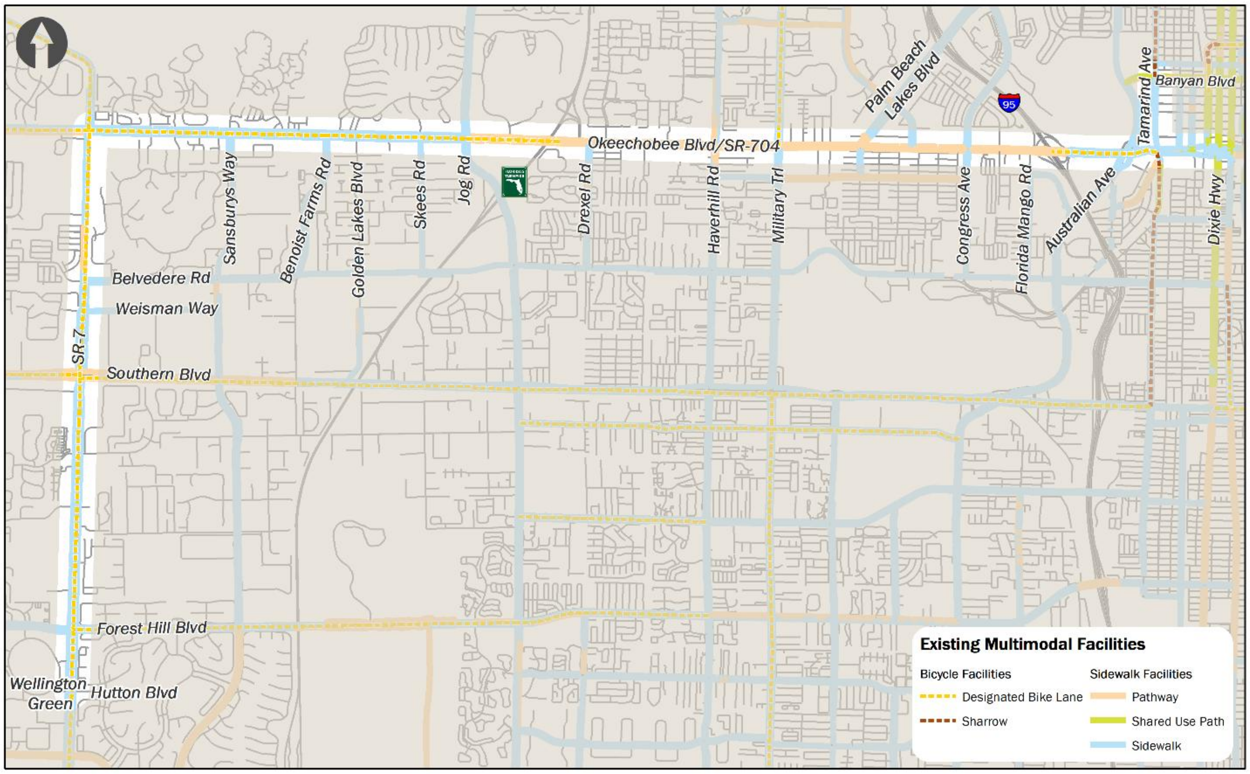


Figure 3. Existing Multimodal Facilities

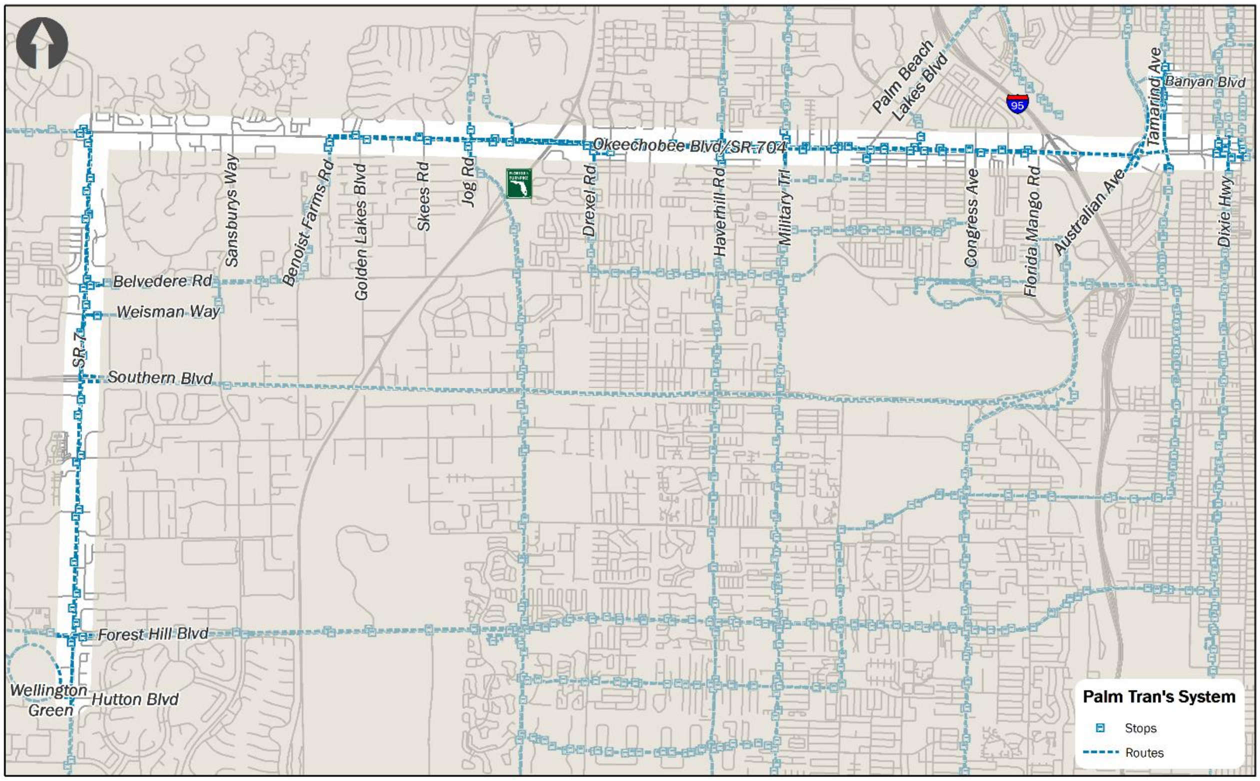


Figure 4. Palm Tran's System

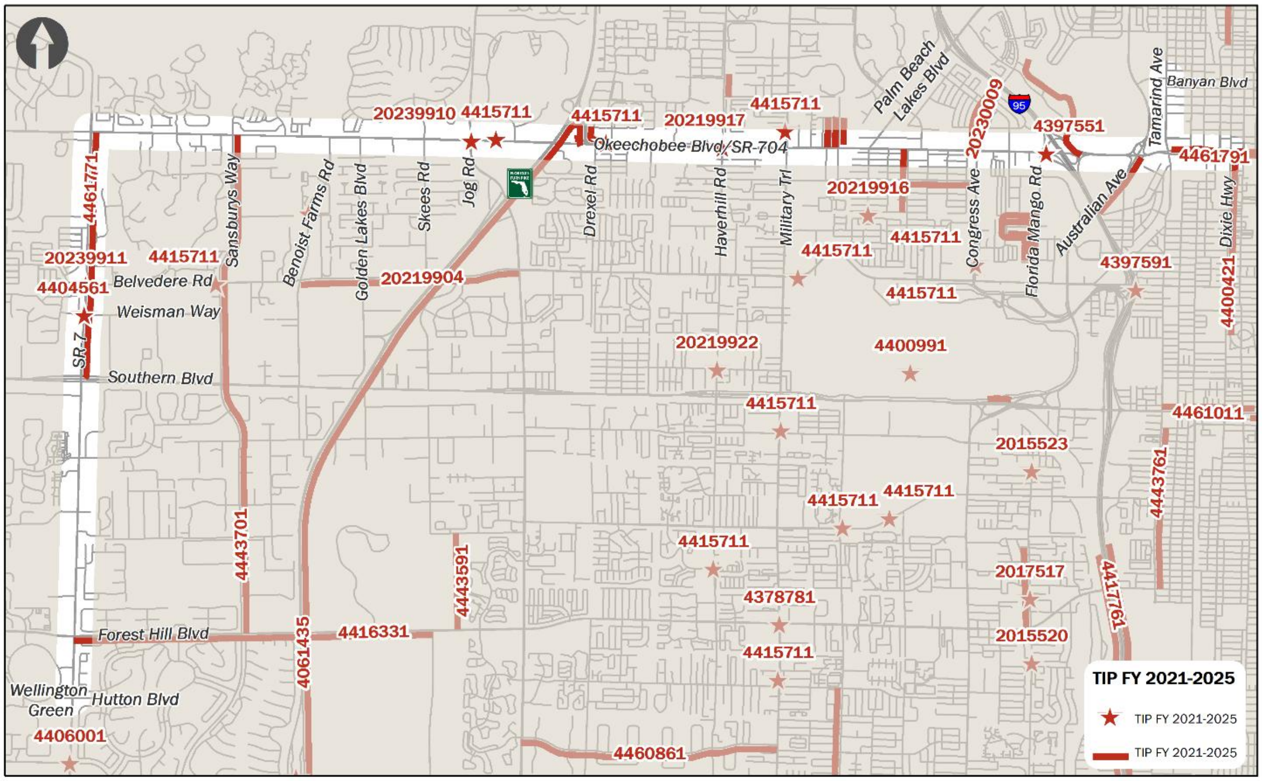


Figure 5. Palm Beach TPA's TIP Fiscal Year 2021-2025

Existing Conditions Presentation

A series of 30"x40" E-size graphics boards were developed to illustrate the existing conditions characteristics for each corridor section and can be found in **Appendix C**. The existing conditions presentation includes multimodal elements and typical sections. The typical sections were developed using streetplan.net, this free web-based is an easy to use Complete Street planning tool.

The study corridor is dynamic and changes in both cross-section and context; therefore, the multiple corridor segments were identified for developing the alternatives.

- Okeechobee Blvd/SR-704 from SR-7 to Florida's Turnpike
- Okeechobee Blvd/SR-704 from Florida's Turnpike to US-1/Intermodal Center
  - Okeechobee Blvd/SR-704 from Florida's Turnpike to I-95
  - Okeechobee Blvd/SR-704 from I-95 to Australian Ave
  - Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave
  - Okeechobee Blvd/SR-704 from Tamarind Ave to Rosemary Ave
  - Okeechobee Blvd/Lakeview Ave pair
- SR-7 from Hutton Blvd (Wellington Mall) to Okeechobee Blvd/SR-704
  - SR-7 from Hutton Blvd (Wellington Mall) to Southern Blvd/SR-80
  - SR-7 from Southern Blvd/SR-80 to Weisman Way
  - SR-7 from Weisman Way to Belvedere Rd
  - SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704

Baseline Traffic Evaluation

The baseline traffic evaluation compared the base year 2019 and LRTP horizon year 2045 traffic volumes against level of service (LOS) thresholds to evaluate the feasibility for multimodal improvements. Traffic counts and locations were collected using the Florida Department of Transportation (FDOT) Florida Traffic Online (2019). The calculated LOS utilized the FDOT 2020 Quality/Level of Service (QLOS) Handbook. Southeast Florida Regional Planning Model (SERPM) data for 2015 and 2045 was obtained to calculate the annual growth rate. The projected LRTP horizon year 2045 was calculated using the SERPM annual growth rate and 2019 traffic volumes. **Appendix D** displays the results of the baseline traffic evaluation.

Corridor Safety Analysis

A crash data analysis was conducted for bicycle and pedestrian crashes for the most recent five (5)-year period between 2015 and 2019. Crash data was obtained from the *University of Florida's Signal Four Analytics* web-based application.

The study corridors consist of Okeechobee Blvd/SR-704 from SR-7 to US-1 and SR-7 from Forest Hill Blvd to Okeechobee Blvd/SR-704.

The following sections provide a review of historical pedestrian and bicycle crash data analysis. A summary of previous findings from *the TPA's Pedestrian and Bicycle Safety Study, 2017* is also provided.

Crash Frequency and Severity

A total of 159 pedestrian and bicycle crashes, or approximately 32 crashes per year, occurred along the study corridor between January 2015 and December 2019. Overall, the frequency of crashes slightly increased in 2017 and in 2019. As shown in **Table 1**, 12 crashes resulted in fatalities, 116 crashes resulted in injuries, and there were 31 property damage only crashes. **Figure 6** illustrates the crash density or hot spots along the study corridors.

Table 1. Pedestrian/Bicycle Crash Frequency and Severity

Year	Fatal Crashes	Injury Crashes	Property Damage Only Crashes	Total Number of Crashes
2015	5	20	5	30
2016	2	20	5	27
2017	1	29	6	36
2018	3	18	6	27
2019	1	29	9	39
Total	**12**	**116**	**31**	**159**

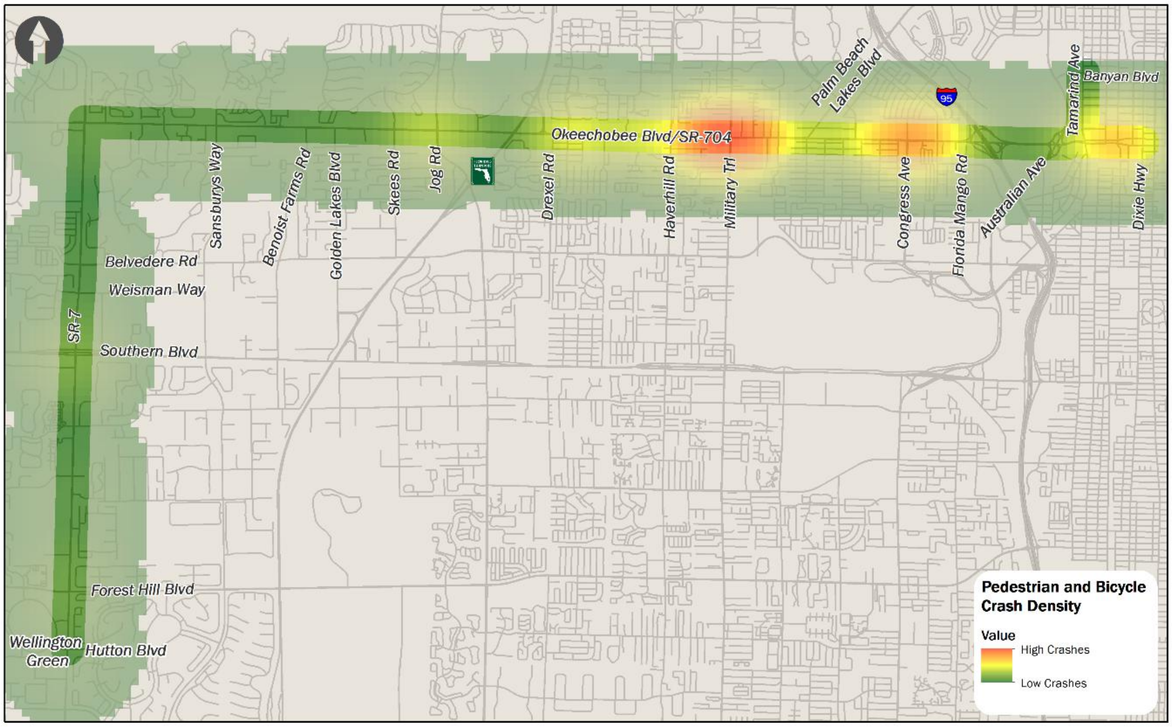


Figure 6. Pedestrian and Bicycle Crash Density

Crashes by Type

Crashes by type are summarized in **Table 2** and **Figure 7**. Bicycle crashes (89 crashes or 56%) were more frequent than pedestrian crashes (70 crashes or 44%) over five (5) years. **Figure 8** illustrates the approximate location of the crashes.

Table 2. Crashes by Type

Type	Number of Crashes	Percent of Total
Pedestrian	70	44%
Bicycle	89	56%
Total	**159**	**100%**

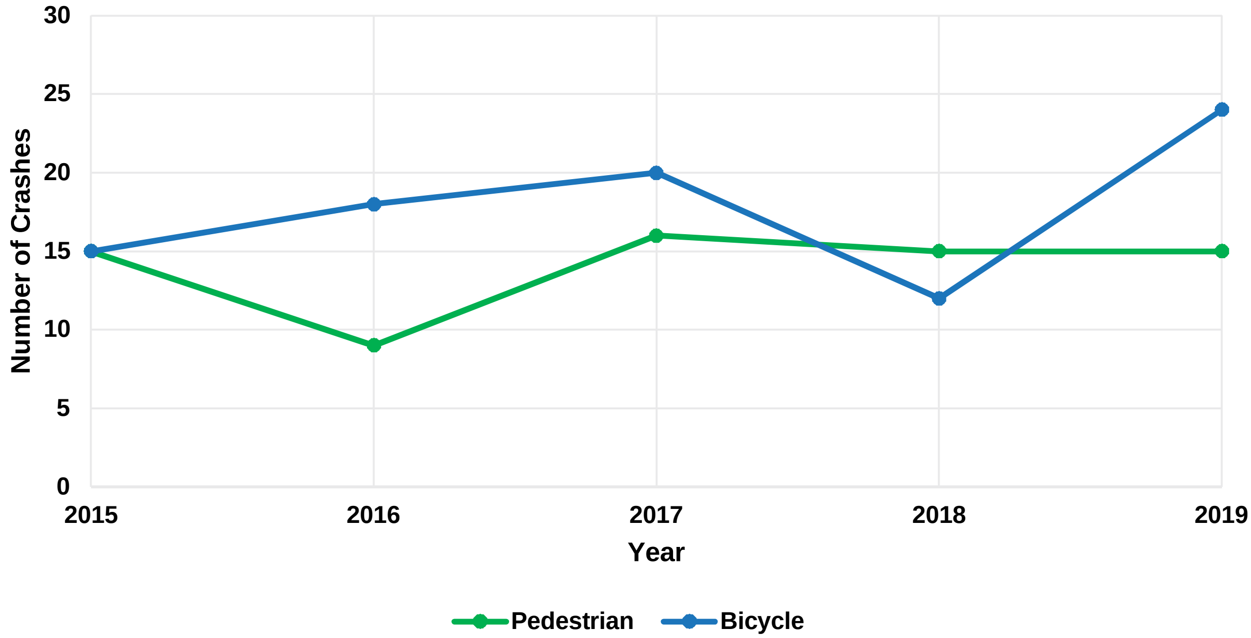


Figure 7. Pedestrian and Bicycle Crashes (2015-2019)

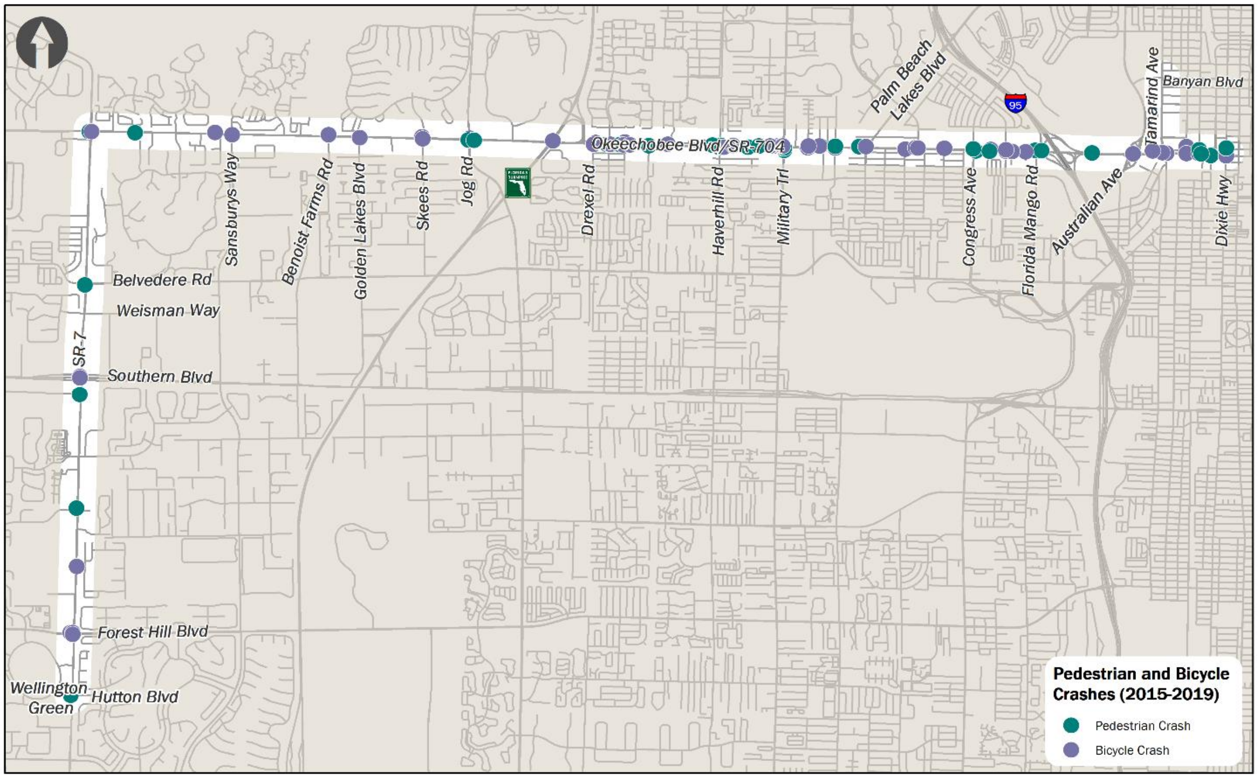


Figure 8. Pedestrian and Bicycle Crashes (2015-2019)

Crashes Near Transit Stops

There were three (3) crashes within 100 feet of Palm Tran bus stops including two (2) pedestrian and one (1) bicycle crash. Below is a summary of the findings.

- **09/02/2016 (11:53 PM)** a **PEDESTRIAN** was crossing the east leg of the intersection of Okeechobee Blvd/SR-704 and Indian Rd when a motorist traveling west failed to yield and struck the pedestrian. The crash occurred during non-daylight conditions and within 100 feet of Palm Tran stop ID 3209.
- **06/02/2017 (9:15 PM)** a **BICYCLIST** was traveling east along the sidewalk on the north side of Okeechobee Blvd/SR-704 when a motorist exiting for 2077 N Military Trl failed to yield and struck the bicyclist. The crash occurred during daylight conditions and within 100 feet of Palm Tran stop ID 3212.
- **10/17/2018 (6:02 AM)** a **PEDESTRIAN** was crossing Okeechobee Blvd/SR-704 midblock approximately 300 feet west of Haverhill Rd when a motorist traveling west along Okeechobee Blvd/SR-704 struck the pedestrian. The crash occurred during non-daylight conditions and within 100 feet of Palm Tran stop ID 3214.

Crashes by Lighting Condition

Table 3 shows that 62 percent (62%) of crashes occurred during daylight conditions and 37 percent of crashes occurred during dark (non-daylight) conditions which is greater than the statewide average (30 percent) as documented by FDOT. Street lighting is provided on both sides of the roadway along the study corridor.

Table 3. Crashes by Lighting Condition

Lighting Condition	Number of Crashes	Percent of Total
Daylight	99	62%
Dark - Lighted	45	29%
Dusk	6	4%
Dark - Not Lighted	4	2%
Dawn	4	2%
Unknown	1	1%
Grand Total	**159**	**100%**

Crash Heat Maps/Density Maps

The TPA conducted crash density analysis using FDOT Unified Basemap Repository (UBR) data for years 2010-2014 as part of the previous Pedestrian and Bicycle Safety Study (2017). **Figure 9** and **Figure 10** shows the previously developed crash density data for pedestrian and bicycle crashes at the level of the study corridor.

Notable observations include the following.

- There is a pronounced concentration of pedestrian and bicycle crashes near Okeechobee Blvd/SR-704 and Military Trl, consistent with a hot spot along the study corridor using the updated data (2015-2019).
- There is a pronounced concentration of pedestrian and bicycle crashes near Okeechobee Blvd/SR-704 and US-1, consistent with a hot spot along the study corridor using the updated data.

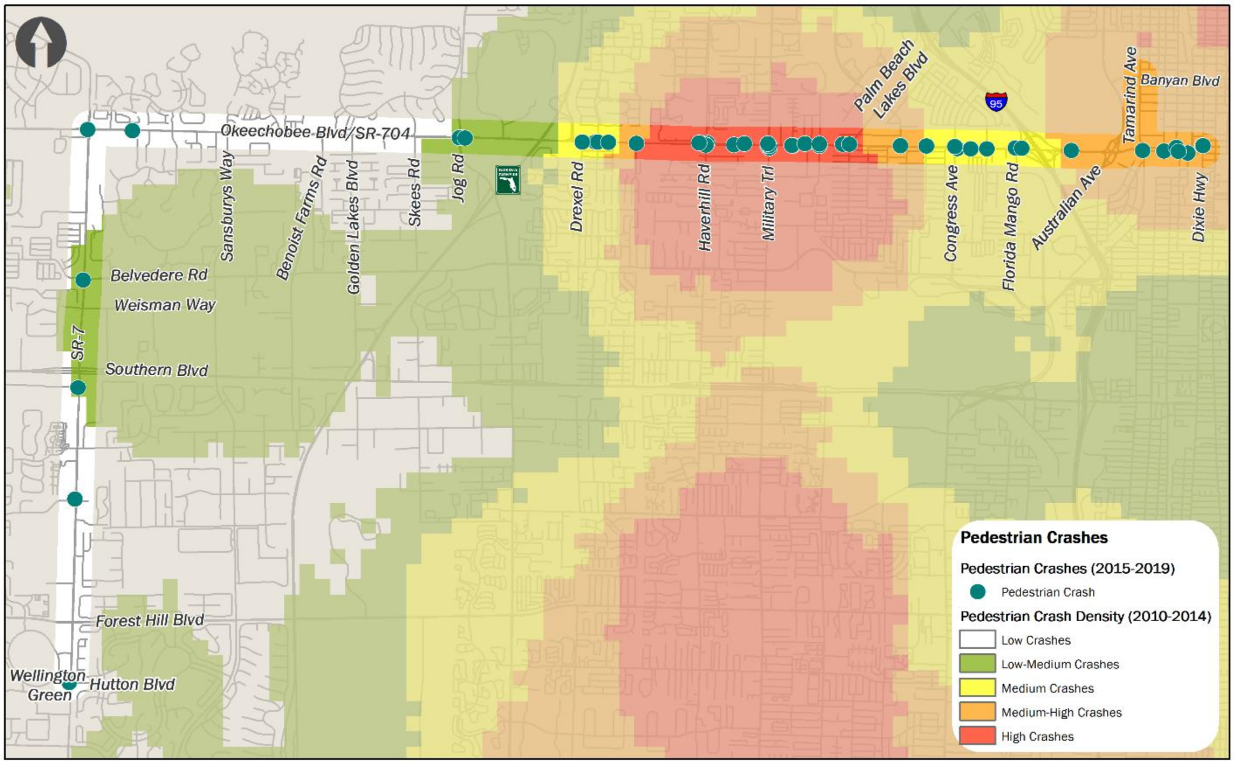


Figure 9. Pedestrian Crashes

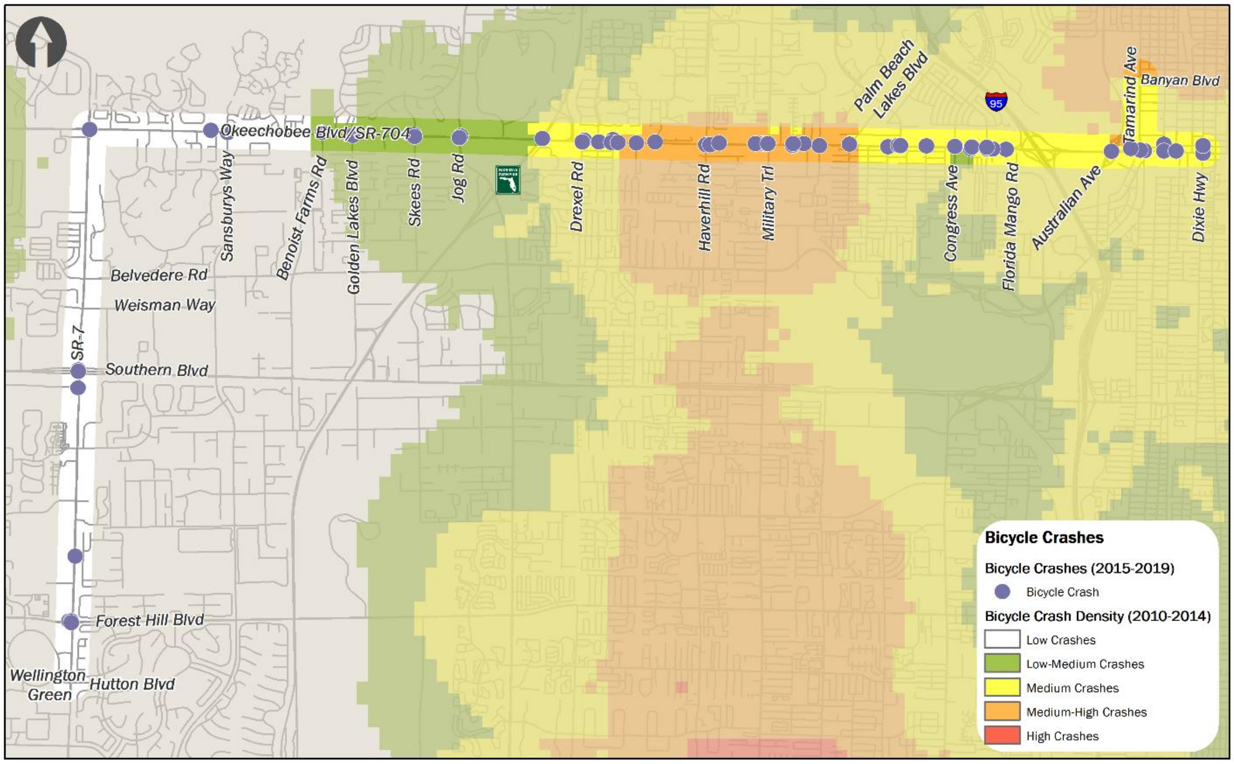


Figure 10. Bicycle Crashes

Alternatives Definition

The roadway improvements are organized first by transit alternative, then by corridor segment and context for each transit alternative. **Appendix E** includes the typical sections.

Roadway Improvements

Mixed Traffic Bus Alternative

Mixed traffic bus is essentially the existing condition along the majority of the corridor study limits. Mixed traffic bus is also the most common roadway configuration for accommodating bus service. To load and unload passengers, buses stop in the outside traffic lane or in a roadside bus bay if at a timed service point or layover.

Pros

» Will not require reconstruction of existing roadway typical section.
» Bicycle lanes on SR-7 and on Okeechobee Blvd/SR-704 between SR-7 and Florida's Turnpike widened to buffered bicycle lanes through lane width narrowing.
» Sidewalks widened to 12-foot shared use paths where feasible within the right-of-way.

Cons

» Only marginal improvements to existing transit service can be achieved, such as from transit signal priority (TSP).

Business Access and Transit (BAT) Lanes

Business Access and Transit (BAT) lanes are expressly reserved for buses and with limited access for non-transit motor vehicles. Bicycles can be permitted to use BAT lanes if a dedicated bicycle lane is not provided on the street. Non-transit motor vehicles can use BAT lanes only to make a right-turn into a driveway or side street. Non-transit motor vehicles turning out of a driveway or side street should turn into the nearest general purpose through lane.

Pros

» Improved travel times for buses compared to mixed traffic bus.
» Can be viewed as an interim step to dedicated transit lanes.
» Widened bicycle lanes throughout most of the corridor.
» Sidewalks widened to 12-foot shared use paths where feasible within the right-of-way.
» On segments without space for bicycle lanes, BAT lanes can provide a more comfortable shared operating space for bicyclists than general purpose lanes.
» Existing median width throughout the corridor primarily remains unchanged.
» Repurposing of an existing travel lane results in a low capital investment with low construction impacts.

Cons

» Not as fast as a purely dedicated transit lane. Non-transit motor vehicles using BAT lane to turn right can impact bus travel time.
» May increase enforcement burden to achieve acceptable compliance levels from non-transit motor vehicles.
» Potential conflicts with turning non-transit motor vehicles.

Reversible Lanes

Reversible lanes allow for a dynamic directional capacity of a roadway to accommodate peak traffic demands. This allows for a more efficient and economical use of the right-of-way. Overhead signalization is used to designate the current direction of each lane. Three reversible lanes will be implemented to allow for five travel lanes in the peak travel direction during peak time periods and for the middle lane to be used for left turning movements during mid-day. Transit is accommodated by designating the outside lanes as BAT lanes to improve transit efficiency.

Pros

» Efficiently uses right-of-way space by providing additional through movement capacity in the peak travel direction without adding capacity in the off-peak travel direction.
» Improved travel times for buses compared to mixed traffic bus.
» BAT lanes can be viewed as an interim step to dedicated transit lanes.
» Widened bicycle lanes throughout the majority of the corridor.
» Sidewalks widened to 12-foot shared use paths where feasible within the right-of-way.

- On segments without space for bicycle lanes, BAT lanes can provide a more comfortable shared operating space for bicyclists than general purpose lanes.

Cons

- Removes a significant portion of the existing median along the corridor to create the flexibility for dynamic lane assignment.
- Creates complicated intersection operations/signalization.
- Inconsistent with access management principles.
- Reduces capacity of left-turn movements.
- Clear identification of lane assignment is required. At minimum this consists of double-yellow skip-line markings separating potentially opposing directions of traffic.
- Requires strict adherence to maintain lane use and integrity.

Dedicated Lane Bus Rapid Transit (BRT)

Bus Rapid Transit (BRT) is a high-quality bus-based transit application that delivers fast and efficient service that may include dedicated exclusive lanes, busways, traffic signal priority, off-board fare collection, elevated platforms for level boarding, and enhanced stations. Because BRT contains some features similar to a light rail or heavy rail transit system, it is often considered more reliable, convenient, and faster than regular bus services. The BRT guideway is commonly found in the outside travel lane to provide convenient access from the sidewalk and adjacent land use. A BRT guideway can also be located in the median although this requires more complex passenger access routes and impacts to intersection turning movements.

Pros

- Improved bus travel time and schedule adherence.
- Improved bus passenger experience more similar to rail, but with lower investment costs.
- Able to avoid the delays that can slow regular bus services, such as impacts from traffic congestion.
- Existing median width throughout the corridor primarily remains unchanged.
- Construction of separated bicycle lanes across majority of corridor for increased bicycle safety.
- Sidewalks widened to 12-foot shared use paths where feasible within the right-of-way.

Cons

- Requires lane repurposing, which may impact traffic flow.
- Right-turning vehicles would need to turn across the bus lane.
- Requires extensive reconstruction and cost through roadway widening.

Dedicated Lane Light Rail Transit (LRT)

Light Rail Transit (LRT) is an electrically powered, high-capacity rail technology capable of operating in a wide range of physical configurations. LRT typically operates in single-vehicle or short trains in mostly or fully dedicated guideway. The two primary types of light rail vehicles are streetcar and LRT. Streetcars are typically applied to a highly urbanized environment and service more as a distributor system. LRT provides more passenger capacity and is more of a line haul service which is more appropriate for this corridor. Substantial and sophisticated passenger amenities are typically provided in LRT systems. LRT systems that operate within an exclusive guideway are typically median running within a roadway. However, LRT lines can be configured to operate in a curbside travel lane along one-way streets within an exclusive lane or with mixed traffic. Whether in dedicated or mixed-traffic lanes, the guideway must be kept clear from all but the briefest obstructions. Light Rail Vehicles (LRVs) have their own geometric needs that may differ from buses.

Pros

» LRT typically has better on-time service performance compared to bus service.
» LRT systems provide a clear identification of the route visibly marked by the rail infrastructure.
» Allows for higher transit speeds and passenger capacity than bus.
» Fixed, permanent rail infrastructure serves as an enhanced catalyst for Transit Oriented Development.
» Construction of separated bicycle lanes for increased bicycle safety.
» Sidewalks widened to 12-foot shared use paths where feasible within the right-of-way.

Cons

» Requires lane repurposing, which may impact traffic flow.
» Requires more extensive capital investment than BRT.
» Significant construction impacts including roadway widening and installation of rails and catenary.
» Requires additional right-of-way for station platforms.
» Center-running LRT systems require passengers to cross into the median to access the stations instead of boarding from the sidewalk.
» LRVs typically have larger turning radii than buses. Where an LRV makes turns, care must be taken to clear the entire swept path.
» Catenary wire typically hangs 17–20 feet above street level; coordinate overhead elements with street trees, traffic signals and overpasses.
» Additional right-of-way is required within close proximity to the corridor for a vehicle storage and maintenance facility.
» Will result in left-turning vehicle restrictions due to implementation in median. Left-turn lanes must be signal controlled. Multiple left-turn lane configurations would likely be reduced to a single left-turn lane unless additional right-of-way is acquired.

Elevated LRT

Elevated LRT operates within an above street level exclusive guideway and therefore reduces impact on non-transit motor vehicle traffic. LRT may also follow street alignments but allows for tracing a different alignment, if necessary, crossing above streets, canals, and other rail lines.

Pros

» LRT typically has better on-time service performance compared to bus service.

- Elevated LRT is similar to heavy rail transit in service branding and ride quality.
- Does not interact with motor vehicle traffic.
- Allows for higher transit speeds and passenger capacity than bus.
- Does not require special consideration for bicycle lanes like ground level LRT.
- Construction of separated bicycle lanes for increased bicycle safety.
- Sidewalks widened to 12-foot shared use paths where feasible within the right-of-way.
- Has the highest person movement capacity and does not require lane repurposing.

Cons

- Much higher construction and maintenance costs than street level LRT.
- Elevated stations require more complex passenger access patterns than ground level stations.
- Visual impacts with the introduction of guideway support columns and elevated LRT guideway.
- Support column placement may eliminate left turn lanes at some locations along the corridor.
- Additional right-of-way is required within close proximity to the corridor for a vehicle storage and maintenance facility.
- Overpasses will require conversion of rail alignment to at-grade for portions of the corridor including between I-95 and Australian Ave.

Person Movement Analysis

An analysis along the transportation facilities, Okeechobee Blvd/SR-704 and SR-7, was performed for each of the proposed transit alternatives, to estimate person movement capacity along these corridors.

- Mixed Traffic Bus
- BAT Lanes
- Reversible Lanes with BAT Lanes
- Dedicated BRT
- Dedicated Lane LRT
- Elevated LRT

This analysis provides a comparison between alternatives that show how many people would be moved if an alternative was implemented. Some alternatives provide transit service and keep the existing number of lanes while others repurpose existing travel lanes for dedicated transit use. These differences are quantified to show the trade-offs between the proposed transit alternatives.

The quantification of person movement capacities for transit can be found in **Table 4**. The volumes were determined using the Transit Cooperative Research Program (TCRP) *Transit Capacity and Quality of Service Manual, Third Edition*. Transit capacity is highly variable due to (a) variability based upon vehicle manufacturer, (b) variability based upon vehicle configuration, and (c) passenger behavior. For the purposes of this study an assumption of full seating capacity was made. Assumptions related to service headways can also have a significant impact on person movement capacity.

Three (3) transit vehicle types were identified: Standard bus, Articulated bus, and Light Rail Transit. Passenger capacities for the following vehicle types were obtained from TCRP's *Transit Capacity and Quality of Service Manual, Third Edition*:

» **STANDARD BUS** has a capacity of 35 passengers per vehicle (TCRPC Exhibit 6-15); a common assumption of 15-minute headways can be made for a frequent service Mixed Traffic Bus service in a crosstown route configuration.

» **ARTICULATED BUS** has a capacity of 80 passengers per vehicle (adapted from TCRPC Exhibit 6-15); a common assumption of 15-minute headways can be made for BAT Lanes and Reversible Lanes with BAT lanes; Dedicated Lane BRT can have more frequent headways and an assumption of 5-minute headways can be made.

» **LIGHT RAIL TRANSIT** has a capacity of 200 passengers per Light Rail Vehicle (TCRPC Exhibit 8-54); the assumption of 10-minute headways for Dedicated Lane LRT and Elevated LRT with three (3) car train sets can be made.

Table 4. Transit Passenger Movement Capacity (Passengers/Hour/Direction)

Transit Alternative	Headway (Minutes)	Bus Type/ Number of Cars	Capacity
Mixed Traffic Bus	15	Standard	140
BAT Lanes	15	Articulated	320
Reversible Lanes	15	Articulated	320
Dedicated Lane BRT	5	Articulated	960
Dedicated Lane LRT	10	3	3,600
Elevated LRT	10	3	3,600

The effect on the travel lanes and peak hour directional capacity was analyzed for each proposed transit alternative. The capacity assumed for this analysis is based upon a threshold to maintain LOS D as determined by the *FDOT 2020 Quality/Level of Service Handbook*, Table 7. All roadway segments are Class I and a five percent (5%) right-turn adjustment factor was applied for multi-lane roadways with right-turn lanes. The passenger movement for traffic is the capacity multiplied by the passengers per vehicle. The analysis assumes SOVs; however, this is a variable field in the accompanying spreadsheet from the weblink below. Different occupancy assumptions will produce different results.

Mixed Traffic Bus and Elevated LRT alternatives maintain the existing number of travel lanes. Both BAT Lanes and Reversible Lanes have unique lane configurations. Finally, Dedicated Lane BRT and Dedicated Lane LRT share the same lane configurations except for the segment of Okeechobee Blvd/SR-704 from Rosemary Ave to US-1. A detailed breakdown of the traffic capacity person movement for each of the alternatives can be found in **Table 5**.

The total person movement for each transit alternative is shown in **Table 6** which includes both types of calculated capacities – transit and traffic. The total person movement includes each alternatives' respective transit option and its capacity plus the person movement capacity of SOVs in the remaining general purpose through lanes.

Table 5. Traffic Capacity Person Movement (Passengers/Hour/Peak Direction)

Segment	From	To	Existing/ Mixed Traffic Bus		BAT Lanes		Reversible Lanes		Dedicated Lane BRT		Dedicated Lane LRT		Elevated LRT	
			Lanes	Traffic Capacity	Lanes	Traffic Capacity	Lanes	Traffic Capacity	Lanes	Traffic Capacity	Lanes	Traffic Capacity	Lanes	Traffic Capacity
SR-7	Wellington Mall	Belvedere Rd	8	4,242	6	3,171	6	3,171	6	3,171	6	3,171	8	4,242
SR-7	Belvedere Rd	Okeechobee Blvd/SR-704	6	3,171	4	2,100	4	2,100	6	3,171	6	3,171	6	3,171
Okeechobee Blvd/SR-704	SR-7	Rosemary Ave	8	4,242	6	3,171	8	4,242	6	3,171	6	3,171	8	4,242
Okeechobee Blvd (pair)	Rosemary Ave	US-1	4	4,068	3	3,024	3	3,024	3	3,024	4	4,068	4	4,068

Table 6. Total Person Movement (Passengers/Hour/Peak Direction)

Segment	From	To	Existing/ Mixed Traffic Bus			BAT Lanes			Reversible Lanes			Dedicated Lane BRT			Dedicated Lane LRT			Elevated LRT		
			Transit	Traffic	Total	Transit	Traffic	Total	Transit	Traffic	Total	Transit	Traffic	Total	Transit	Traffic	Total	Transit	Traffic	Total
SR-7	Wellington Mall	Belvedere Rd	140	4,242	4,382	320	3,171	3,491	320	3,171	3,491	960	3,171	4,131	3,600	3,171	6,771	3,600	4,242	7,842
SR-7	Belvedere Rd	Okeechobee Blvd/SR-704	140	3,171	3,311	320	2,100	2,420	320	2,100	2,420	960	3,171	4,131	3,600	3,171	6,771	3,600	3,171	6,771
Okeechobee Blvd/SR-704	SR-7	Rosemary Ave	140	4,242	4,382	320	3,171	3,491	320	4,242	4,562	960	3,171	4,131	3,600	3,171	6,771	3,600	4,242	7,842
Okeechobee Blvd (pair)	Rosemary Ave	US-1	140	4,068	4,208	320	3,024	3,344	320	3,024	3,344	960	3,024	3,984	3,600	4,068	7,668	3,600	4,068	7,668

Design Option

The design option for the Okeechobee Boulevard Multimodal Corridor Study will use Dedicated BAT lanes for SR-7 and Dedicated Lane LRT for Okeechobee Blvd/SR-704. The purpose of the design option analysis is to analyze and demonstrate what programming and implementation of one of the enhanced transit options could look like.

Prioritization Criteria Development

The *Okeechobee Boulevard Multimodal Corridor Study* project prioritization criteria are the foundation of a system that scores the proposed segments that will satisfy the goals and objectives and Palm Beach TPA Mission and Vision. This better allows prioritization of the different segments to determine the largest need along the 13.8-miles corridor. Factors includes the feasibility of project delivery, cost, and benefit.

- » **FEASIBILITY** rates projects by the level of procedural or administrative tasks that would need to be accomplished to implement a project such as lane repurposing studies, public-private partnerships, and environmental documentation.
- » **COST** rates projects by the level of financial investment that would be required as determined by the types of physical construction that would be required.
- » **BENEFIT** rates projects by the level of transportation benefits that would accrue which includes transit ridership, enhancement of modal facilities, and relief of roadway congestion. In addition to the transportation benefits, improvement to higher quality of life with better places to live, work, and play is equally important.

Shown in **Table 7** is the prioritization criteria. Programmed projects within the corridor study from the Palm Beach TPA's TIP Fiscal Years 2021-2025 will be identified and may improve the prioritization criteria score pending on the description of the project.

Table 7. Prioritization Criteria

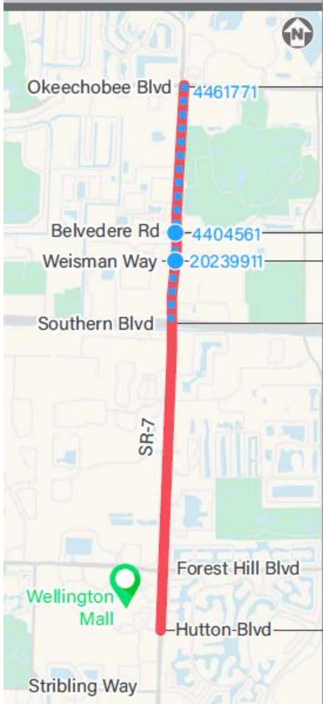
Feasibility		Cost		Benefit	
Turn lane modifications and/or restriping	●	Resurfacing	●	Significant increase in person movement	●
Lane repurposing	●	Partial reconstruction	●	Add new modal facilities and adding physical separation	●
Significant additional planning process may be required (public-private partnerships/environmental impacts)	●	Full reconstruction	●	Enhancement of existing facilities with no physical separation	●

The implementation for these proposed segments is broken into three (3) phases. This reflects the reality that the transportation system cannot function efficiently unless there are major funding investment or reconstruction. In some cases, the proposed segments will include multiple phases in order to leverage existing programmed projects and to keep the momentum of active transportation.

» **Phase 1:** Build in 5 Years (State funding only)
» **Phase 2:** Build in 5-10 Years (State/Federal funding)
» **Phase 3:** Build in 10+ Years (State/Federal funding and includes the fixed guideways)

Prioritization of Proposed Multimodal Improvements

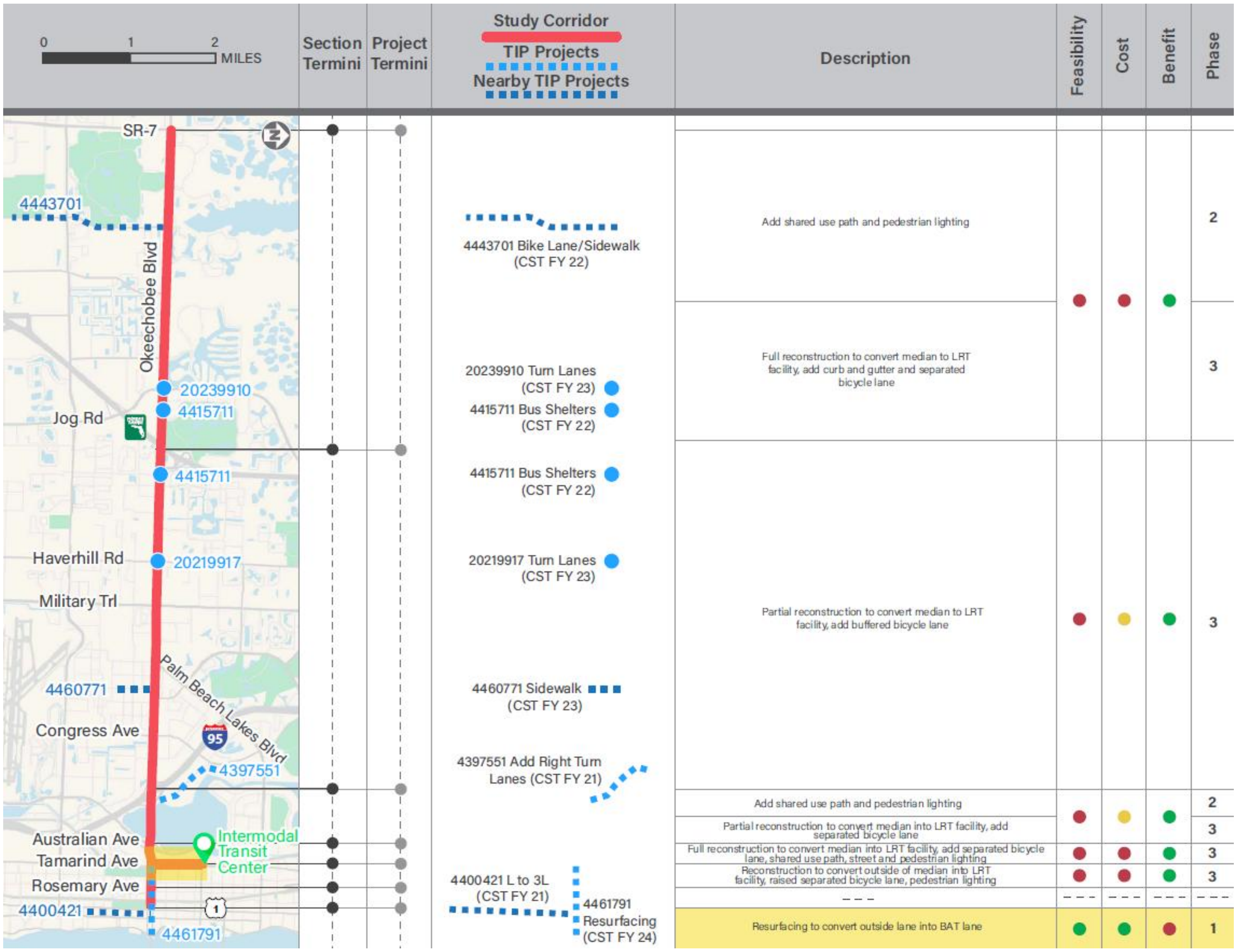
Shown below are the prioritization of the proposed multimodal improvements and can be found in **Appendix F**.



Section Termini	Project Termini	Study Corridor / TIP Projects	Description	Feasibility	Cost	Benefit	Phase
Okeechobee Blvd – Belvedere Rd		4461771 Resurfacing (CST FY 23)	Add shared use path and pedestrian lighting	Green	Green	Yellow	2
Belvedere Rd – Southern Blvd		4404561 Turn Lanes (CST FY 21); 20239911 Turn Lanes (CST FY 21)	Resurfacing to convert outside lane into BAT lane, add buffered bicycle lane				1
Southern Blvd – Hutton Blvd			Partial reconstruction to convert outside lane to BAT lane, add buffered bicycle lane and shared use path	Green	Yellow	Yellow	2

LEGEND

	Complexity	Cost	Benefit
Green	Turn lane modifications and/or restriping	Resurfacing	Significant increase in person movement
Yellow	Lane repurposing	Partial reconstruction	Add new modal facilities and adding physical separation
Red	Significant additional planning process may be required (public-private partnerships/ environmental impacts)	Full reconstruction	Enhancement of existing facilities with no physical separation



Benefits

Graphics illustrating the design option typical sections are included in **Appendix G**. The following sections provide a summary of the effects of the design option on transportation safety and multimodal level of service.

Crash Modification Factors

Appropriate Crash Modification Factors (CMF) were identified to estimate the anticipated effects the design option improvements will have on transportation safety. The U.S. Department of Transportation's (DOT) Federal Highway Administration (FHWA) maintains the CMF Clearinghouse webpage. The CMF Clearinghouse provides a star rating indicating the quality or confidence in the results of the studies producing CMFs. The star rating accounts for criteria such as study design, sample size, standard error, potential bias, and data source. The star rating is based on a scale of one (1) through five (5), where a five (5) indicates the highest or best rating. CMFs with three (3) or more stars were considered for this study, consistent with FDOT transportation safety best practices. The following appropriate CMFs were identified:

» **CMF ID 2128:** Install bicycle tracks
» **CMF ID 2159:** Install bicycle lanes
» **CMF ID 7274:** Implement transit lane priority (at transit-serviced locations)
» **CMF ID 8699:** Increase bike lane width
» **CMF ID 9120:** Median treatments for ped/bike safety

A summary of appropriate CMFs and Clearinghouse CMF detail sheets are included in **Appendix H**. The summary table provides a description of the design option for each study segment and applicable CMFs for the identified improvements.

The following design option improvements are expected to further enhance transportation safety along the study corridor despite appropriate CMFs not being available:

» Wider sidewalks along SR-7 and most of Okeechobee Blvd/SR-704
» Pedestrian lighting

Multimodal Level of Service

Understanding multimodal mobility is key for the safe, efficient, and connected travel along an enhanced transit corridor. Contemporary research has provided insight into travel behavior and how to measure LOS for different modes. More specifically, the term multimodal level of service (MMLOS) addresses the perceived quality of service for pedestrians, bicyclists, transit users, and automobile. The focus of this analysis is on the MMLOS for pedestrians, bicyclists, and transit users. MMLOS is measured using a letter grade methodology of A through F with MMLOS A representing the best operating conditions and MMLOS F representing the worst.

FDOT's LOSPLAN 2012 application provides Quality/Level of Service (Q/LOS) for planning and preliminary engineering. The application employs the 2010 Highway Capacity Manual (HCM) methodologies for automobiles and other leading methodologies for pedestrian, bicycle, and bus modes to compute Q/LOS. **Table 8** provides a summary of the major inputs, service measure, and the criteria used to determine the MMLOS.

Pedestrian, bicycle, and bus/transit MMLOS were calculated for the study corridor under existing and design option conditions. A summary of inputs and ARTPLAN report outputs are included in **Appendix I**. **Table 9** provides a summary of the MMLOS results for pedestrian, bicycle, and bus/transit modes. Map figures illustrating the MMLOS results for pedestrian, bicycle, and bus/transit modes under existing and design option conditions are also included in **Appendix I**.

Please note, the results indicate pedestrian MMLOS worsens for all study segments in **Table 9** under design option conditions. This is due to pedestrian MMLOS being sensitive to vehicular volumes per travel lane. The design option includes greater vehicular volumes and fewer travel lanes thus negatively affecting pedestrian MMLOS. For similar reasons, bicycle MMLOS worsens for four (4) of the study segments in **Table 9** under design option conditions.

Table 8. MMLOS Major Inputs, Service Measure, and LOS Determinator

Mode	Major Inputs	Service Measure	LOS Determinator
Pedestrian	» Sidewalk » Volume and lanes » Other traffic and roadway characteristics » Arterial running speed	Pedestrian MMLOS score	HCM LOS Criteria
Bicycle	» Bicycle lanes » Volume and lanes » Other traffic and roadway characteristics » Arterial running speed	Bicycle MMLOS score	HCM LOS Criteria
Bus/transit	» Bus frequency » Sidewalk characteristics	Adjusted bus frequency	Transit Capacity and Quality of Service Manual (TCQSM) LOS Criteria

Table 9. MMLOS Summary of Results

Roadway Name/Limits	Direction	Pedestrian MMLOS	Bicycle MMLOS	Bus/Transit MMLOS
		Existing Conditions (Design Option)		
SR-7 from Wellington Mall to Southern Blvd/SR-80	Bidirectional	4.13/D (5.29/F)	3.12/C (1.86/B)	4.94/B (6.34/A)
SR-7 from Southern Blvd/SR-80 to Weisman Way	Bidirectional	3.66/D (4.66/E)	3.42/C (2.08/B)	2.15/D (8.39/A)
SR-7 from Weisman Way to Belvedere Rd	Northbound (1)	3.71/D (4.60/E)	3.38/C (3.61/D)	2.15/D (8.39/A)
	Southbound (1)	3.59/D (4.60/E)	3.38/C (3.61/D)	2.15/D (8.39/A)
SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704	Northbound (1)	4.88/E (4.97/E)	4.05/D (1.94/B)	0.92/F (6.99/A)
	Southbound (1)	3.69/D (4.97/E)	4.05/D (1.94/B)	1.08/E (6.99/A)
Okeechobee Blvd/SR-704 from SR-7 to Florida's Turnpike	Bidirectional	4.20/D (4.91/E)	3.55/D (2.01/B)	3.29/C (11.19/A)
Okeechobee Blvd/SR-704 from Florida's Turnpike to I-95	Bidirectional	4.28/E (4.88/E)	4.60/E (3.08/C)	2.54/D (11.19/A)
Okeechobee Blvd/SR-704 from I-95 to Australian Ave	Eastbound (1)	4.24/D (5.15/F)	3.49/C (2.93/C)	(2) (5.43/B)
	Westbound (1)	4.24/D (5.15/F)	3.49/C (3.64/D)	(2) (5.43/B)
	Eastbound (1)	3.81/D	2.95/C	(2)

Roadway Name/Limits	Direction	Pedestrian MMLOS	Bicycle MMLOS	Bus/Transit MMLOS
		Existing Conditions (Design Option)		
Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave		(4.61/E)	(3.10/C)	(8.39/A)
	Westbound (1)	4.10/D (4.88/E)	3.14/C (3.32/C)	(2) (6.72/A)
Okeechobee Blvd/SR-704 from Tamarind Ave to Rosemary Ave	Bidirectional	3.45/C (4.05/D)	4.49/E (3.80/D)	(2) (7.90/A)
Okeechobee Blvd/SR-704 from Rosemary Ave to US-1	Eastbound (1)	3.08/C (3.18/C)	3.95/D (3.99/D)	(2)
	Westbound (1)	3.16/C (3.29/C)	3.84/D (3.92/D)	(2)

Notes: (1) Each direction was analyzed independently due to differences in characteristics (e.g., sidewalk).

(2) Transit service is not provided along the study segment under the analysis period.

Traffic Impacts

Roadway segment LOS analysis was performed to evaluate the impact of the design option alternative. Levels of service range from LOS A (free flow with negligible delays) to LOS F (heavily congested with long delays).

Data Collection

Annual Average Daily Traffic (AADT) and Peak Hour Directional volumes were collected using FDOT Synopsis Reports for locations along the study corridor. To calculate the projected 2045 traffic volumes, 2015 and 2045 SERPM projections were acquired and an annual growth rate was determined. The annual growth rate was applied to the 2019 AADT and peak hour directional volumes to calculate the 2045 traffic volumes.

Level of Service Standards

Article 12 (Traffic Performance Standards) Section 2.C of Chapter B in the Unified Land Development Code (ULDC) for Palm Beach County establishes the LOS standards for all major thoroughfares within Palm Beach County. An adopted LOS of D is used for this analysis.

Capacity Analysis

Using the same methodology applied in Task 2.4 (Baseline Traffic Evaluation), 2019 (Base Year) and 2045 (Horizon Year) LOS was calculated for both AADT and Peak Hour Directional volumes. A summary table included in **Appendix J** provides a summary of the roadways segment analysis. The results indicate a larger portion of failed segments compared to the existing conditions.

As a result, the design option is expected to have a significant impact on the roadway segments. There is a large increase in failed segments compared to the existing conditions analysis. However, the advantages of the design option are far more impactful such as higher passenger capacity, pollution is remote from the vehicle, and positive benefit to areas – affecting property values, and lastly proof that the agency is truly committed to public transport.

Conceptual Plan Views

Conceptual plan view graphics, included in **Appendix K**, were developed to illustrate the design option in planimetric view within the right-of-way for the following five (5) example areas along the corridor.

- SR-7/US 441 from Anthony Groves Rd to Pioneer Rd
- SR-7/US 441 from Belvedere Rd to Okeechobee Blvd/SR-704
- Okeechobee Blvd/SR-704 East of I-95
- Okeechobee Blvd/SR-704 at Jog Rd
- Okeechobee Blvd/SR-704 at Spencer Dr

Next Steps

The roadway alternatives analysis and design option analysis performed and documented in this report will form the basis for Phase 2 of the *Okeechobee Boulevard Multimodal Corridor Study* to be performed in 2021. Phase 2 will include detailed transit planning, public engagement, and will advance the study toward a recommended enhanced transit strategy.

Appendix A

Field Audit Photos

Field Audit

During July and September 2020, Kimley-Horn staff made several visits to the Okeechobee Boulevard study corridor to review the existing roadway conditions.

The corridor study area includes SR-7 from the Wellington Mall to Okeechobee Boulevard and Okeechobee Boulevard/SR-704 from SR-7 to US-1.

The photos and descriptions below reflect the key observations of existing corridor conditions including roadway laneage, median conditions, bus stops, transit connectivity, sidewalks, bicycle facilities, and drainage swales.

Wellington Mall Bus Terminal

Bus bay located at the Wellington Mall Bus Terminal, which is in the back of the Mall property opposite from SR-7 along the ring road.

The bus stop includes a sidewalk and a seating wall; however, the sidewalk is 6 feet wide and does not meet the ADA requirement for an 8 feet wide landing pad perpendicular to the curb.

The distance between the Wellington Mall Bus Terminal and Wellington Mall is approximately 580 feet, which causes bus passengers a long walk across the parking lot to get to and from the Mall.

Transit amenities include a large shelter, benches, and bus route maps.

Five (5) Palm Tran routes serve the Wellington Mall Bus Terminal, including Route 43, which is the Okeechobee Blvd trunk route.

SR-7 from Wellington Mall to Belvedere Rd (8-lane section)

Bicyclist heading eastbound along Forest Hill Blvd at the SR-7 intersection in a "keyhole" lane, which is the portion of a bicycle lane between a through lane and the adjacent right-turn lane at an intersection.

View of the SR-7 travel lanes from the Pioneer Road intersection looking south.

A typical Palm Tran bus stop along SR-7 in this area includes seating area with shelter and a 5 feet wide sidewalk connecting to the road. A pipe culvert exists to carry the drainage swale under the sidewalk.

West side of SR-7 looking north with existing 5 feet wide sidewalk and drainage swale separating pedestrians and motorists.

Bicyclist traveling southbound along SR-7 in the conventional bicycle lane.

Palm Tran bus traveling southbound on SR-7.

Four (4) northbound through lanes along SR-7 looking north.

Traffic in four (4) southbound through lanes on SR-7 looking north.

Wide median along SR-7 looking north.

Four (4) southbound through lanes along SR-7 looking north.

The wide offset between the west sidewalk and the roadway creates midblock crosswalks at driveways.

View of a driveway pedestrian crosswalk from the perspective of a pedestrian looking north on the west side of SR-7.

Short section of missing sidewalk in the Buckingham Square shopping center driveway on the east side of SR-7 south of Pioneer Road.

Northeast corner of SR-7 and Pioneer Road at Bus Stop # 3793 looking south.

Southwest corner of SR-7 and Victoria Groves Blvd at Bus Stop # 3746 looking south.

The sidewalk on the east side of SR-7 south of Weisman Way looking south, which exists between a canal to the left and a drainage swale to the right.

SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704 (6-lane section)

SR-7 between Belvedere Rd and Okeechobee Blvd has three (3) through lanes in each direction as shown here in the southbound lanes looking south.

SR-7 looking north near the signalized intersection at Regal Cinemas 18.

Northbound through lanes and a left-turn lane south of the Regal Cinemas 18 intersection looking south.

There is no sidewalk on the east side of SR-7 and the bicycle lane is encroached by grass.

Crosswalk on the south side of the Regal 18 Cinemas signalized intersection does not lead to a sidewalk on the east side, looking west.

Bus stops exist on the east side of SR-7 in this section but with no sidewalks, such as at Bus Stop # 3472.

Northbound three (3) through lanes looking south.

Southbound three (3) through lanes looking south.

Okeechobee Blvd/SR-704 from SR-7 to Florida’s Turnpike

Pedestrian with baby stroller on the south side sidewalk of Okeechobee Blvd west of Benoist Farms Road looking west.

School crosswalk on the west leg of the Benoist Farms Road signalized intersection looking east.

Westbound four (4) through lanes of Okeechobee Blvd looking west near Renaissance Charter School.

Eastbound four (4) through lanes of Okeechobee Blvd looking east near Turning Points Academy School.

The north side sidewalk is separated from the roadway by a drainage swale looking west.

The Oakton Commons park-and-ride lot is located on the north side of Okeechobee Blvd.

Okeechobee Blvd/SR-704 from Florida's Turnpike to I-95

The sidewalk along Okeechobee Blvd east of Florida's Turnpike is directly adjacent to the curb as shown here on the south side looking east.

Palm Tran bus shelter located at Bus Stop # 3288 in the eastbound direction looking east. The shelter is located in an easement to not block the sidewalk.

Eastbound four (4) through lanes of Okeechobee Blvd looking west near Military Trail.

Westbound four (4) through lanes of Okeechobee Blvd looking east near Military Trail.

Scooter traveling westbound on the north side sidewalk. Note the 3-foot undesignated urban shoulder in the roadway is not a true bicycle facility.

Sidewalk on the south side of Okeechobee Blvd looking west near the recently redeveloped Palm Beach Marketplace shopping center.

Bus Stop # 3848 with seating on the south side of Okeechobee Blvd looking east near Starbucks.

Eastbound four (4) through lanes of Okeechobee Blvd looking west near Church Street.

Traffic separator median on Okeechobee Blvd looking east at the westbound left-turn lane to the Palm Beach Marketplace shopping center.

Traffic separator median on Okeechobee Blvd looking west at the westbound left-turn lane to the Palm Beach Marketplace shopping center.

Westbound four (4) through lanes of Okeechobee Blvd west of I-95 looking east.

Eastbound four (4) through lanes of Okeechobee Blvd west of I-95 looking west.

Okeechobee Blvd/SR-704 from I-95 to US-1

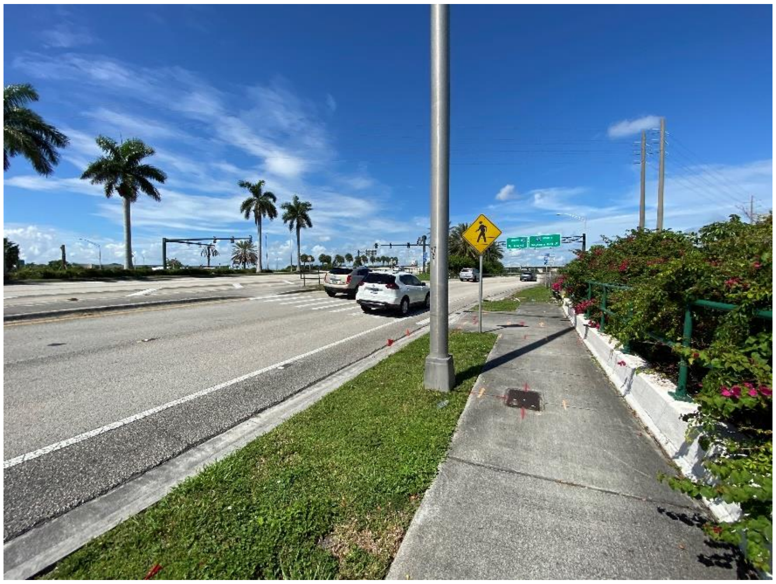
Okeechobee Blvd looking west under the I-95 southbound flyover ramp.

Okeechobee Blvd median looking east on the approach to the I-95 overpass.

The westbound lanes of Okeechobee Blvd include a designated bicycle lane with outdated pavement markings and signage.

The eastbound lanes of Okeechobee Blvd include a designated bicycle lane marked with green bicycle lane pavement in the I-95 northbound on-ramp drop lane.

Bicyclist in the crosswalk across the two-lane I-95 on-ramp from westbound Okeechobee Blvd looking east. Bicyclists choosing to ride on the sidewalk must navigate several 90 degree turns in this area.



The two-lane I-95 on-ramp from westbound Okeechobee Blvd looking west.

The sidewalk on the north side of Okeechobee Blvd east of I-95 includes numerous tree grates that have shifted in place to cause ADA hazards due to lateral gaps and height differences. The sidewalk width is reduced to 2 feet at the minimum pinch point.

The sidewalk on the south side of Okeechobee Blvd east of I-95 includes numerous tree grates with similar ADA concerns as shown in the previous photo, some of which no longer have their trees.

Eastbound bicyclist hugging close to the wall to avoid tree grate gaps on the sidewalk on the north side looking east.

Eastbound runner on the north side looking east. This section of Okeechobee Blvd offers views of Clear Lake with no driveways and cross-streets, which may attract recreational trips.

The eastbound bicycle lane is not buffered and includes a crossing of high-speed traffic from northbound I-95 to eastbound Okeechobee Blvd.

The eastbound bicycle lane approaching the ramp from Australian Avenue to eastbound Okeechobee Blvd includes flexible traffic delineator posts.

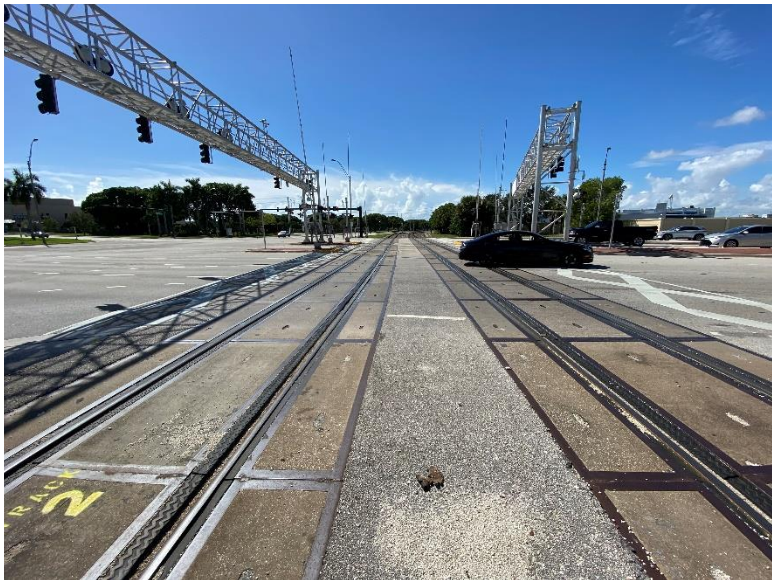
The crosswalk on the north side of Okeechobee Blvd across the Australian Avenue southbound on-ramp looking west. The Australian Avenue interchange is a partial cloverleaf, which presents challenges for pedestrians and bicyclists.

The westbound direction of Okeechobee Blvd includes an unbuffered bicycle lane transition due to the cloverleaf on-ramp to southbound Australian Avenue.

The crosswalk on the north side of Okeechobee Blvd across the Australian Avenue northbound on-ramp looking west.

Gateway Park on the north side of Okeechobee Blvd just east of Australian Avenue, which includes the Okeechobee Sacrifice Memorial to honor those who have lost their life on Okeechobee Blvd.

The South Florida Rail Corridor (SFRC) crossing looking north.



The South Florida Rail Corridor (SFRC) crossing looking south across ten (10) lanes of traffic on Okeechobee Blvd.

Pedestrian walking eastbound on the north side of Okeechobee Blvd looking east.

Southbound bicyclist crossing Okeechobee Blvd.

Westbound raised separated bicycle lane adjacent to sidewalk on the north side of Okeechobee Blvd east of Tamarind Avenue looking west.

The north end of Howard Park is adjacent to Okeechobee Blvd on the south side east of Tamarind Avenue.

Asphalt-surfaced connection from the Okeechobee Blvd sidewalk on the south side to Howard Park.

A maintenance crane blocking the sidewalk outside of the Convention Center on the south side of Okeechobee Blvd.

The westbound raised separated bicycle lane adjacent to the sidewalk in front of the Kravis Center looking west.

Crosswalk across Sapodilla Avenue on the north side of Okeechobee Blvd looking west.

Henry Rolfs Statue in Ramblas Okeechobee, which is in the median of Okeechobee Blvd between Tamarind Avenue and Rosemary Avenue.

Crosswalk across Rosemary Avenue on the north side of Okeechobee Blvd looking west.

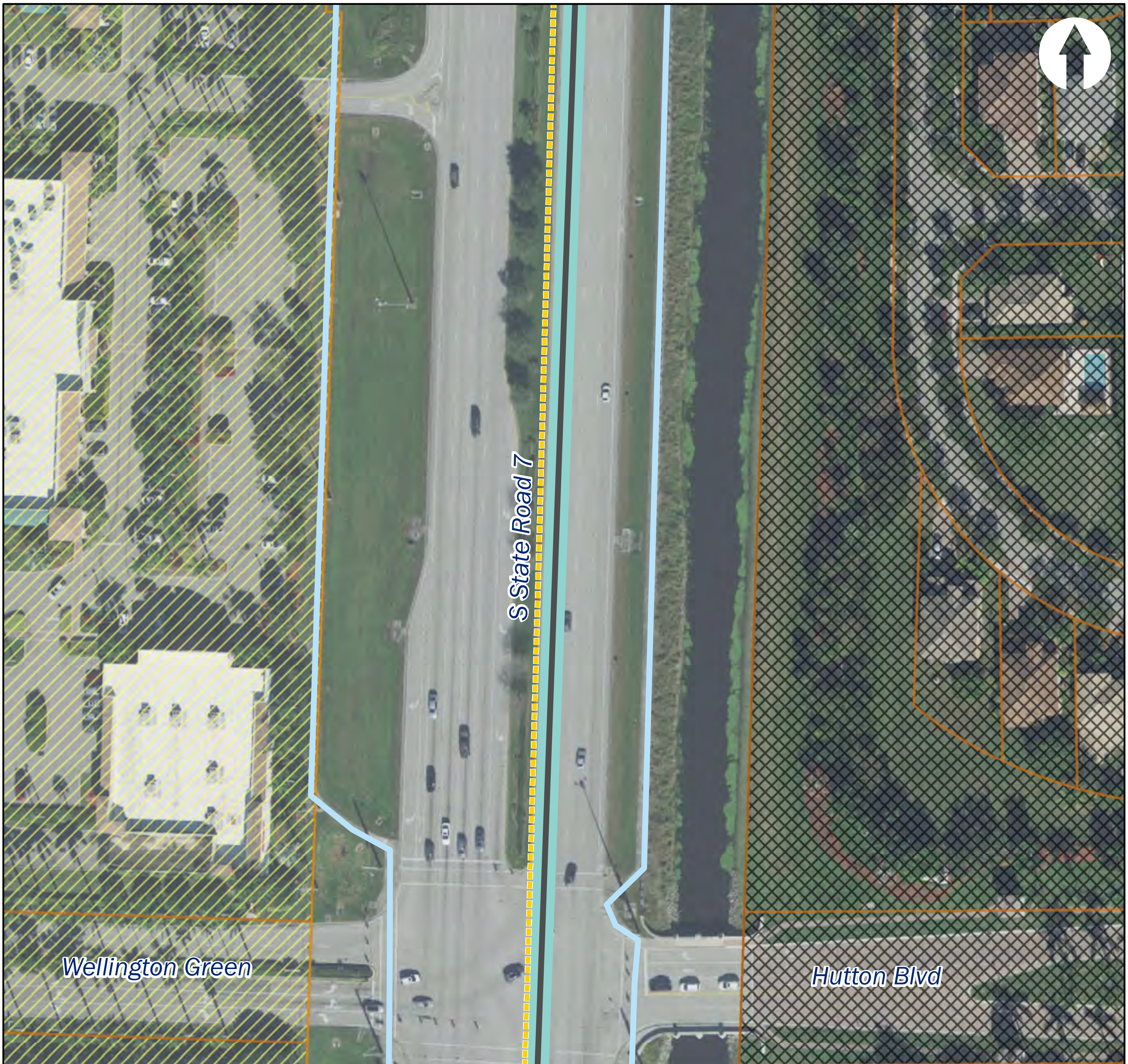
Bicyclists on the sidewalk on the north side of Okeechobee Blvd waiting to cross Rosemary Avenue.

SR-704 is a one-way pair between Rosemary Avenue and US-1, with four (4) westbound lanes carried by Lakeview Avenue looking west.

The Ramblas Okeechobee as seen from the RH rooftop restaurant looking west along Okeechobee Blvd, which includes four (4) through lanes in each direction plus turn lanes. Henry Rolfs Statue is visible in the midground of this photo at Sapodilla Avenue.

Appendix B

8.5”x11” Corridor Maps



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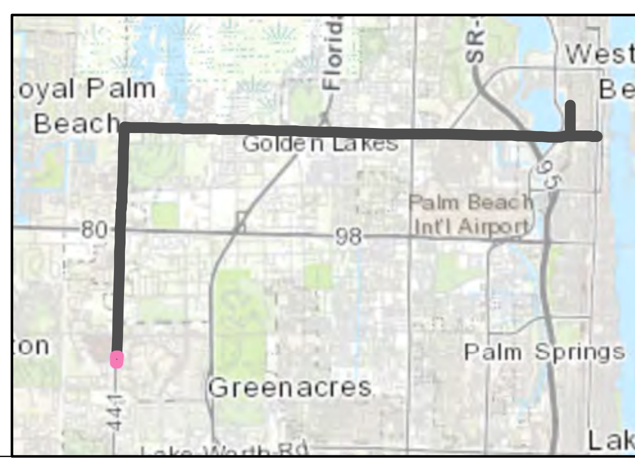

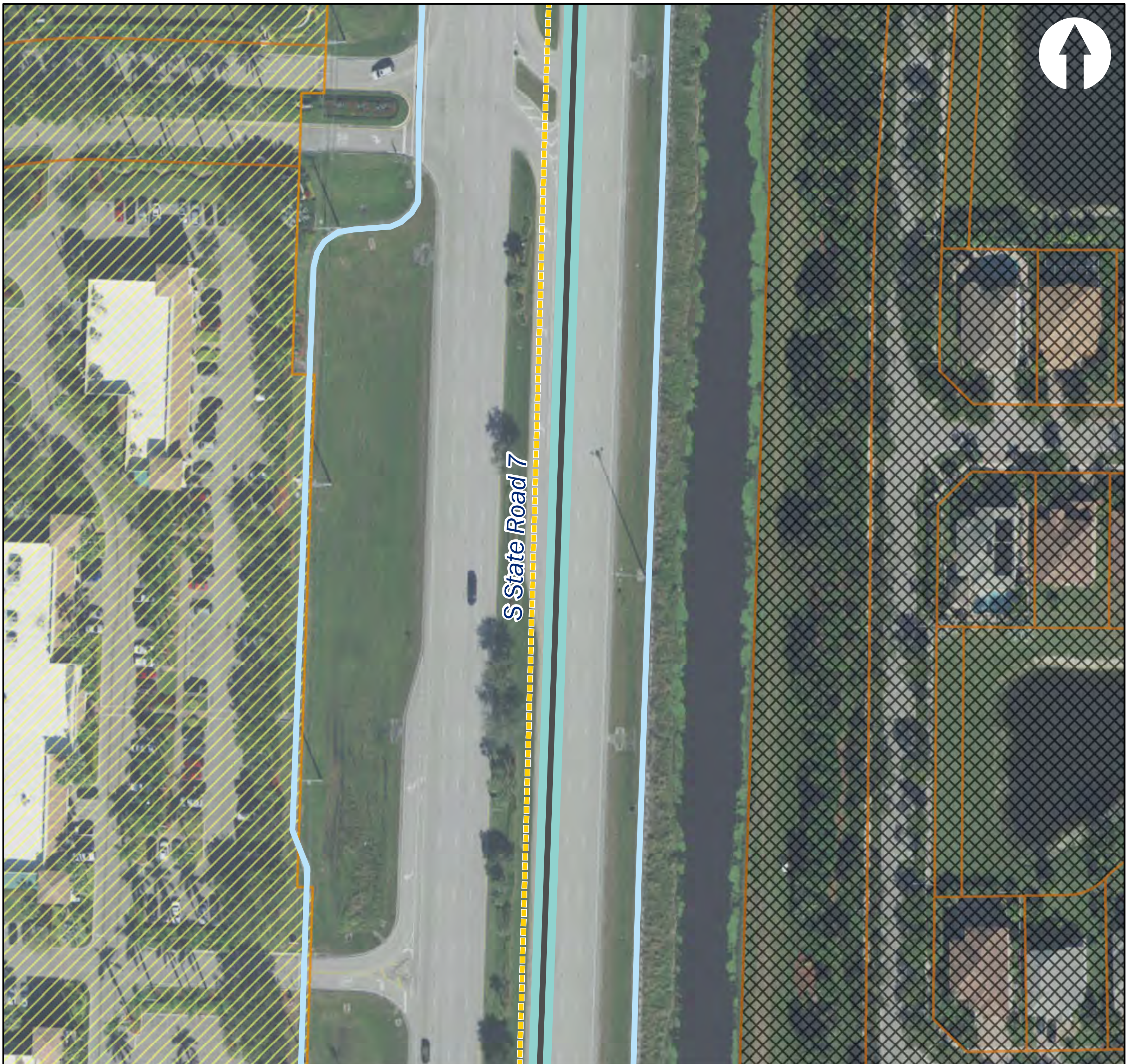
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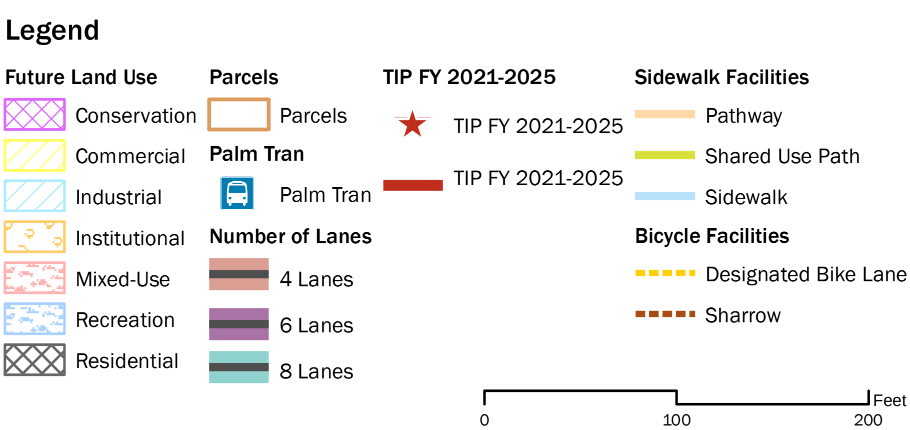
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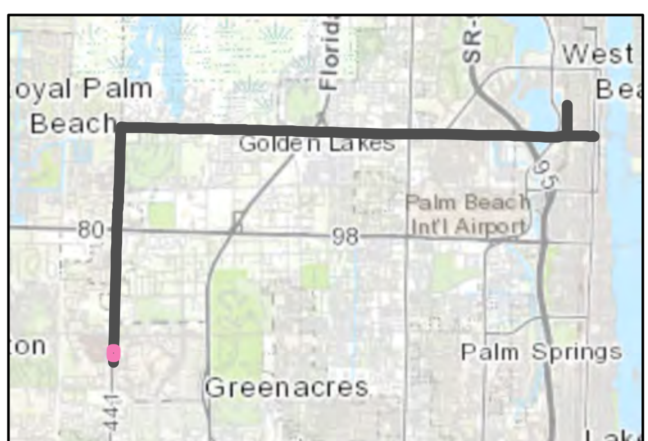
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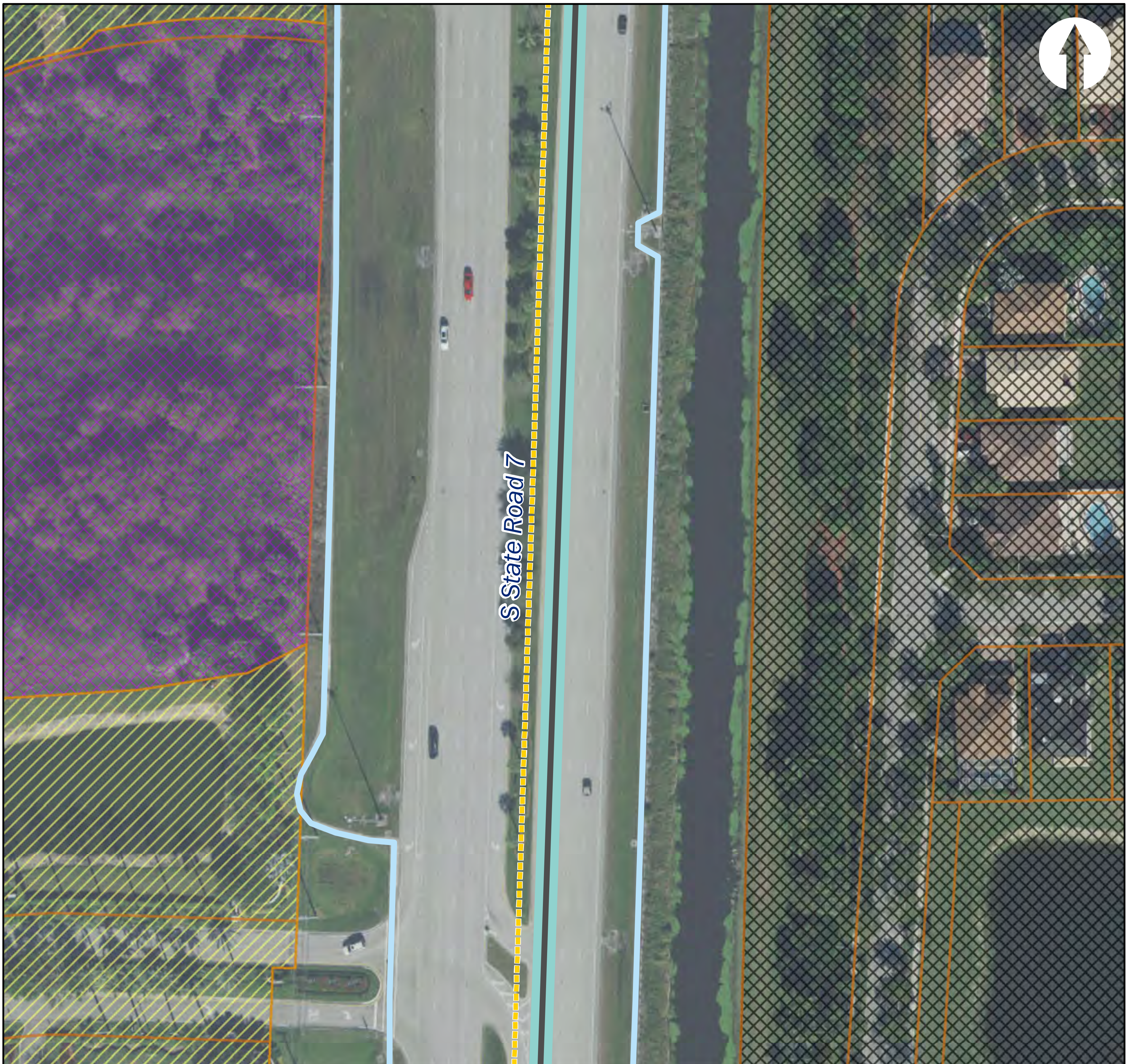

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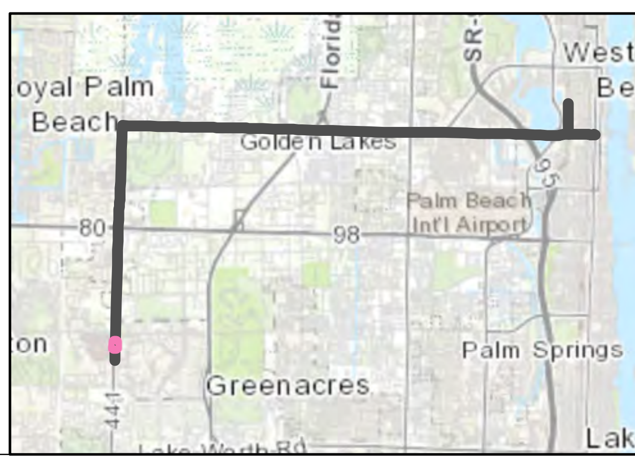

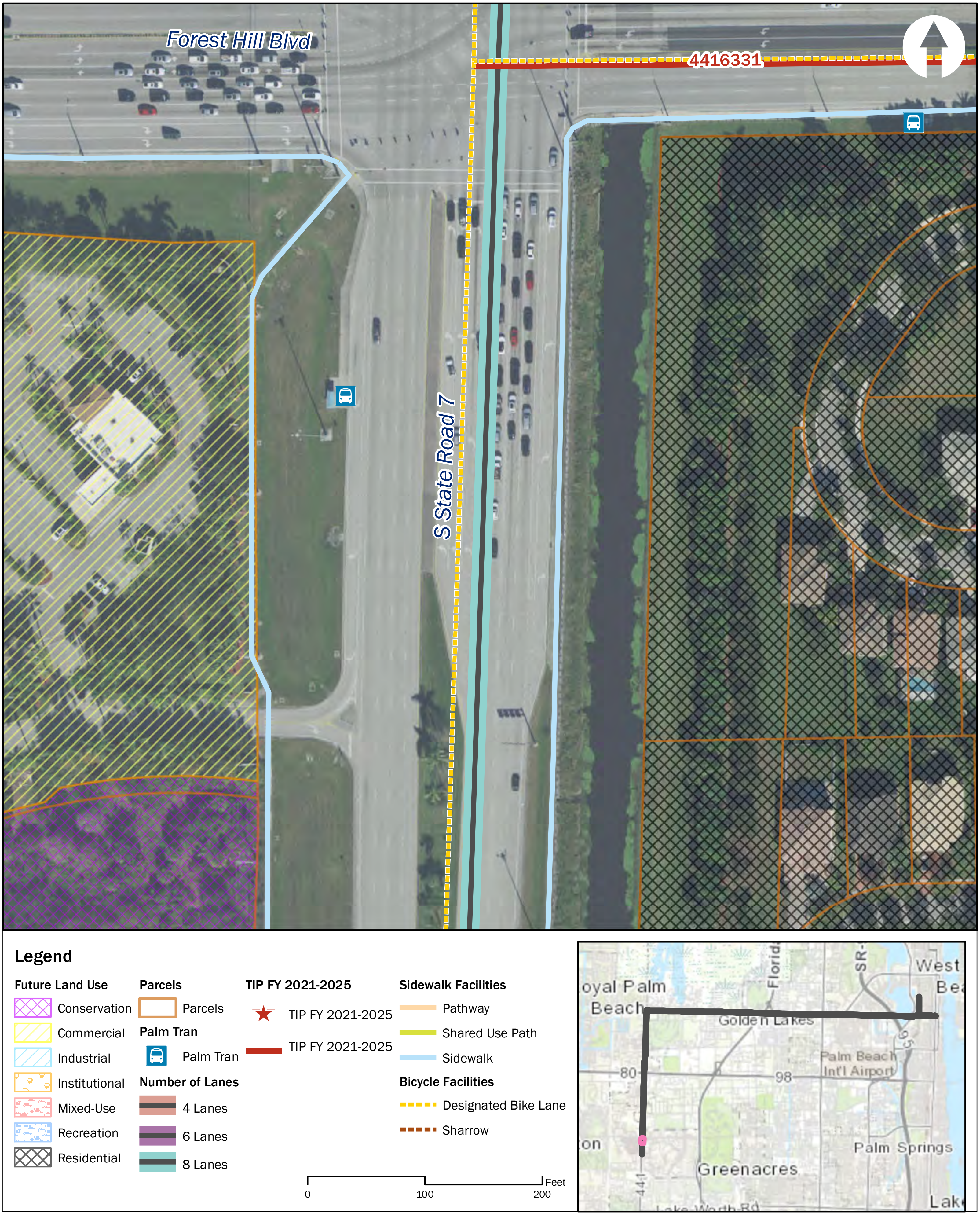
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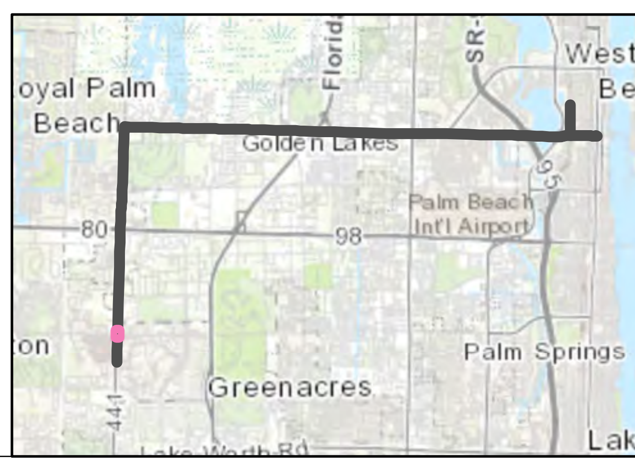

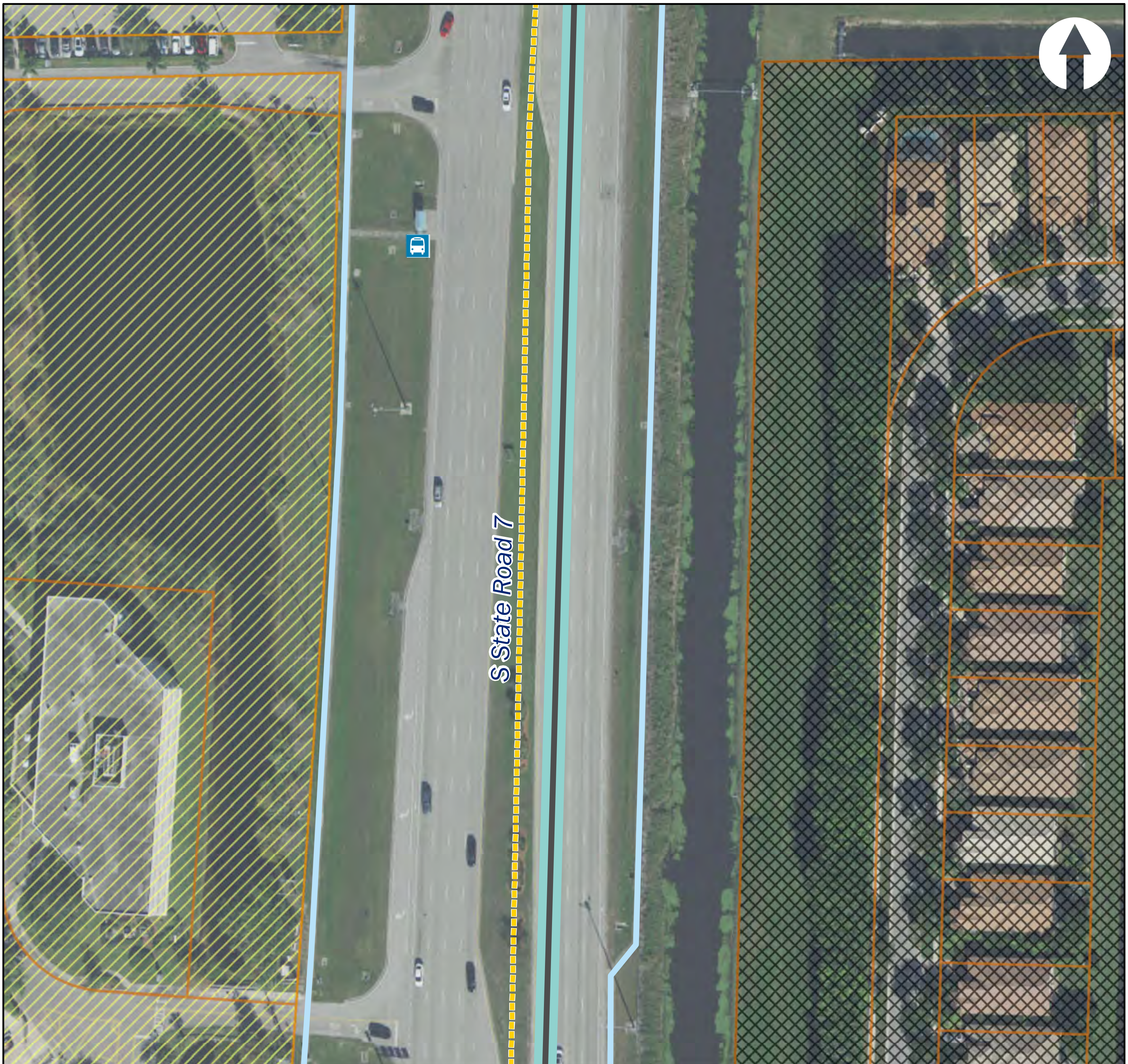

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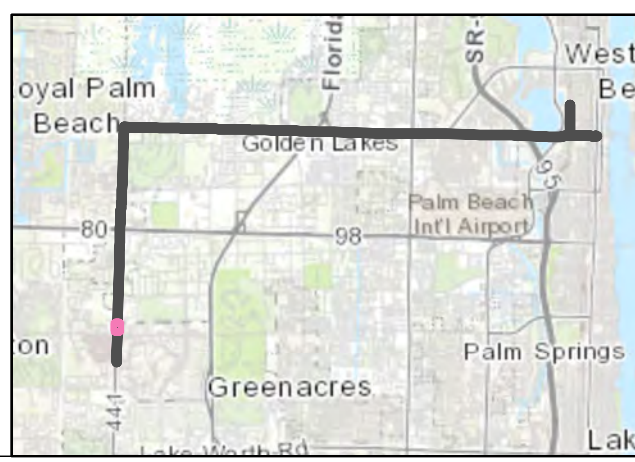

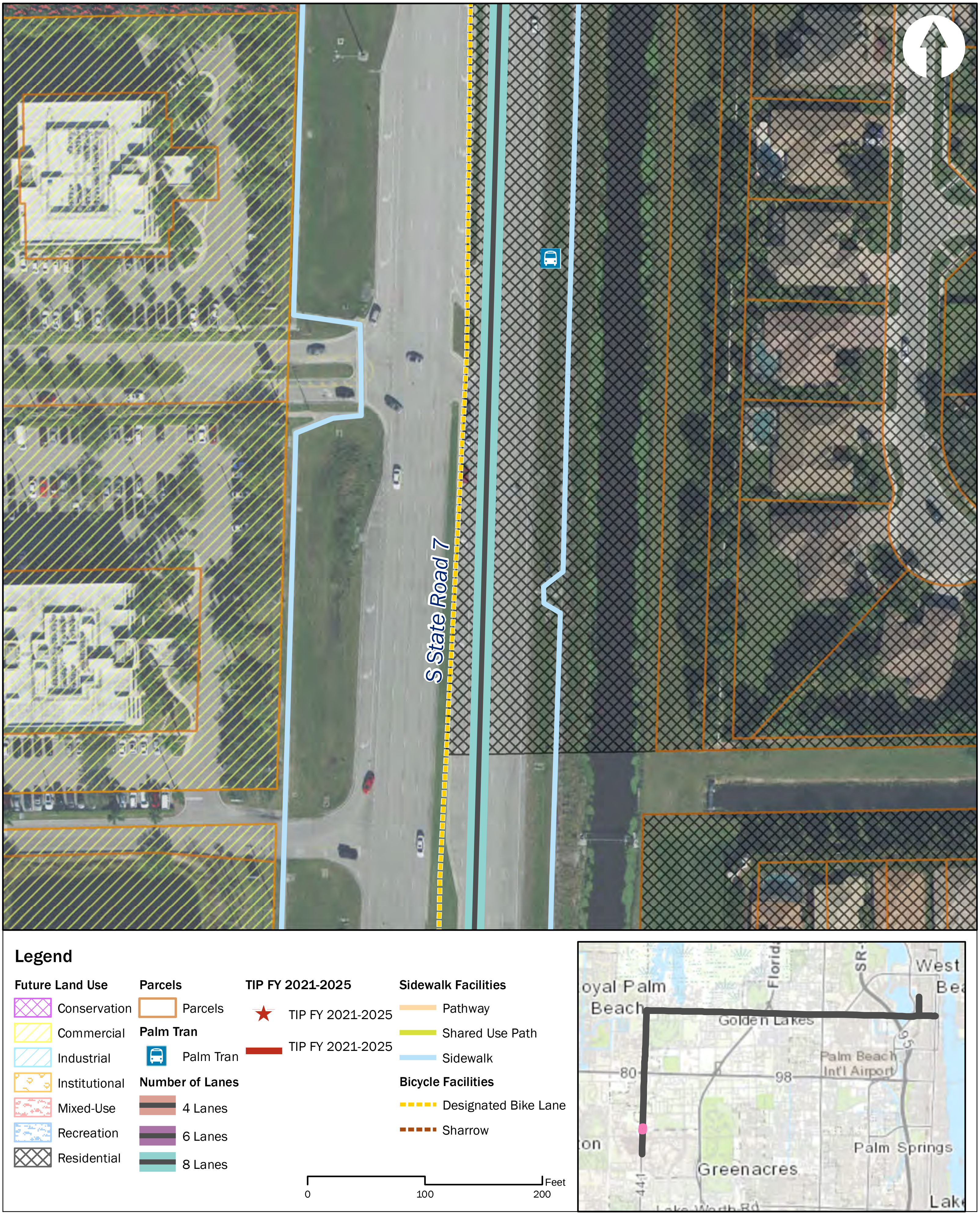
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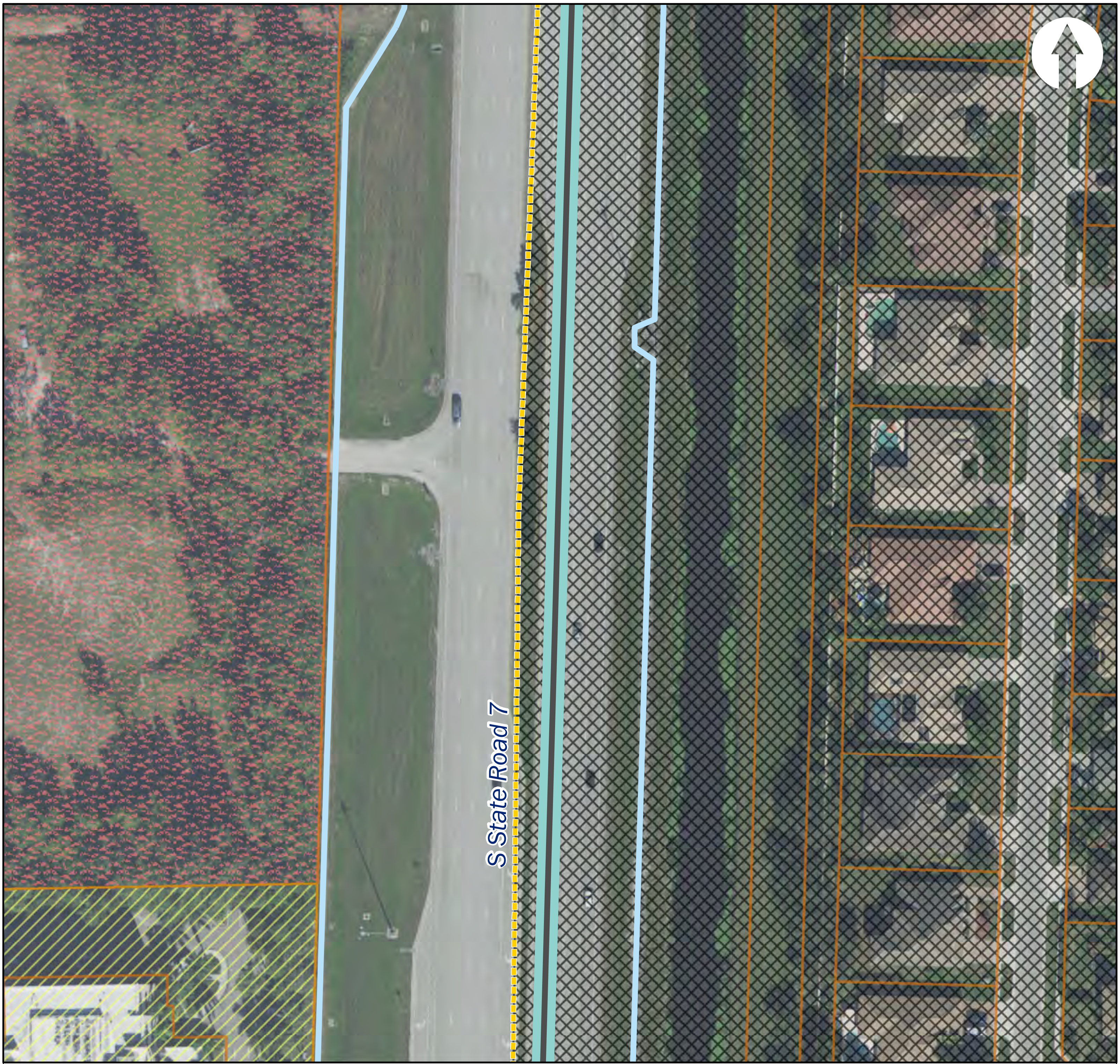

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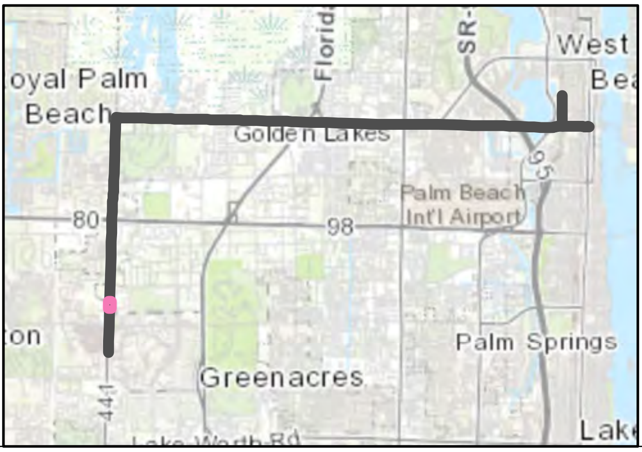

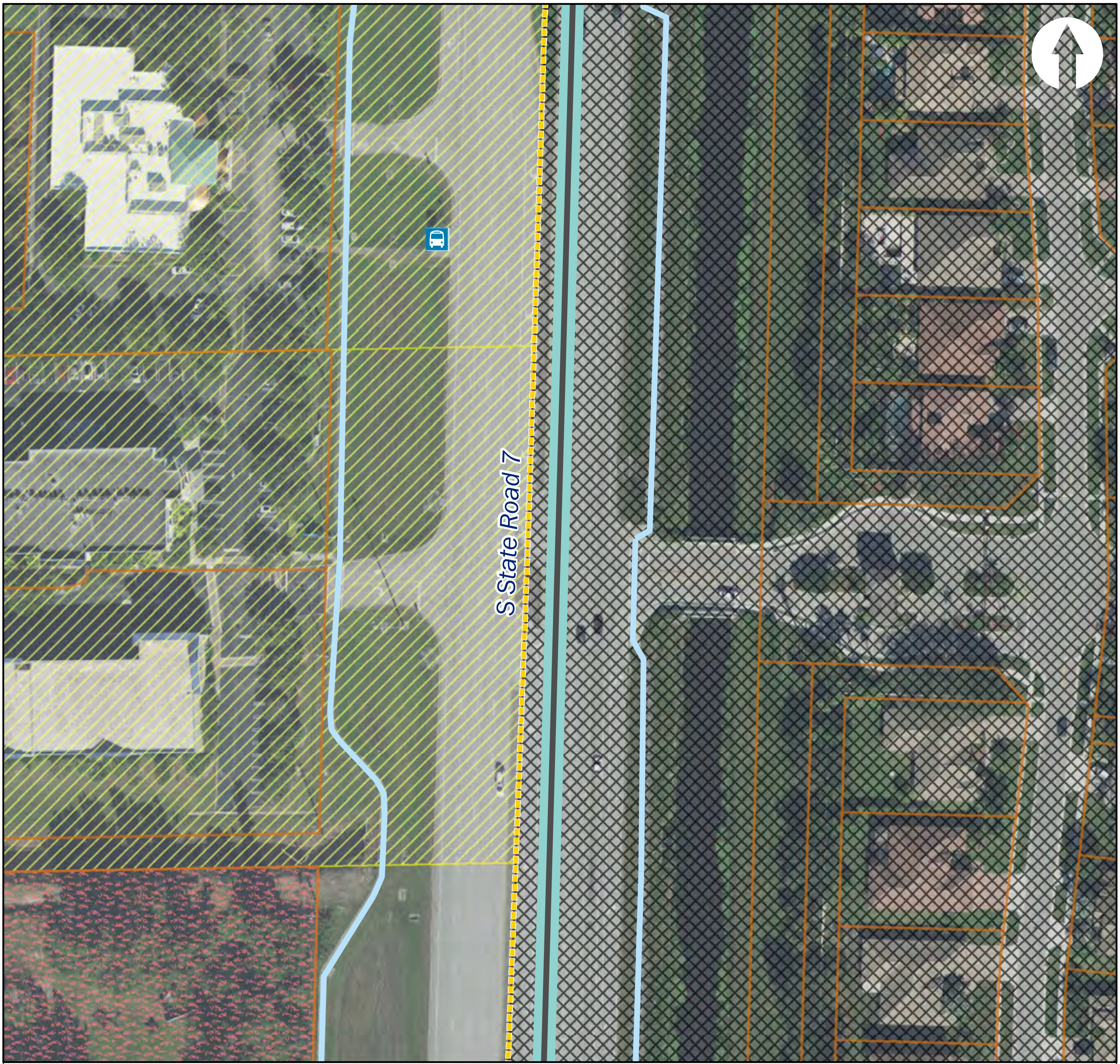

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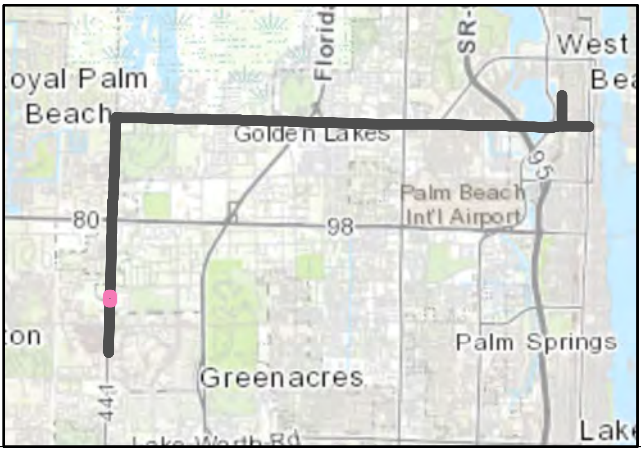

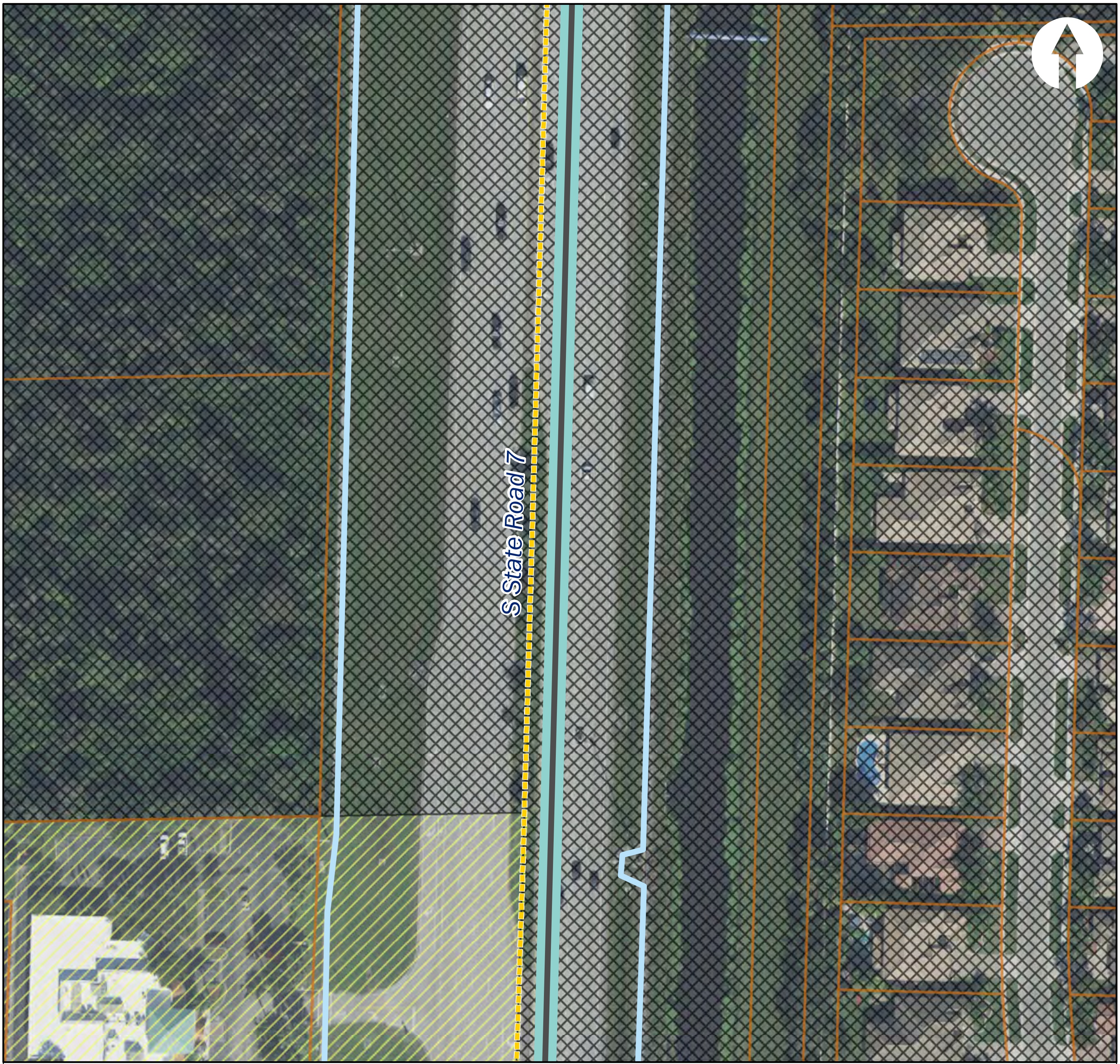

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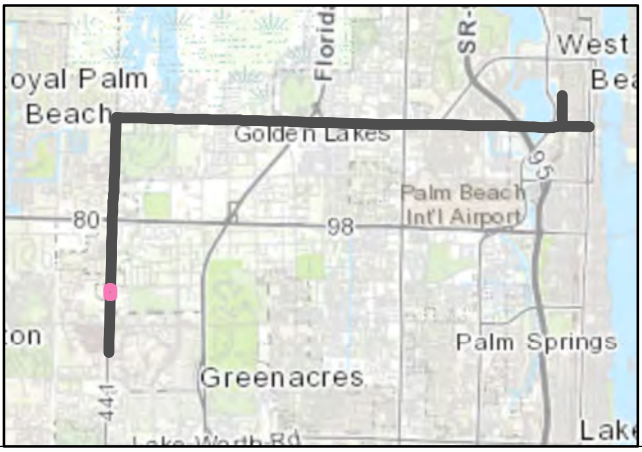

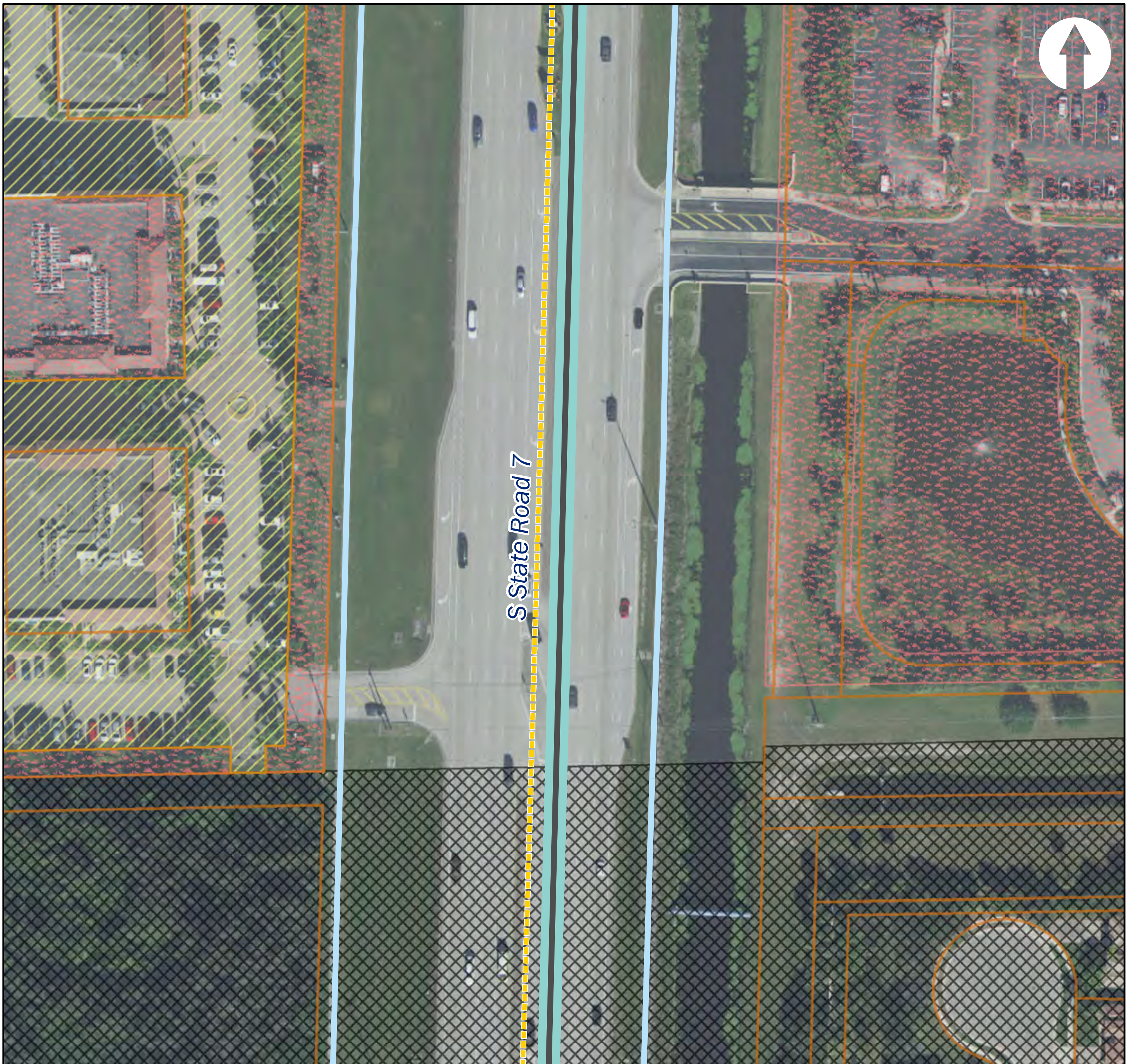
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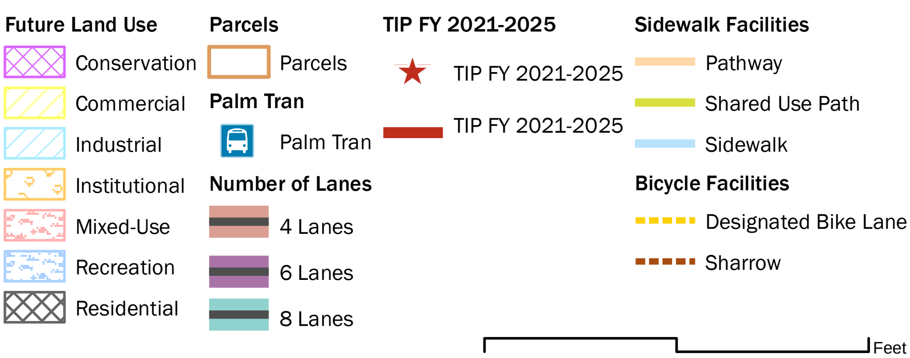
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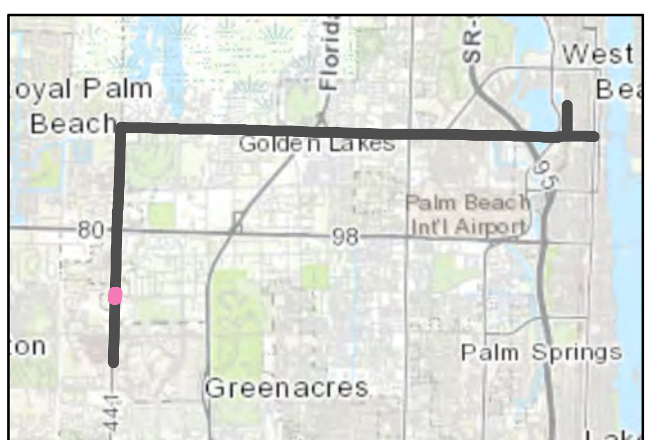
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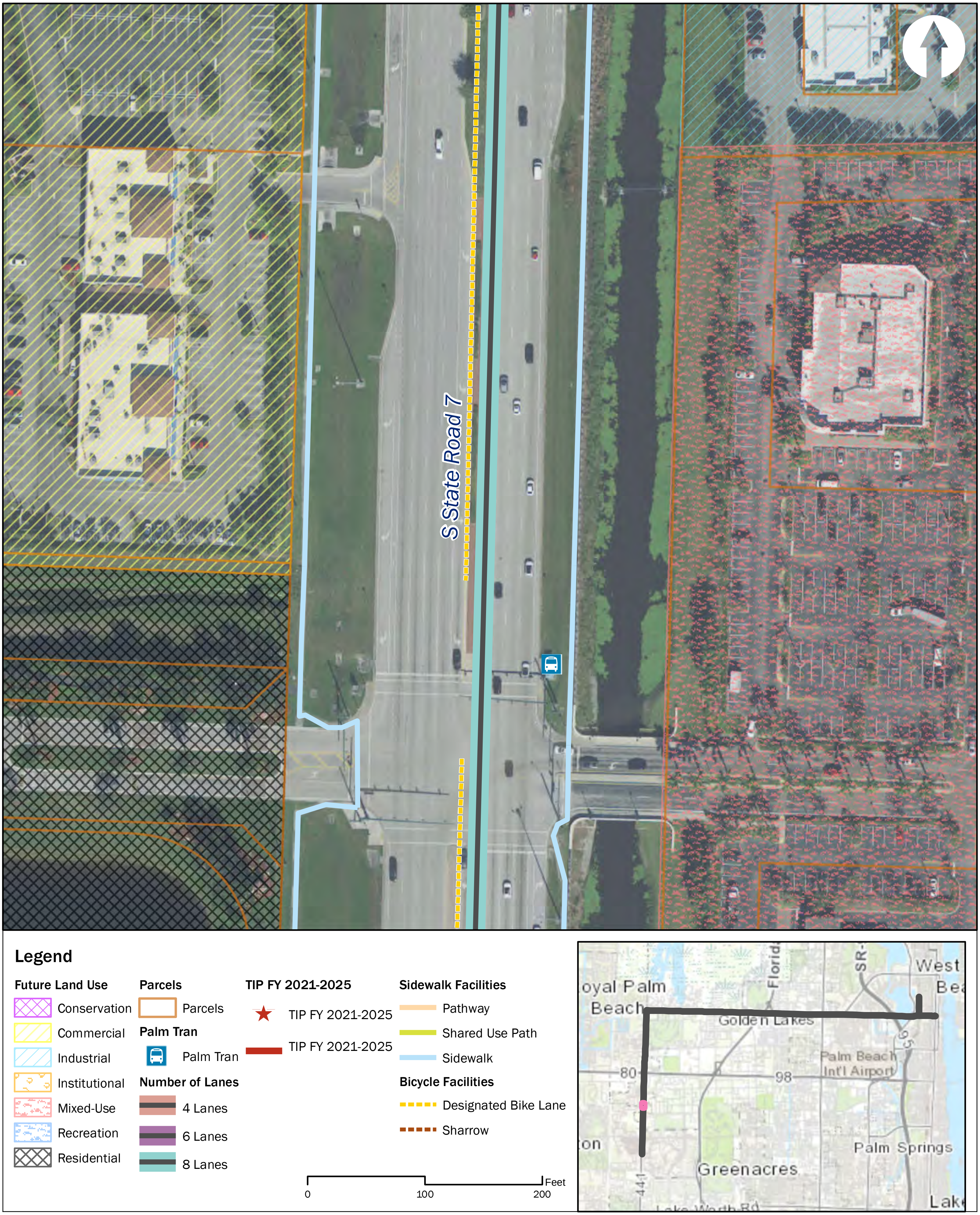
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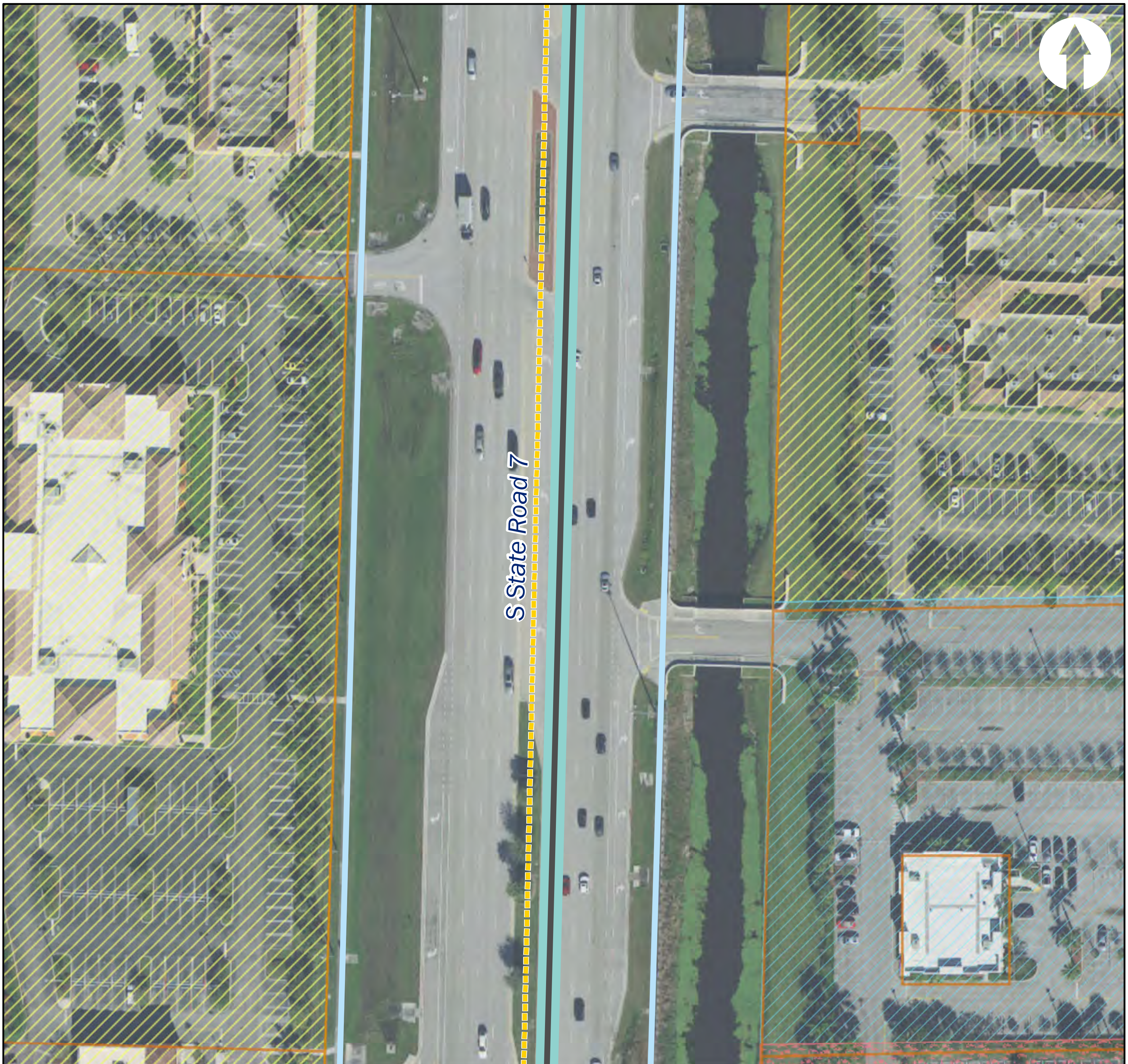

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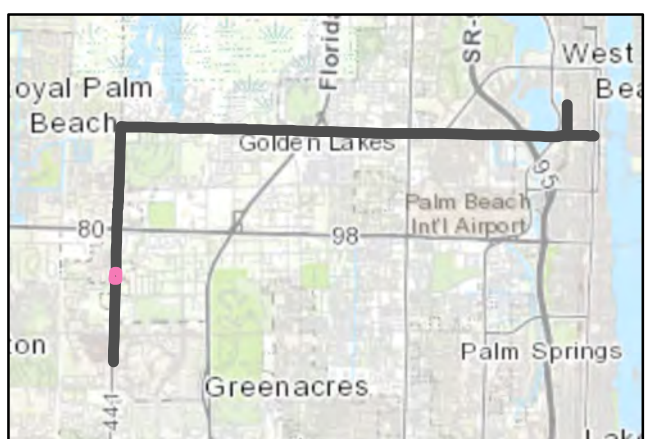
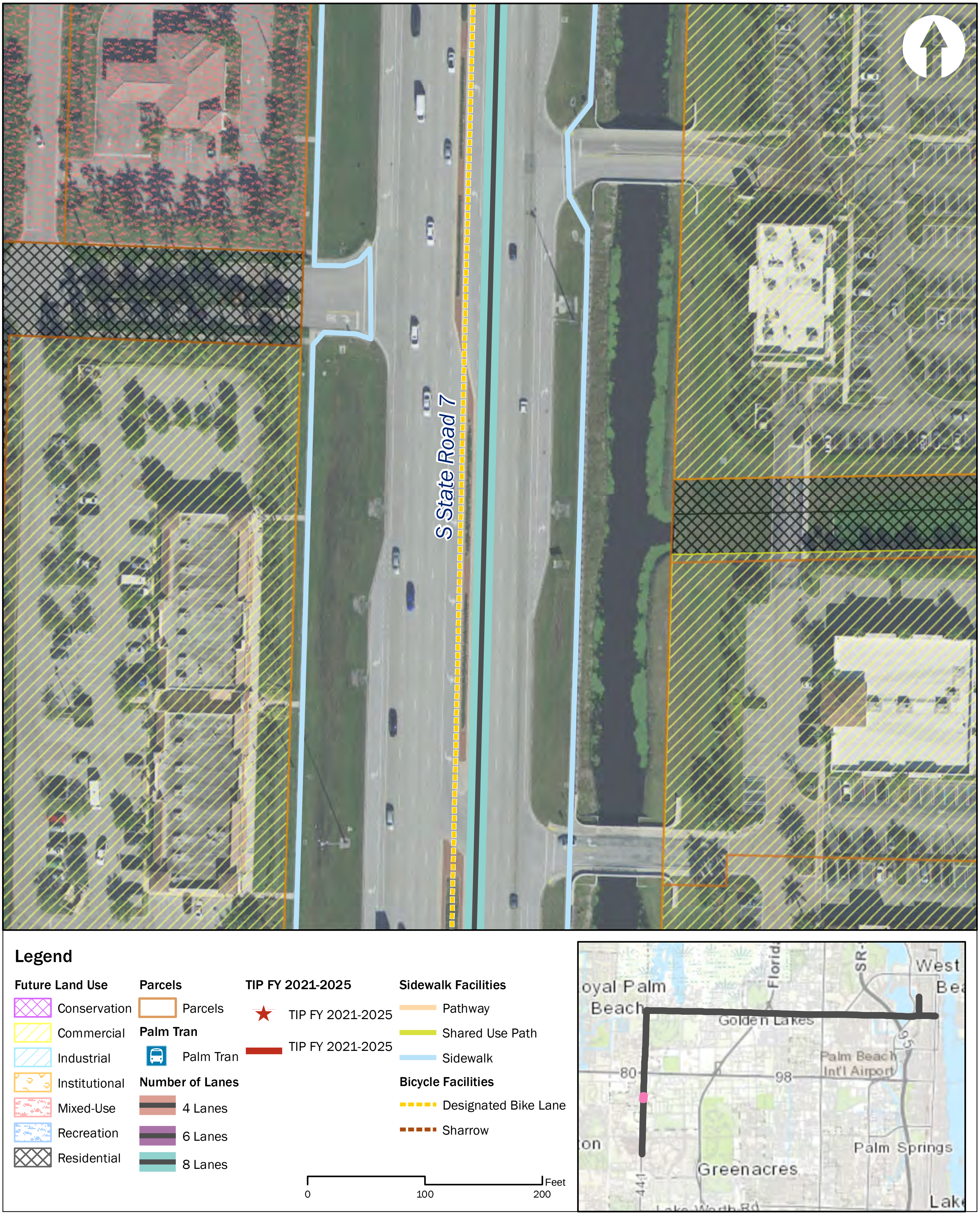
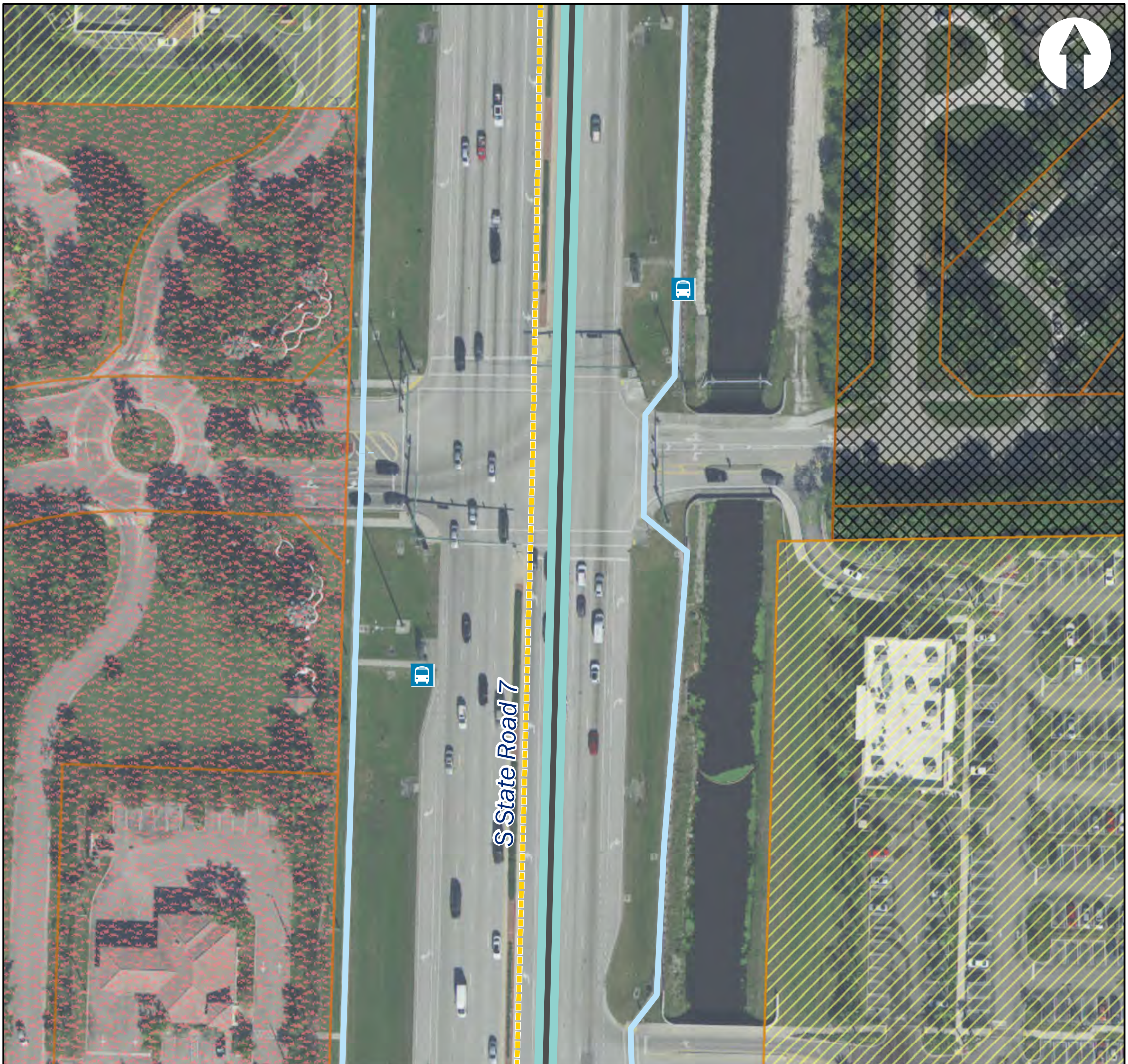



S State Road 7
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
Number of Lanes
4 Lanes
6 Lanes
8 Lanes
TIP FY 2021-2025
TIP FY 2021-2025
TIP FY 2021-2025
Sidewalk Facilities
Pathway
Shared Use Path
Sidewalk
Bicycle Facilities
Designated Bike Lane
Sharrow
0
100
200
Feet
Golden Lakes
Palm Beach Int'l Airport
Palm Springs
Greenacres
West
80
98
441



Legend

Future Land Use
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- Commercial
- Industrial
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Parcels
- Parcels

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Sidewalk Facilities
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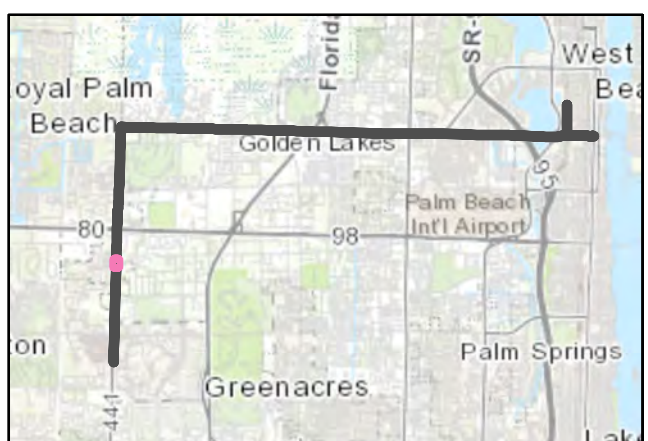
0 100 200 Feet



Legend

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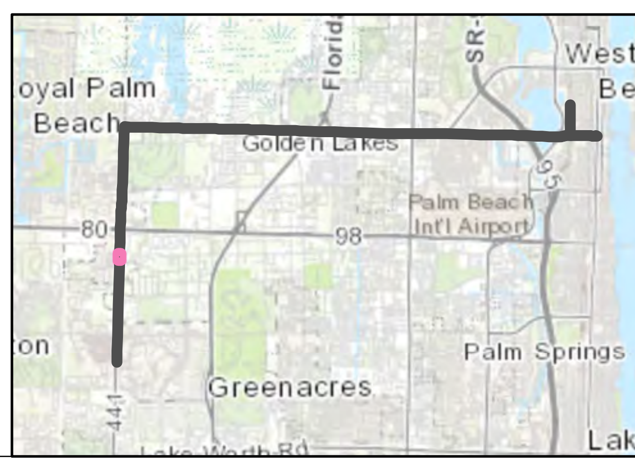

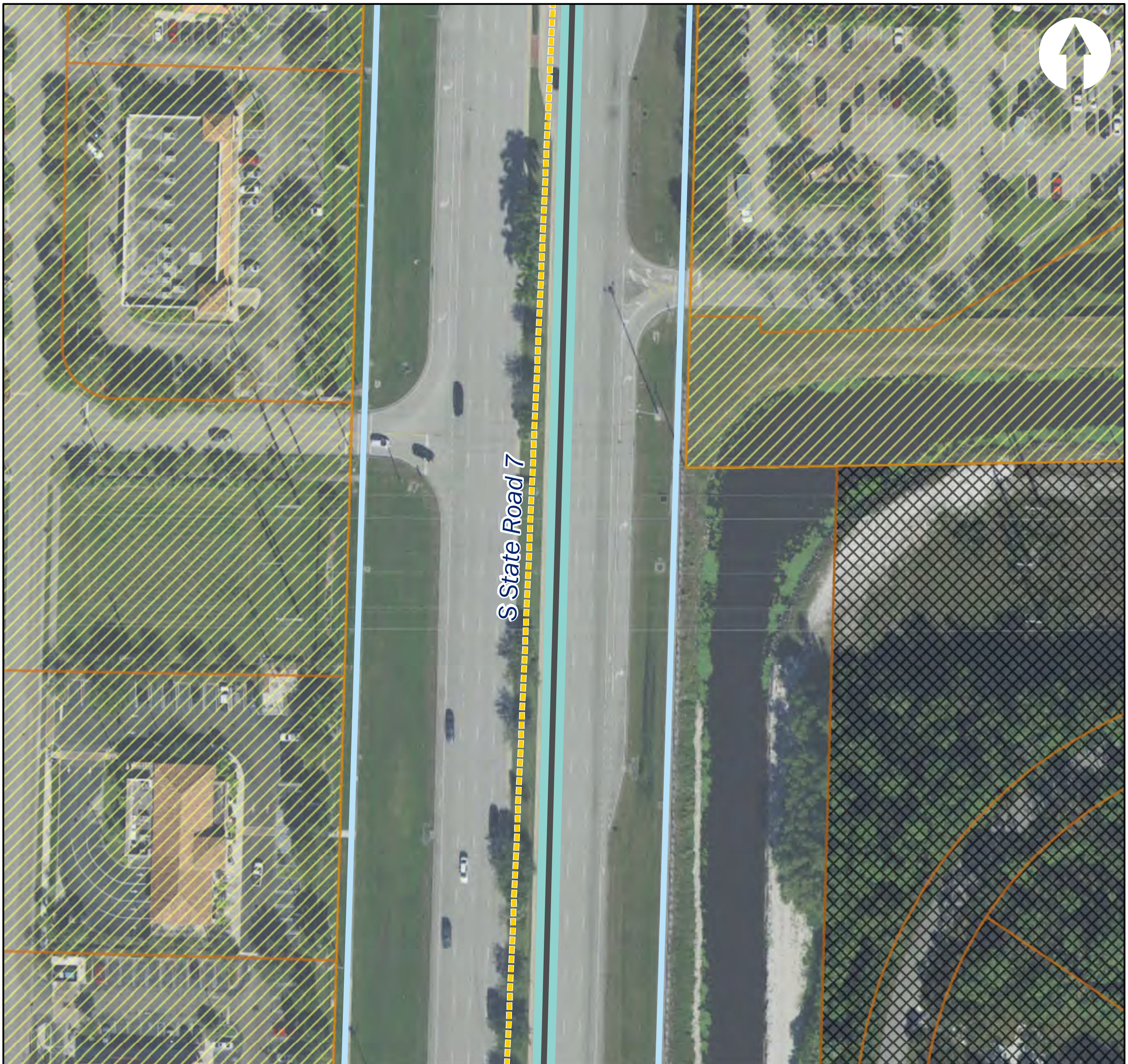

Legend

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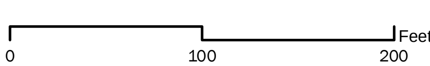

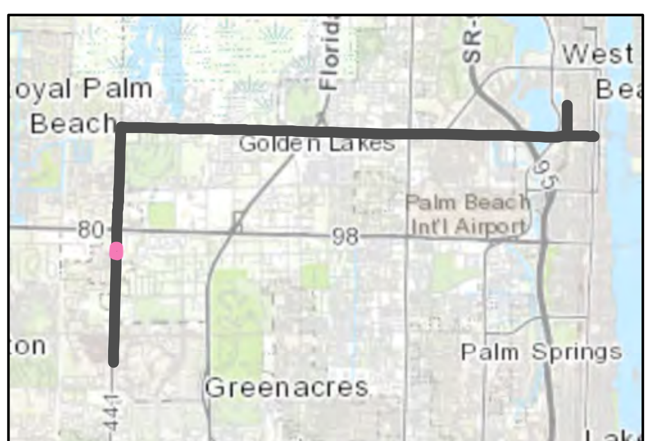

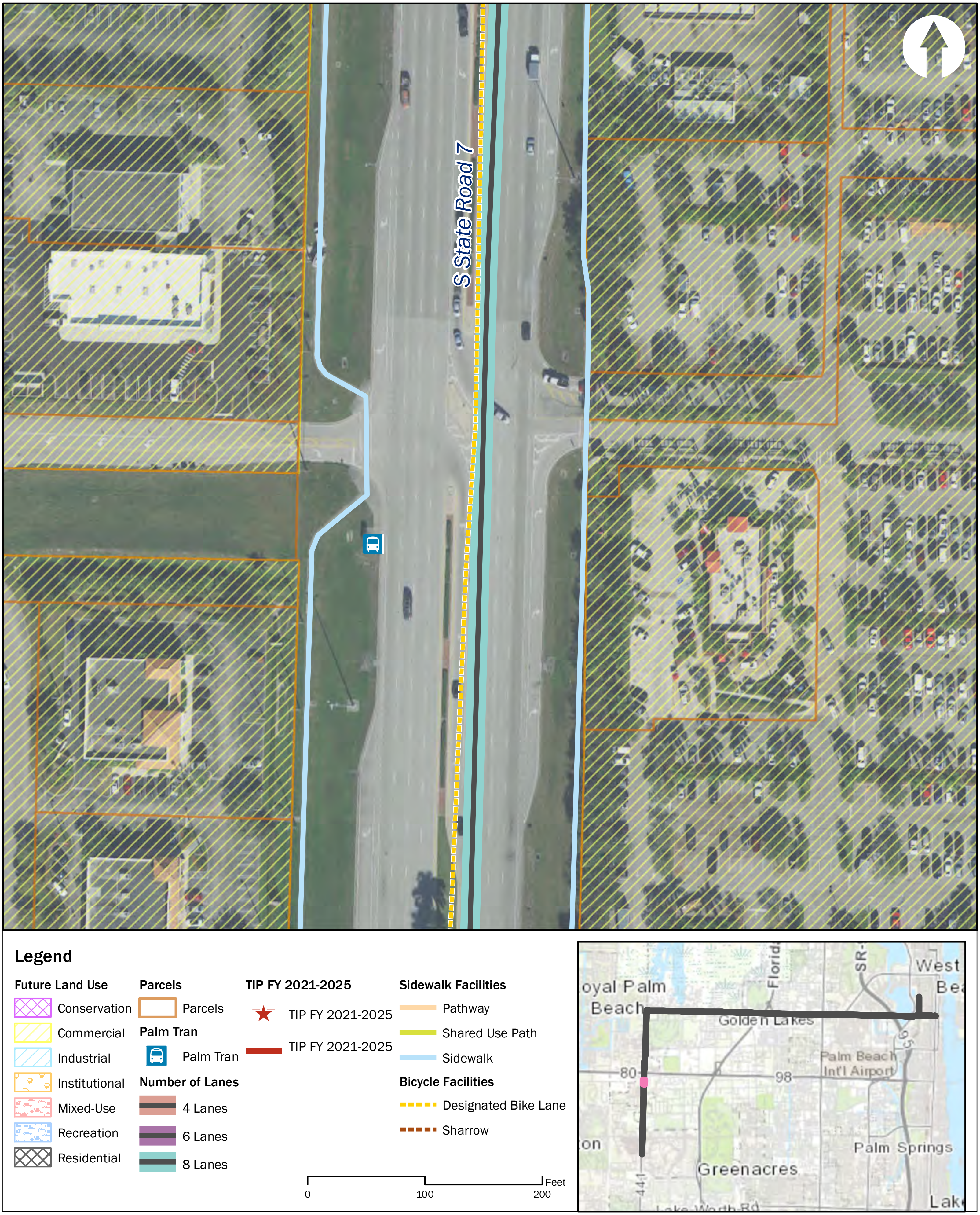

S State Road 7
Legend
Future Land Use
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Sharrow
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Feet
Golden Lakes
Palm Beach Int'l Airport
98
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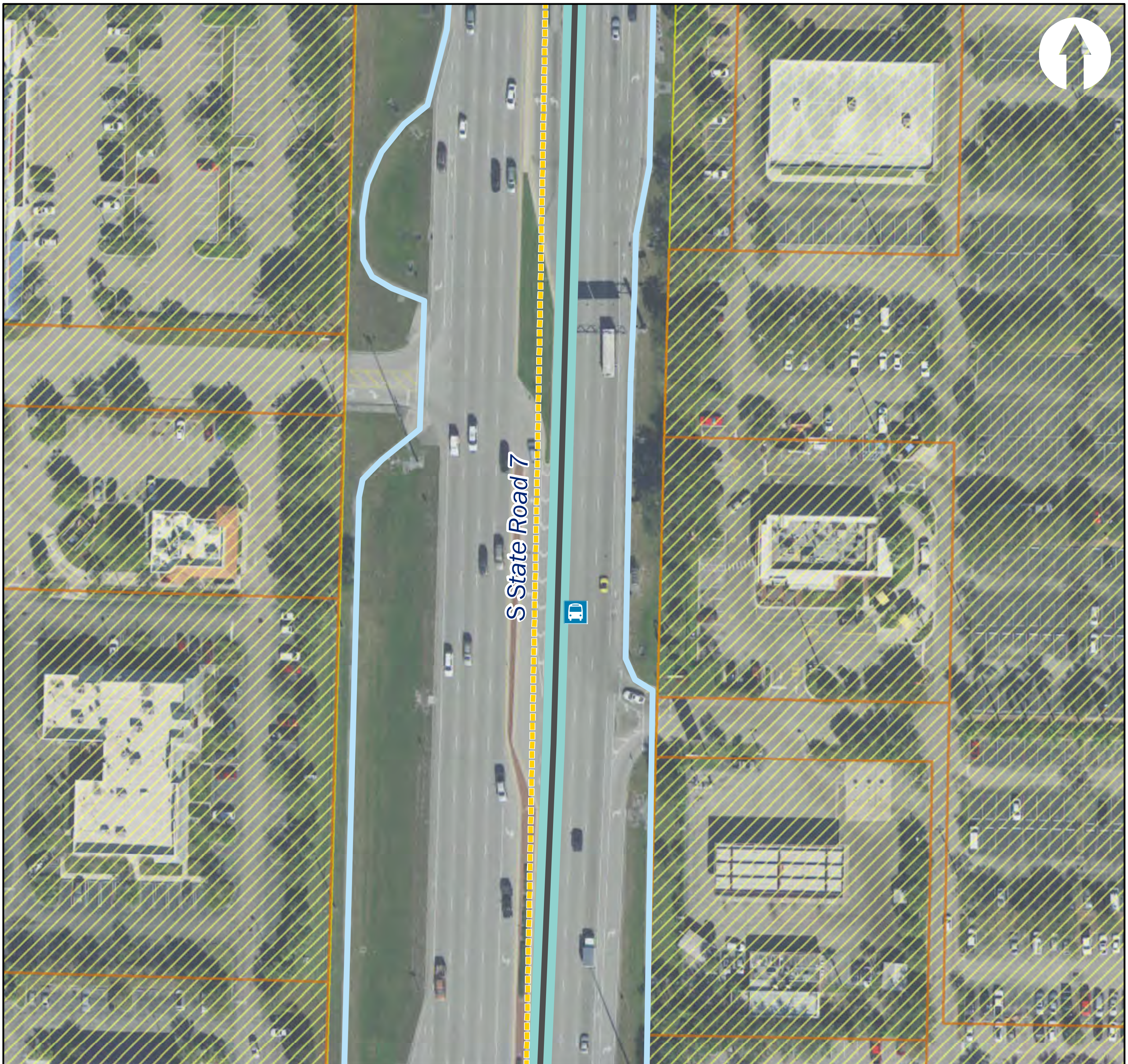
95
441
Greenacres
Palm Springs



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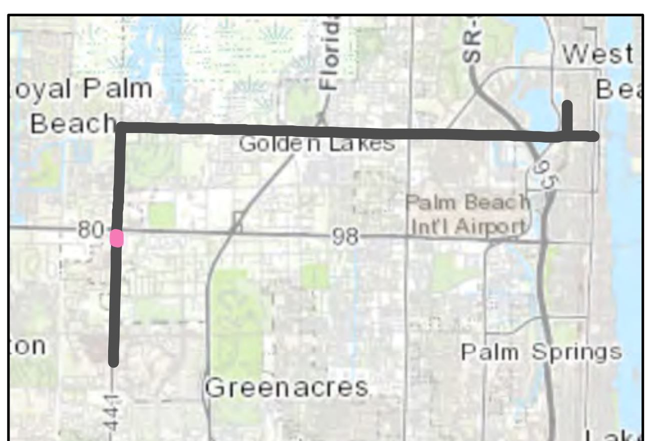

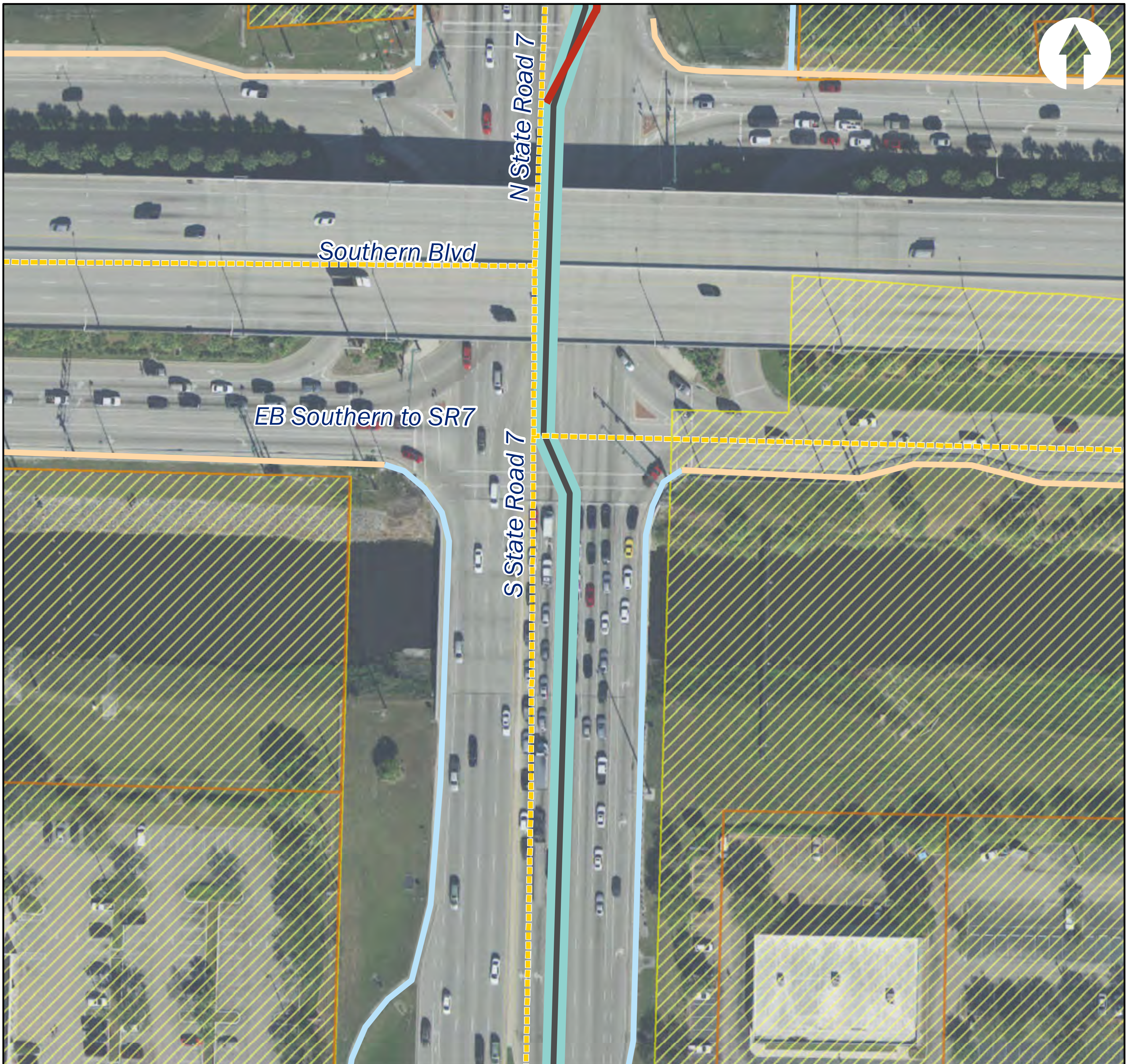

Legend

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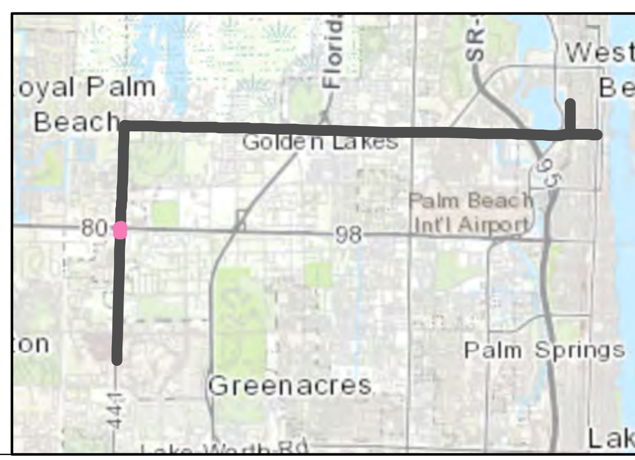

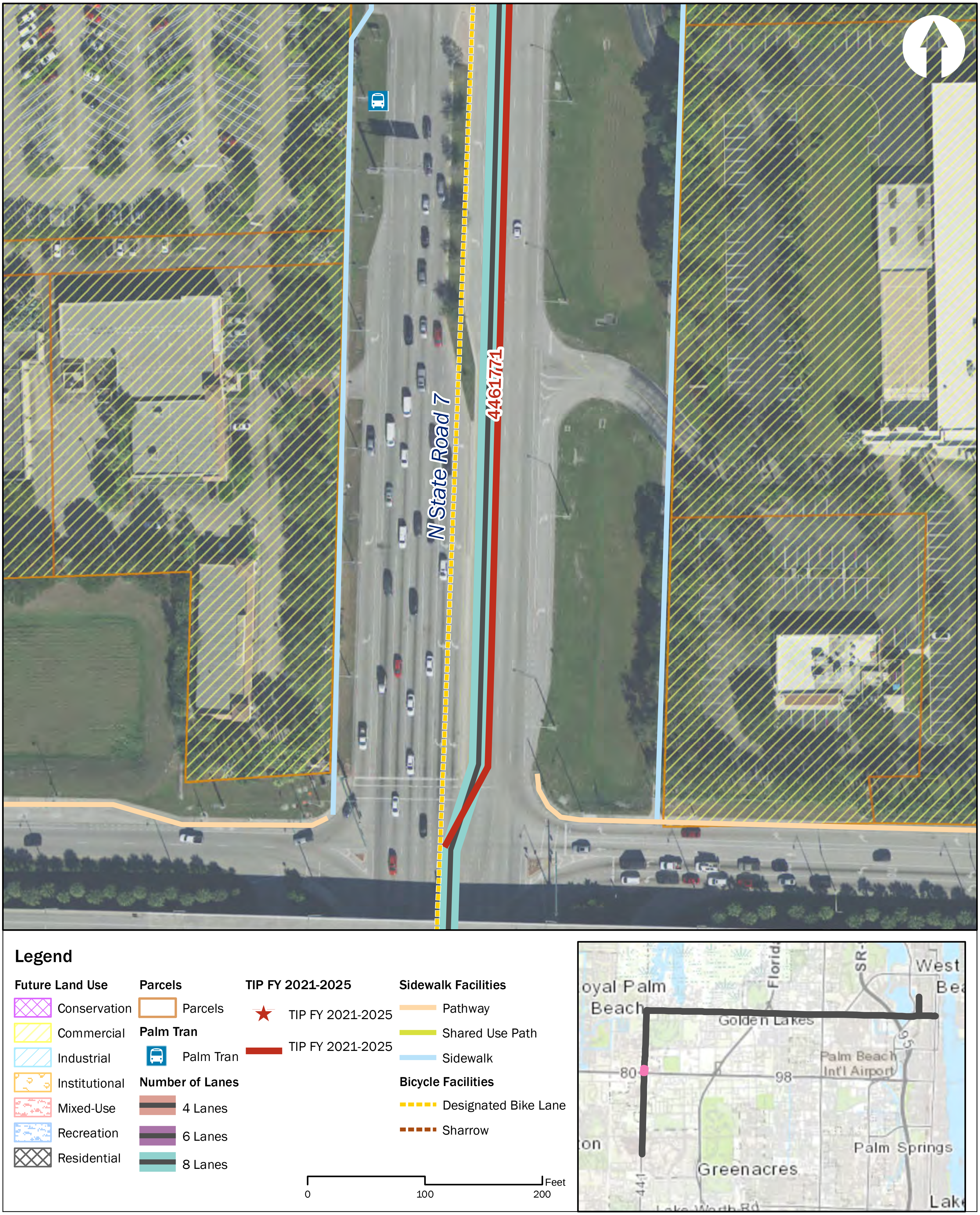
N State Road 7
4461771
Legend
Future Land Use
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Commercial
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Residential
Parcels
Parcels
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Feet
Royal Palm Beach
Golden Lakes
West Palm Beach
Palm Beach Int'l Airport
Palm Springs
Greenacres
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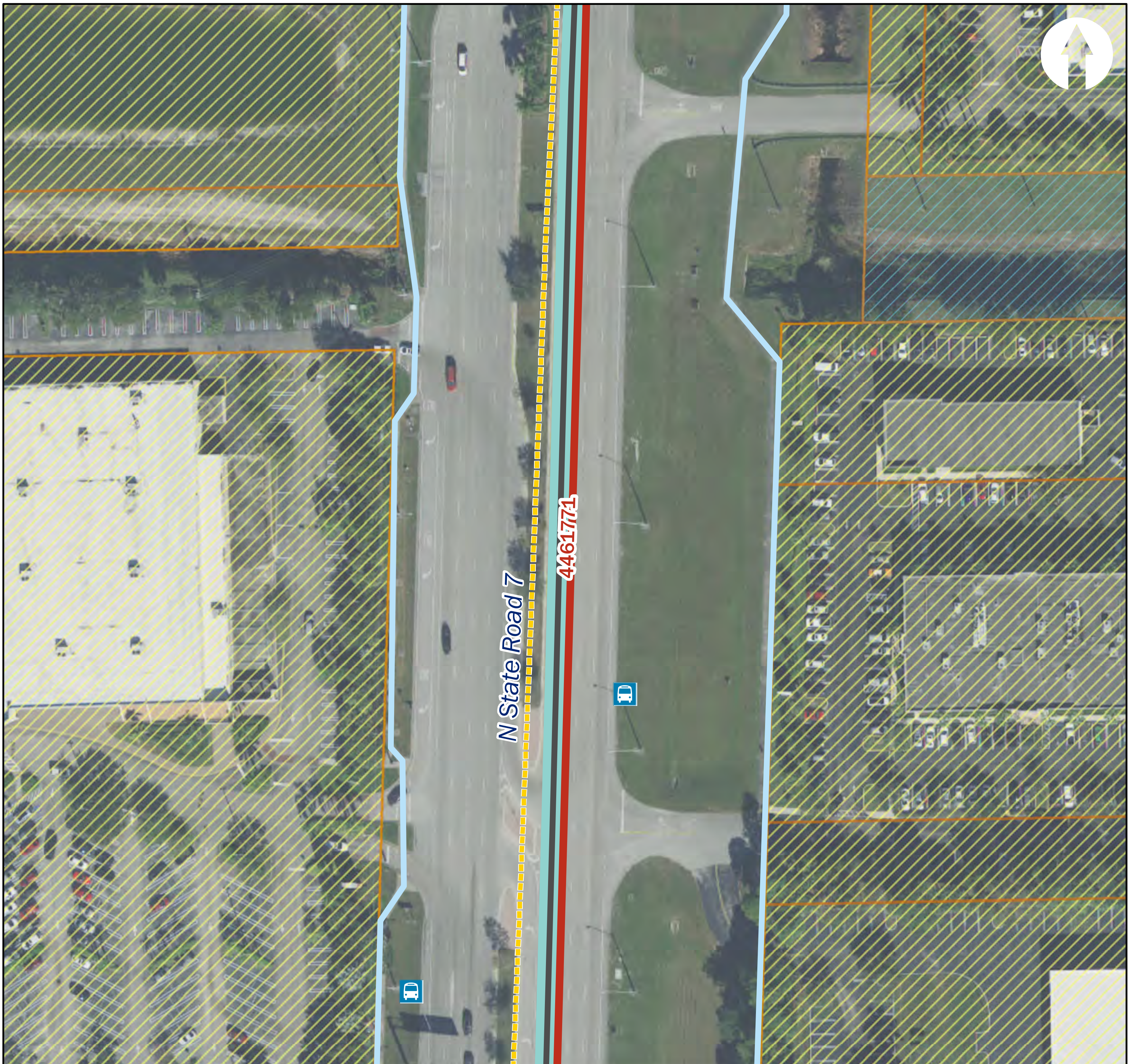

Legend

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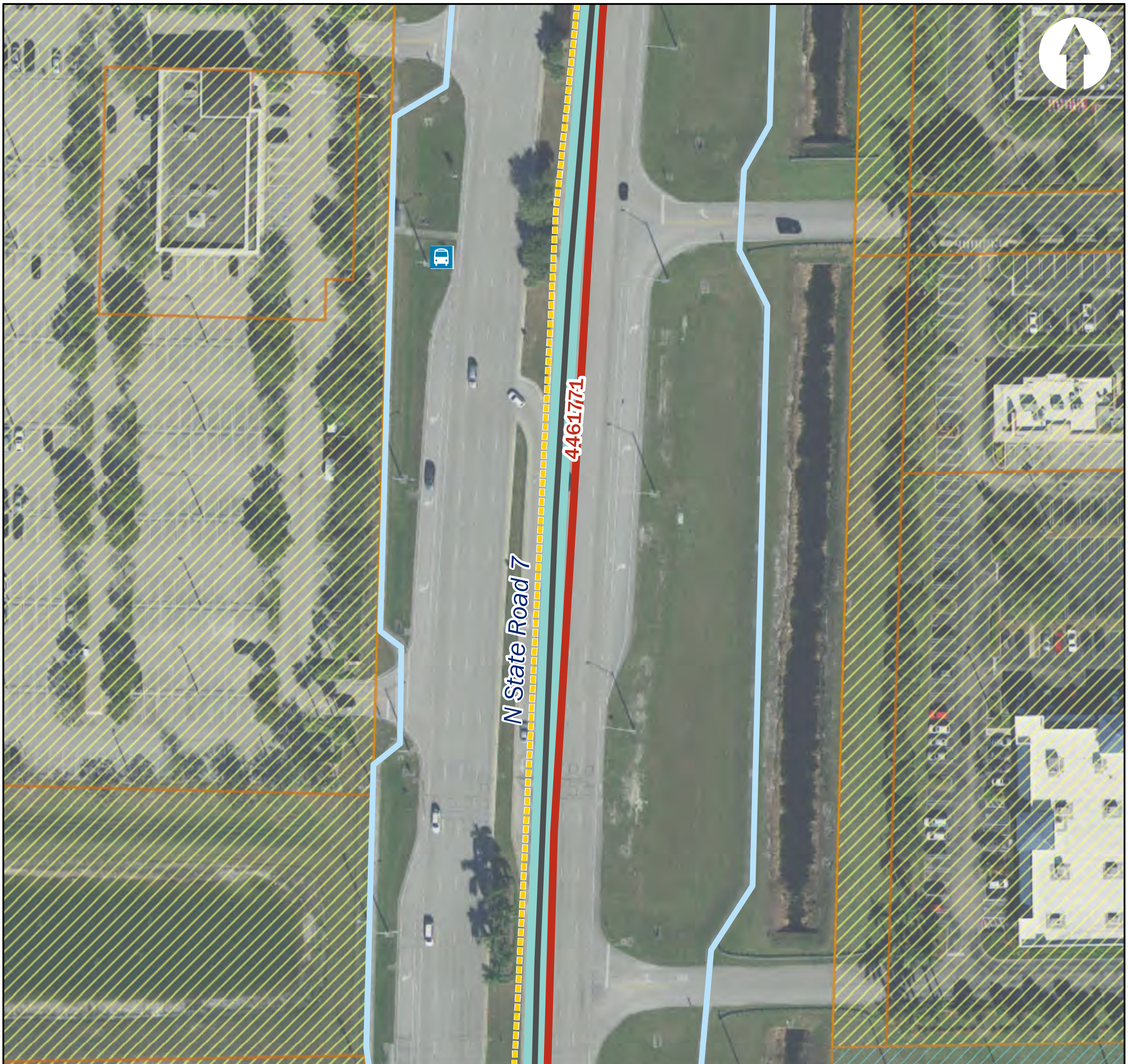
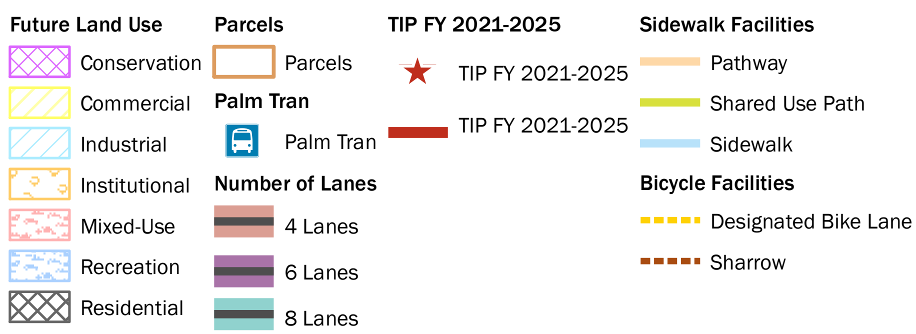

N State Road 7
4461771

Legend


Future Land Use
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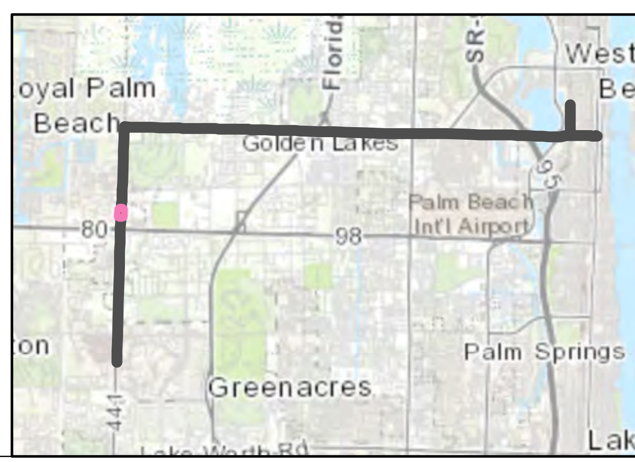
oyal Palm
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West
Palm Beach
Int'l Airport
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Palm Springs
Greenacres
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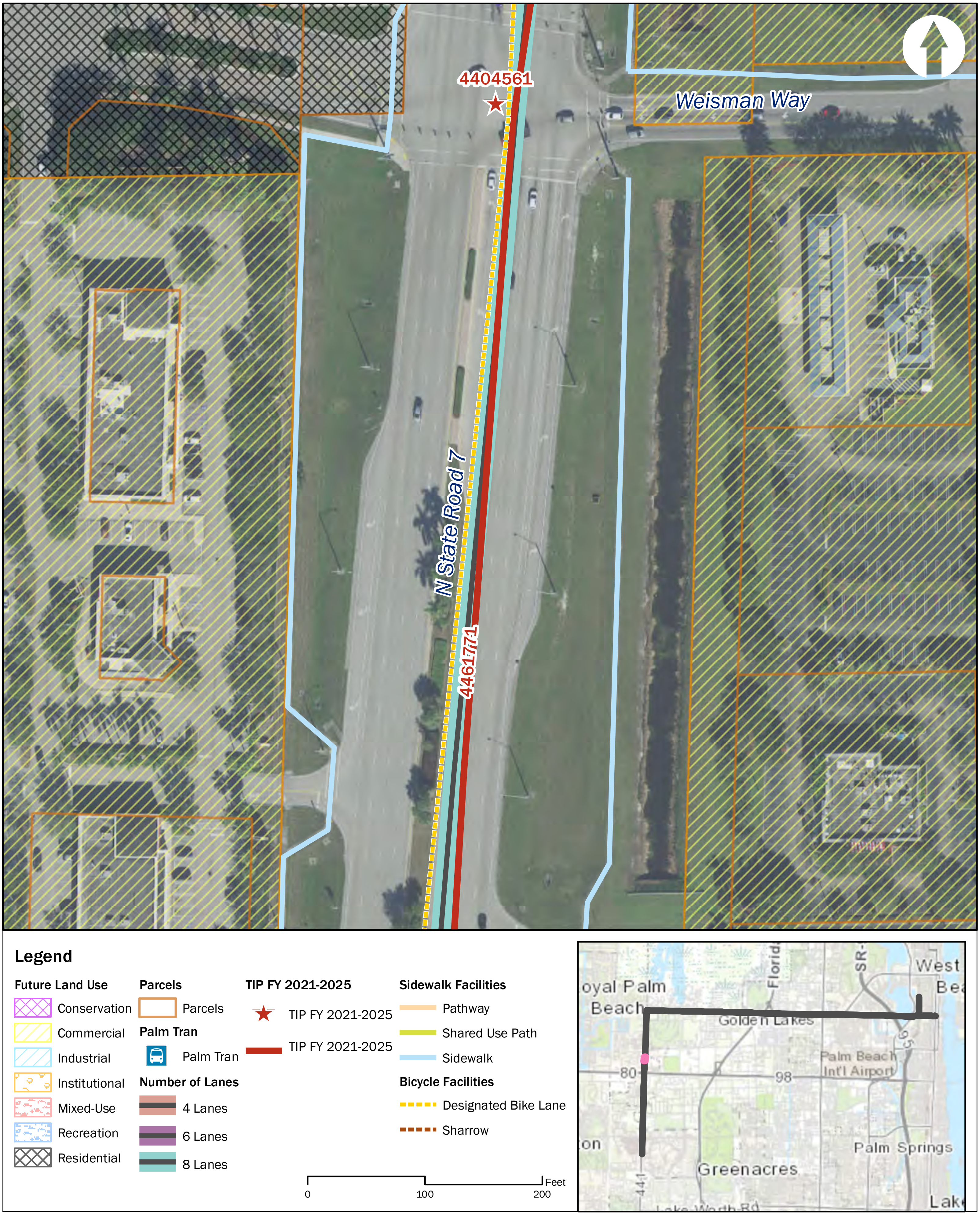
4404561
Weisman Way
N State Road 7
4461771
Legend
Future Land Use
Conservation
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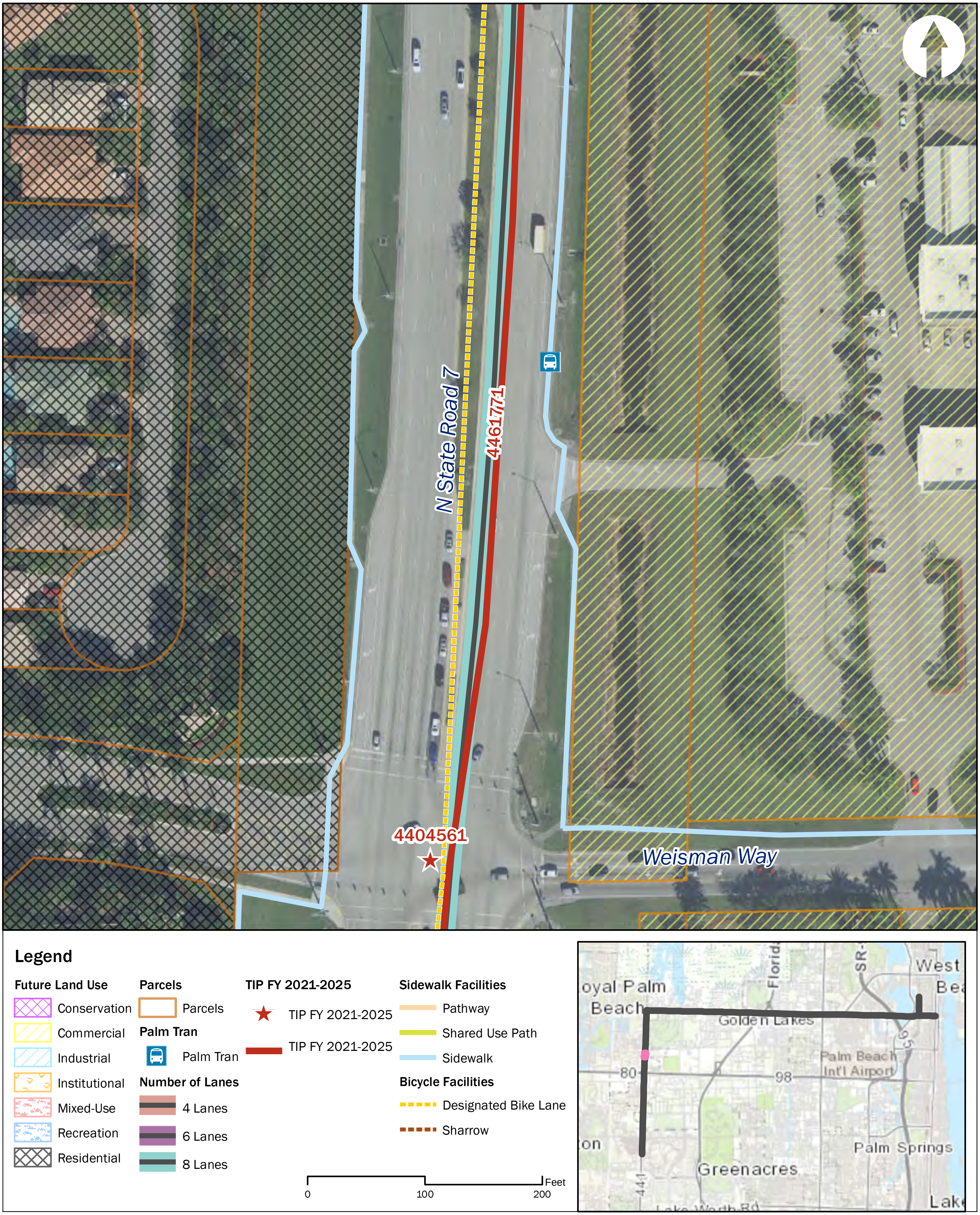
N State Road 7
4461771
4404561
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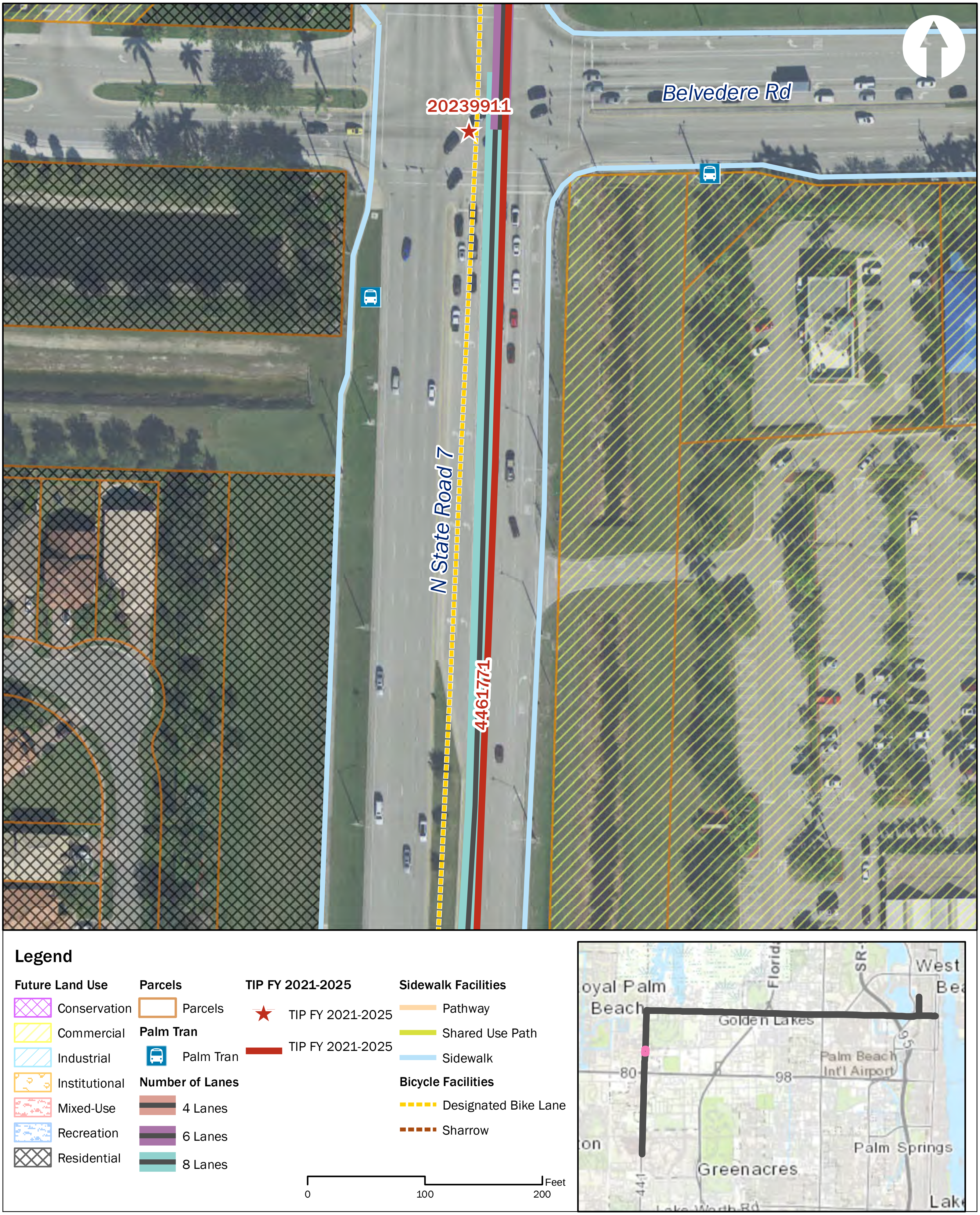
Belvedere Rd
20239911
N State Road 7
4461771
Legend
Future Land Use
Conservation
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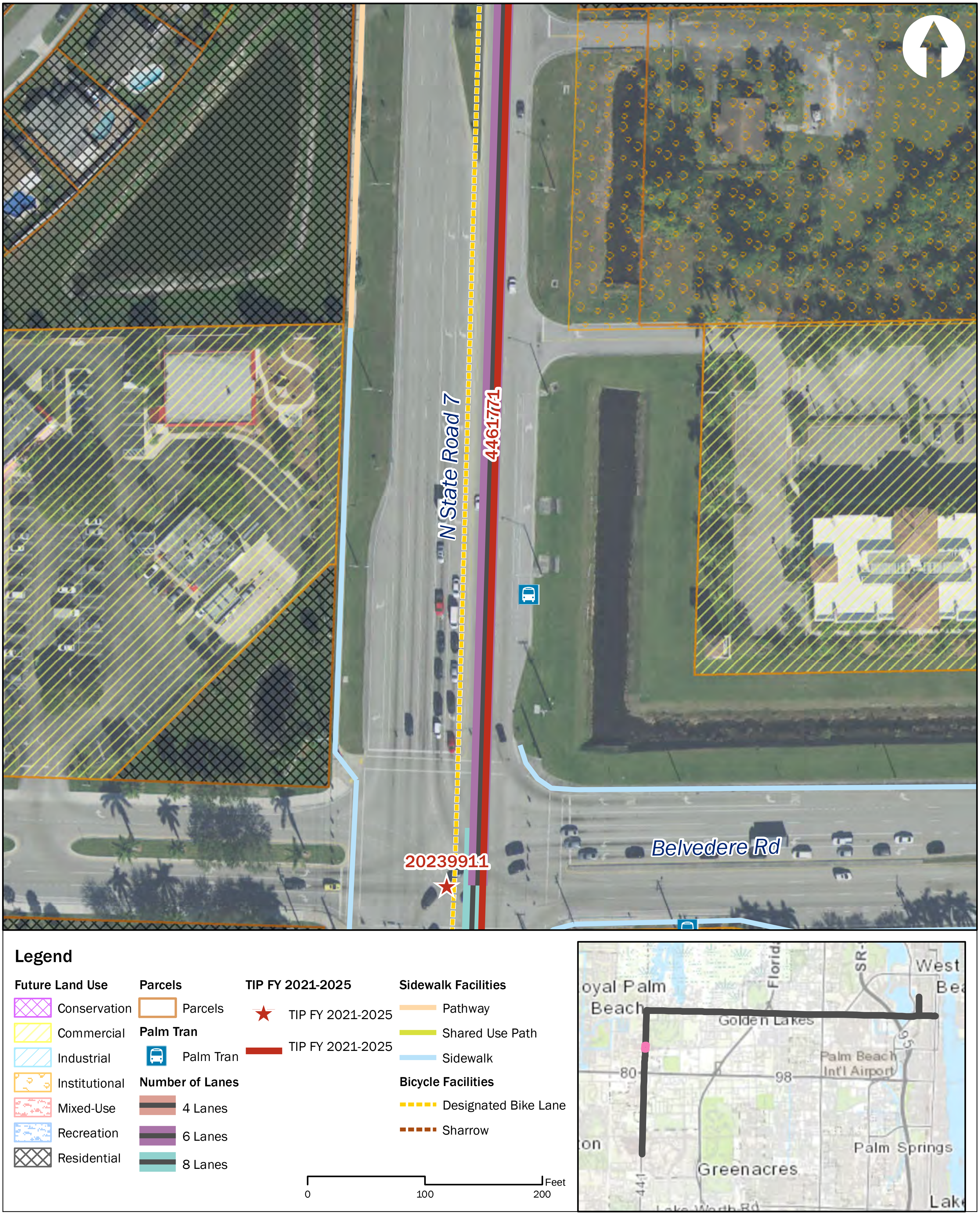
N State Road 7
4461771
Belvedere Rd
20239911
Legend
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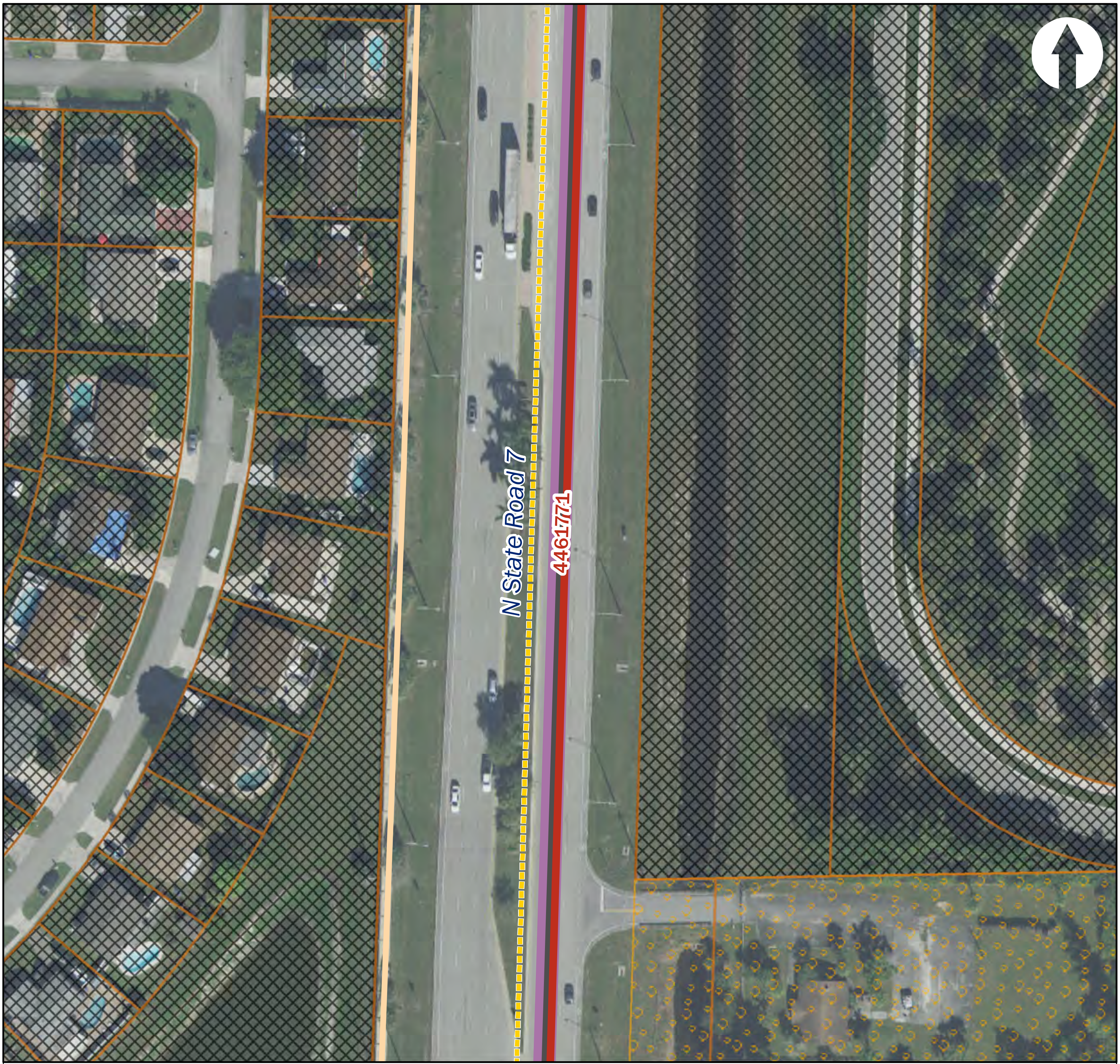

Legend

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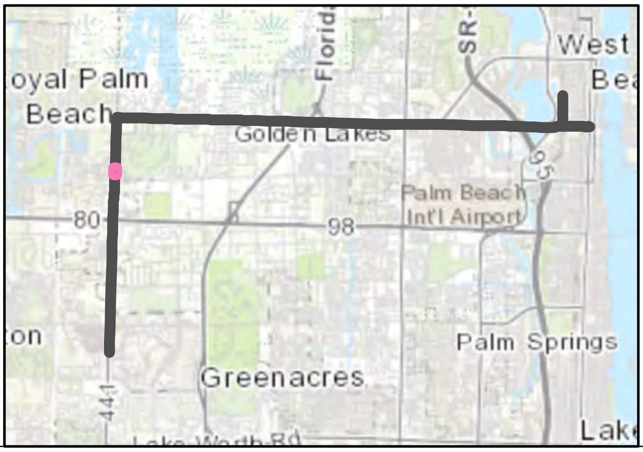

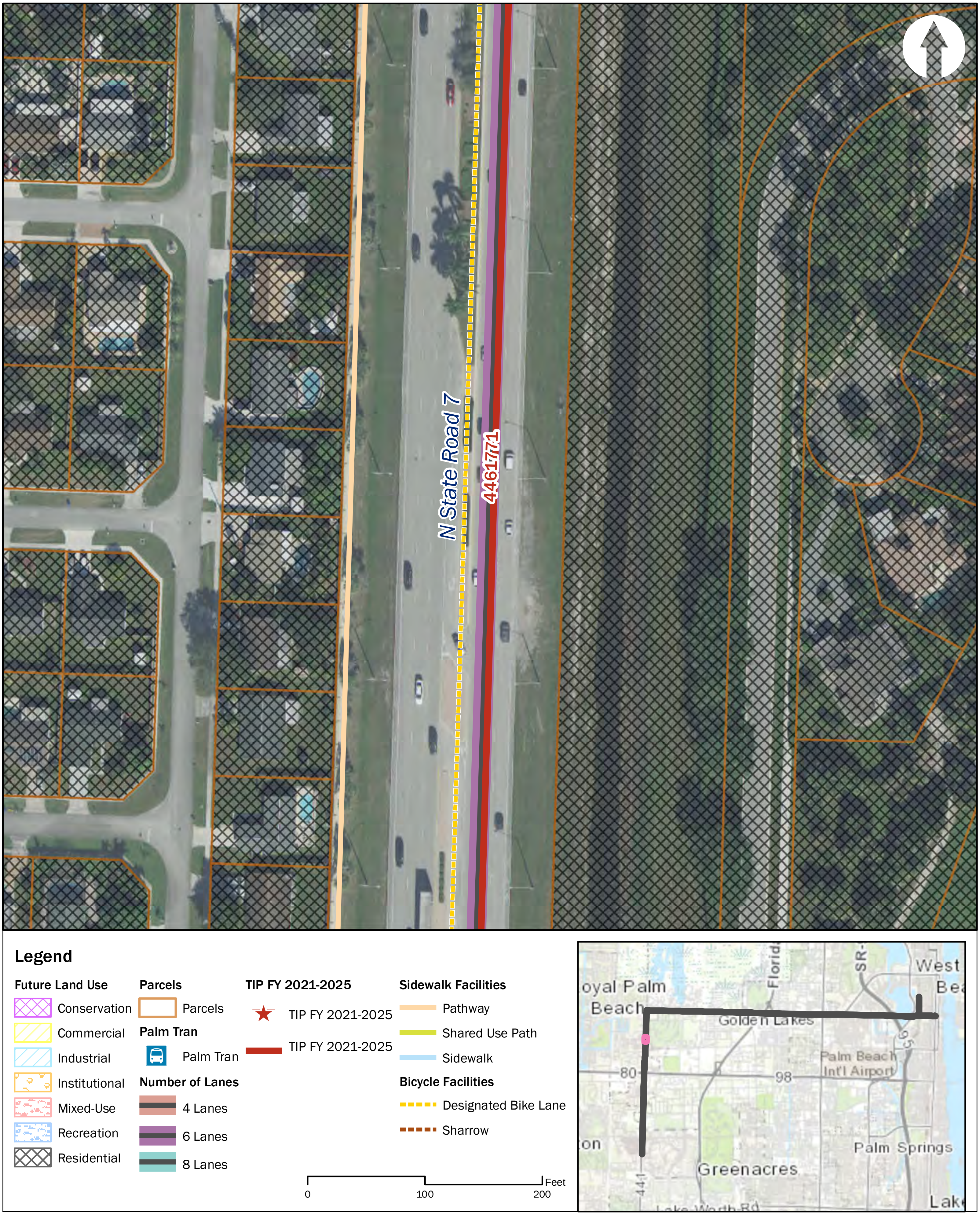
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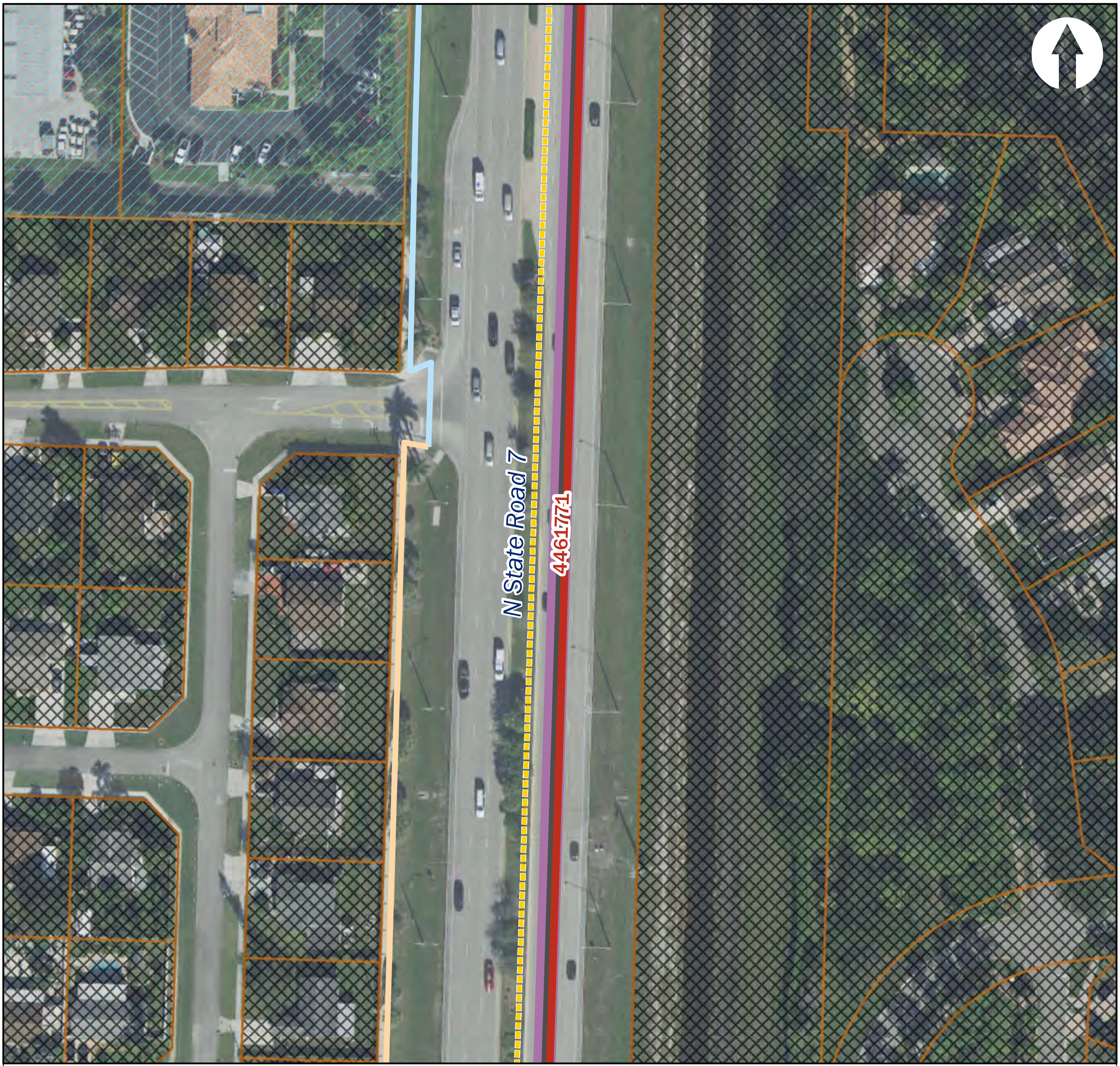

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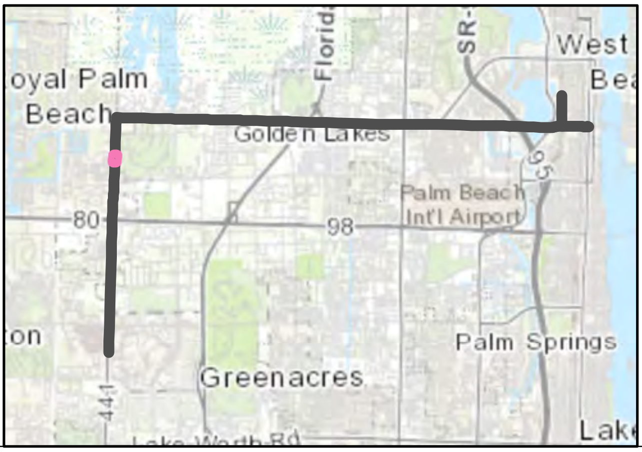

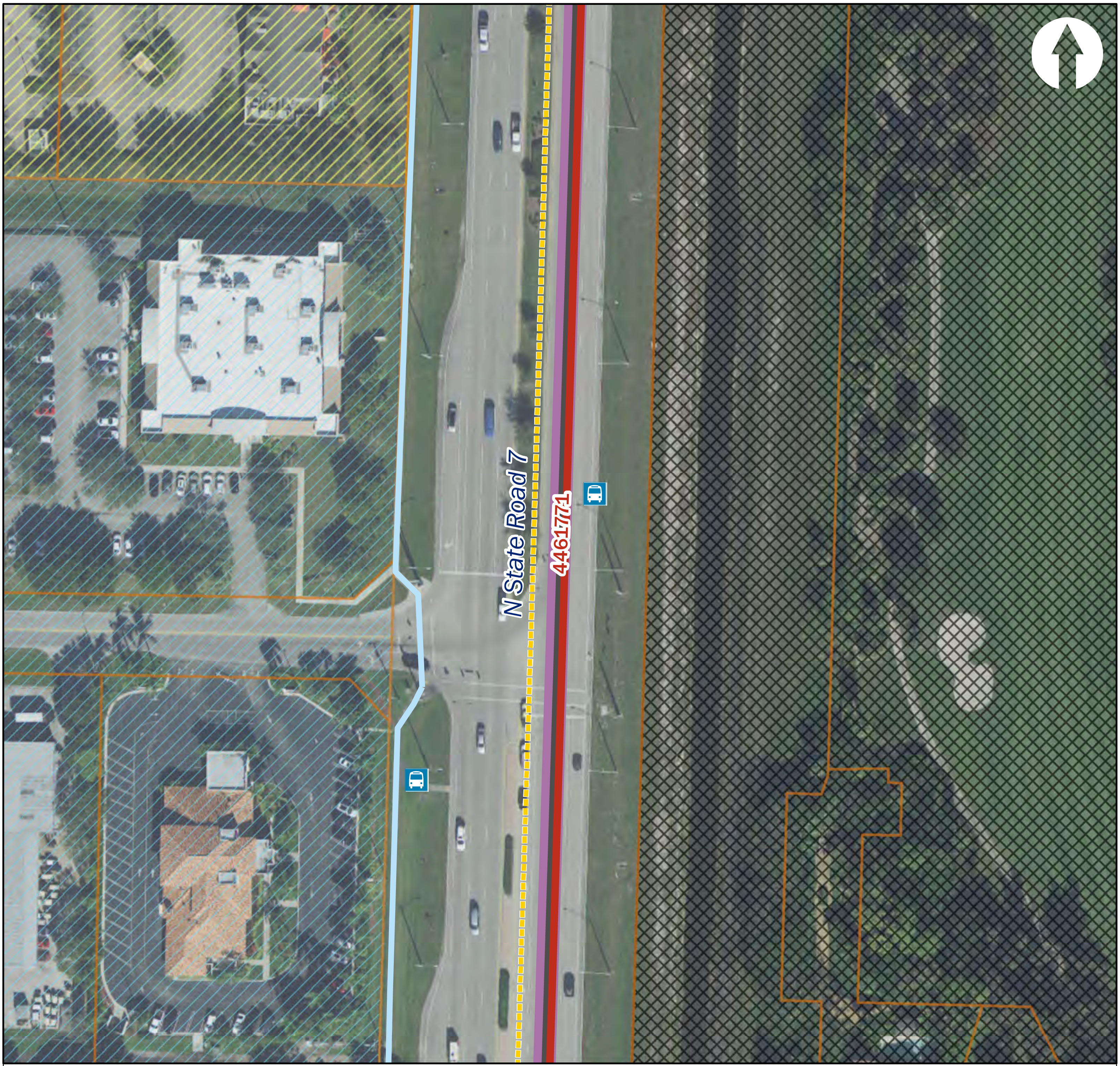

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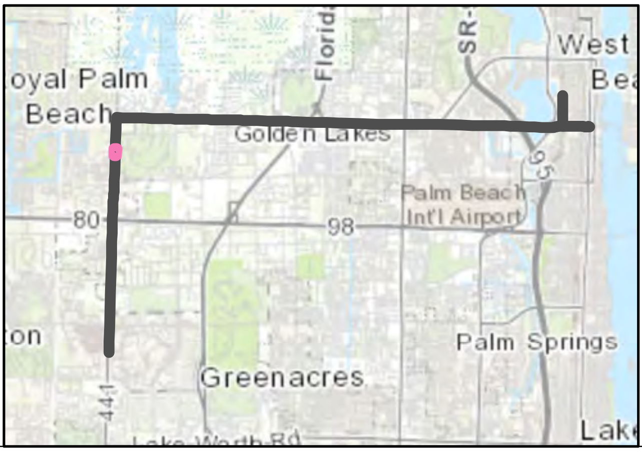

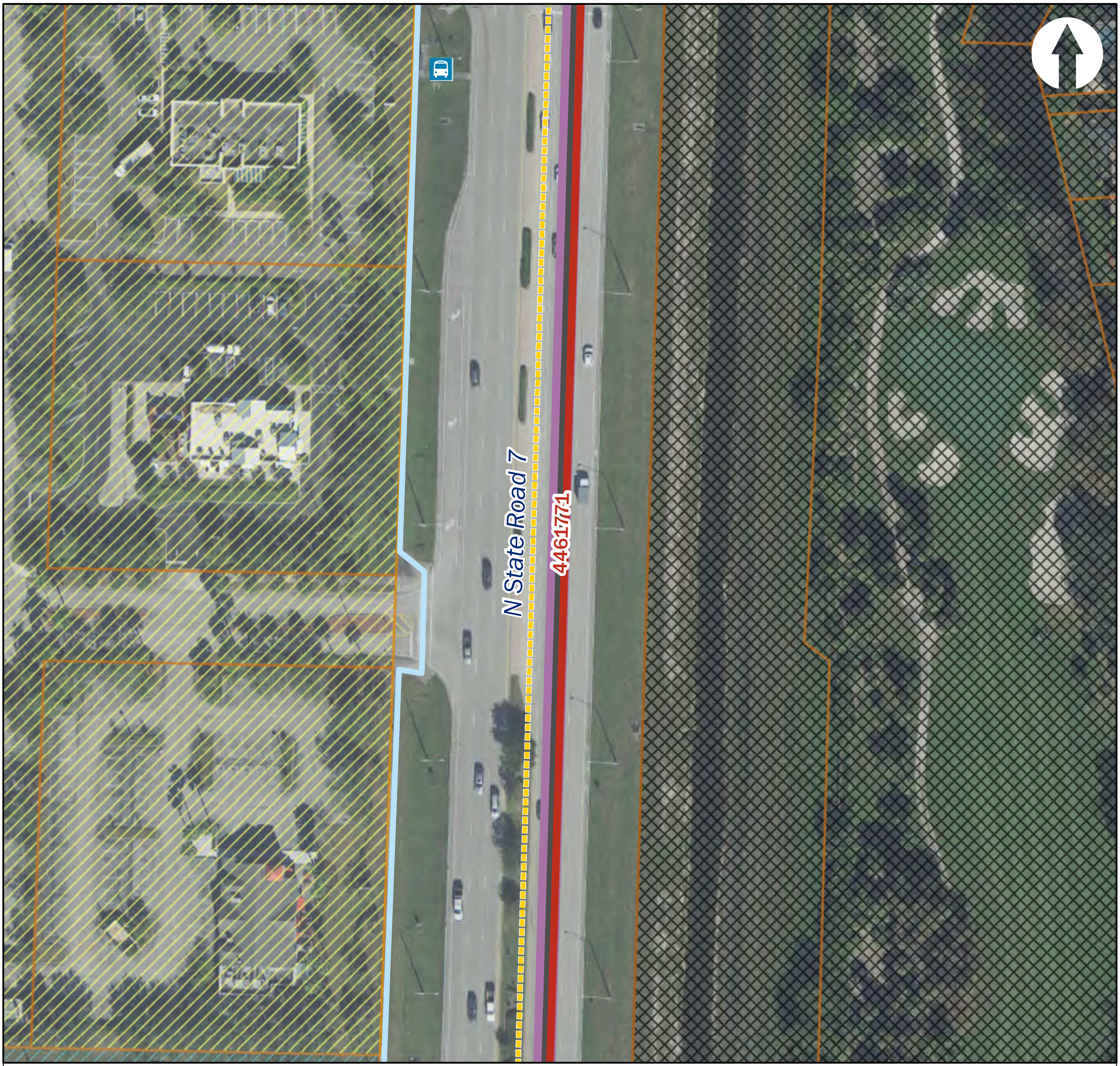

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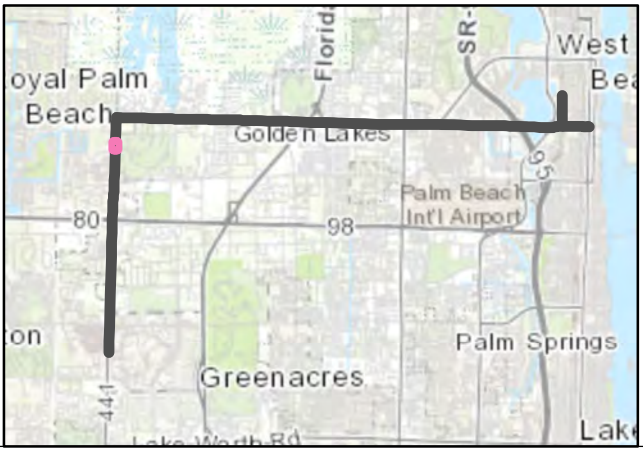

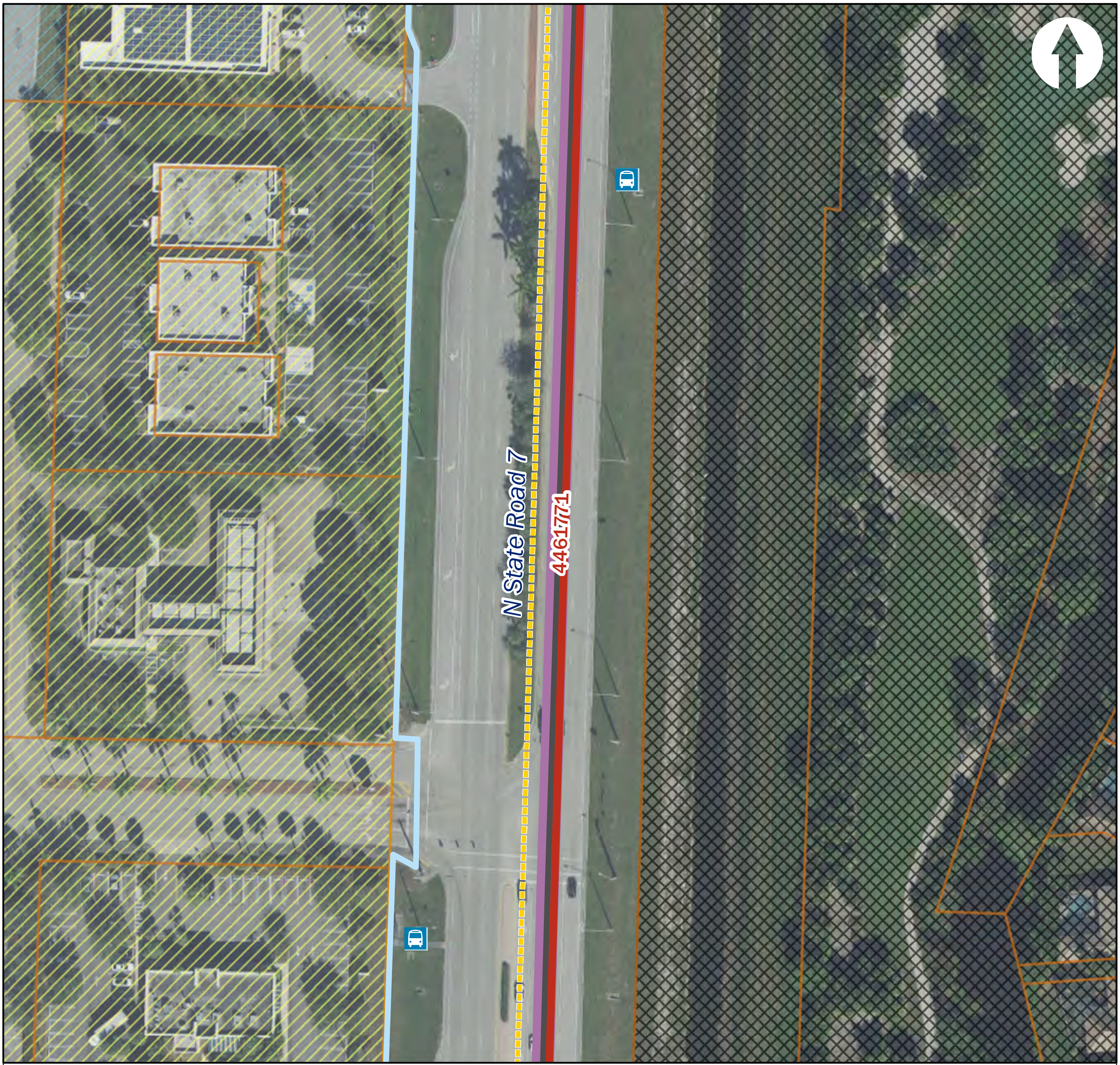
N State Road 7
4461771
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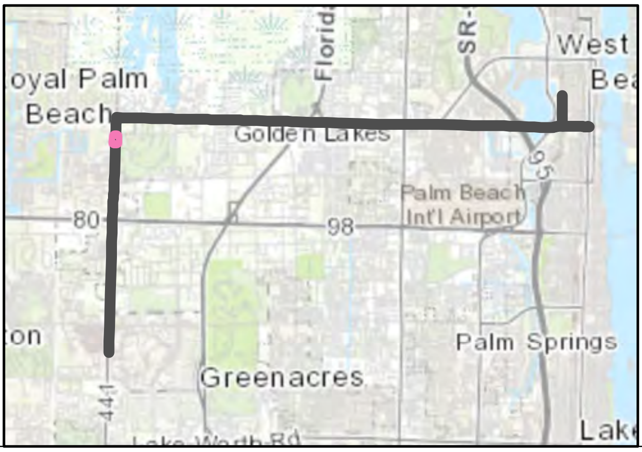
Golden Lakes
Palm Beach Int'l Airport
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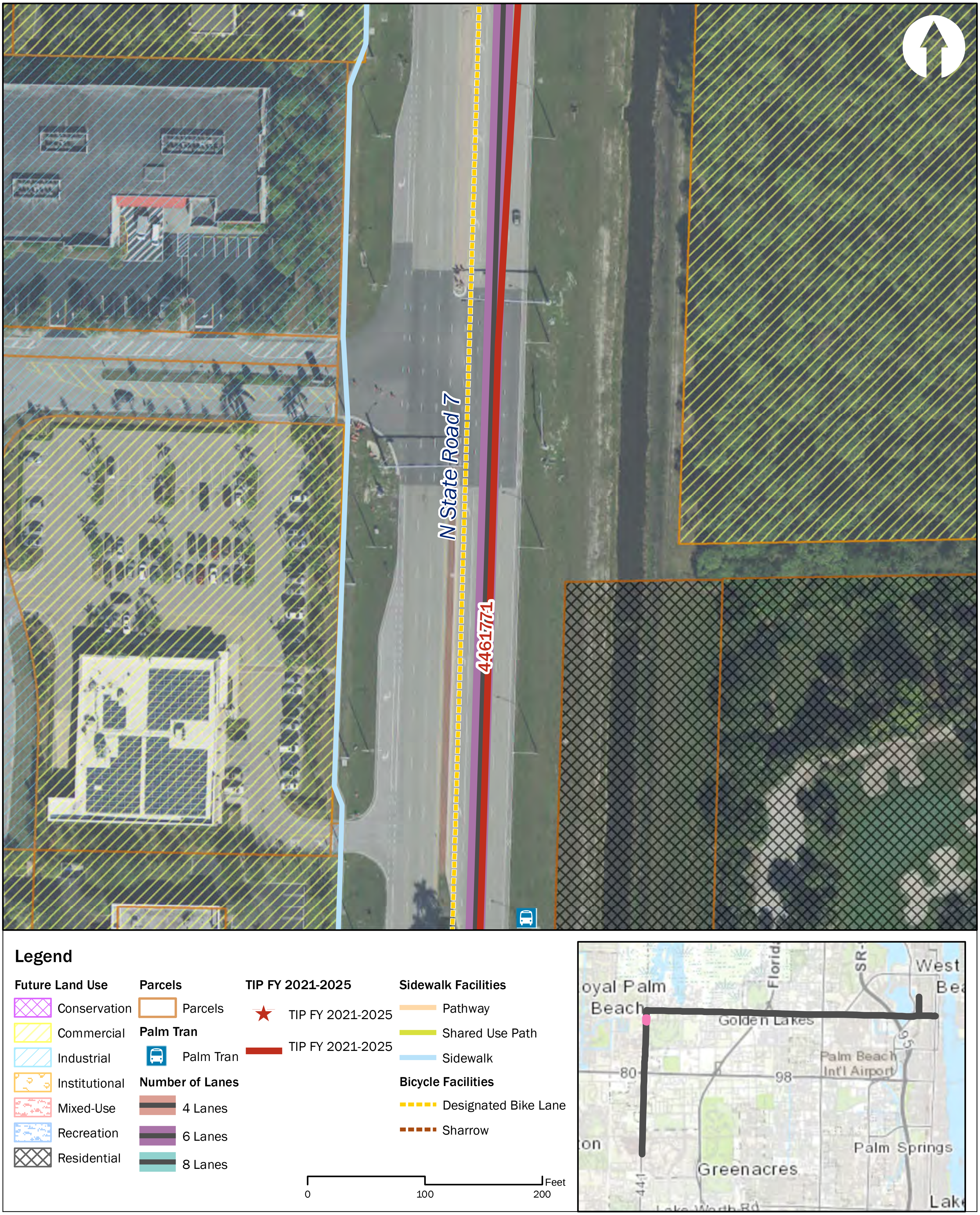
Palm Springs
Greenacres
441


N State Road 7
4461771
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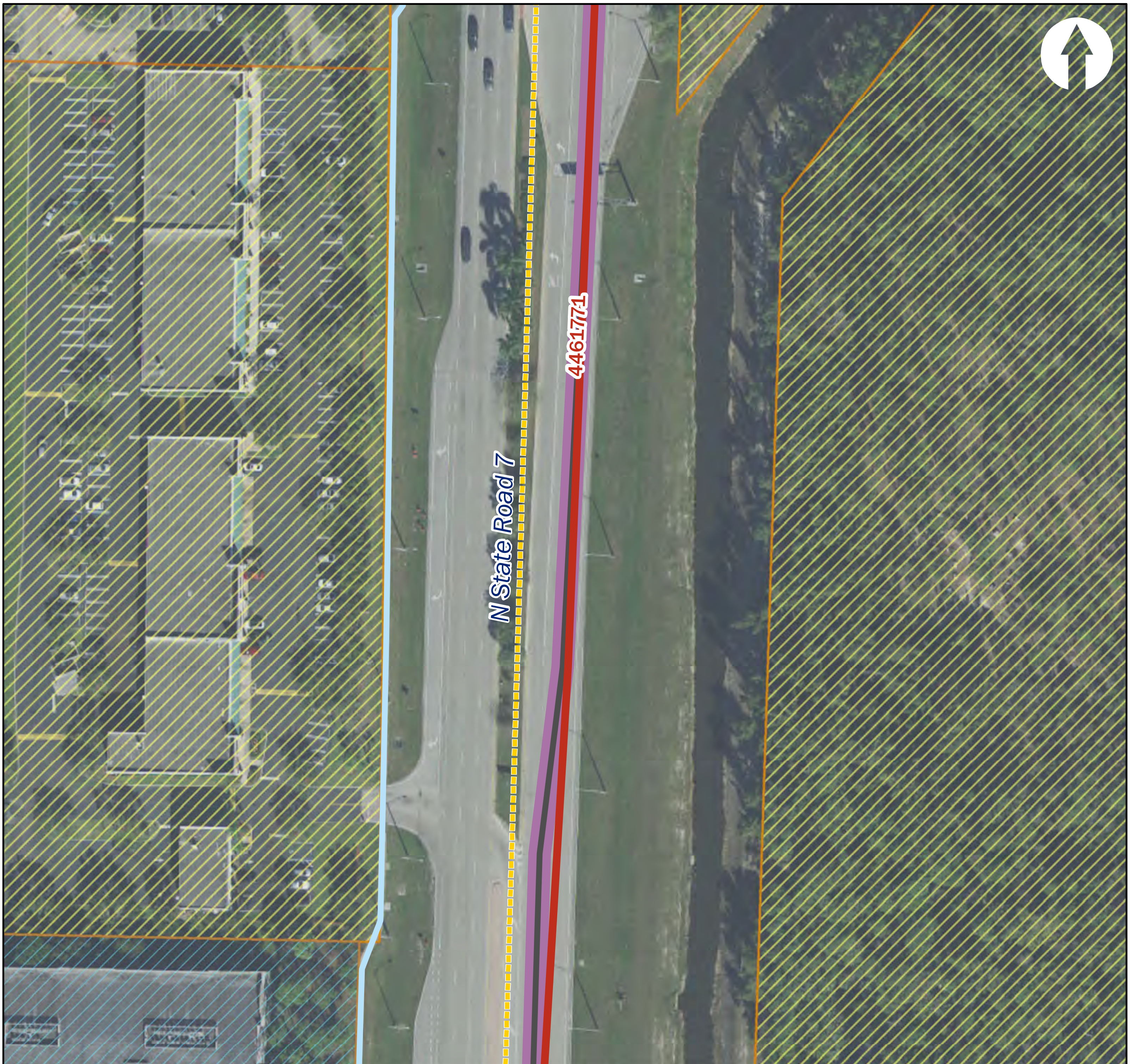

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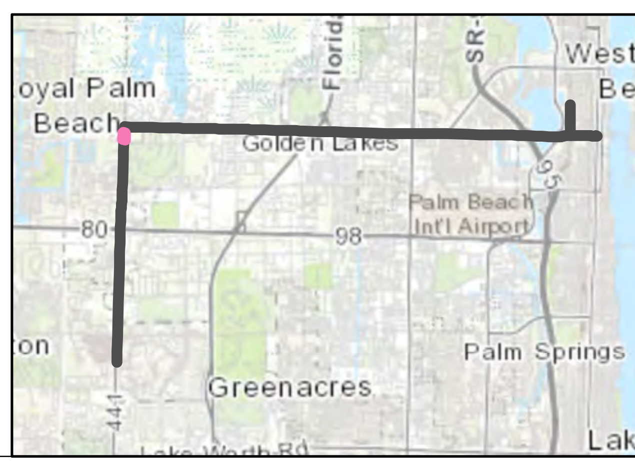
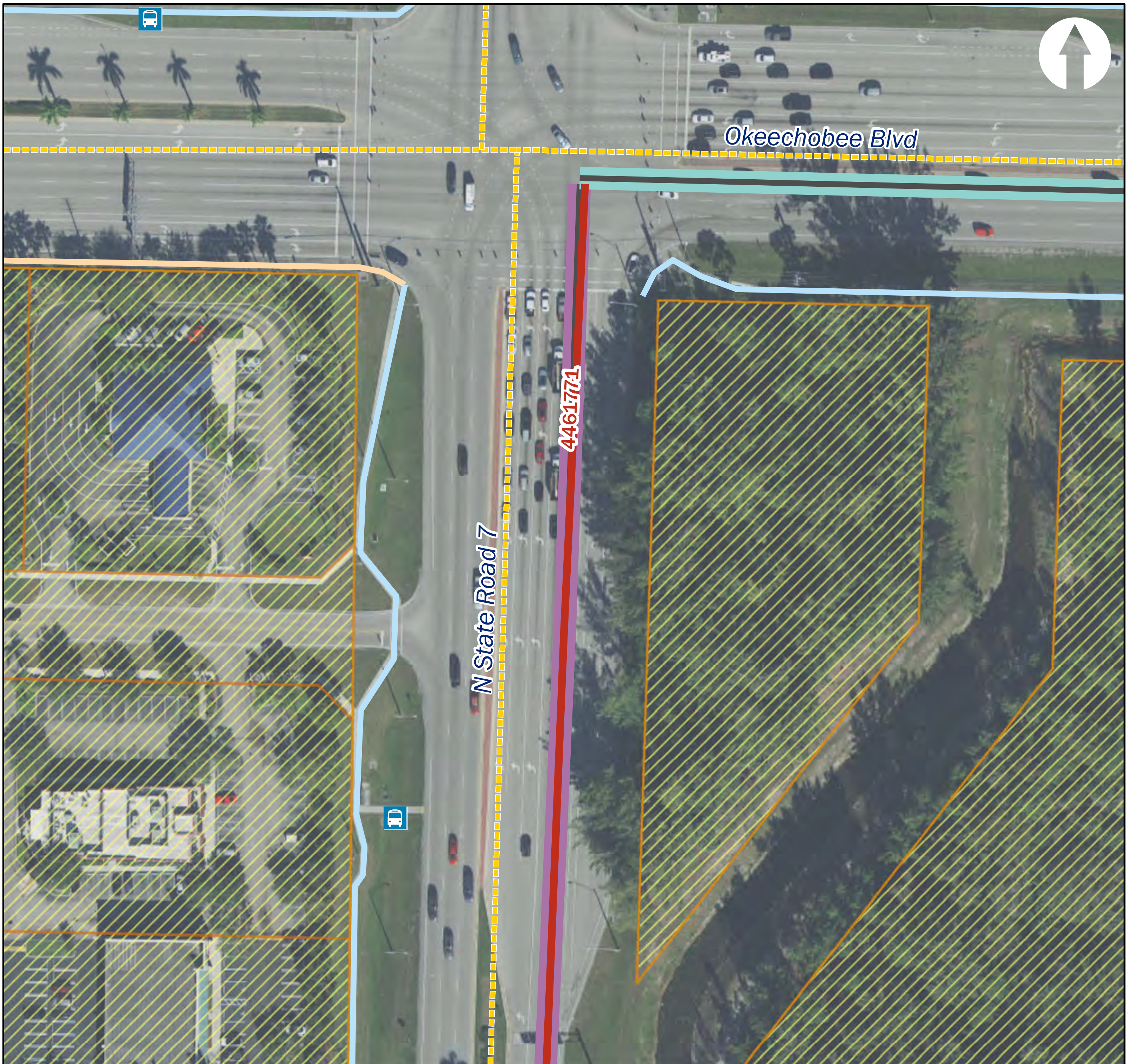
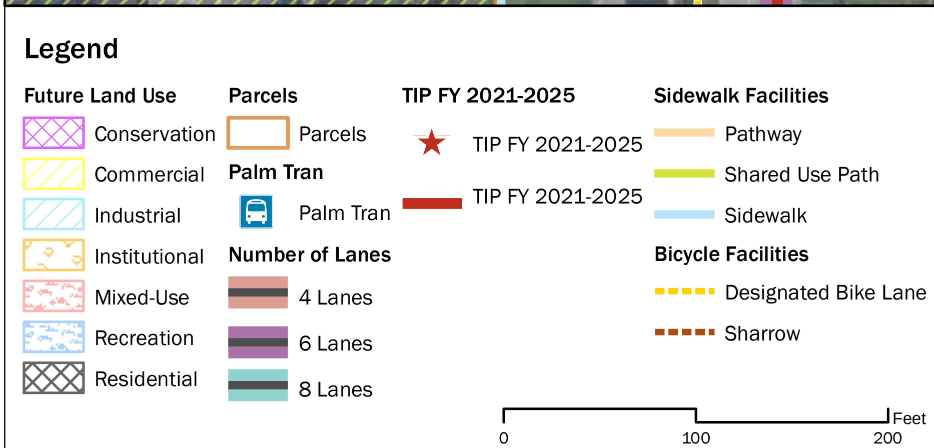
0 100 200 Feet




Okeechobee Blvd
N State Road 7
4461771


Legend
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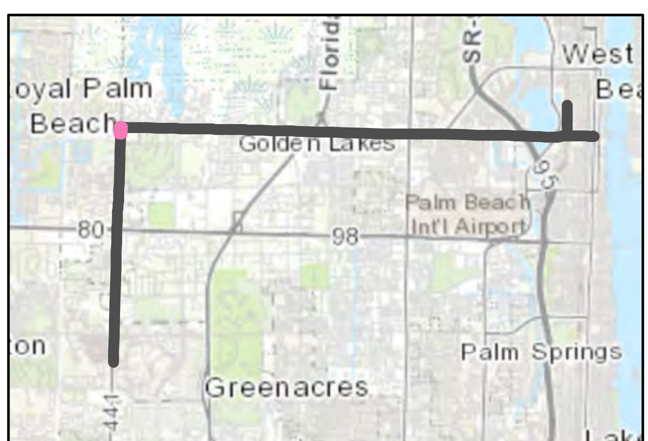
Palm Tran
Number of Lanes
4 Lanes
6 Lanes
8 Lanes
TIP FY 2021-2025
TIP FY 2021-2025
TIP FY 2021-2025
Sidewalk Facilities
Pathway
Shared Use Path
Sidewalk
Bicycle Facilities
Designated Bike Lane
Sharrow
0
100
200
Feet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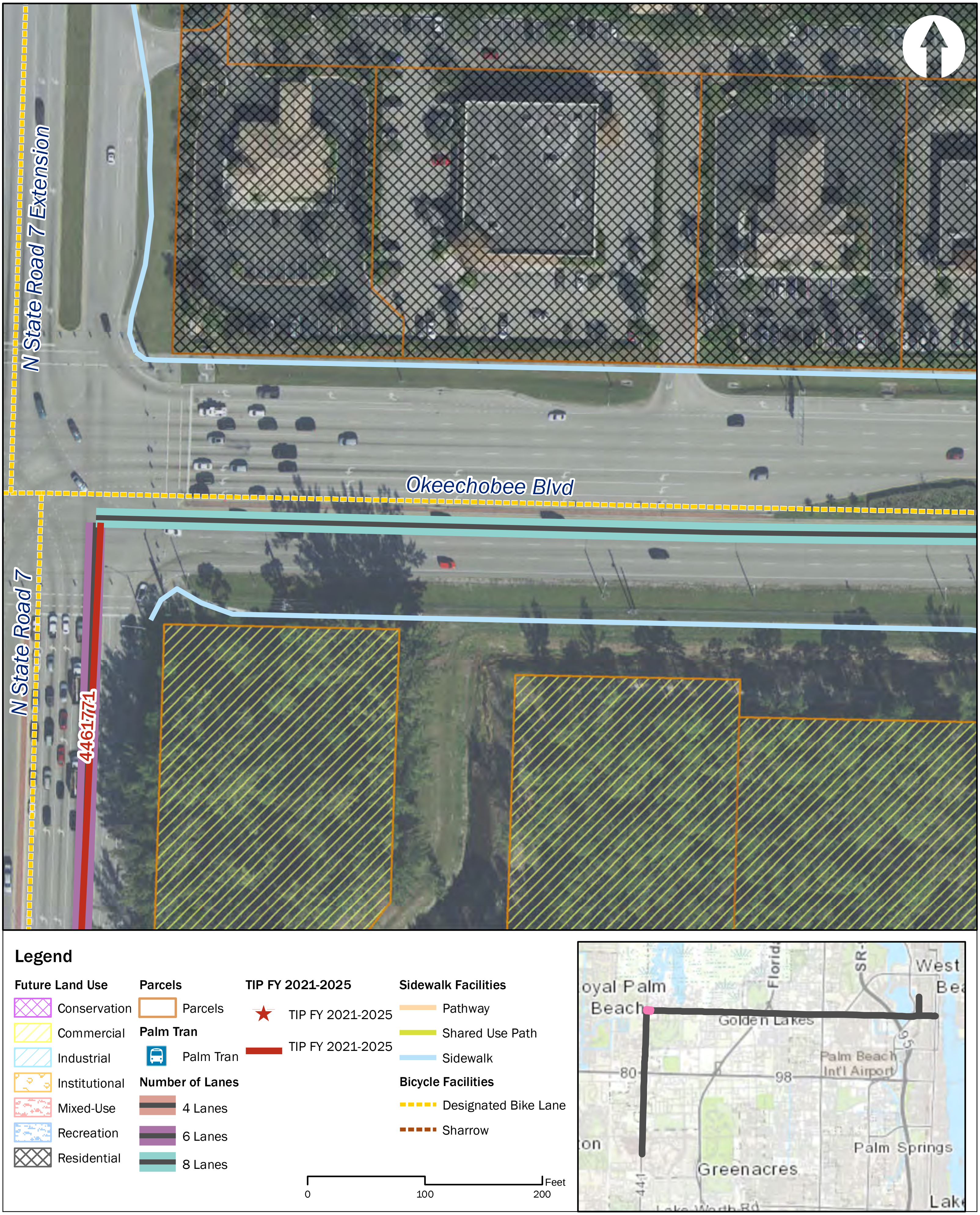
Beach
Golden Lakes
West
Bea
Palm Beach
Int'l Airport
80
98
Palm Springs
Greenacres
441
Lak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Okeechobee Blvd
N State Road 7
4461771
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Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
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TIP FY 2021-2025
TIP FY 2021-2025
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Feet
Royal Palm Beach
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Palm Beach Int'l Airport
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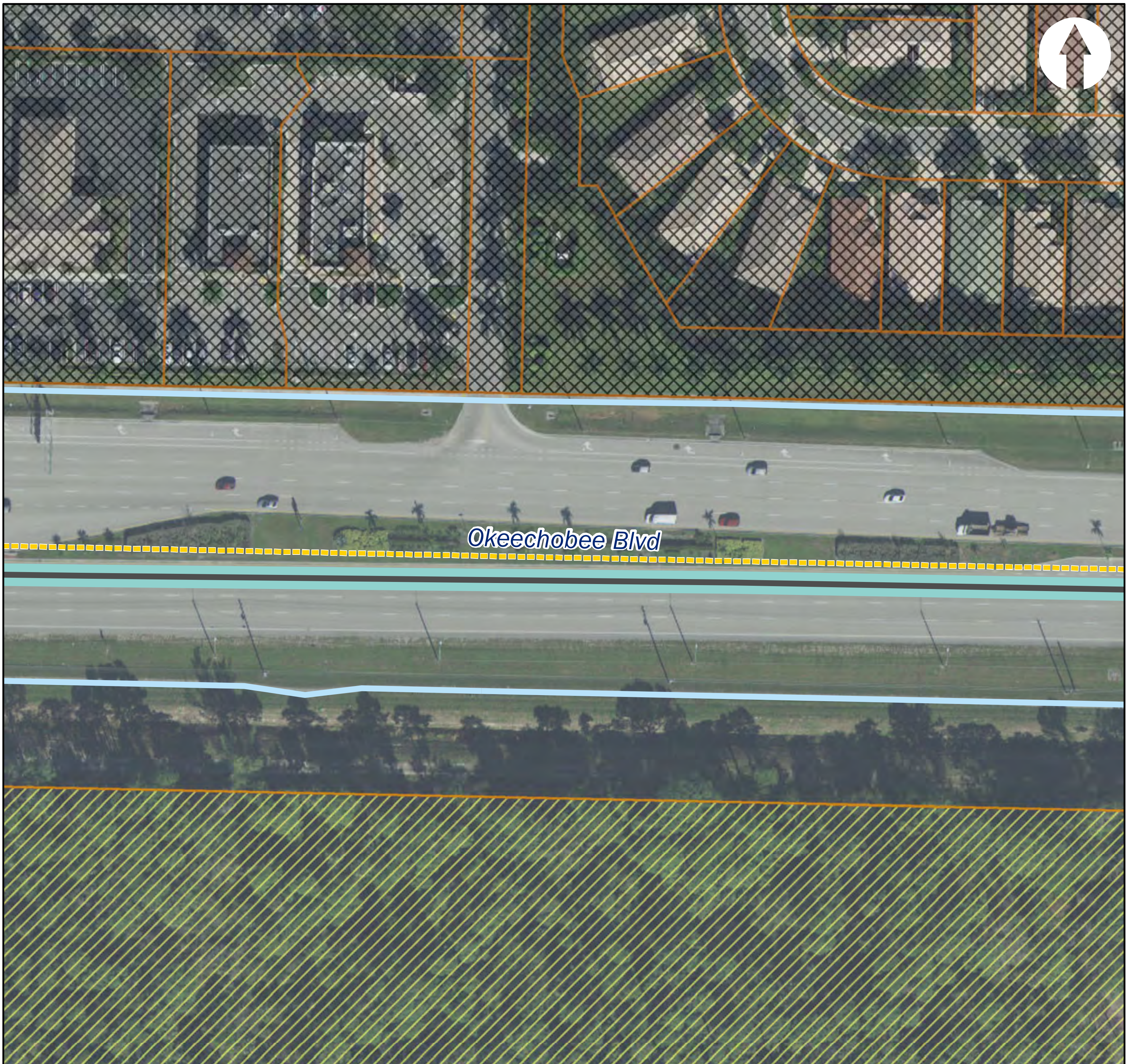

Legend

Future Land Use
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- Parcels

Palm Tran
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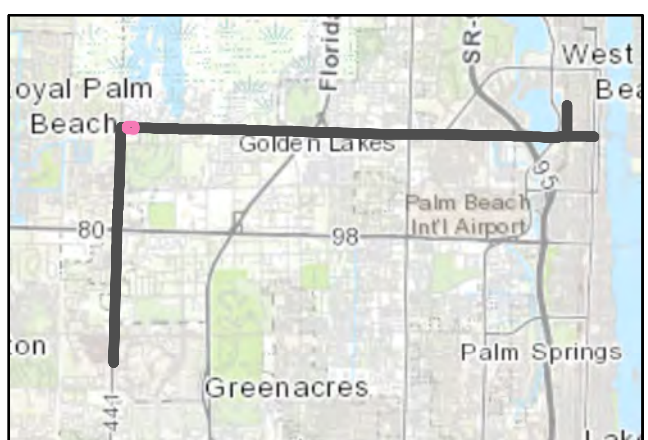

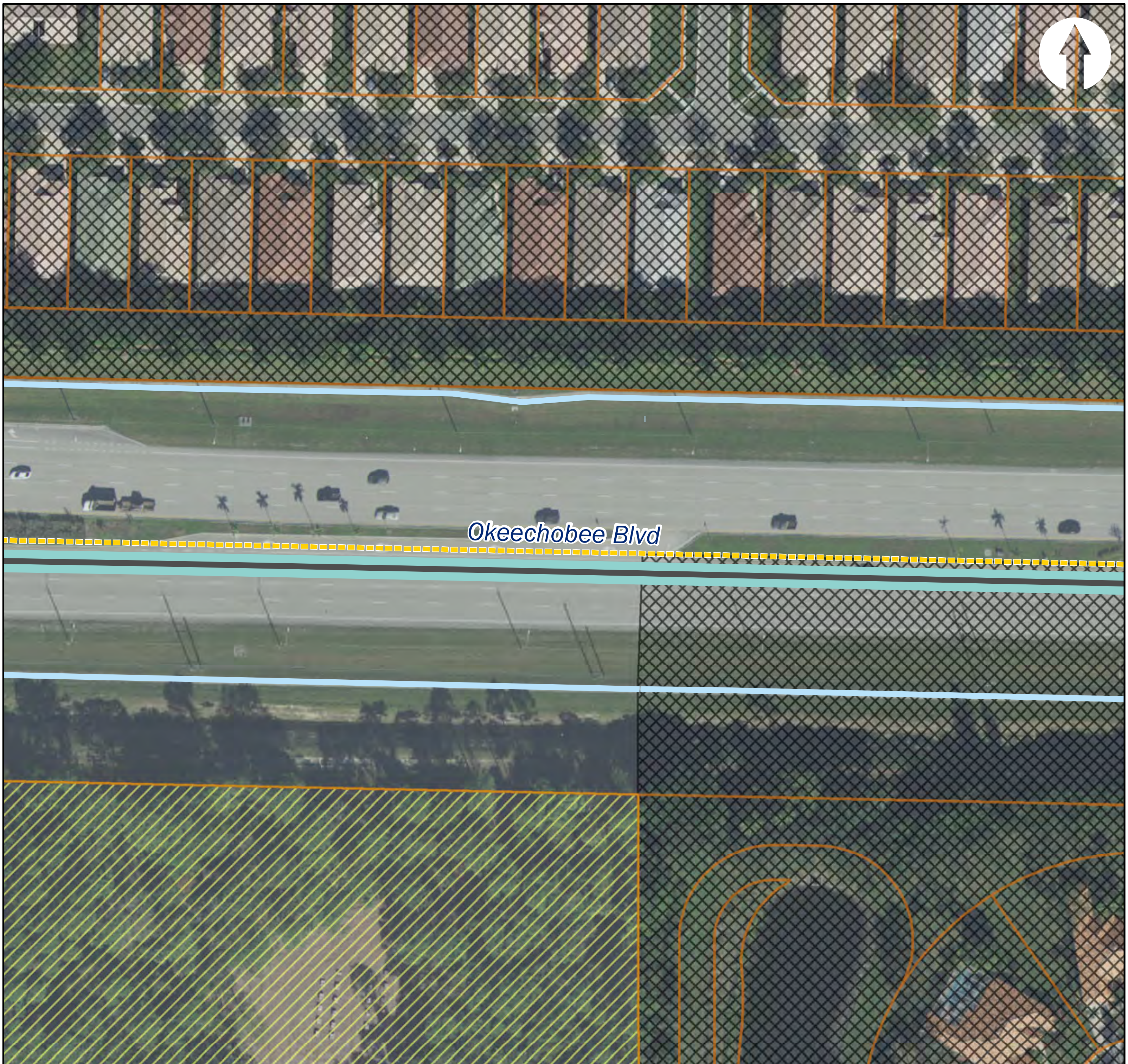

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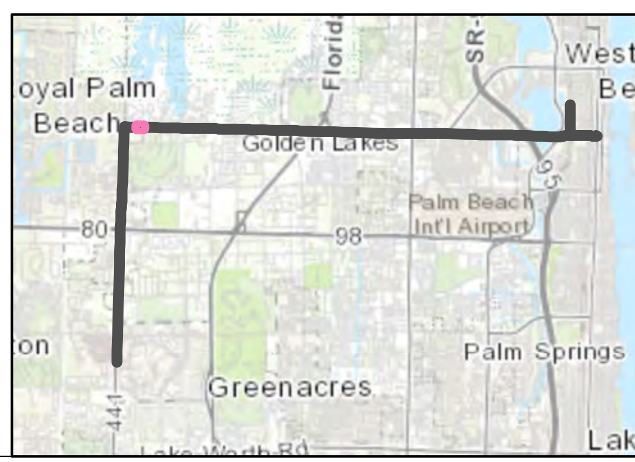
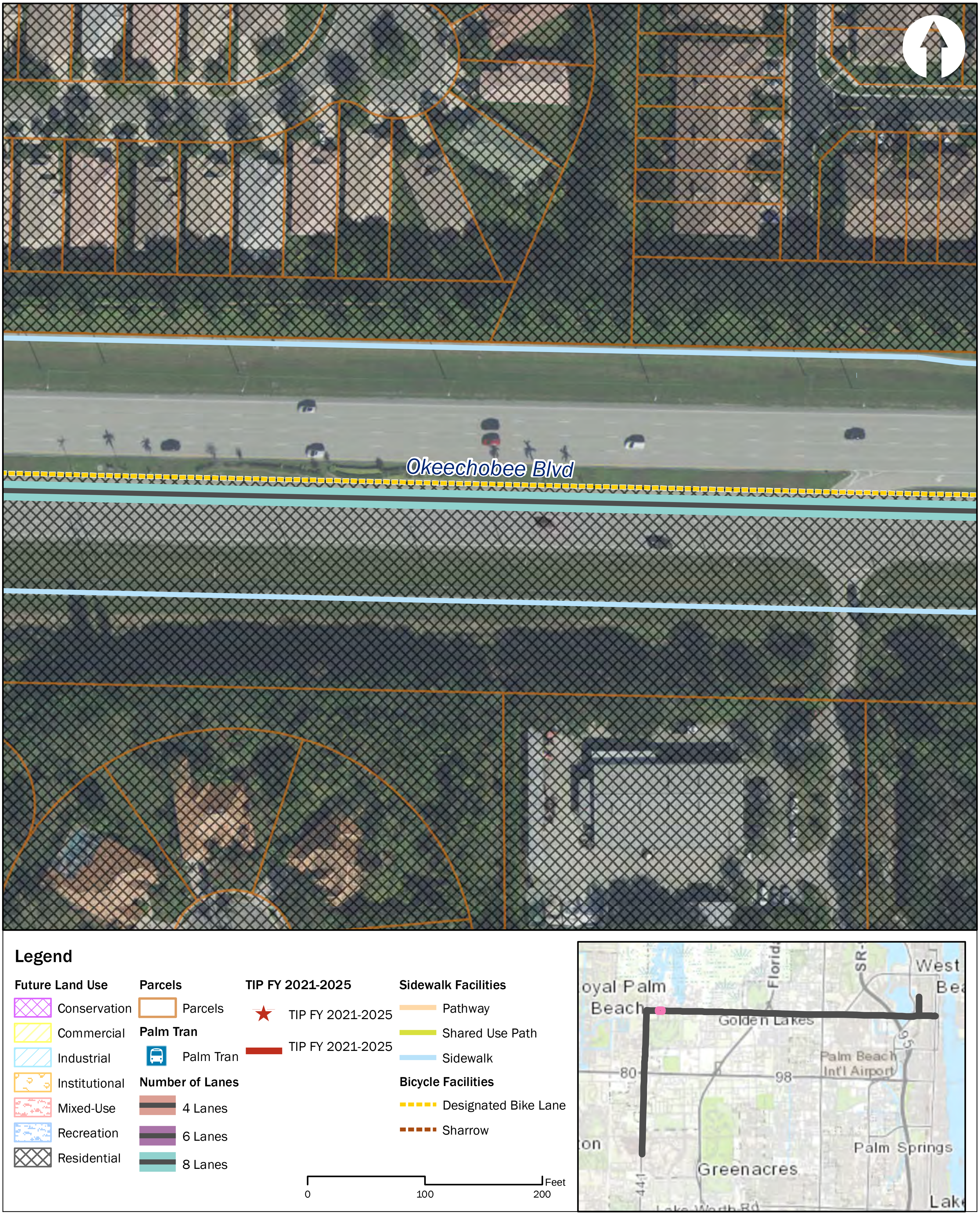
0 100 200 Feet




Okeechobee Blvd
Legend
Future Land Use
Conservation
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Palm Tran
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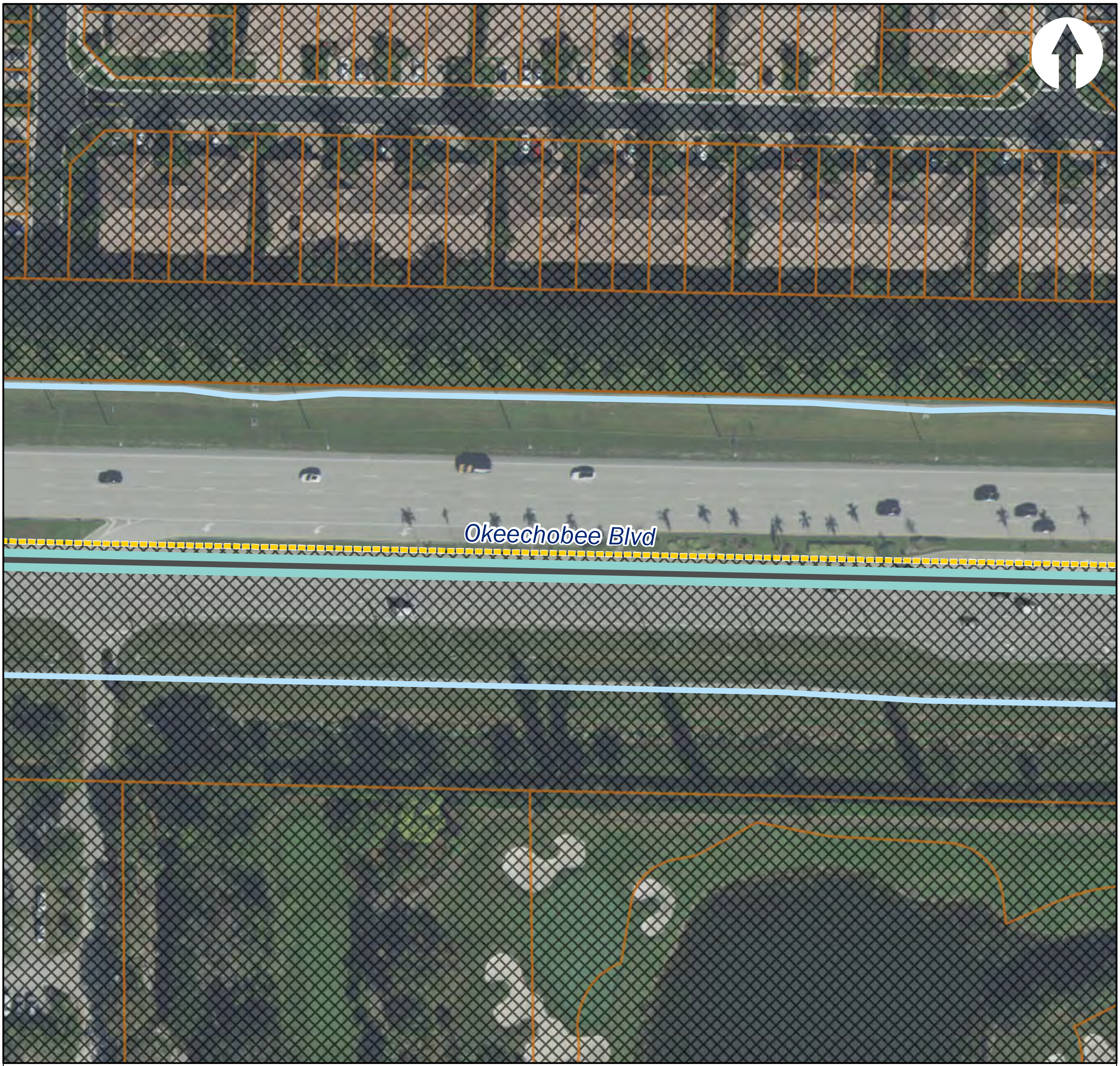

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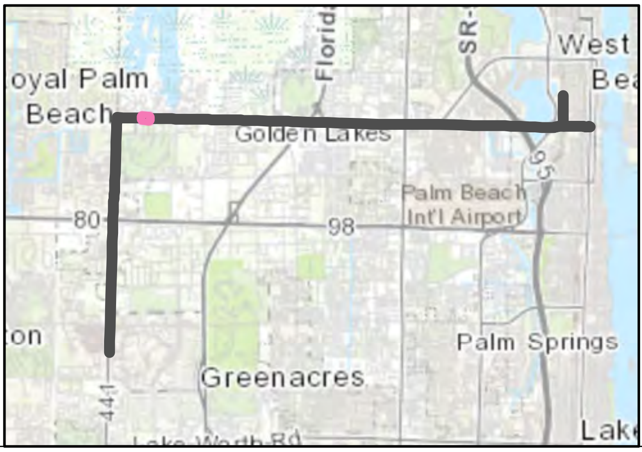

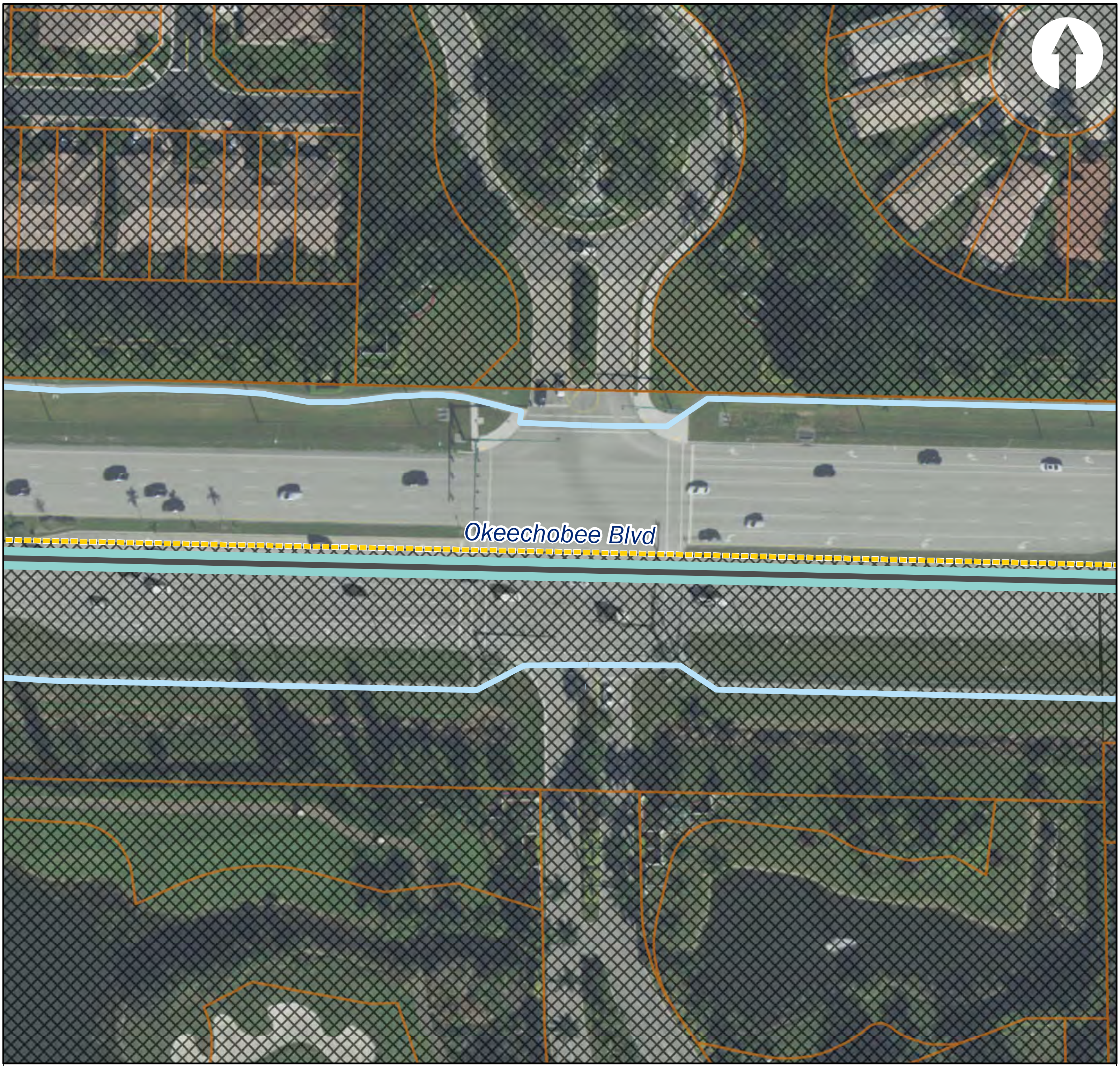

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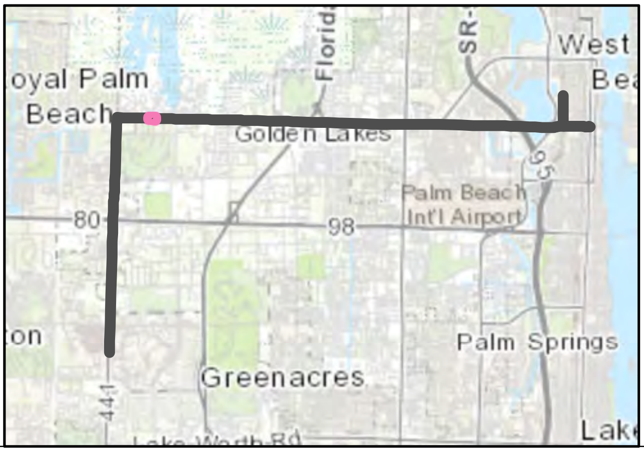

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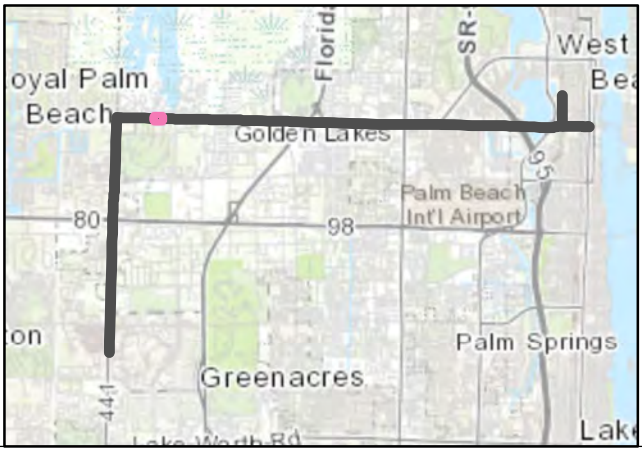

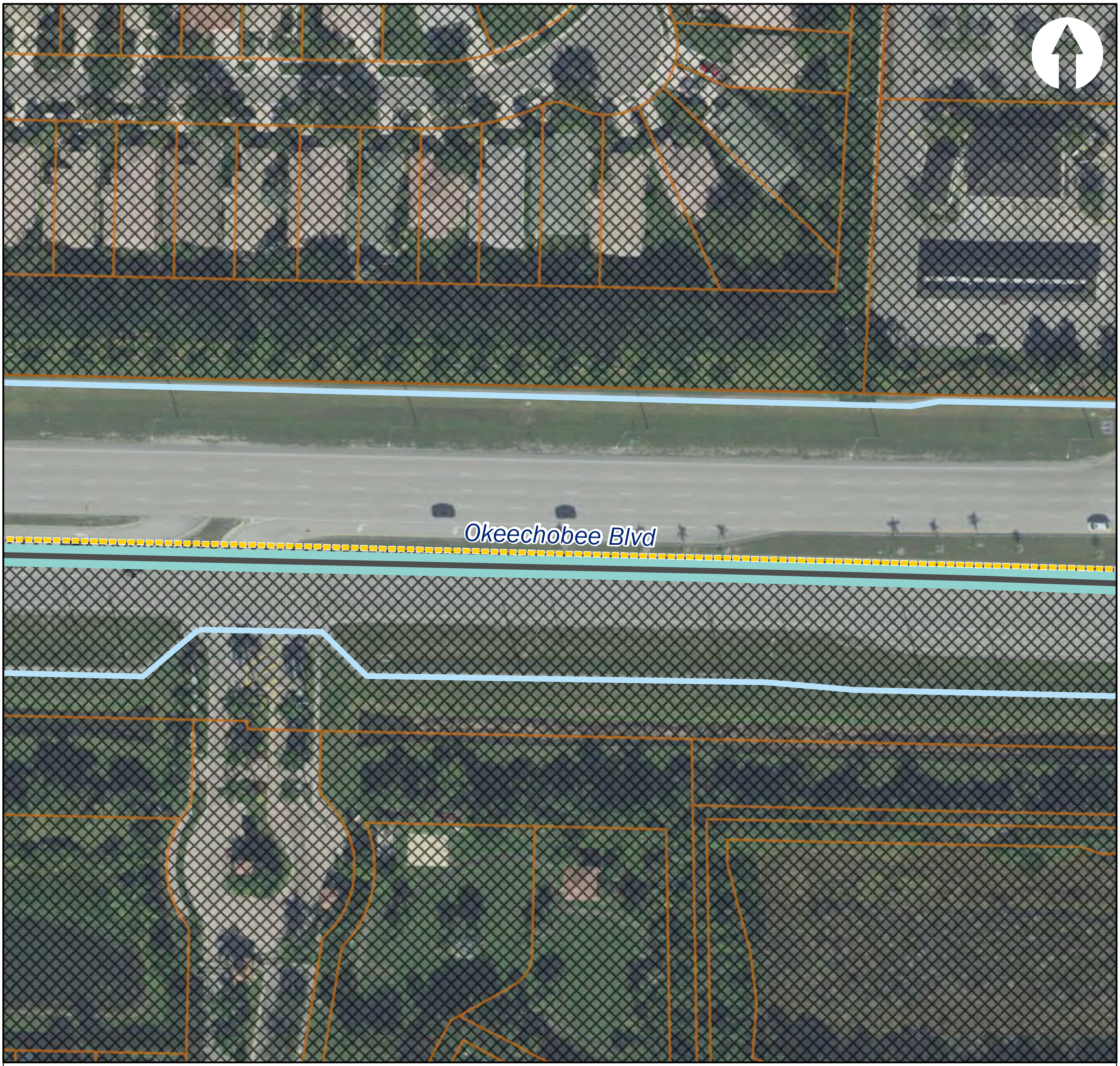

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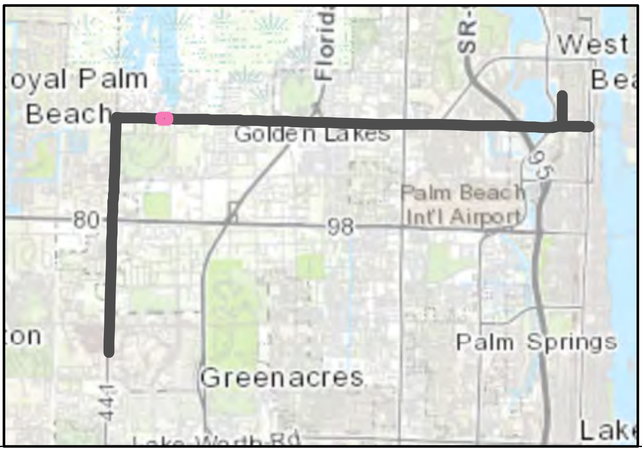

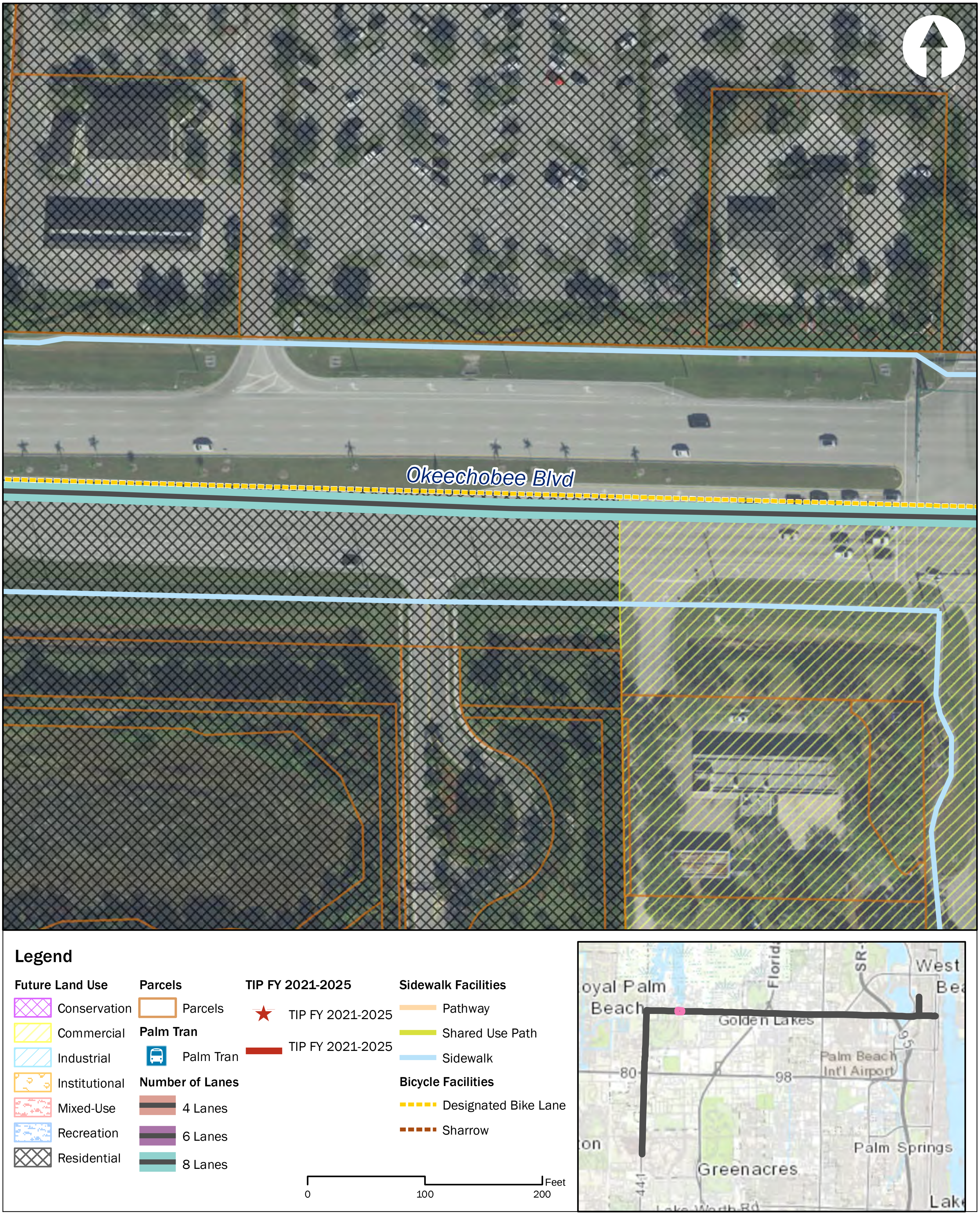
Okeechobee Blvd
Legend
Future Land Use
Conservation
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Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
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Royal Palm Beach
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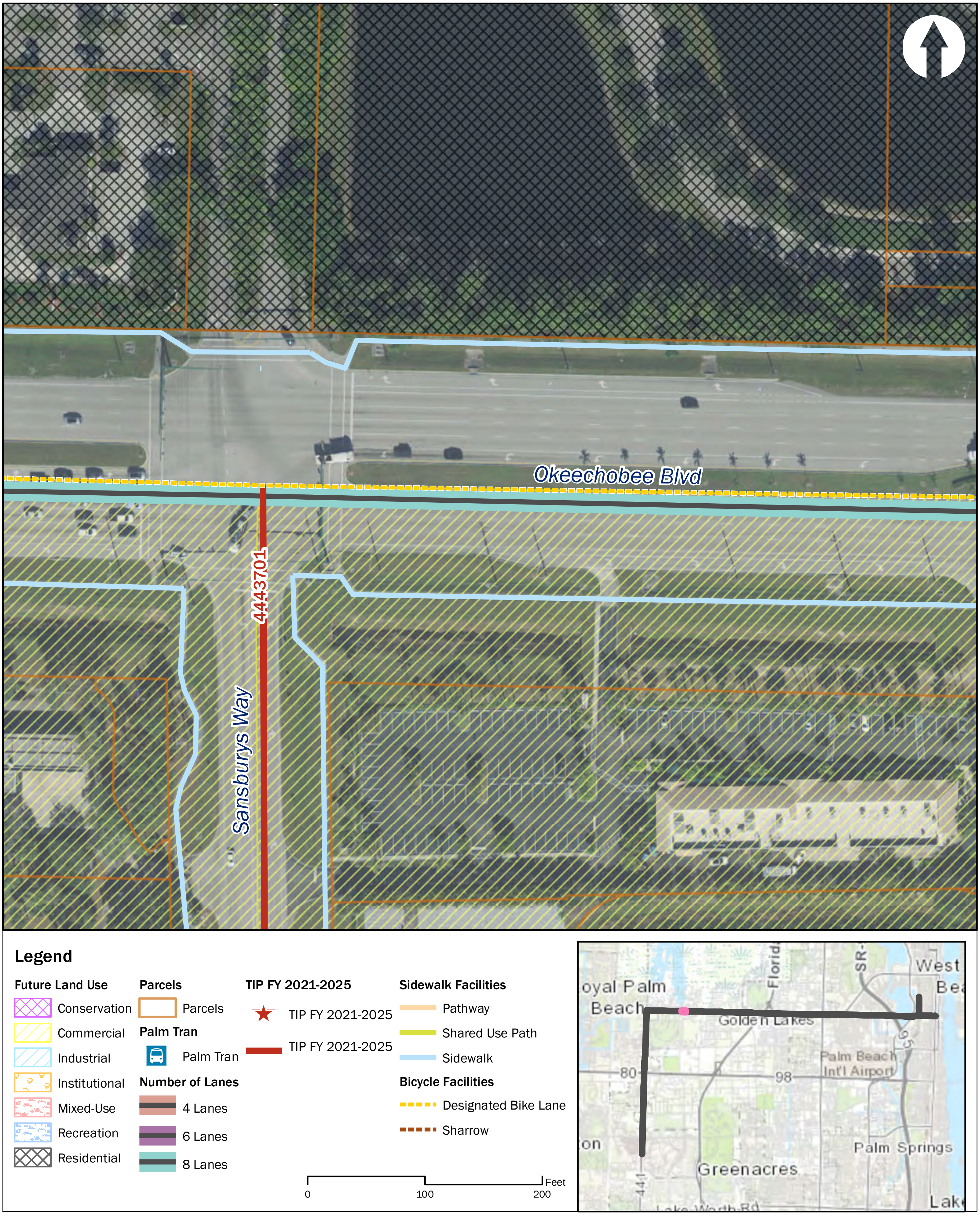
Okeechobee Blvd
Sansburys Way
4443701
Legend
Future Land Use
Conservation
Commercial
Industrial
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Recreation
Residential
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Parcels
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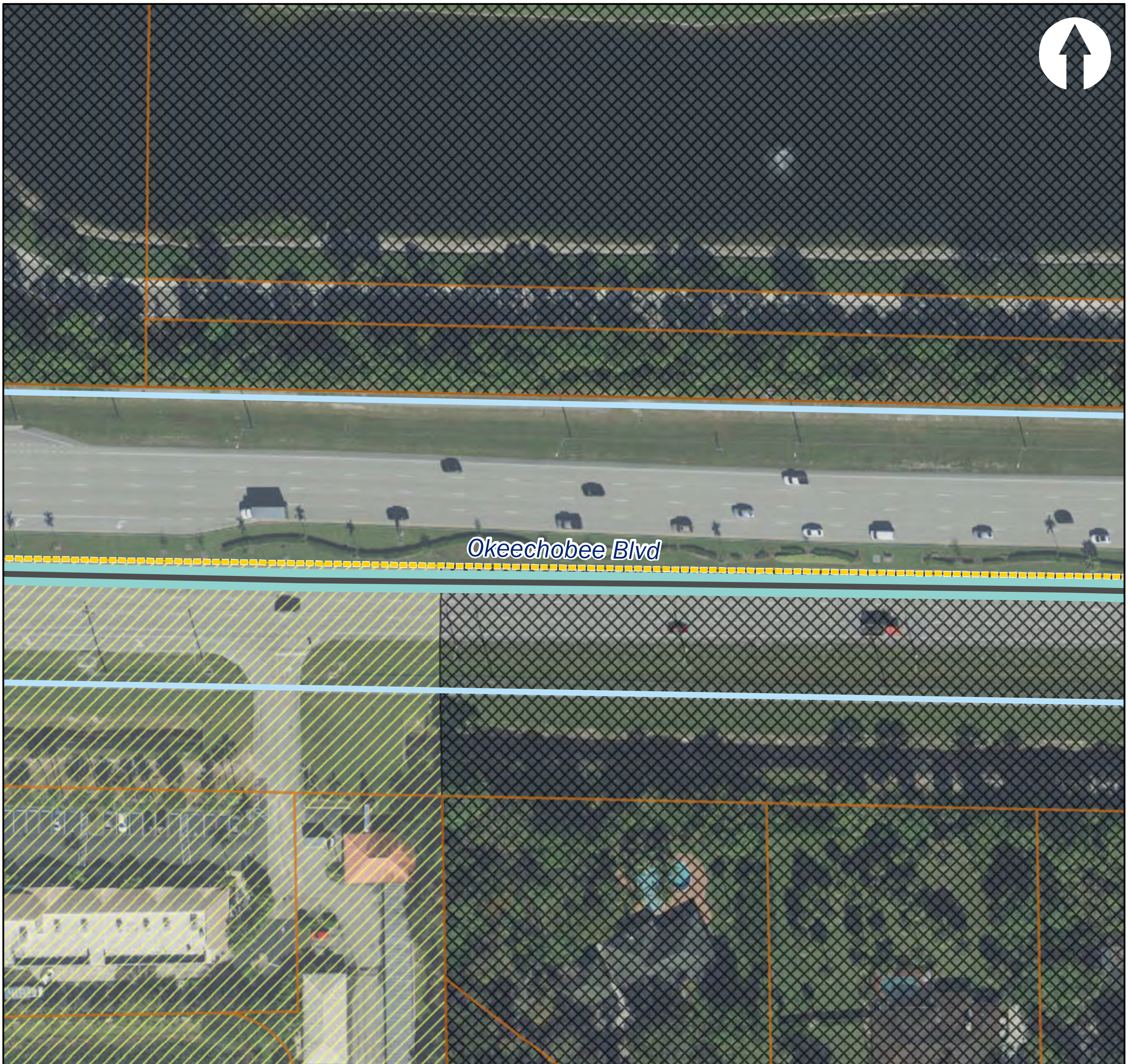

Legend

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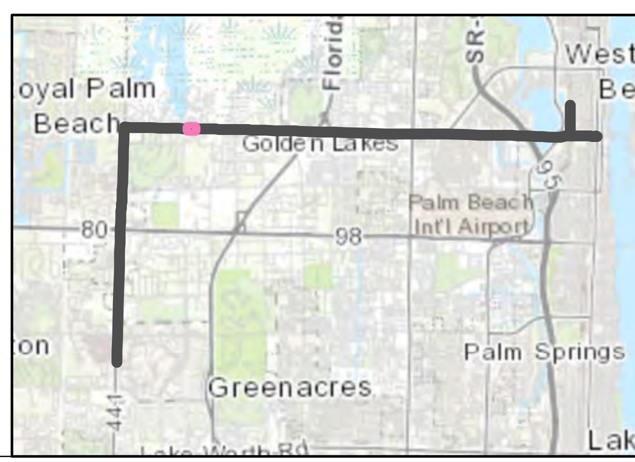

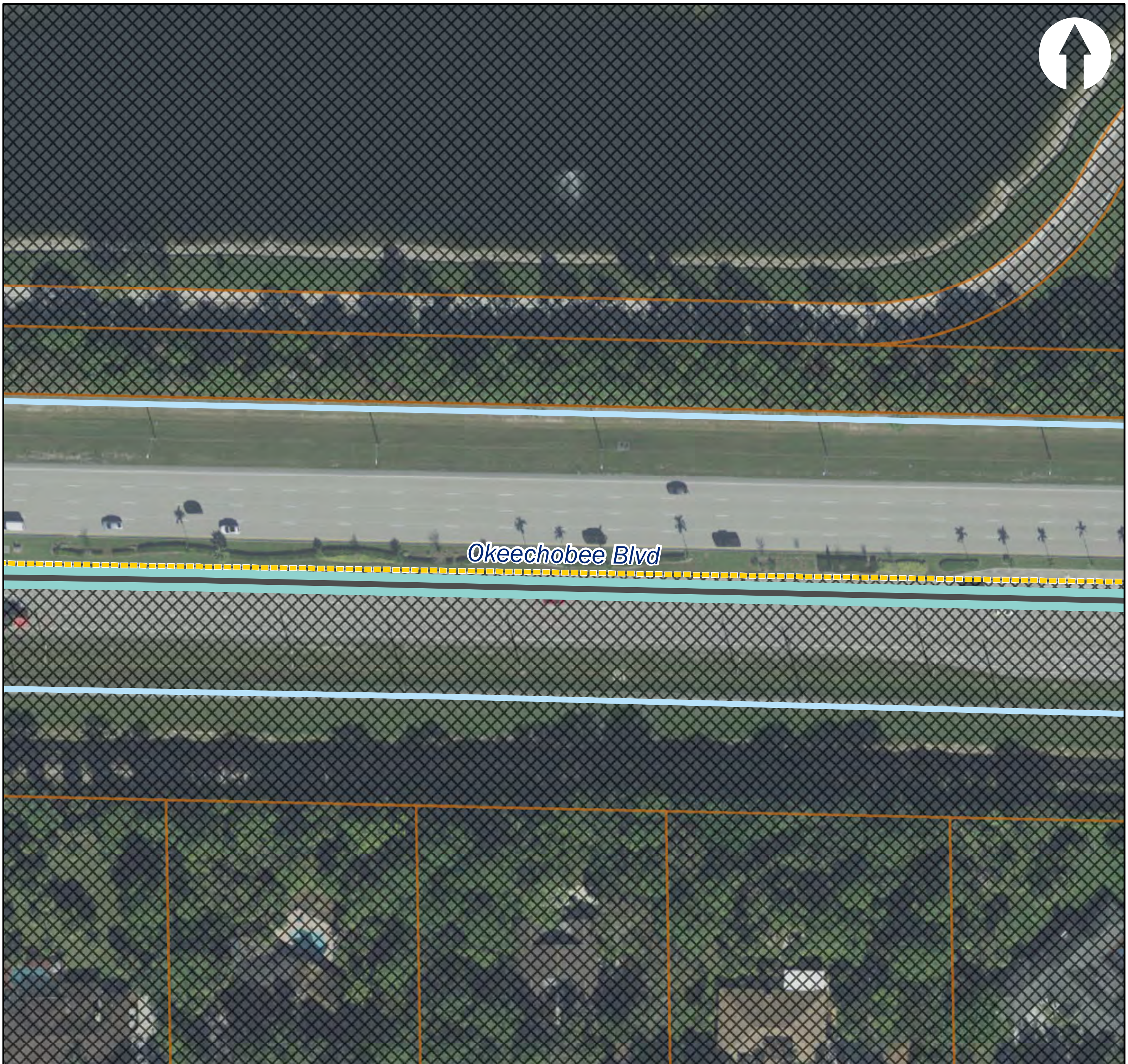

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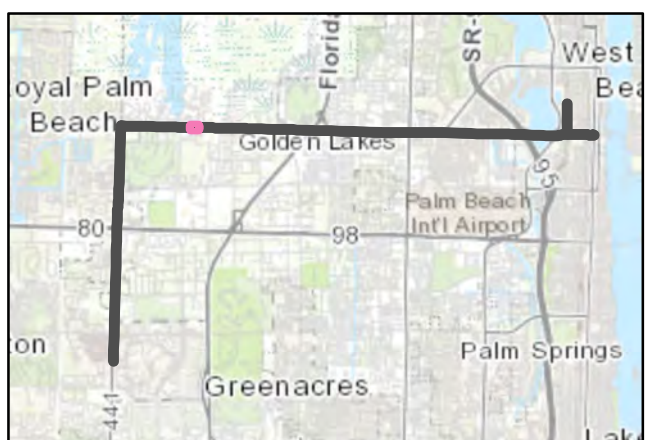

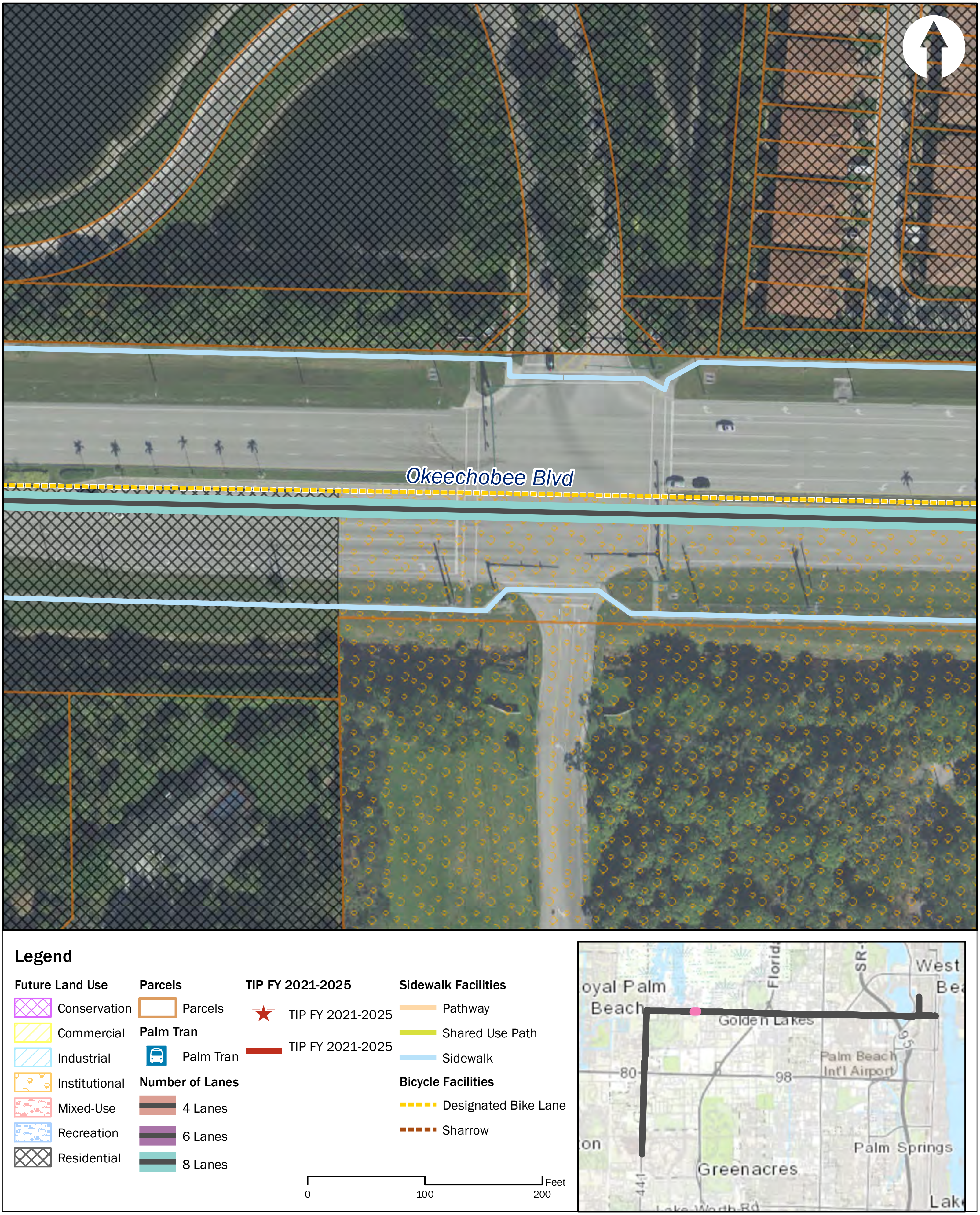
Okeechobee Blvd
Legend
Future Land Use
Conservation
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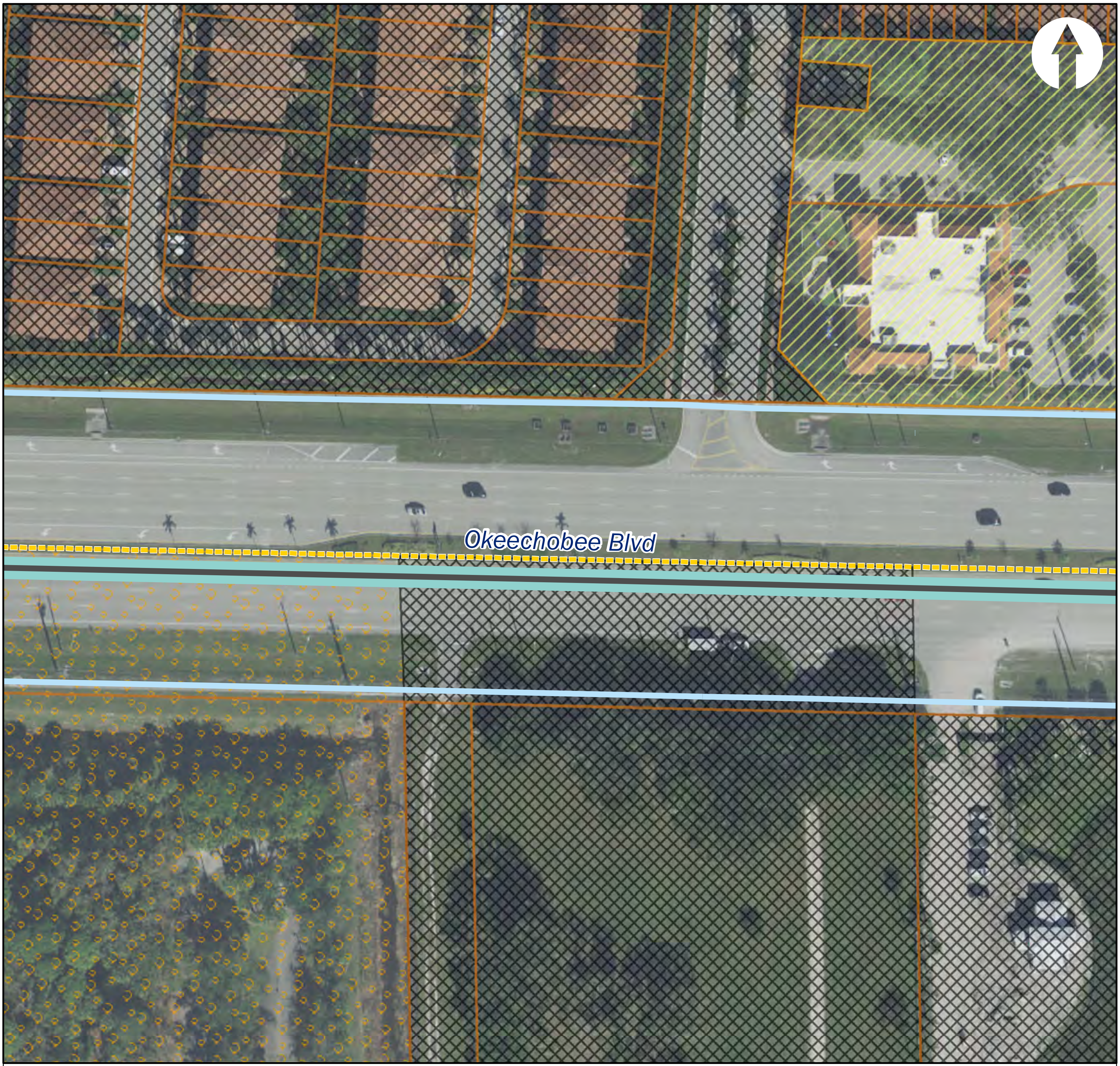

Legend

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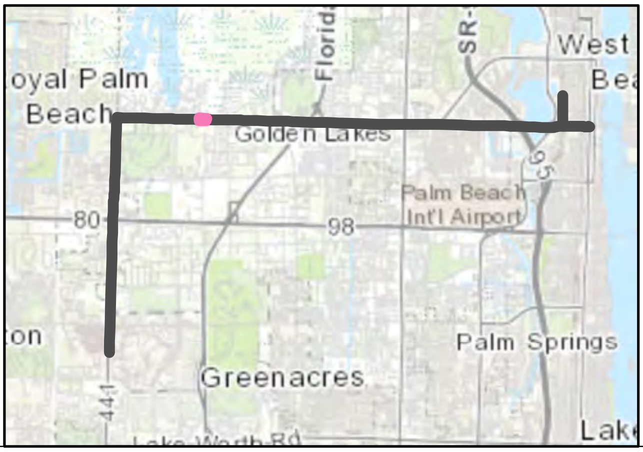

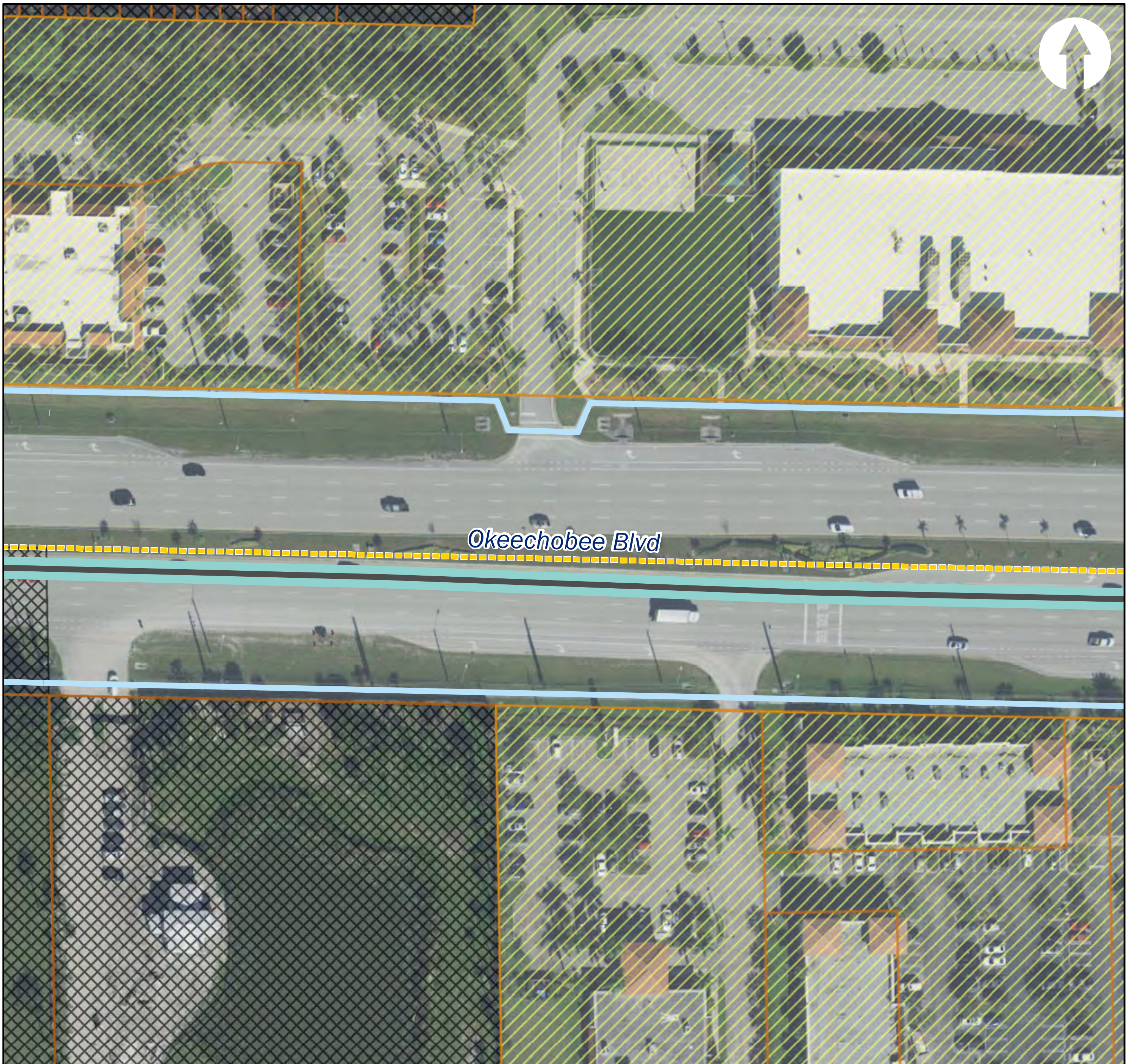

Legend

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Okeechobee Blvd
Benoist Farms Rd
Legend
Future Land Use
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Parcels
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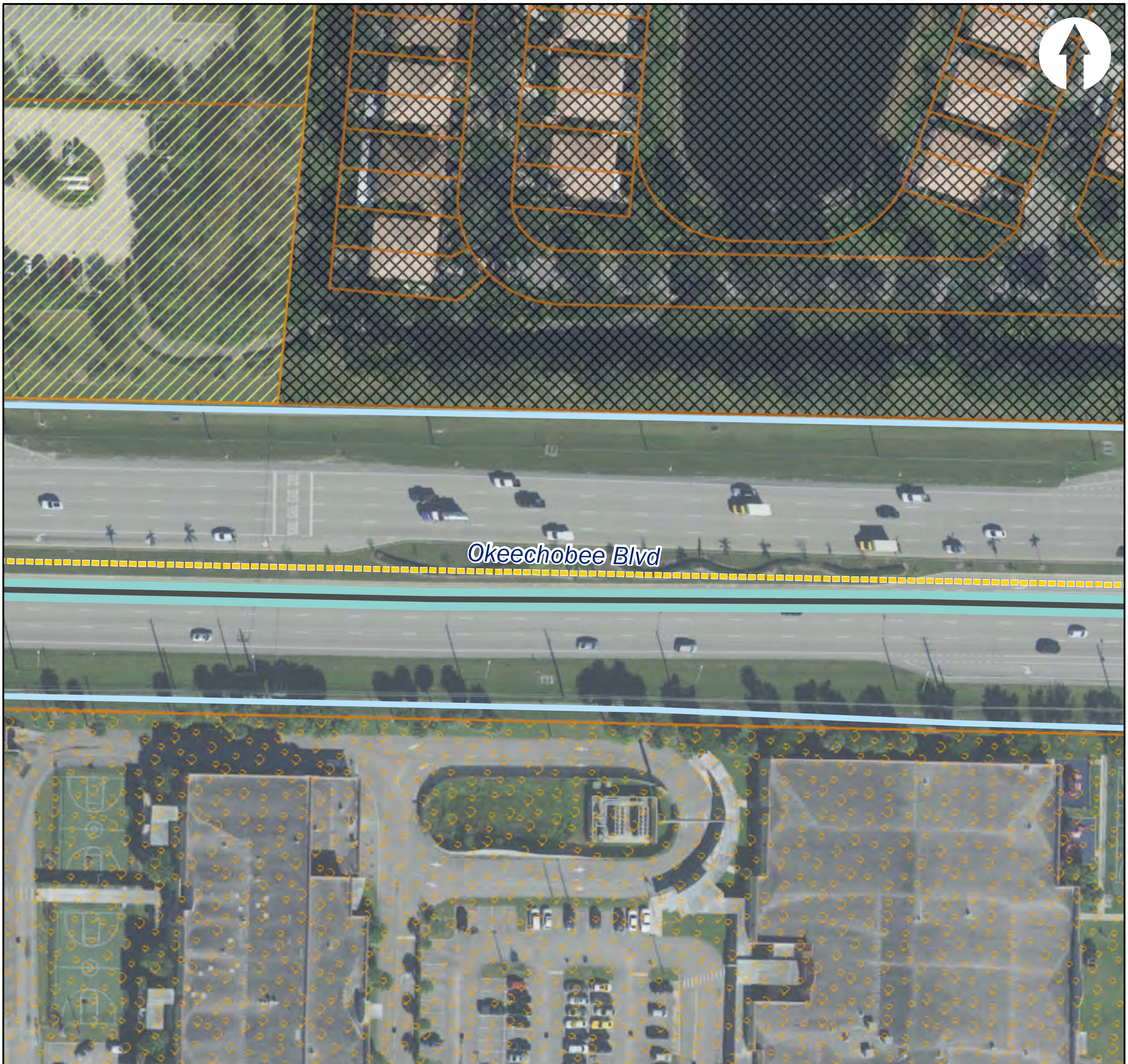

Legend

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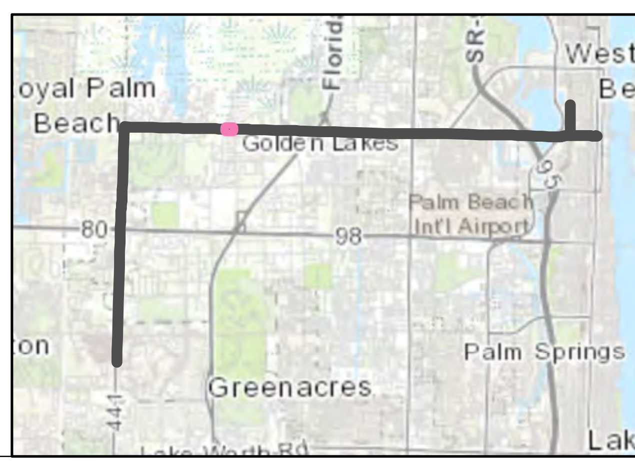

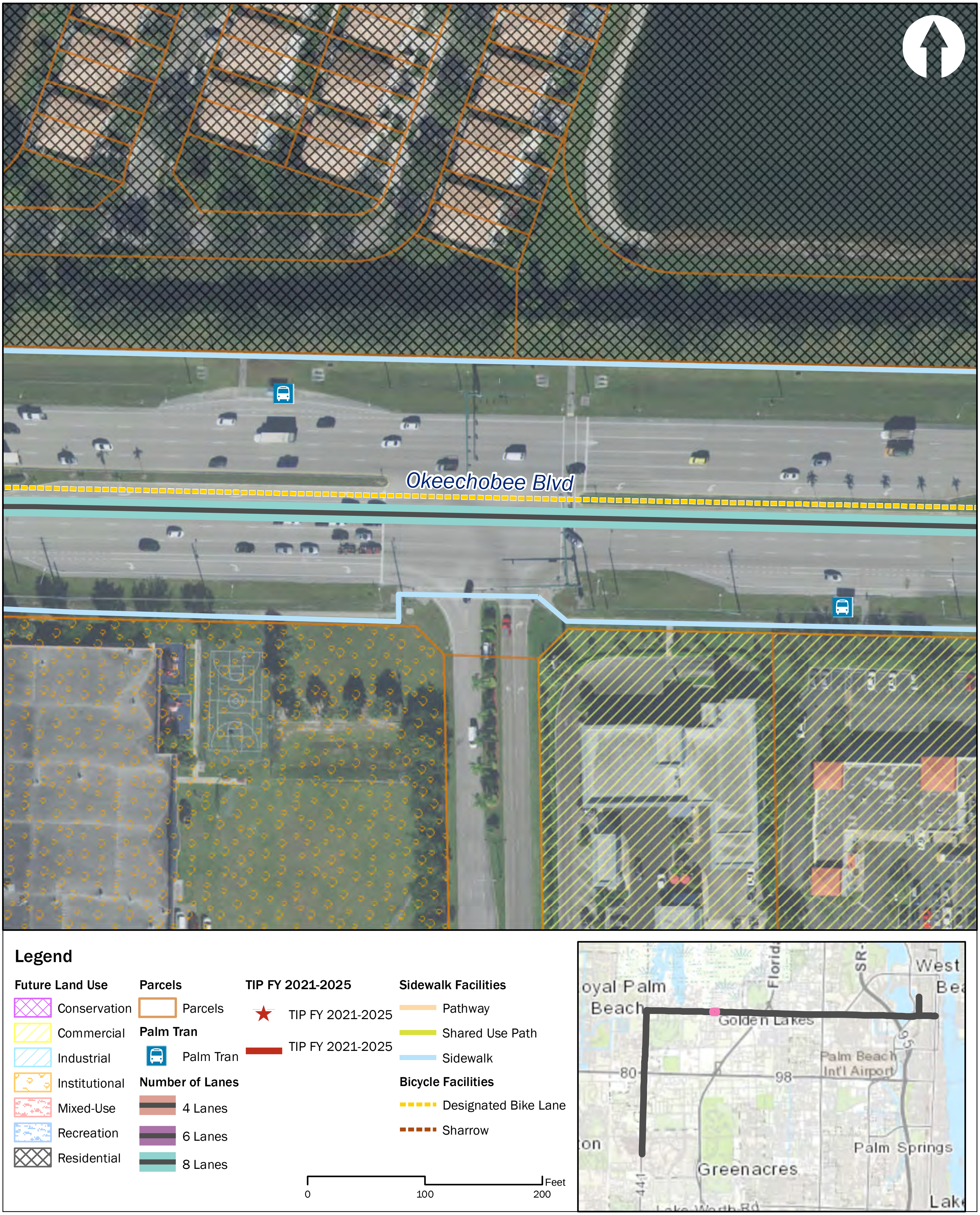
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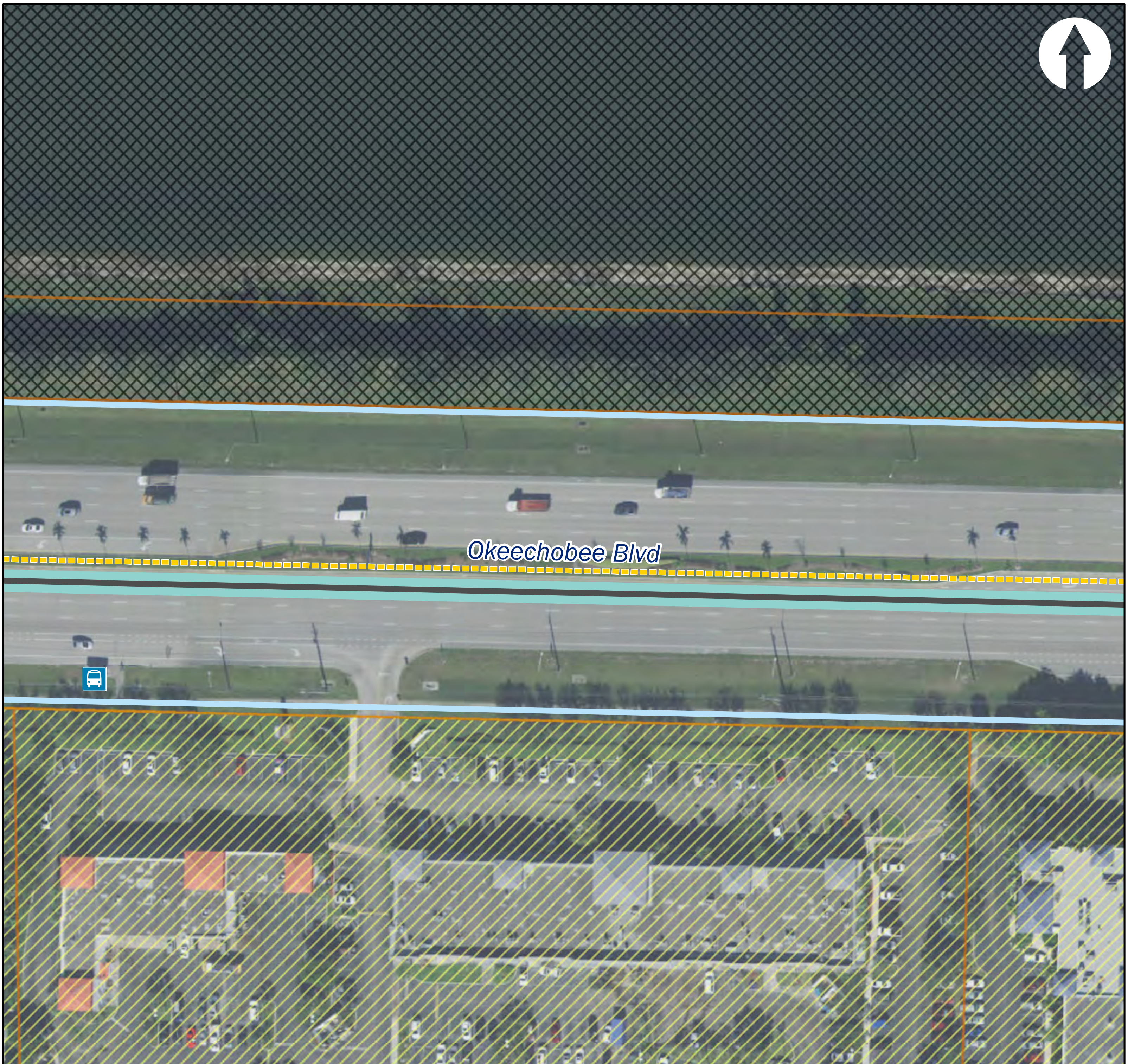

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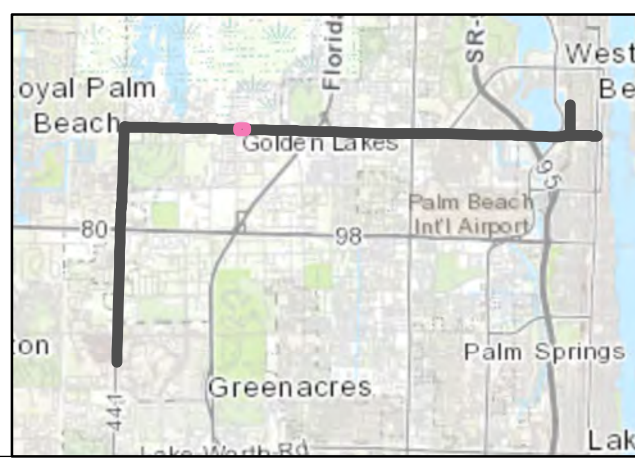
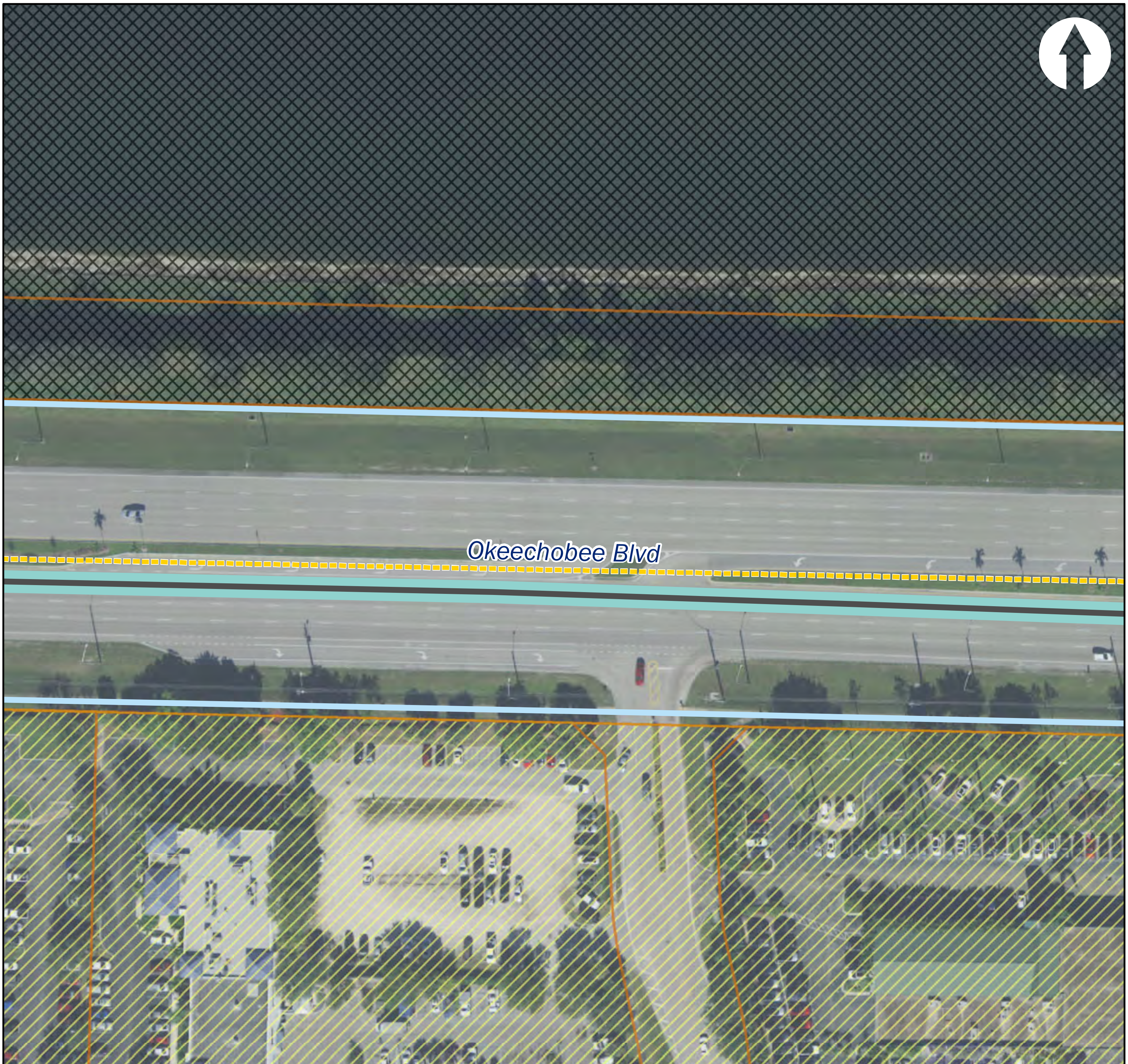
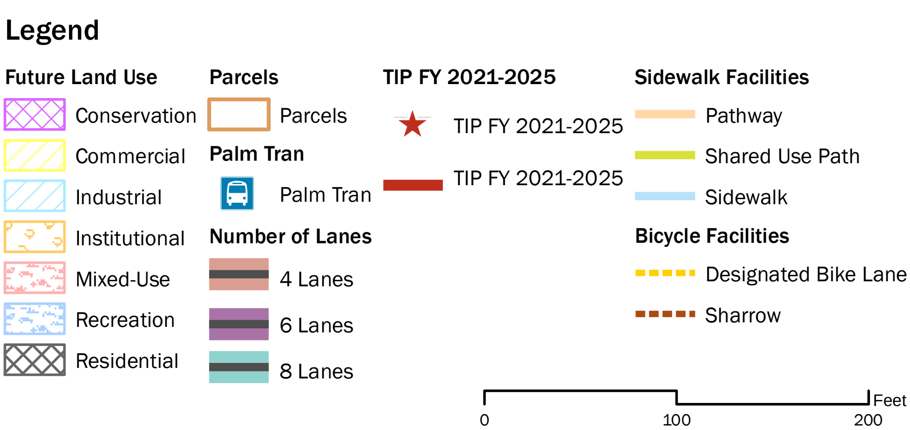



Okeechobee Blvd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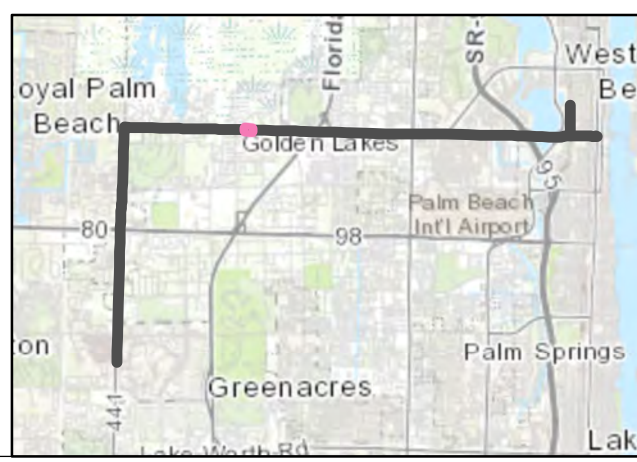
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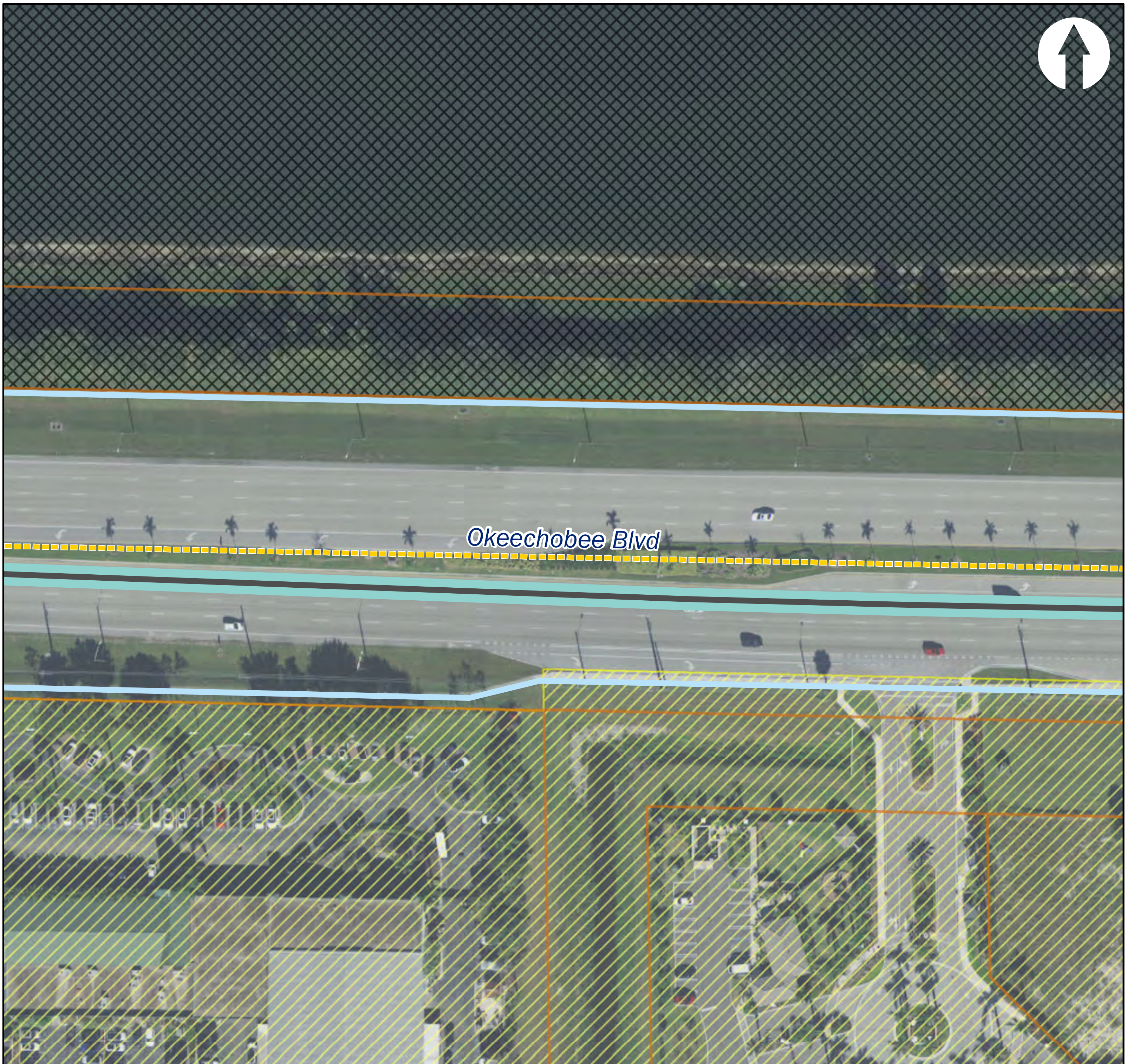

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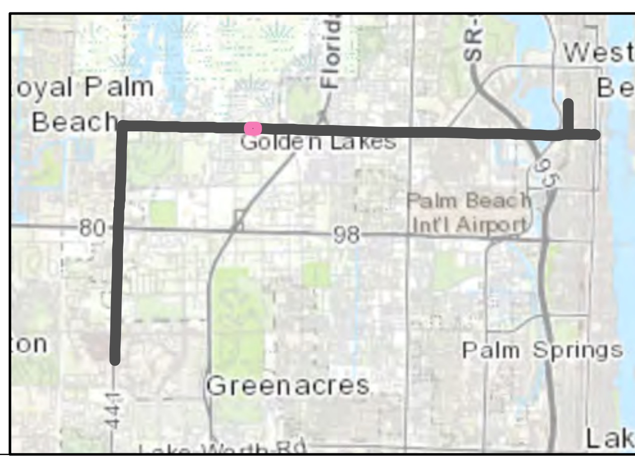

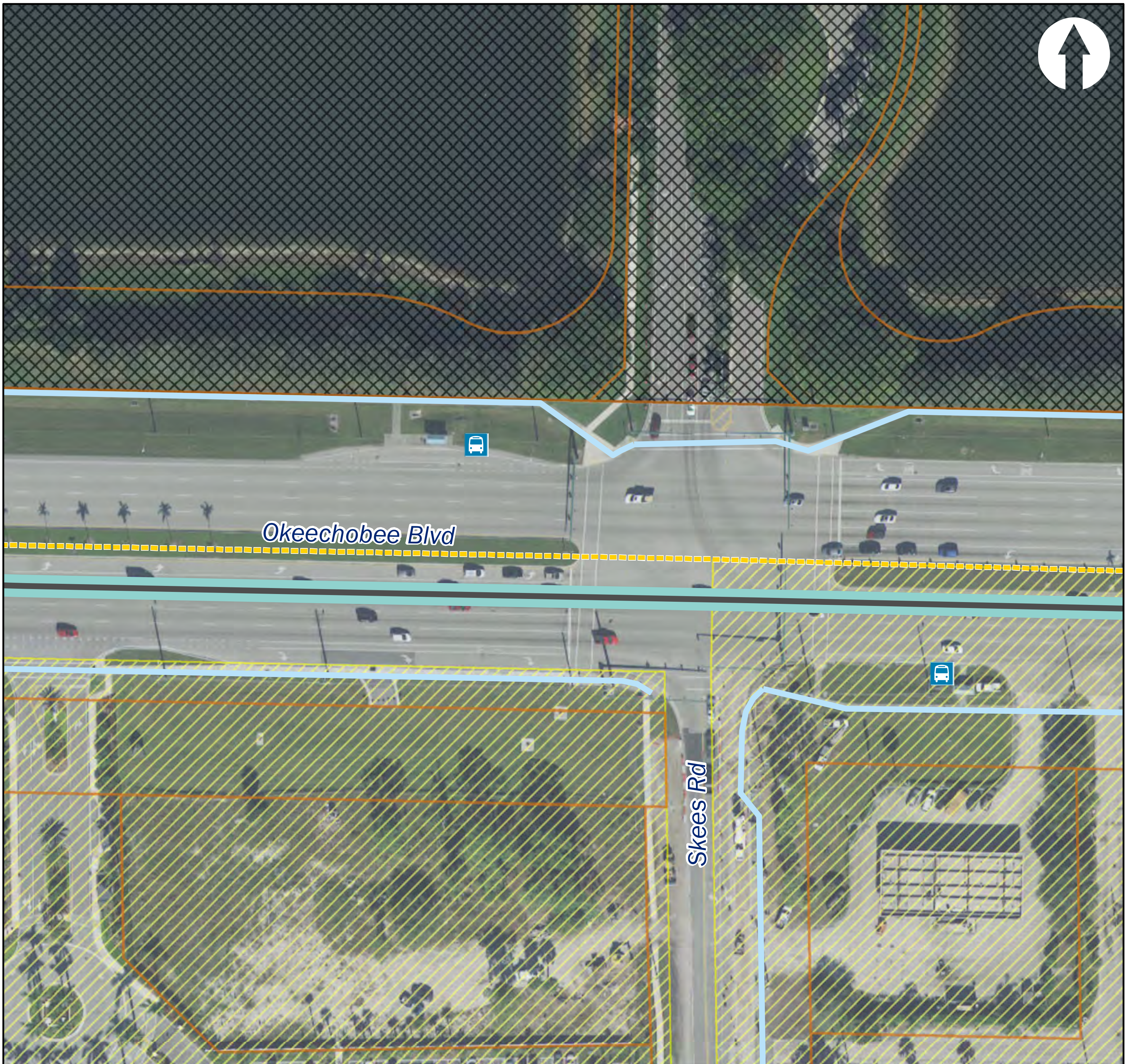

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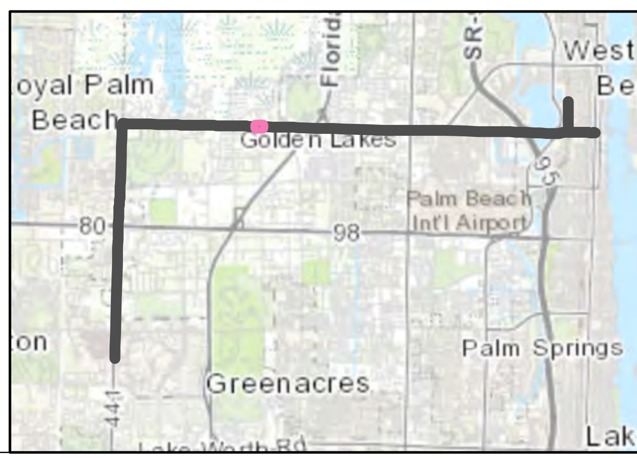

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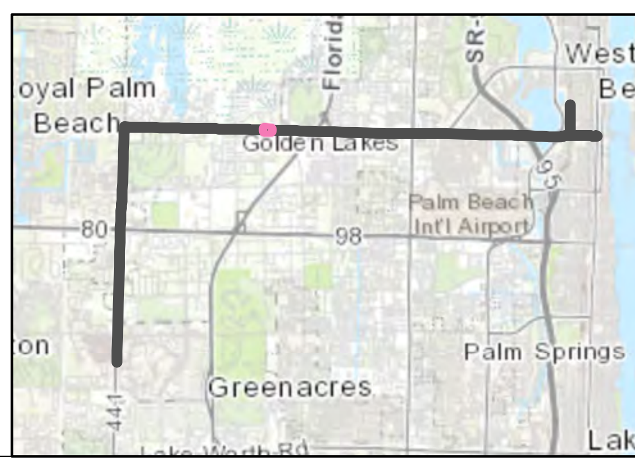
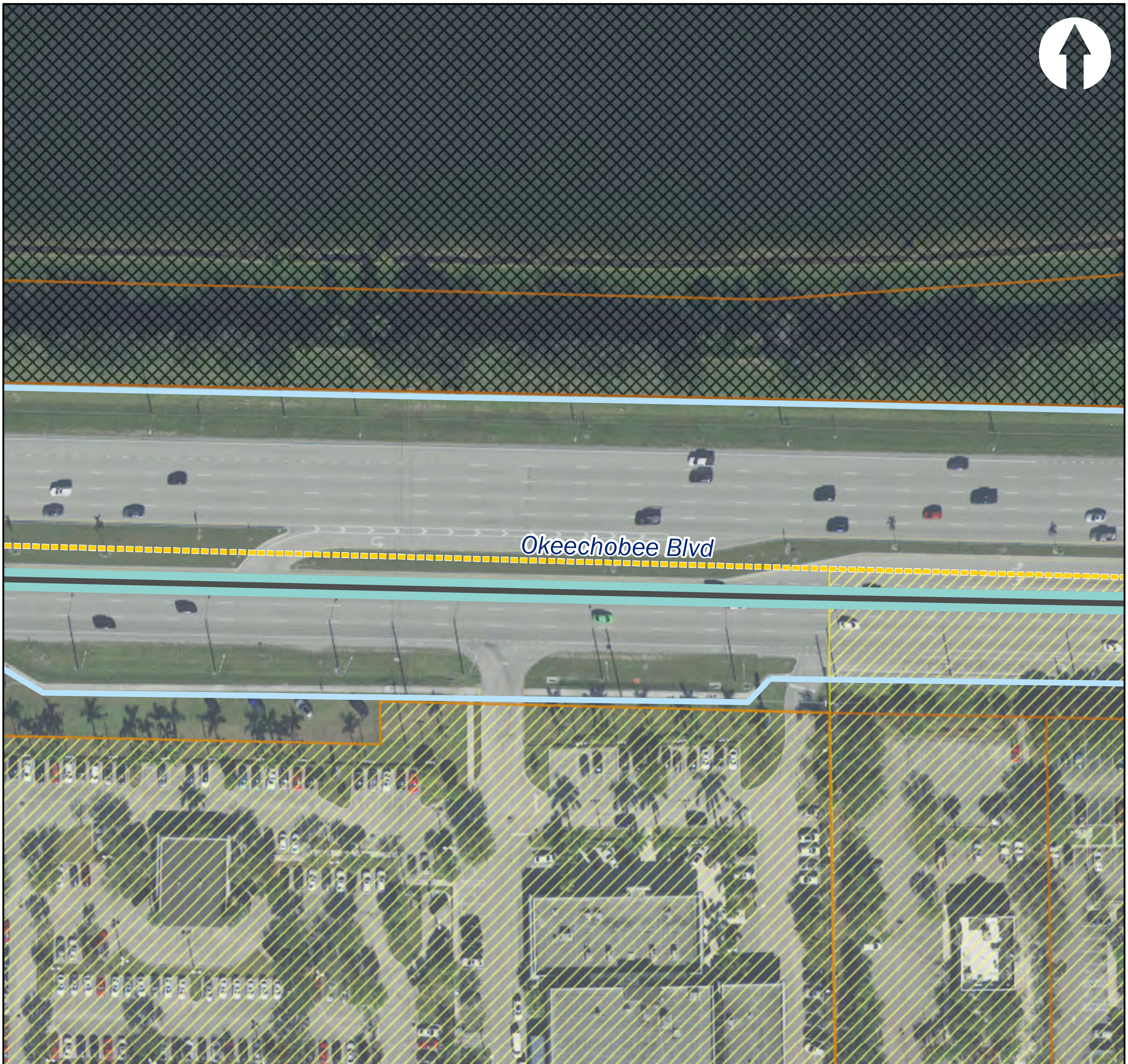
0 100 200 Feet





Legend

Future Land Use
- Conservation
- Commercial
- Industrial
- Institutional
- Mixed-Use
- Recreation
- Residential

Parcels
- Parcels

Palm Tran
- Palm Tran

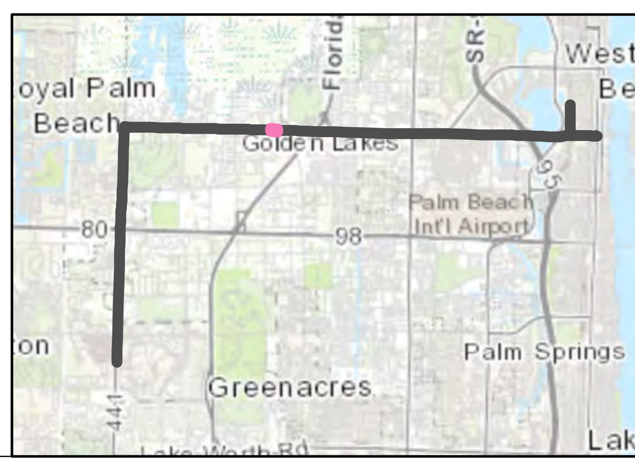
Number of Lanes
- 4 Lanes
- 6 Lanes
- 8 Lanes

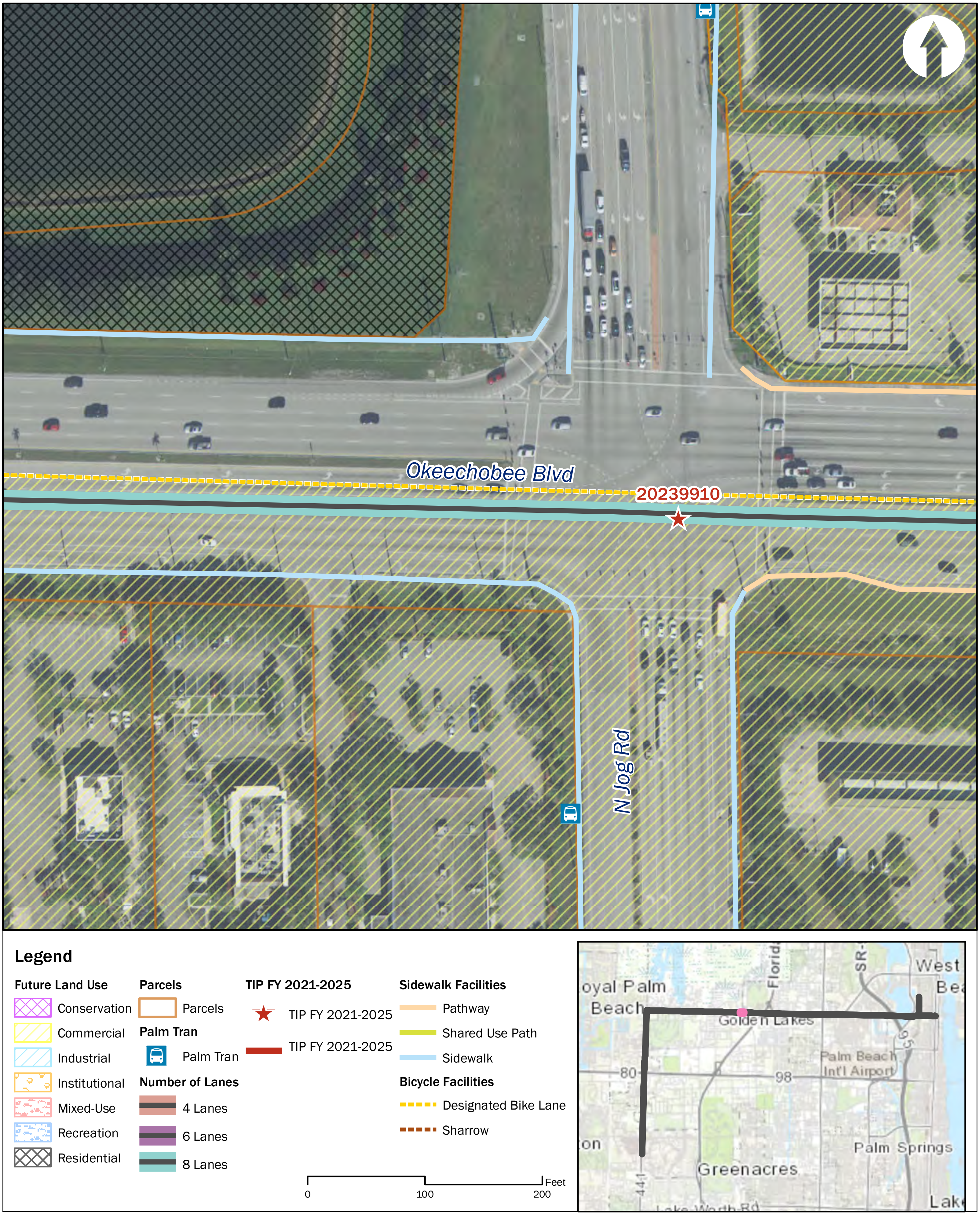
TIP FY 2021-2025
- TIP FY 2021-2025
- TIP FY 2021-2025

Sidewalk Facilities
- Pathway
- Shared Use Path
- Sidewalk

Bicycle Facilities
- Designated Bike Lane
- Sharrow

0 100 200 Feet




Okeechobee Blvd
20239910
N Jog Rd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
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TIP FY 2021-2025
TIP FY 2021-2025
Sidewalk Facilities
Pathway
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Sidewalk
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Sharrow
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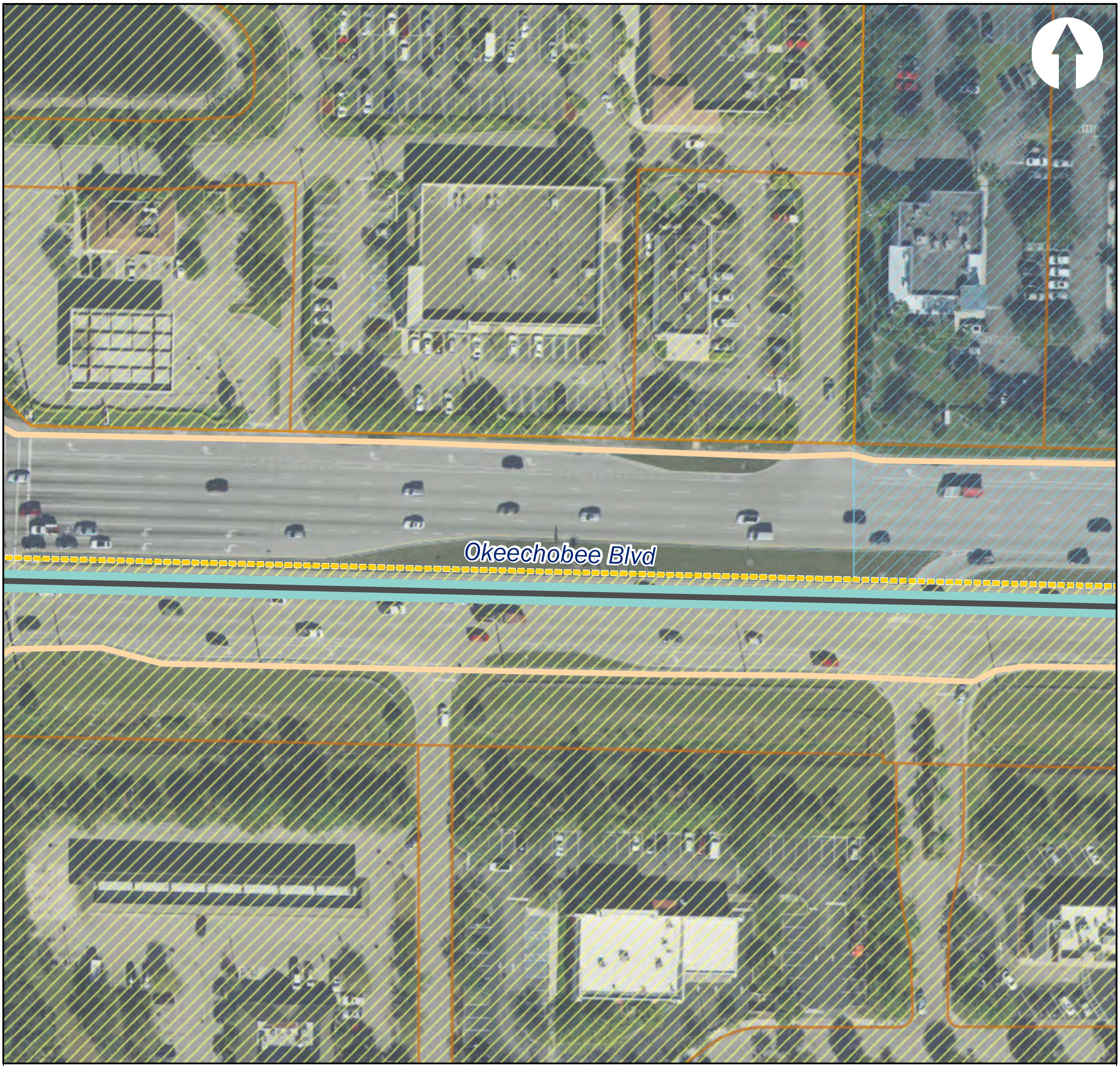
100
200
Feet
Golden Lakes
Palm Beach Int'l Airport
Palm Springs
Greenacres
98
80
441
95



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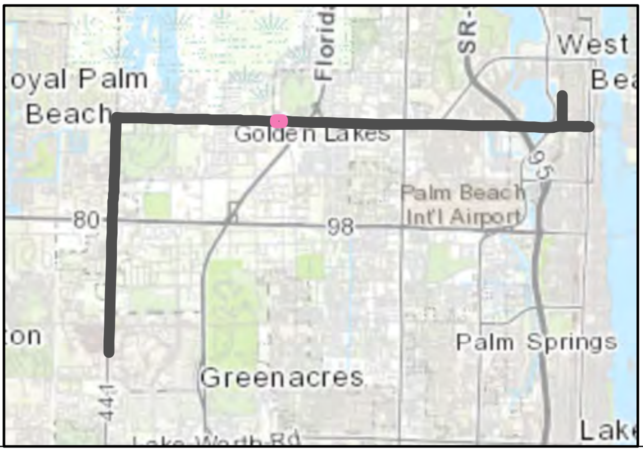

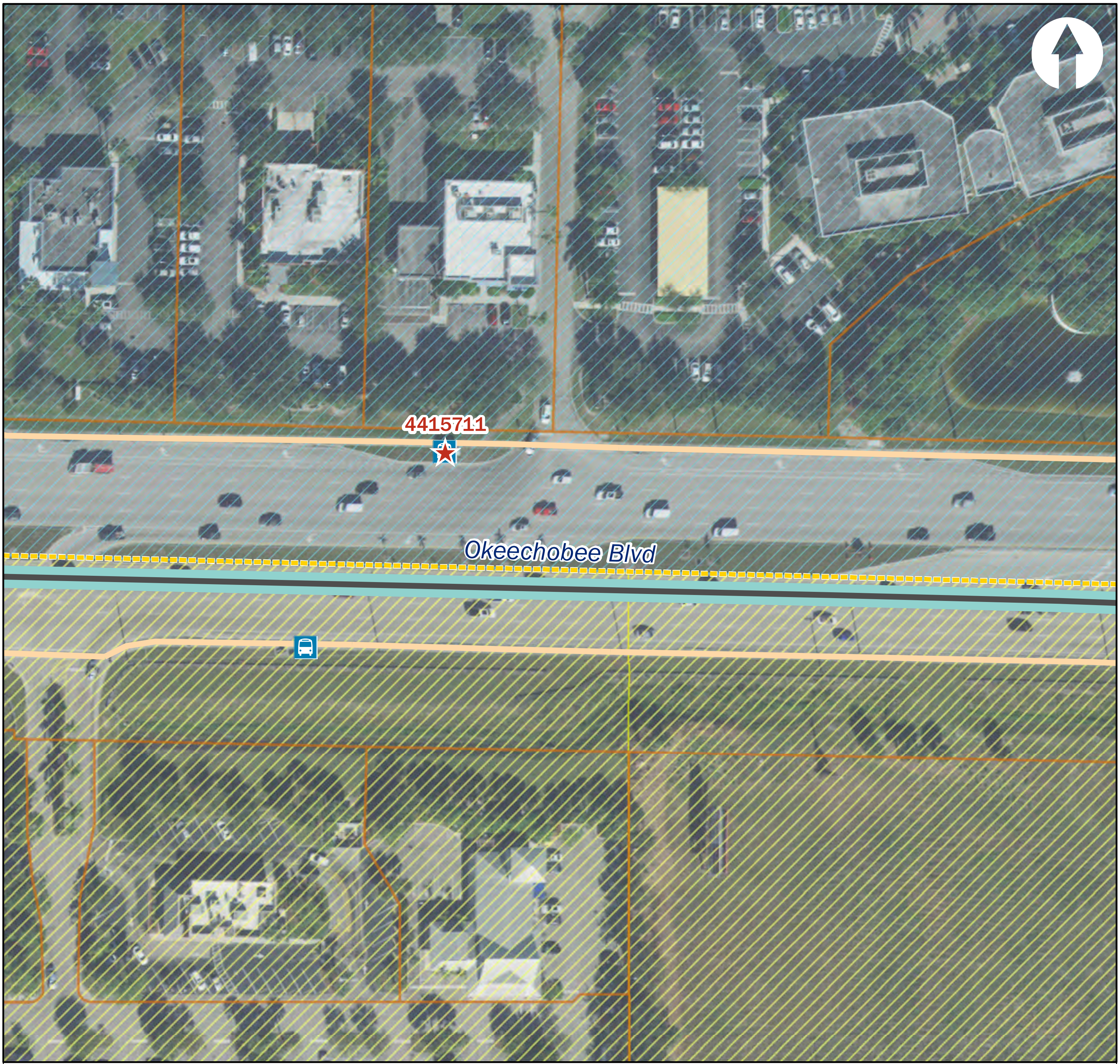

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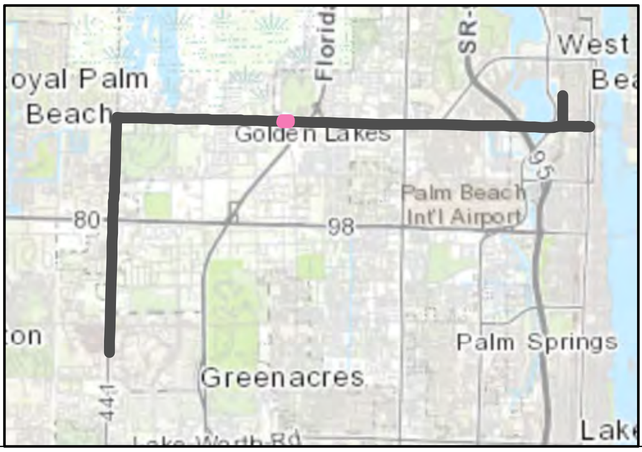

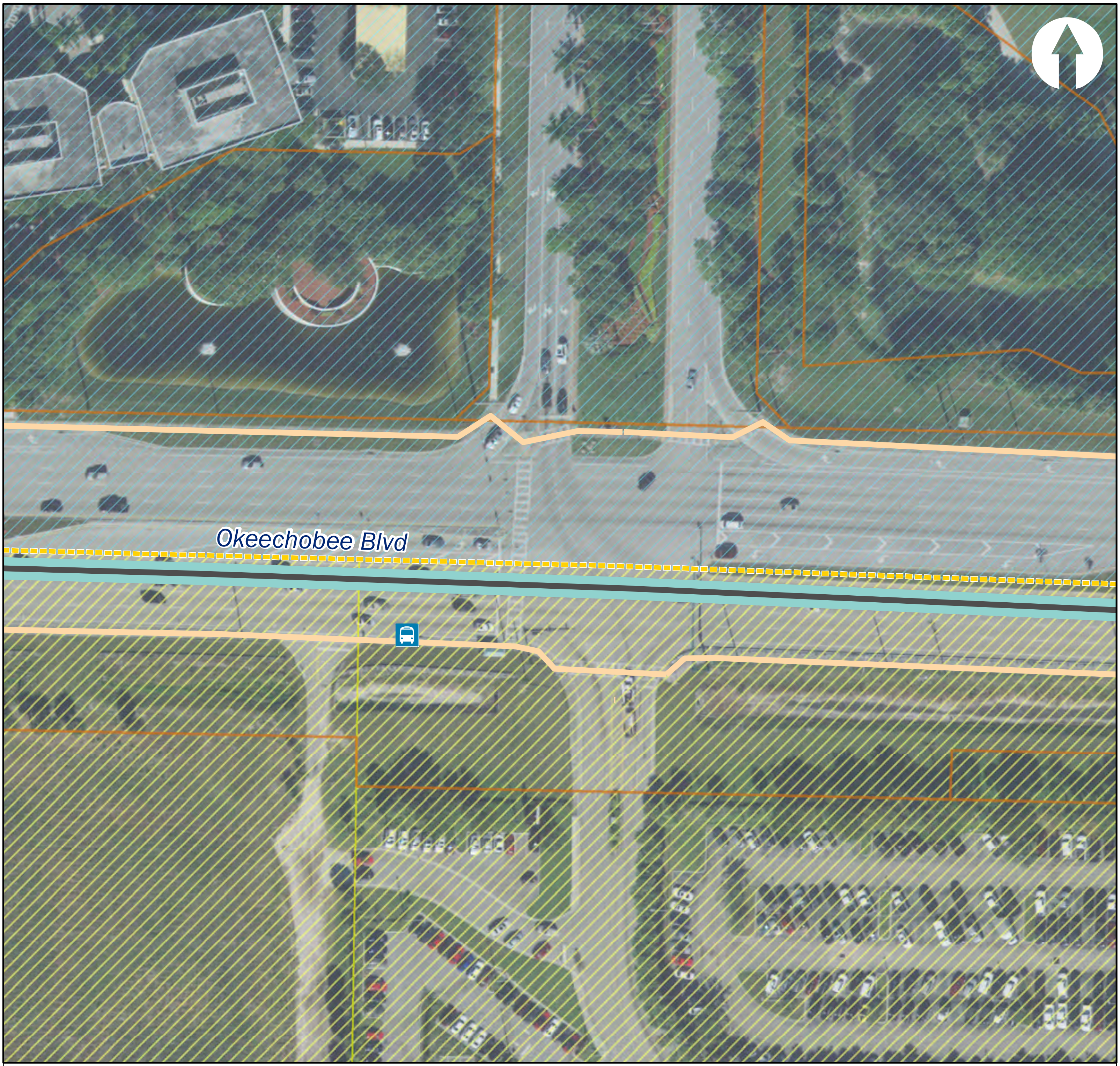

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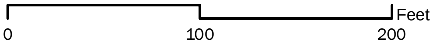

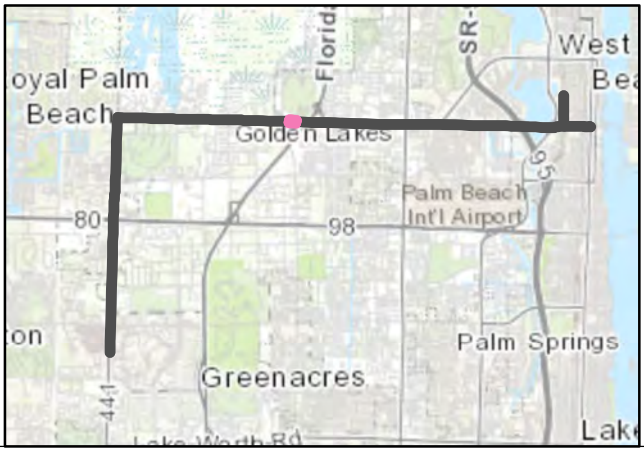

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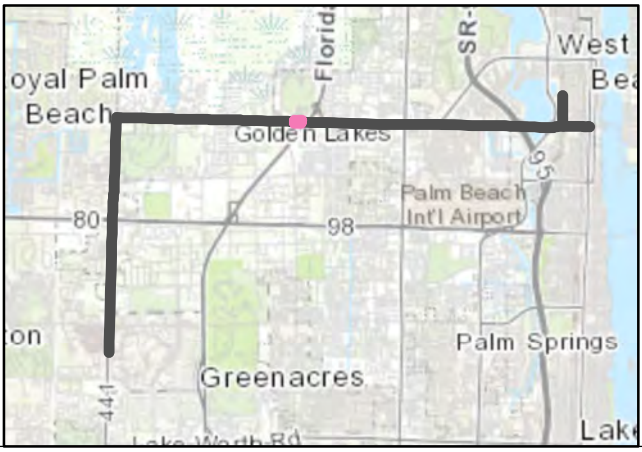
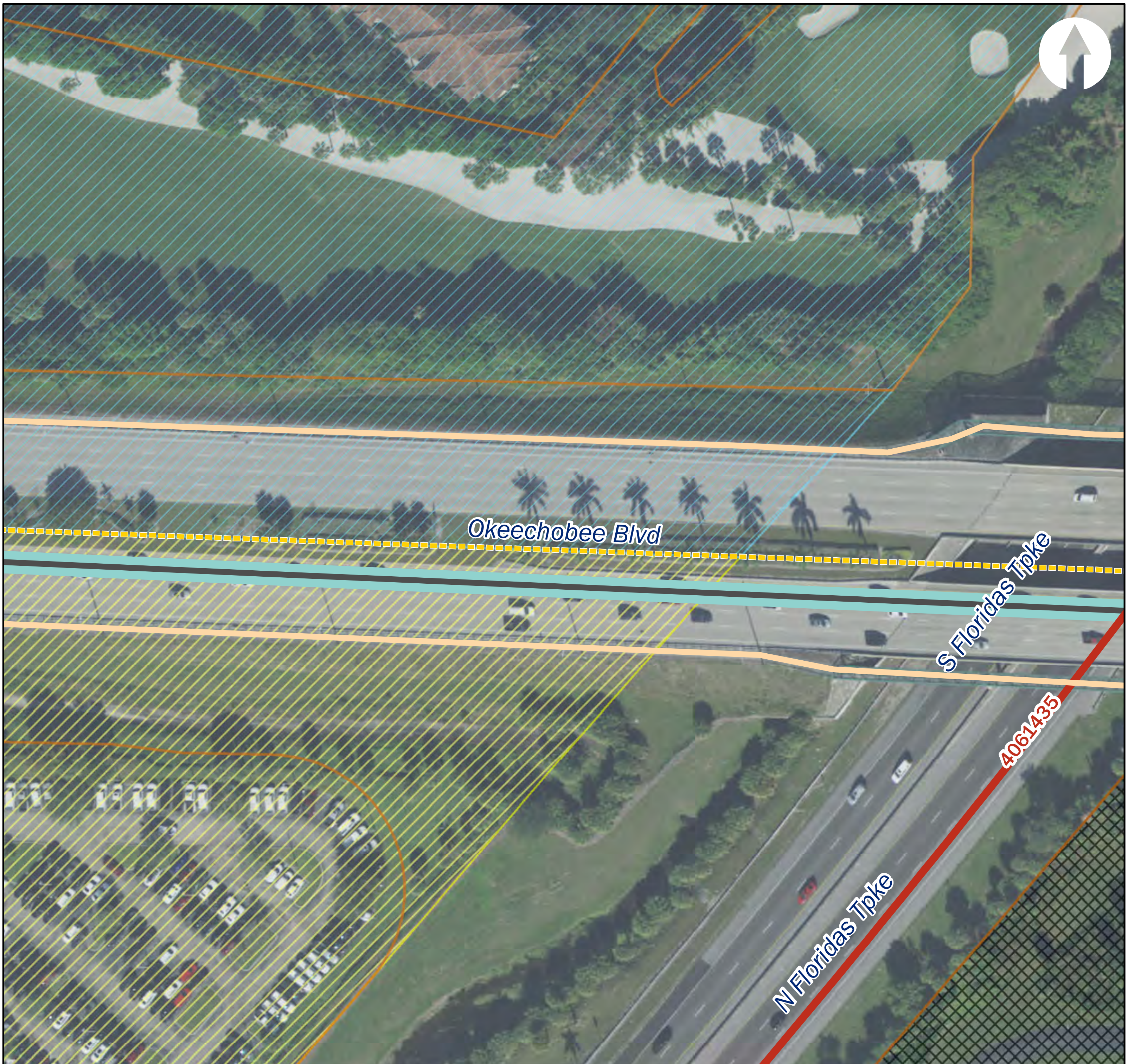
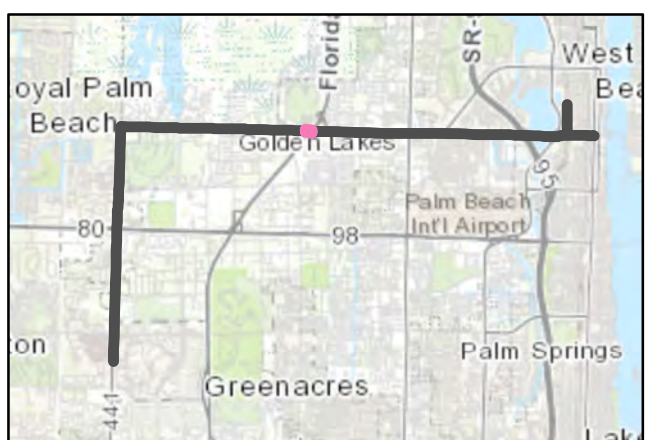
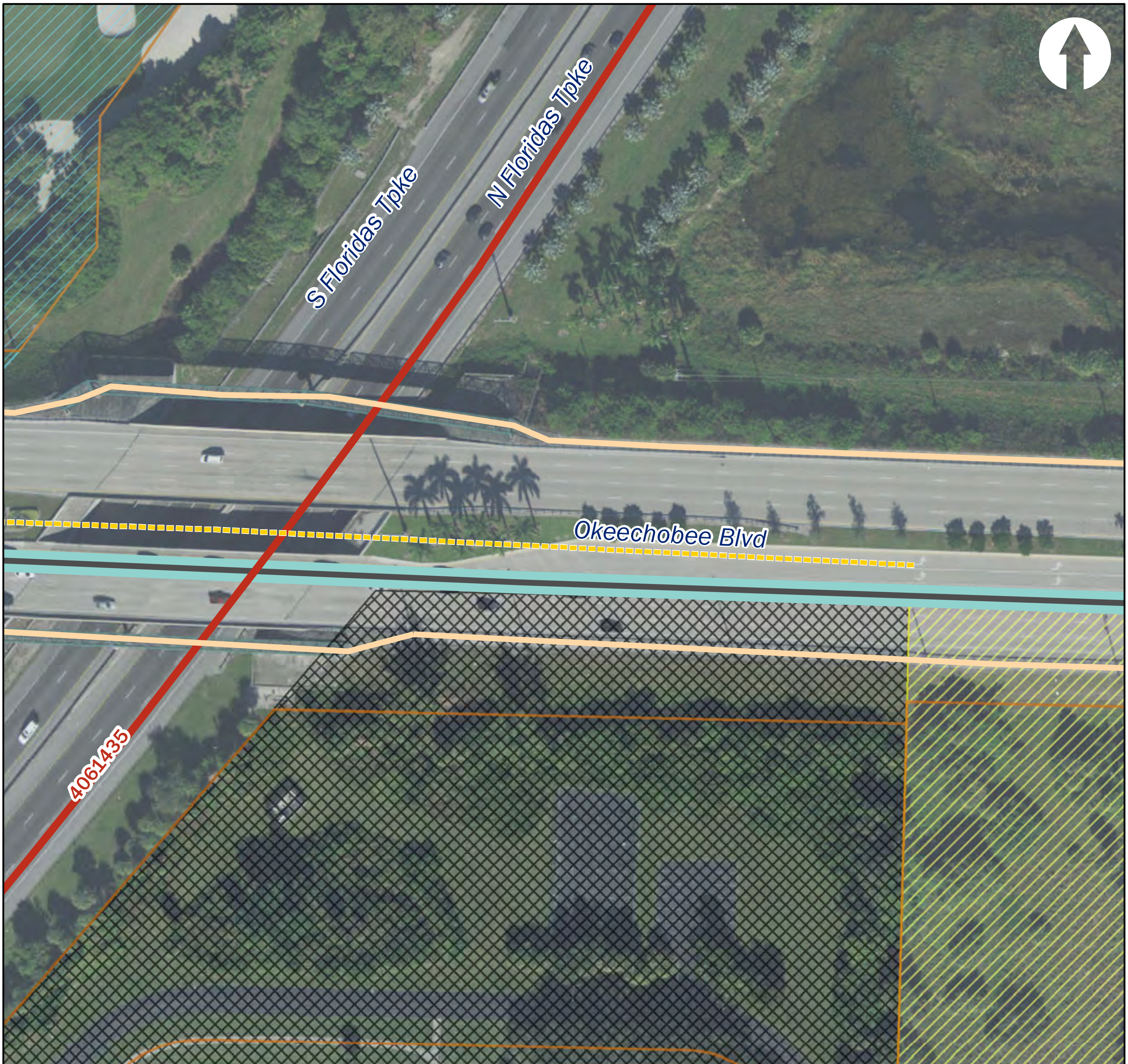




Legend

Future Land Use	Parcels	TIP FY 2021-2025	Sidewalk Facilities
Conservation	Parcels	TIP FY 2021-2025	Pathway
Commercial	**Palm Tran**	TIP FY 2021-2025	Shared Use Path
Industrial	Palm Tran		Sidewalk
Institutional	**Number of Lanes**		**Bicycle Facilities**
Mixed-Use	4 Lanes		Designated Bike Lane
Recreation	6 Lanes		Sharrow
Residential	8 Lanes		





Legend

Future Land Use	Parcels	TIP FY 2021-2025	Sidewalk Facilities
Conservation	Parcels	TIP FY 2021-2025	Pathway
Commercial	**Palm Tran**	TIP FY 2021-2025	Shared Use Path
Industrial	Palm Tran		Sidewalk
Institutional	**Number of Lanes**		**Bicycle Facilities**
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0 100 200 Feet

Legend

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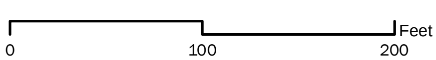

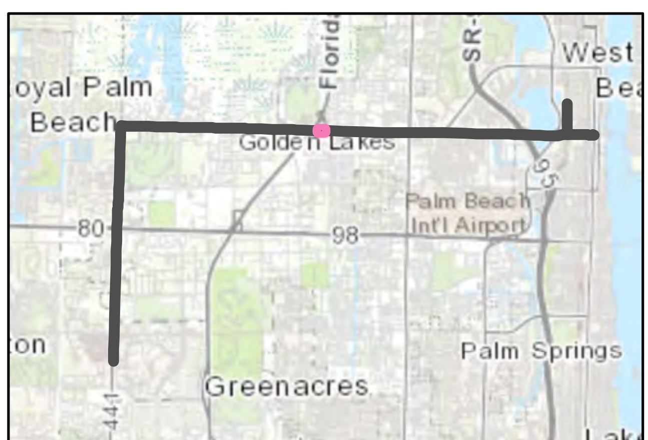

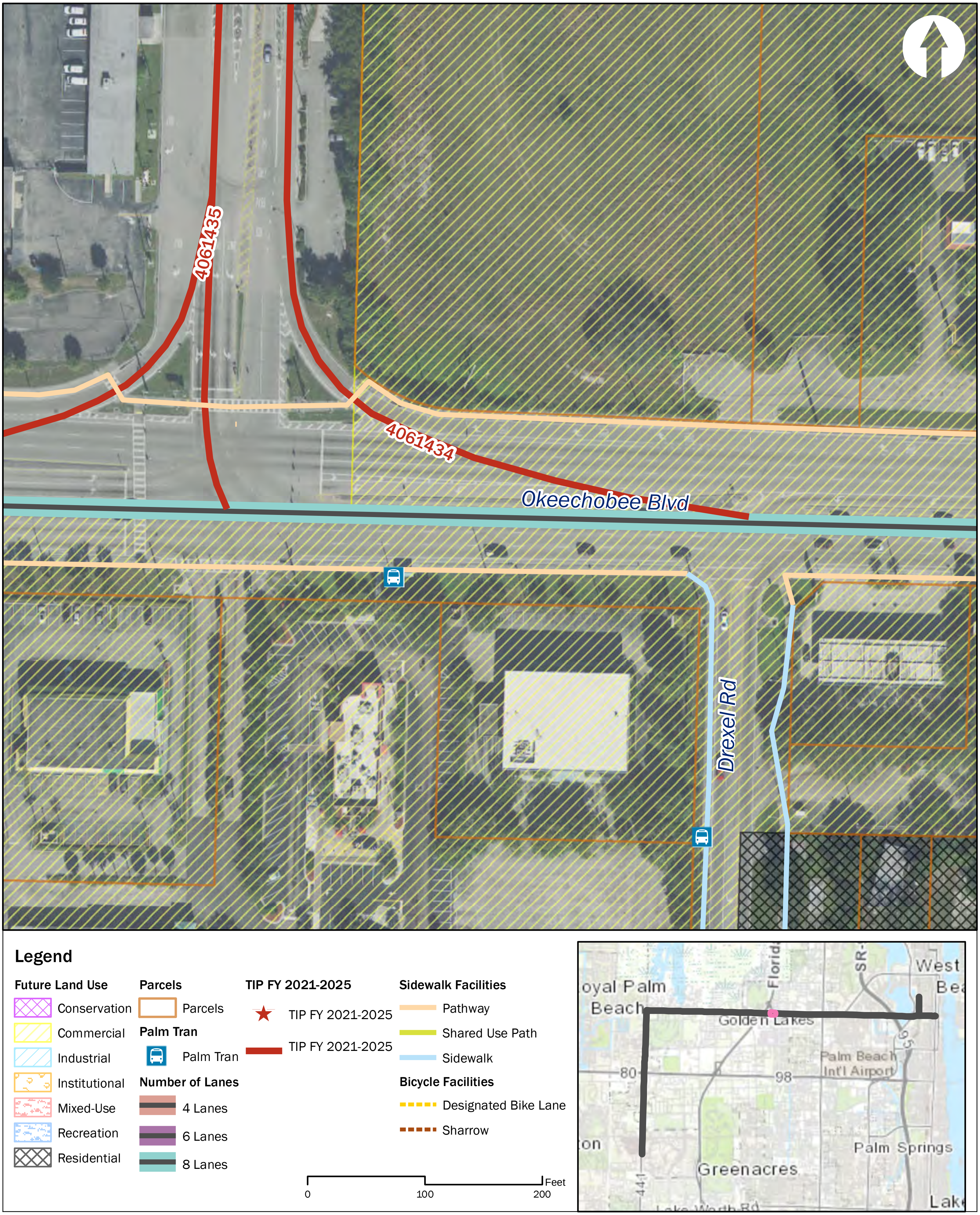
4061435
4061434
Okeechobee Blvd
Drexel Rd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
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Parcels
Palm Tran
Palm Tran
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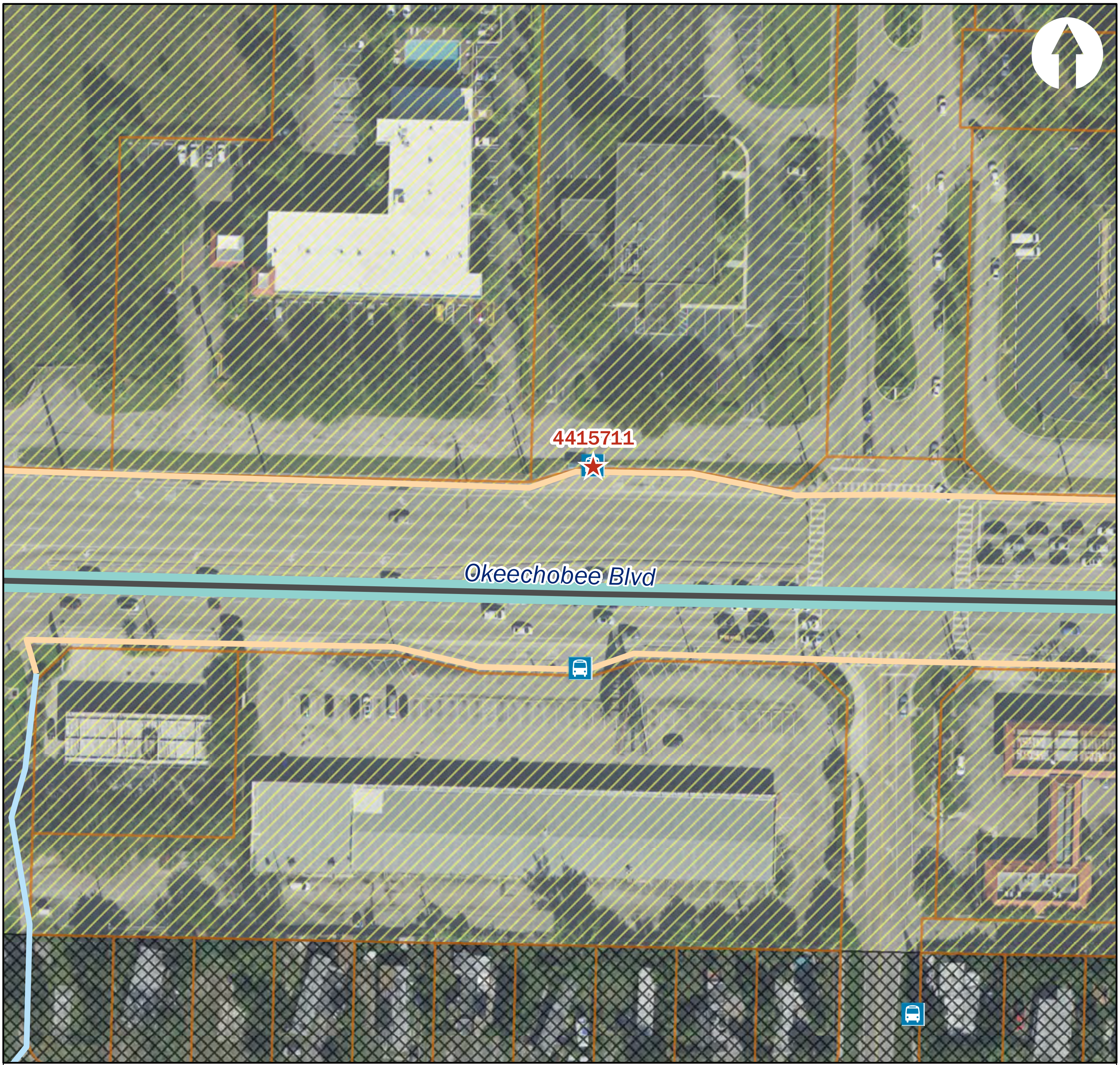

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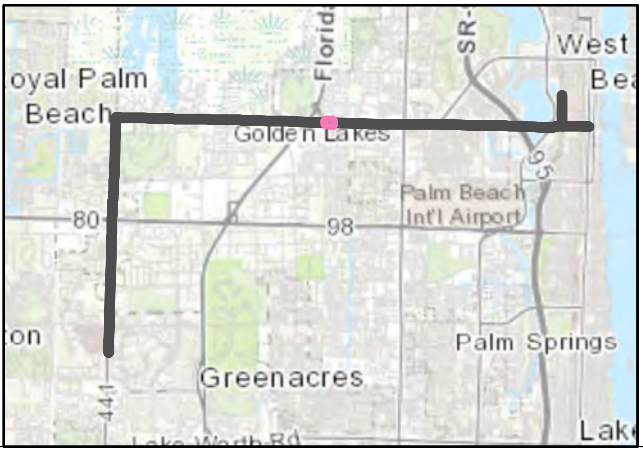

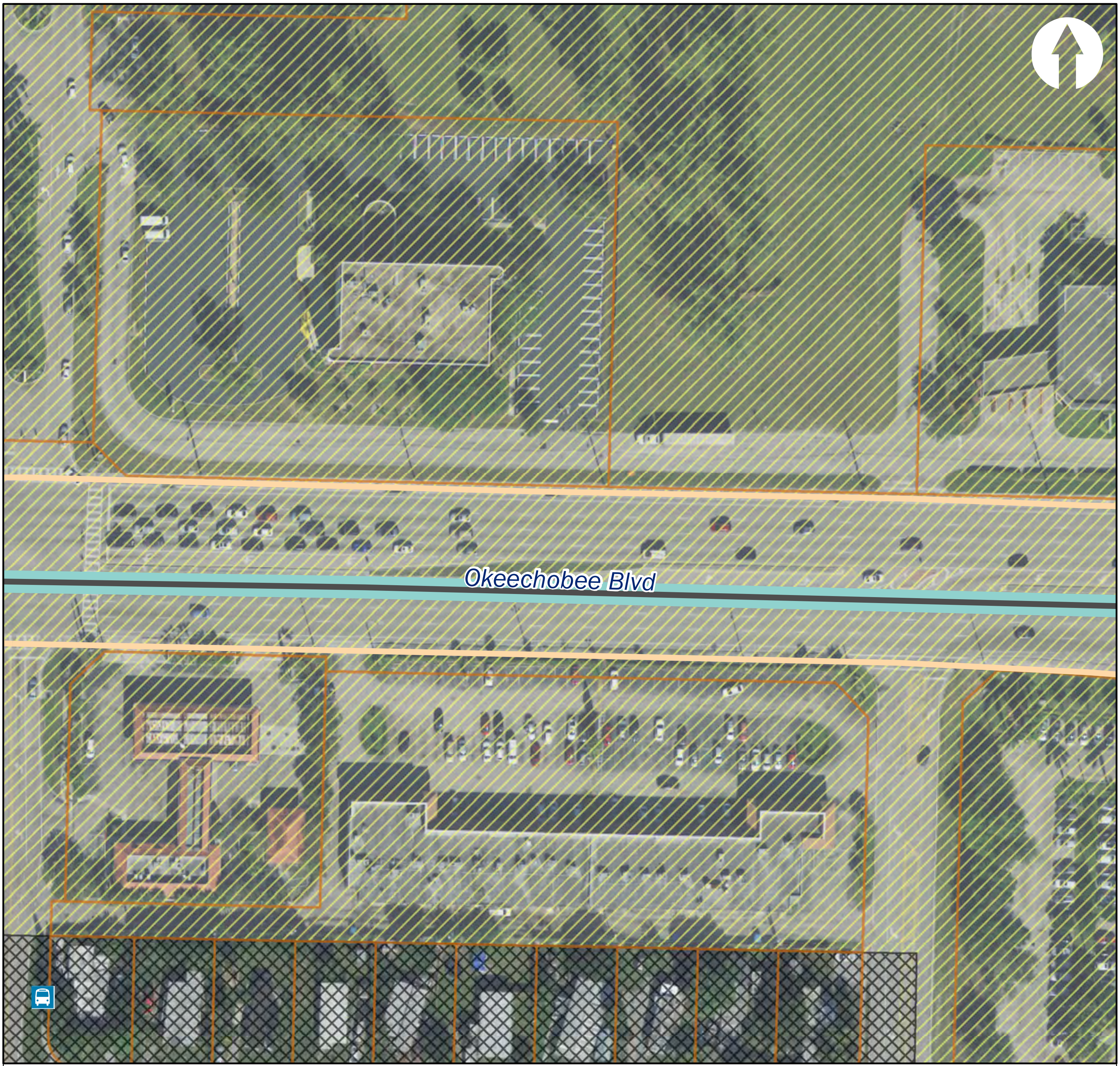

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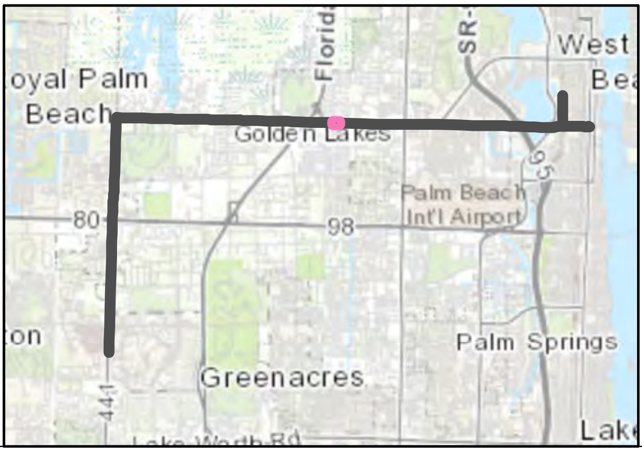

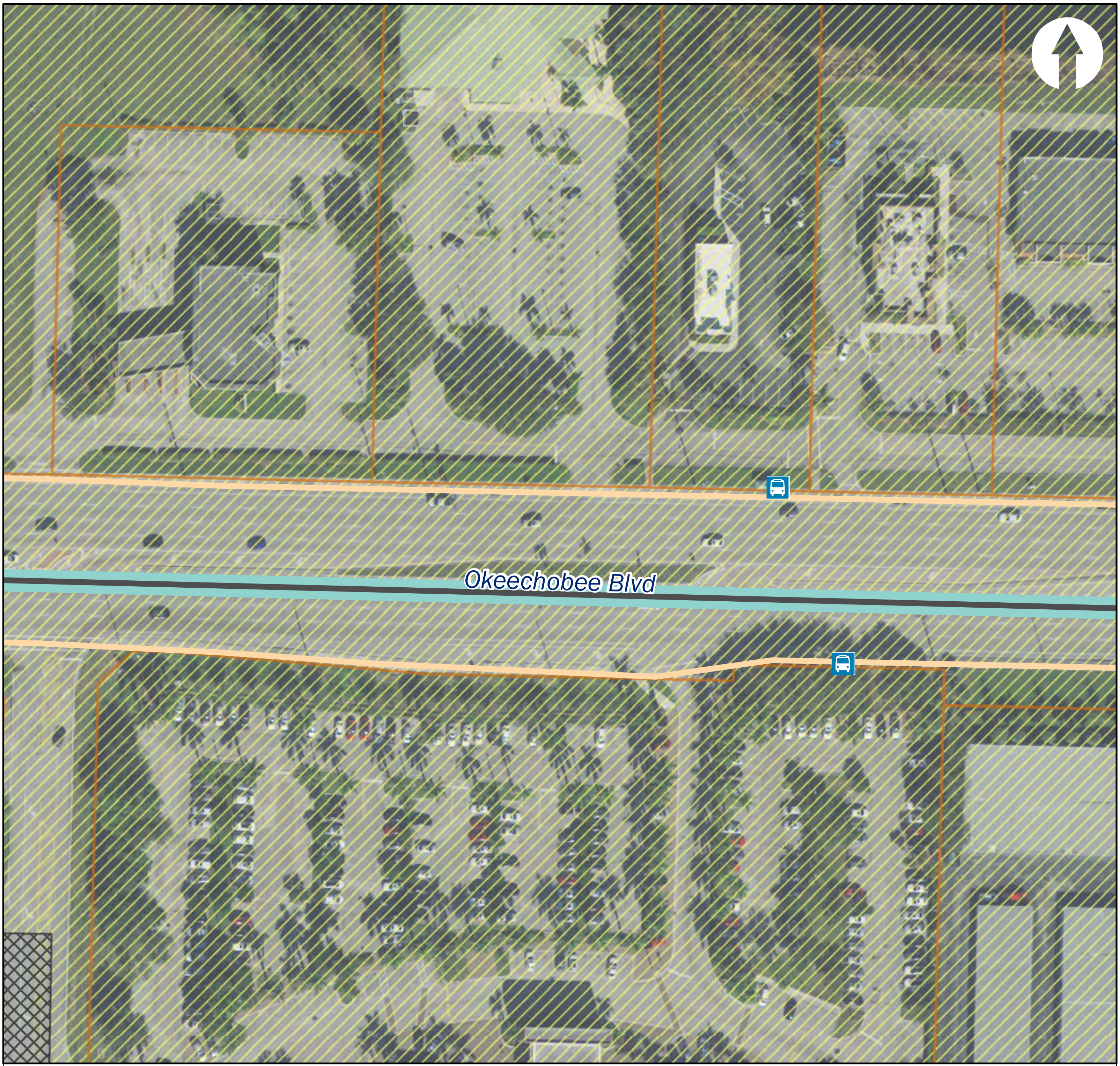

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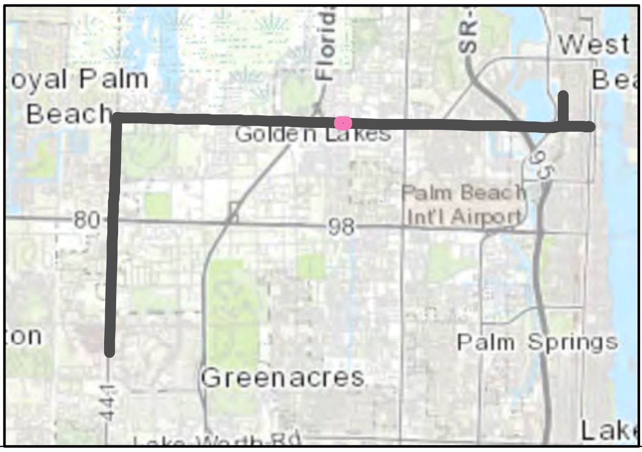

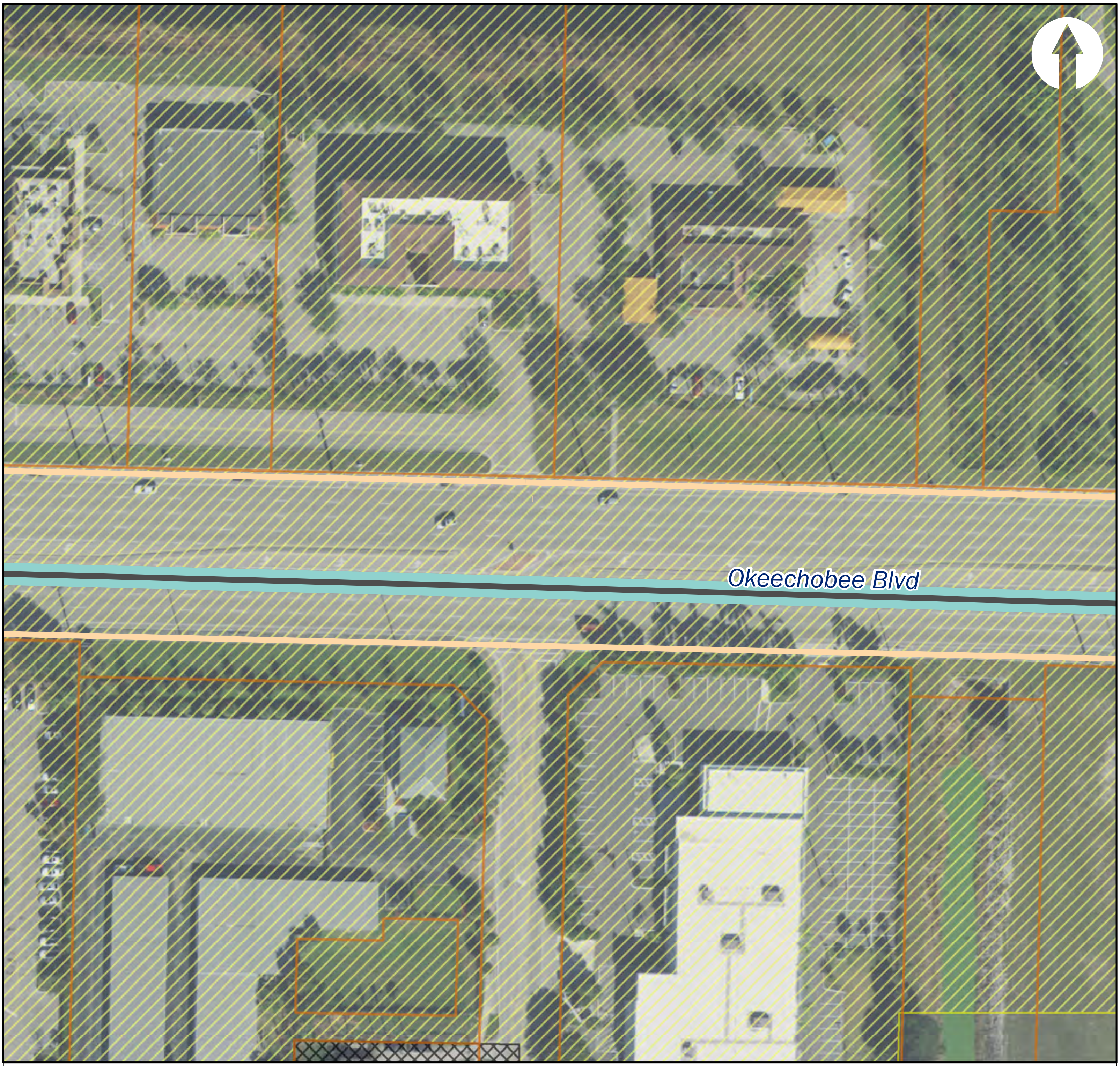

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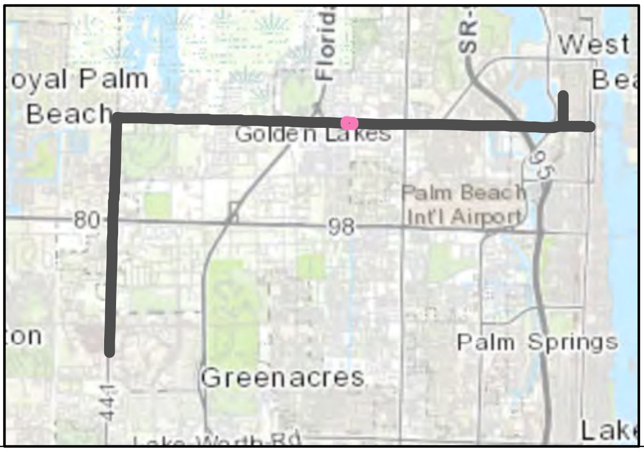

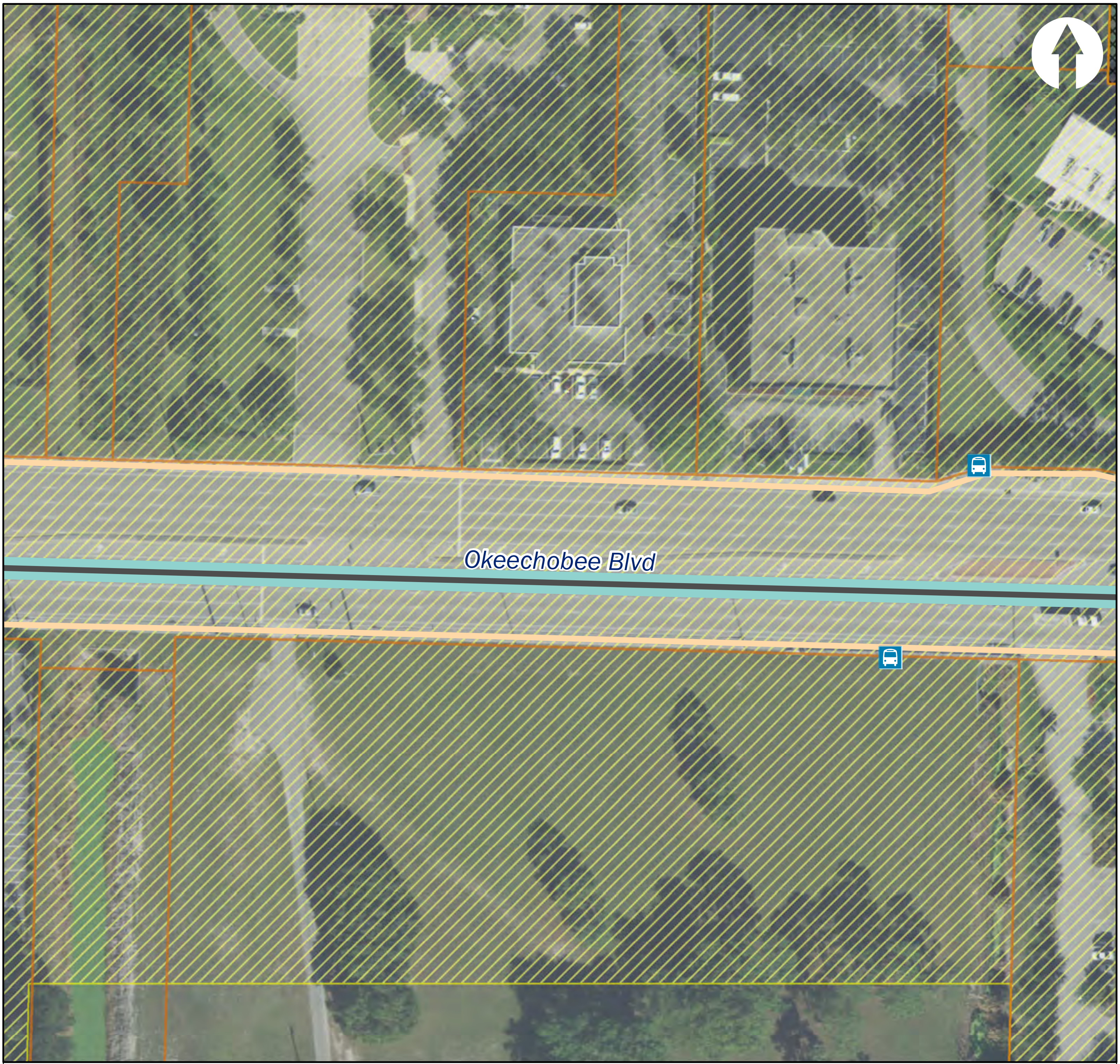

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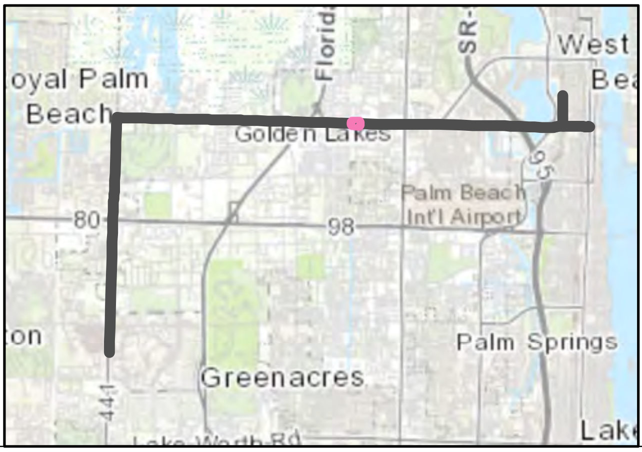

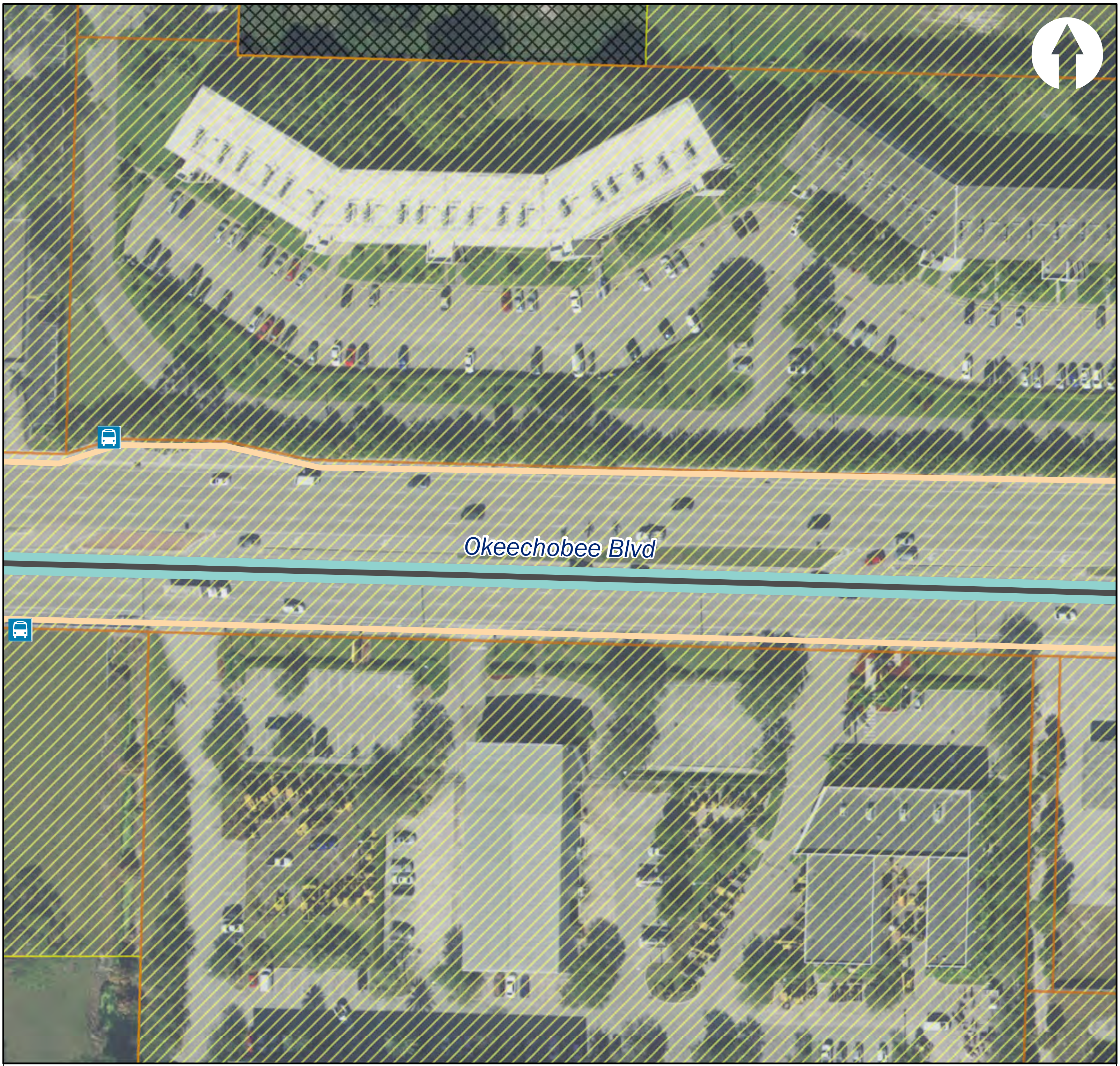

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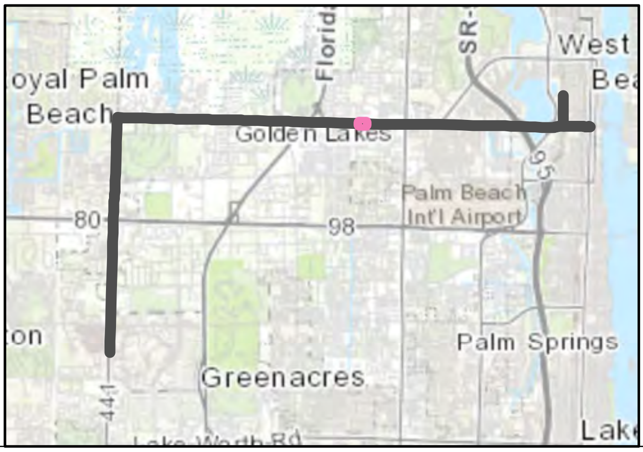

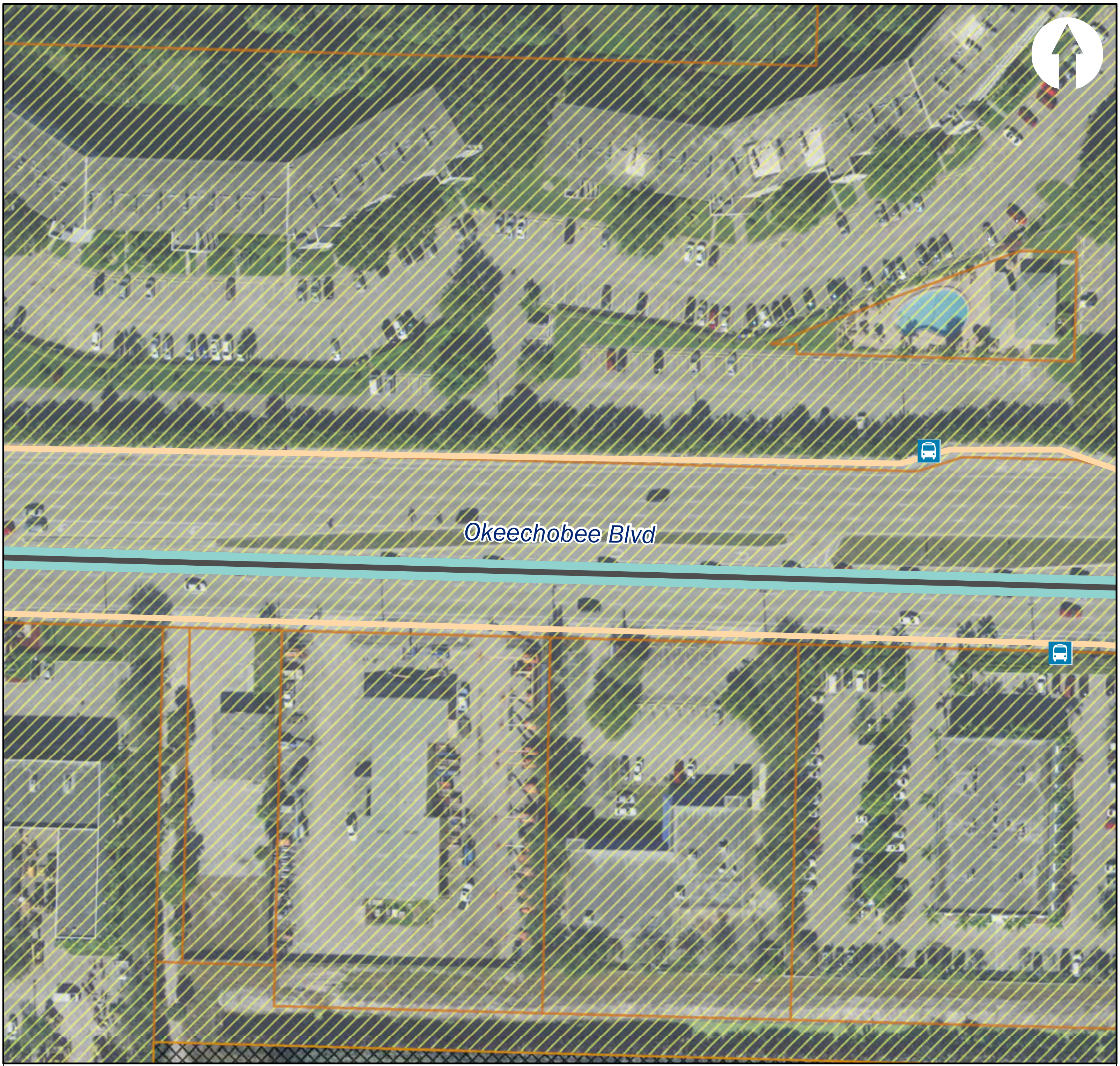

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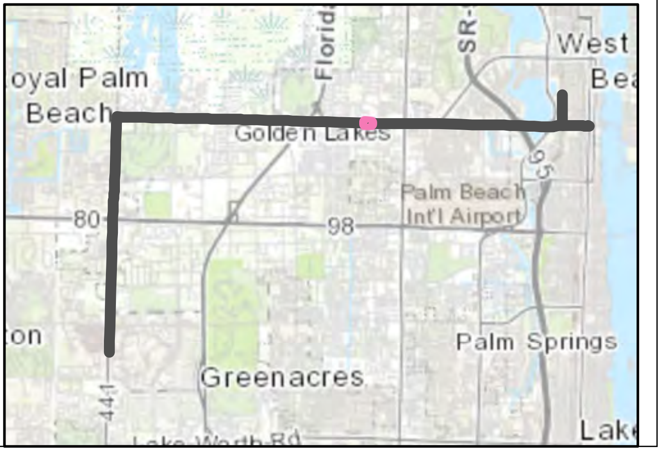

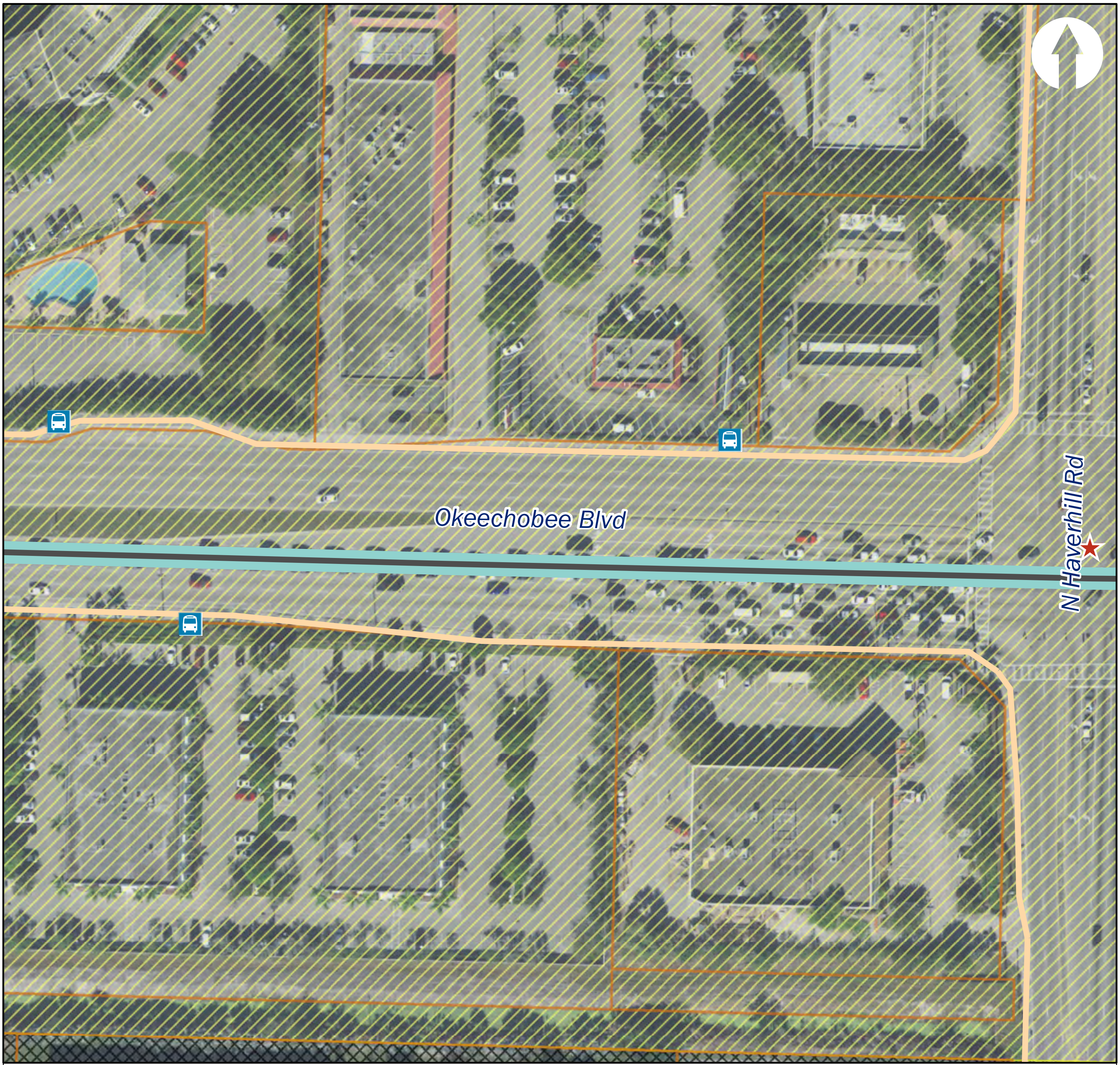

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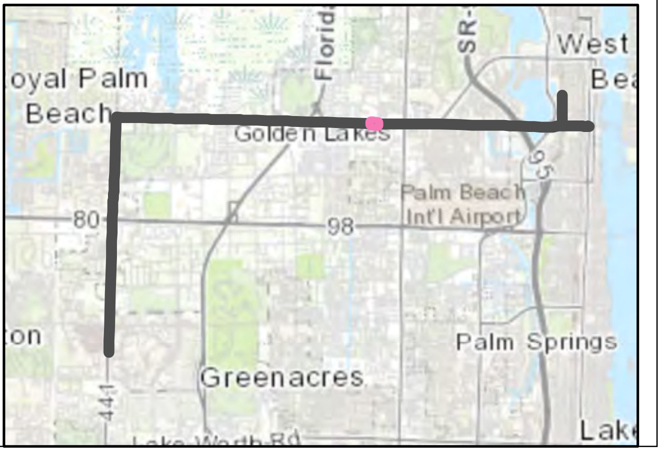

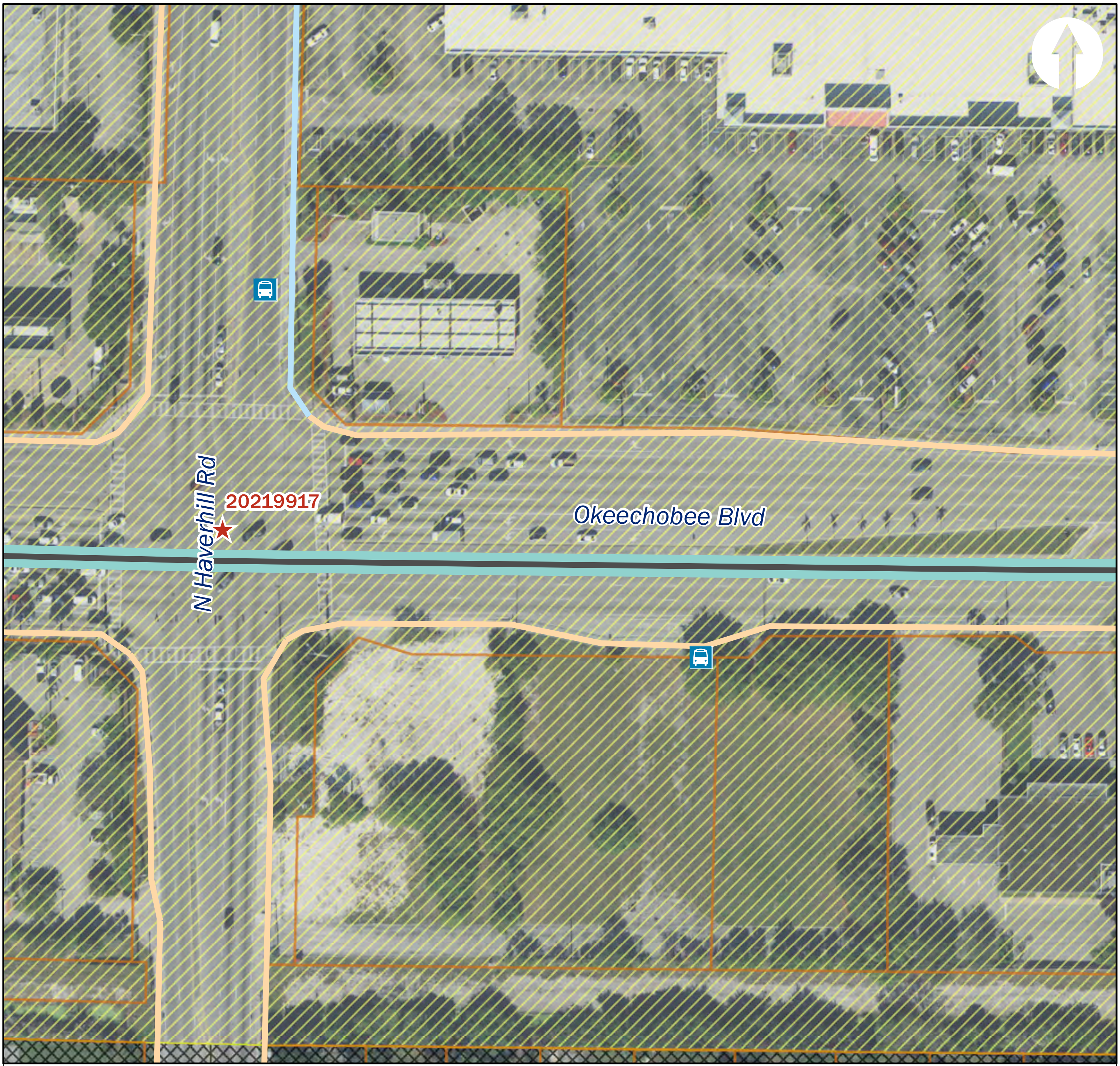

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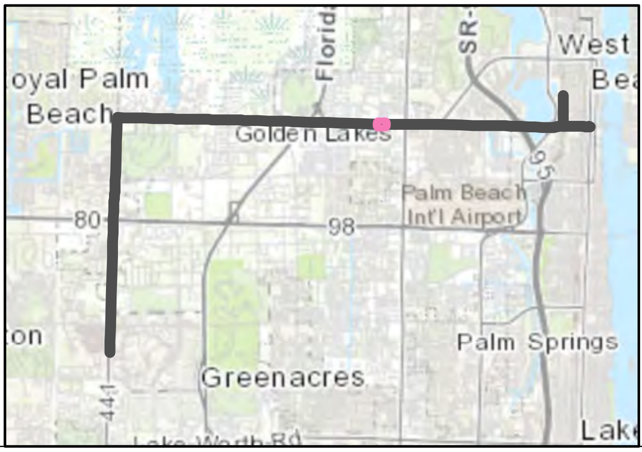

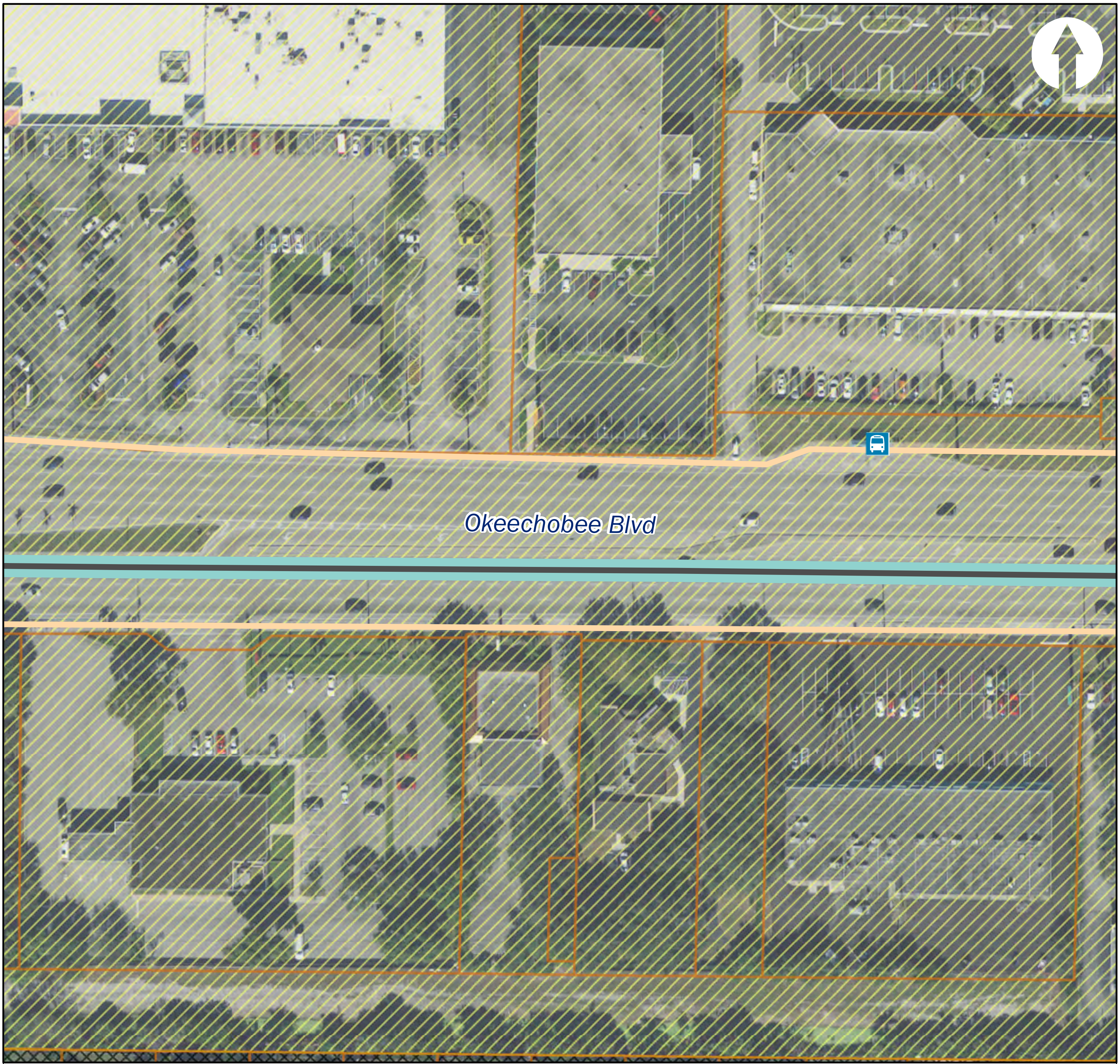

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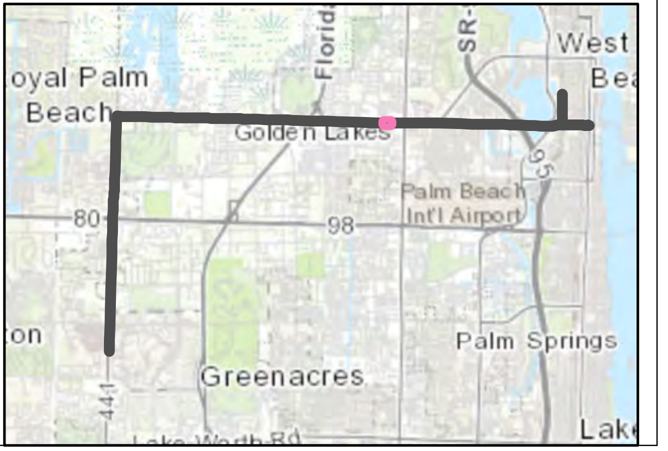

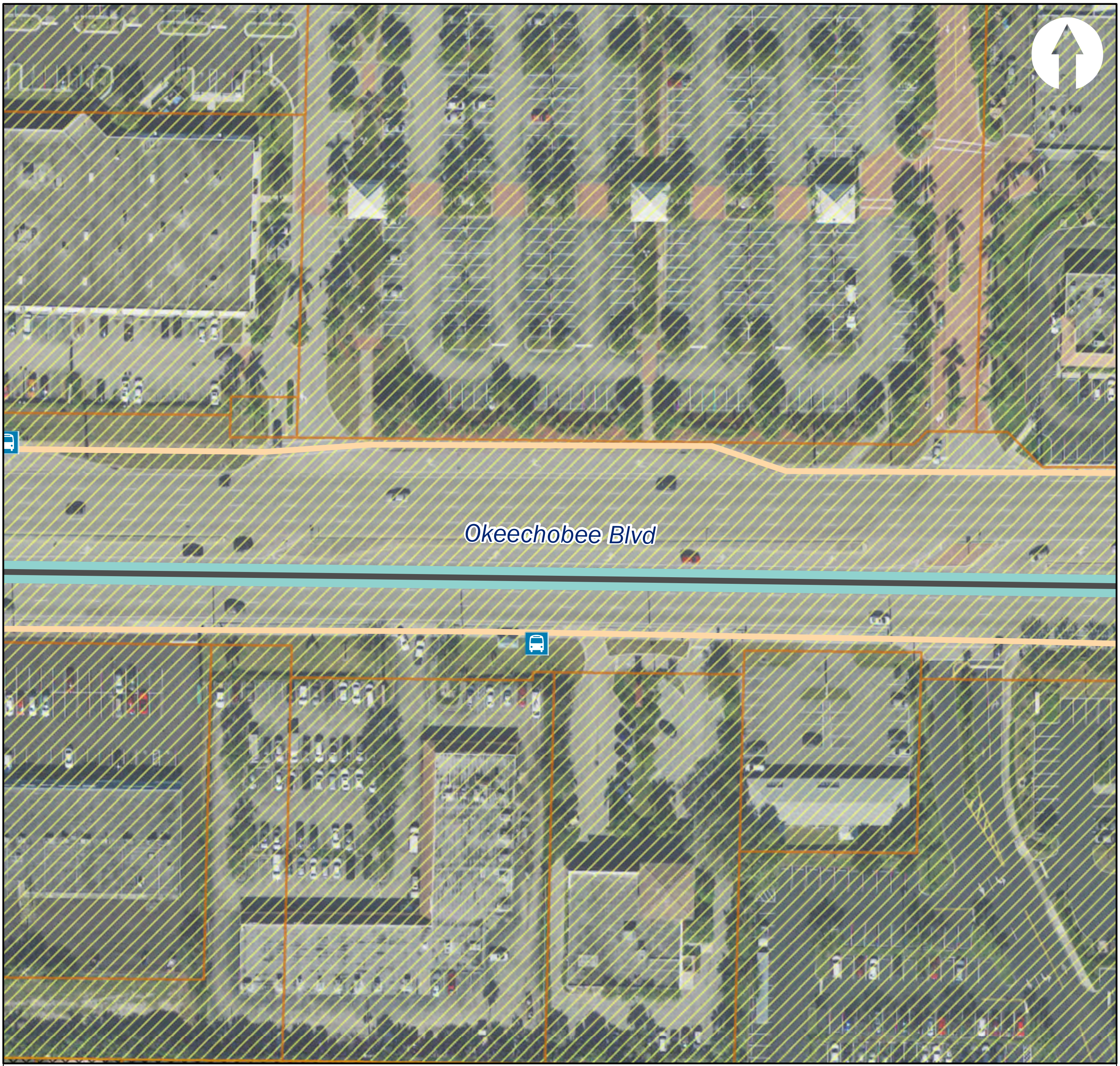

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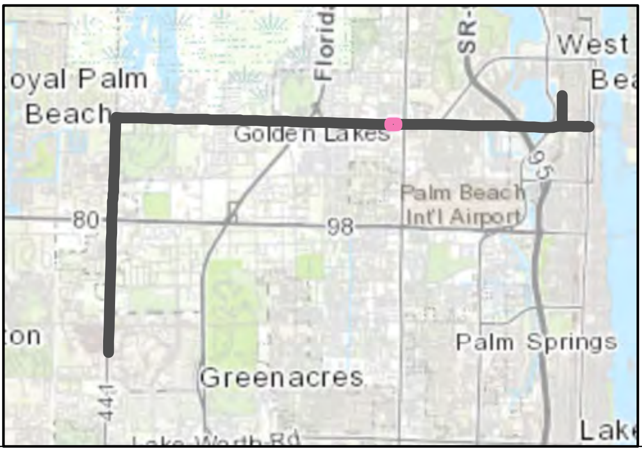

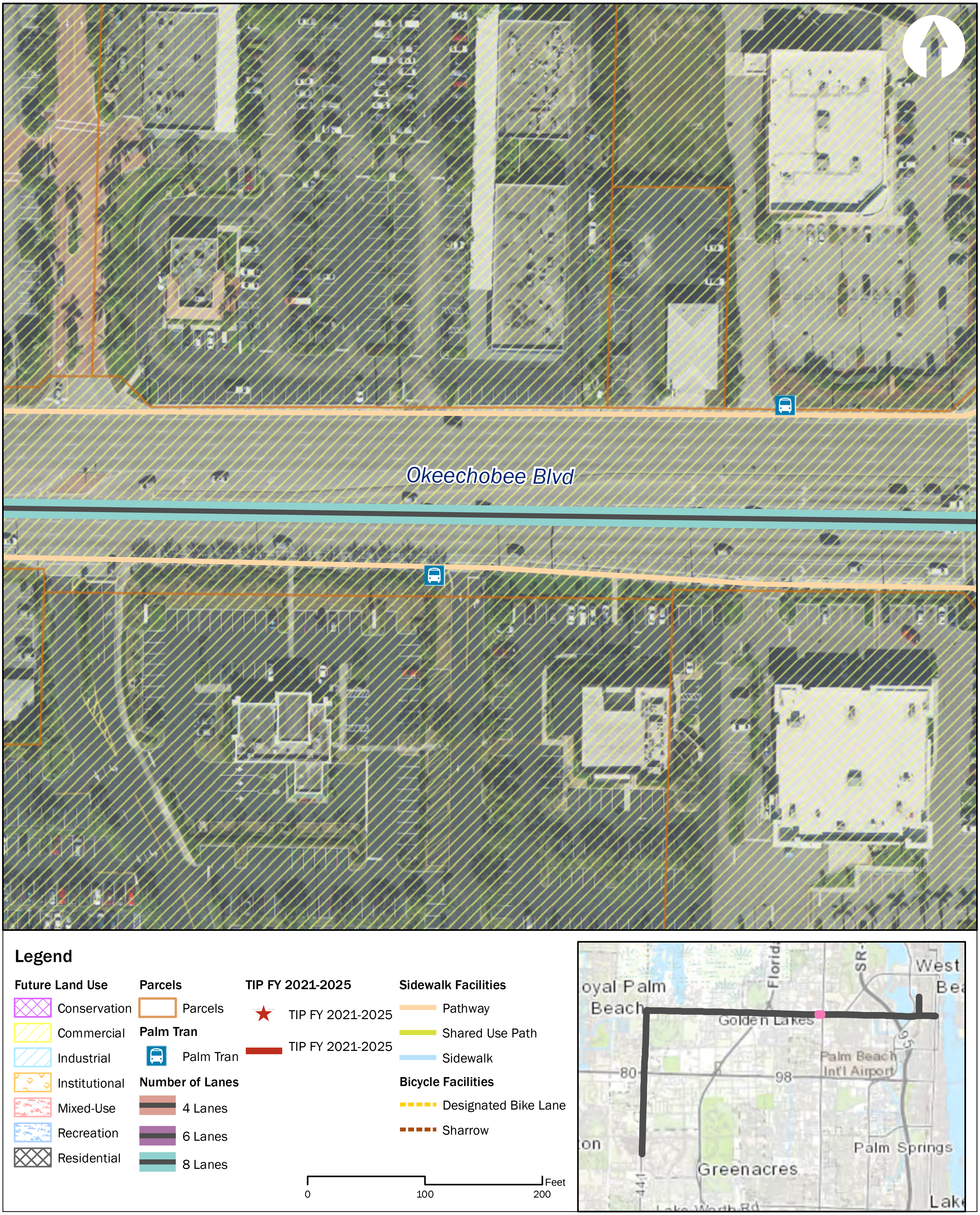
Okeechobee Blvd
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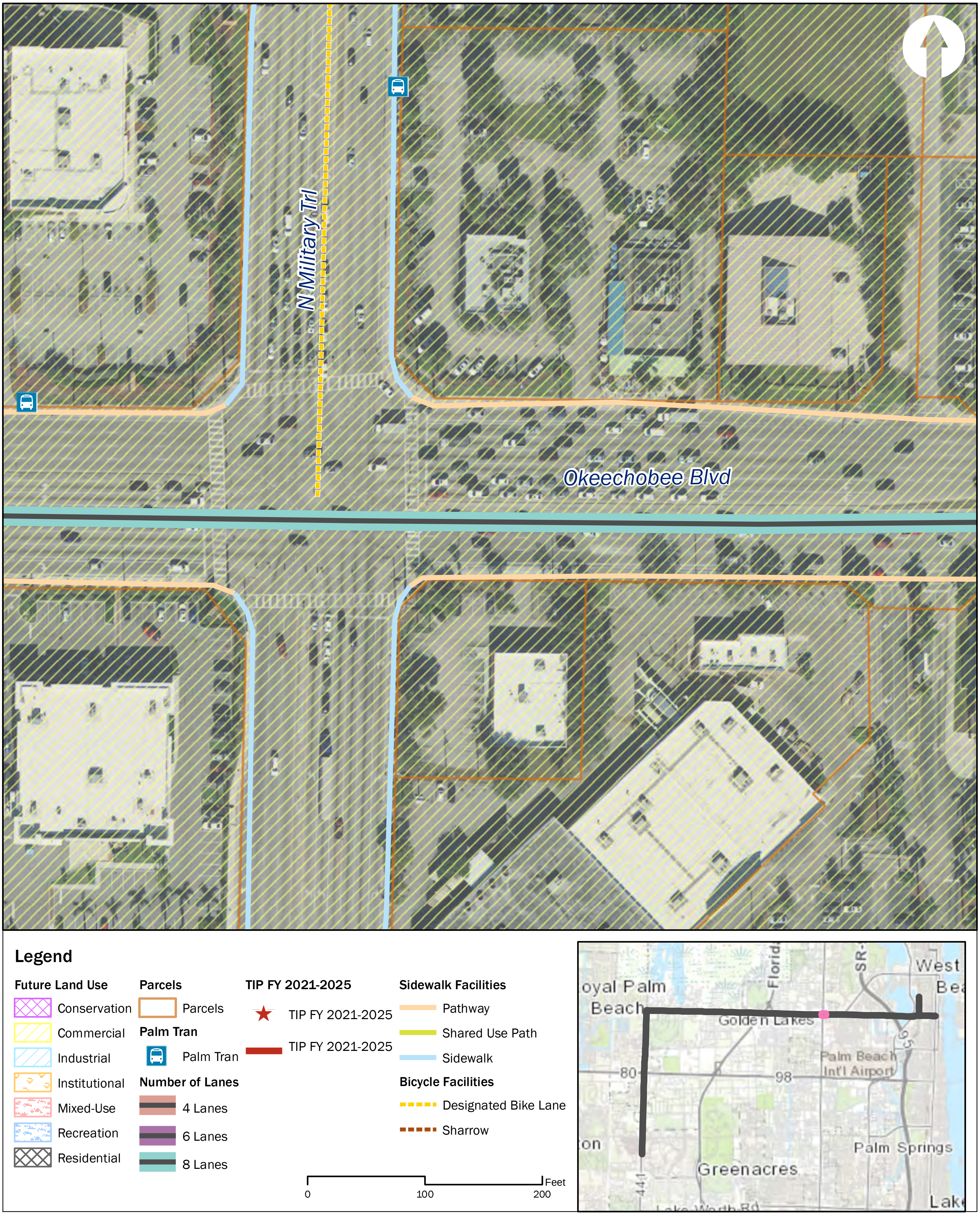
N Military Trl
Okeechobee Blvd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
Number of Lanes
4 Lanes
6 Lanes
8 Lanes
TIP FY 2021-2025
TIP FY 2021-2025
TIP FY 2021-2025
Sidewalk Facilities
Pathway
Shared Use Path
Sidewalk
Bicycle Facilities
Designated Bike Lane
Sharrow
0
100
200
Feet
Royal Palm Beach
Golden Lakes
West Palm Beach
Palm Beach Int'l Airport
Palm Springs
Greenacres
98
80
441
95
Lake Worth Rd


Okeechobee Blvd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
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Feet
Golden Lakes
Palm Beach Int'l Airport
Palm Springs
Greenacres
80
98
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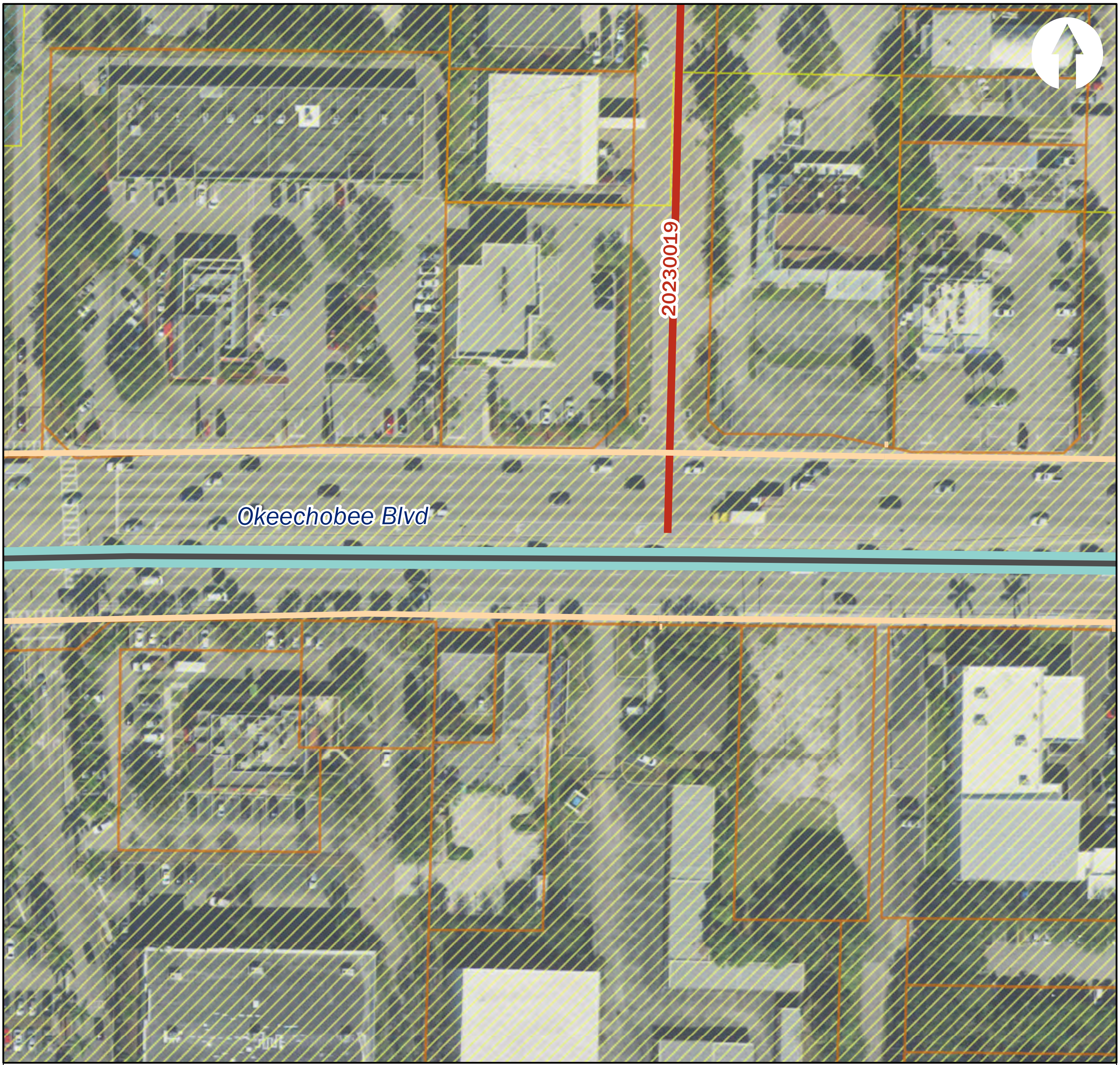
441



Legend

Future Land Use
- Conservation
- Commercial
- Industrial
- Institutional
- Mixed-Use
- Recreation
- Residential

Parcels
- Parcels

Palm Tran
- Palm Tran

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- TIP FY 2021-2025

Sidewalk Facilities
- Pathway
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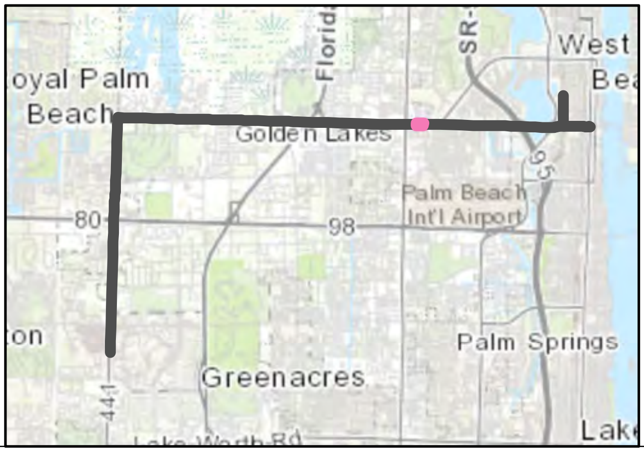
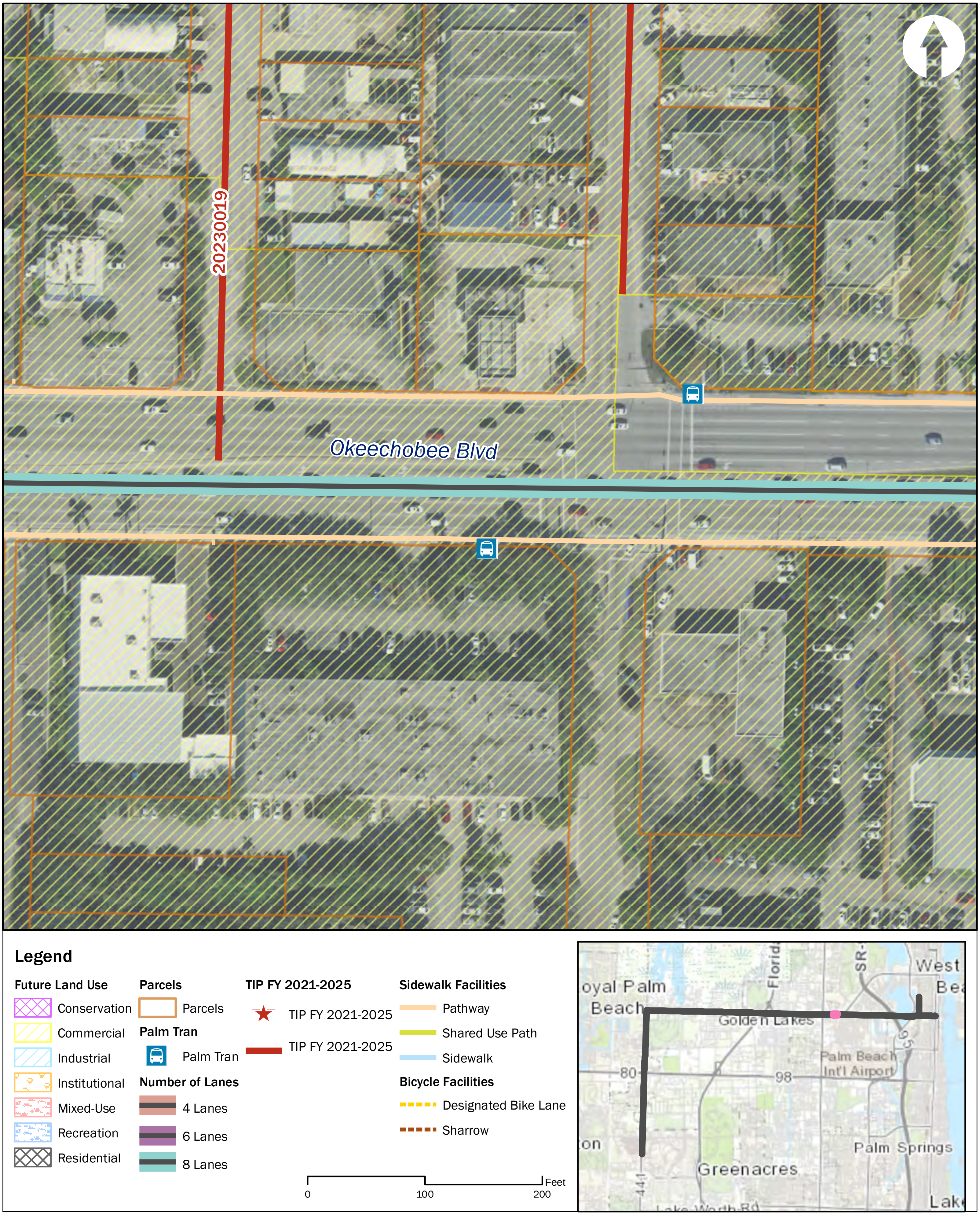
- Sidewalk

Bicycle Facilities
- Designated Bike Lane
- Sharrow

0 100 200 Feet




20230019
Okeechobee Blvd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
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Parcels
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- TIP FY 2021-2025

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- Pathway
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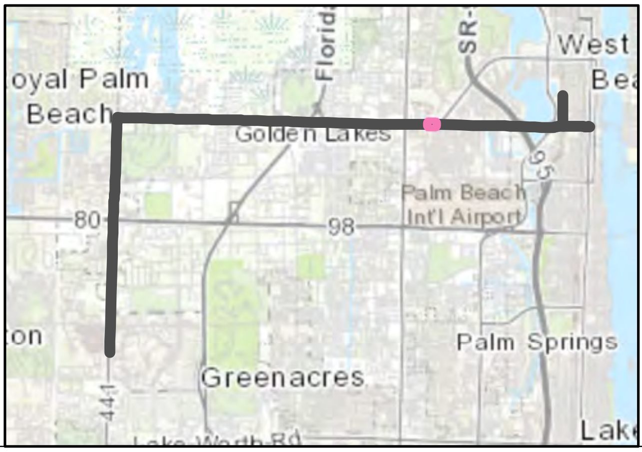
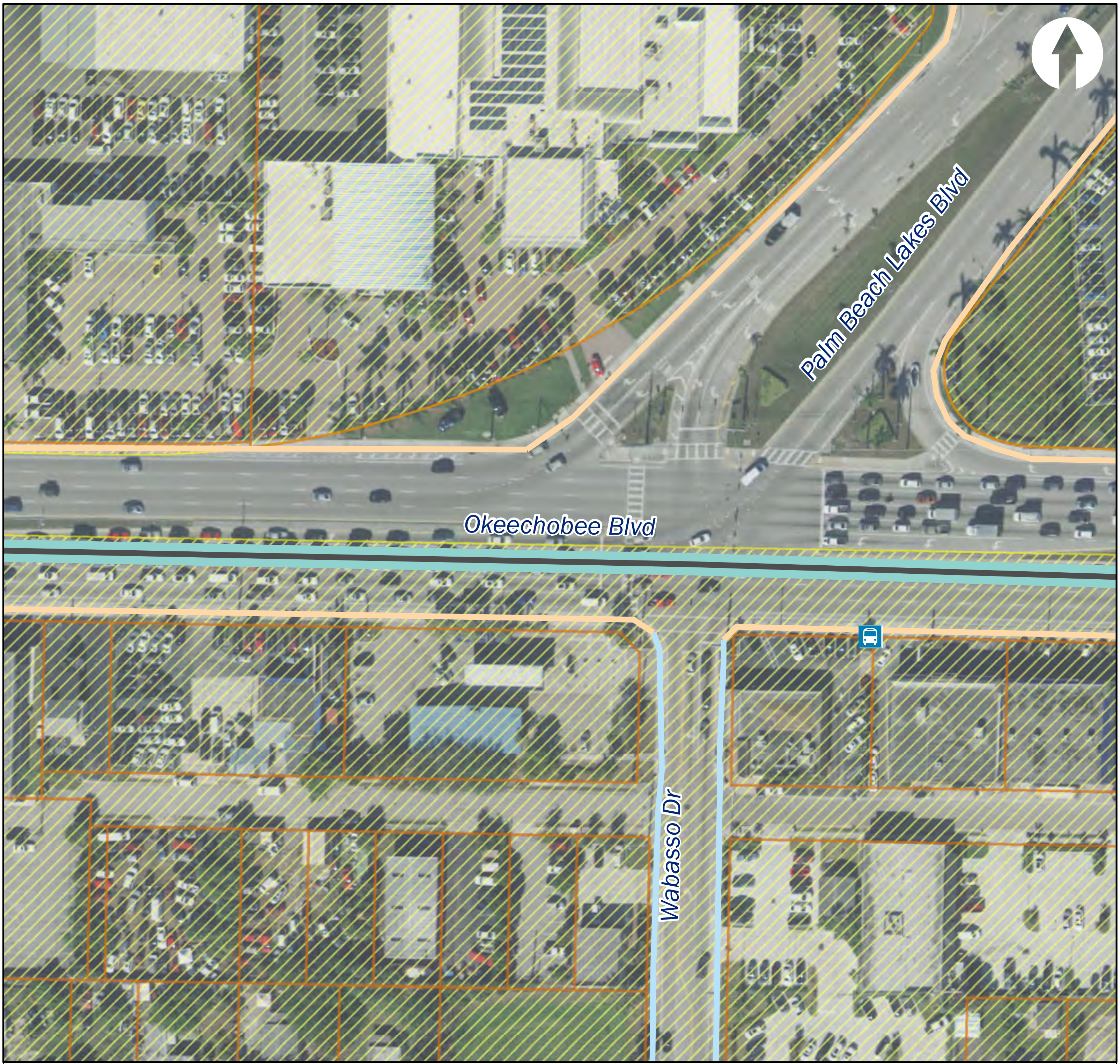
Bicycle Facilities
- Designated Bike Lane
- Sharrow

0 100 200 Feet





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- Parcels

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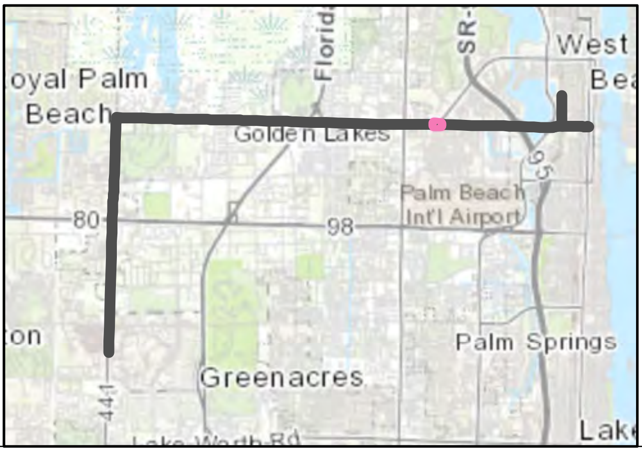
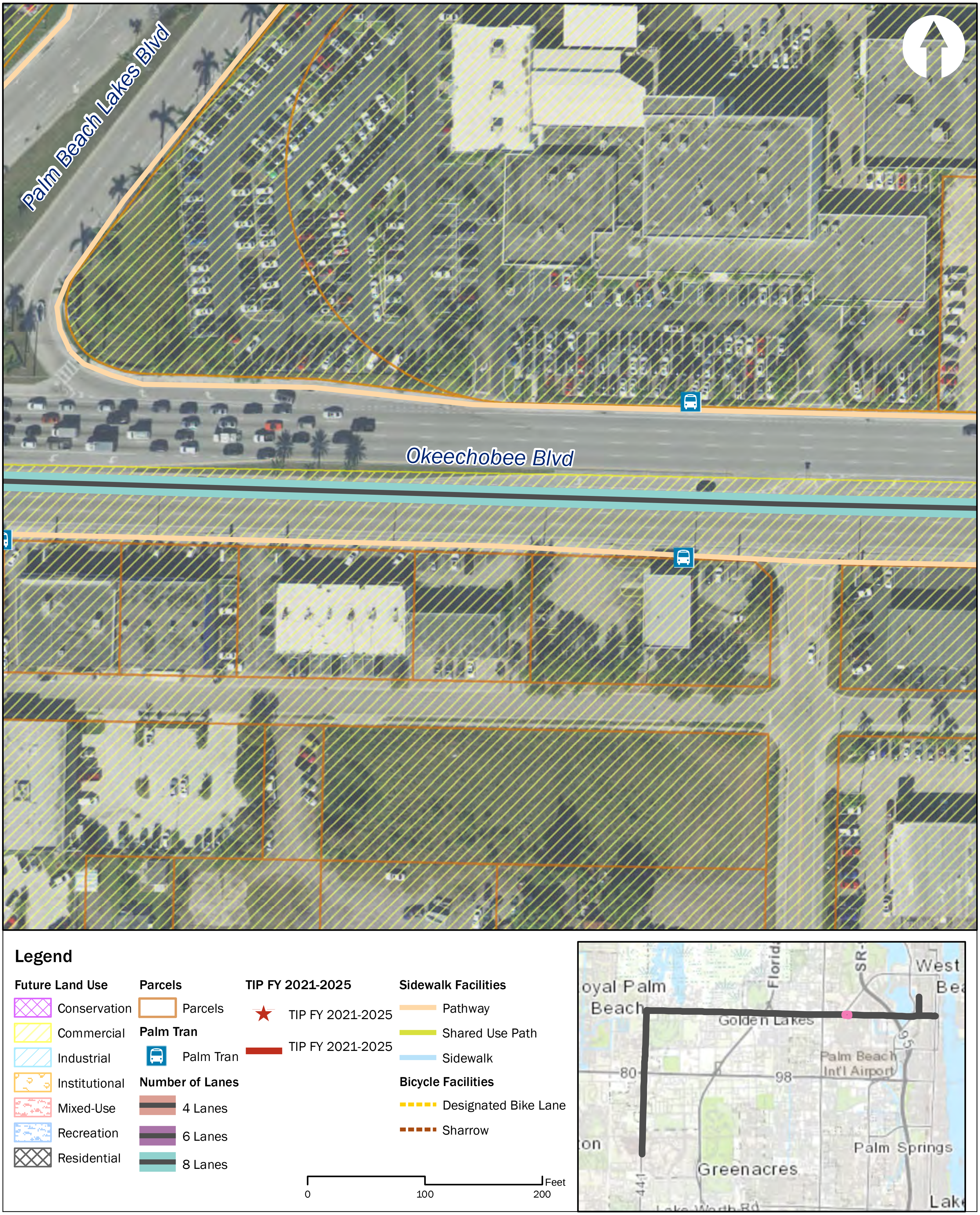
0 100 200 Feet




Palm Beach Lakes Blvd
Okeechobee Blvd
Legend
Future Land Use
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Commercial
Industrial
Institutional
Mixed-Use
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Parcels
Parcels
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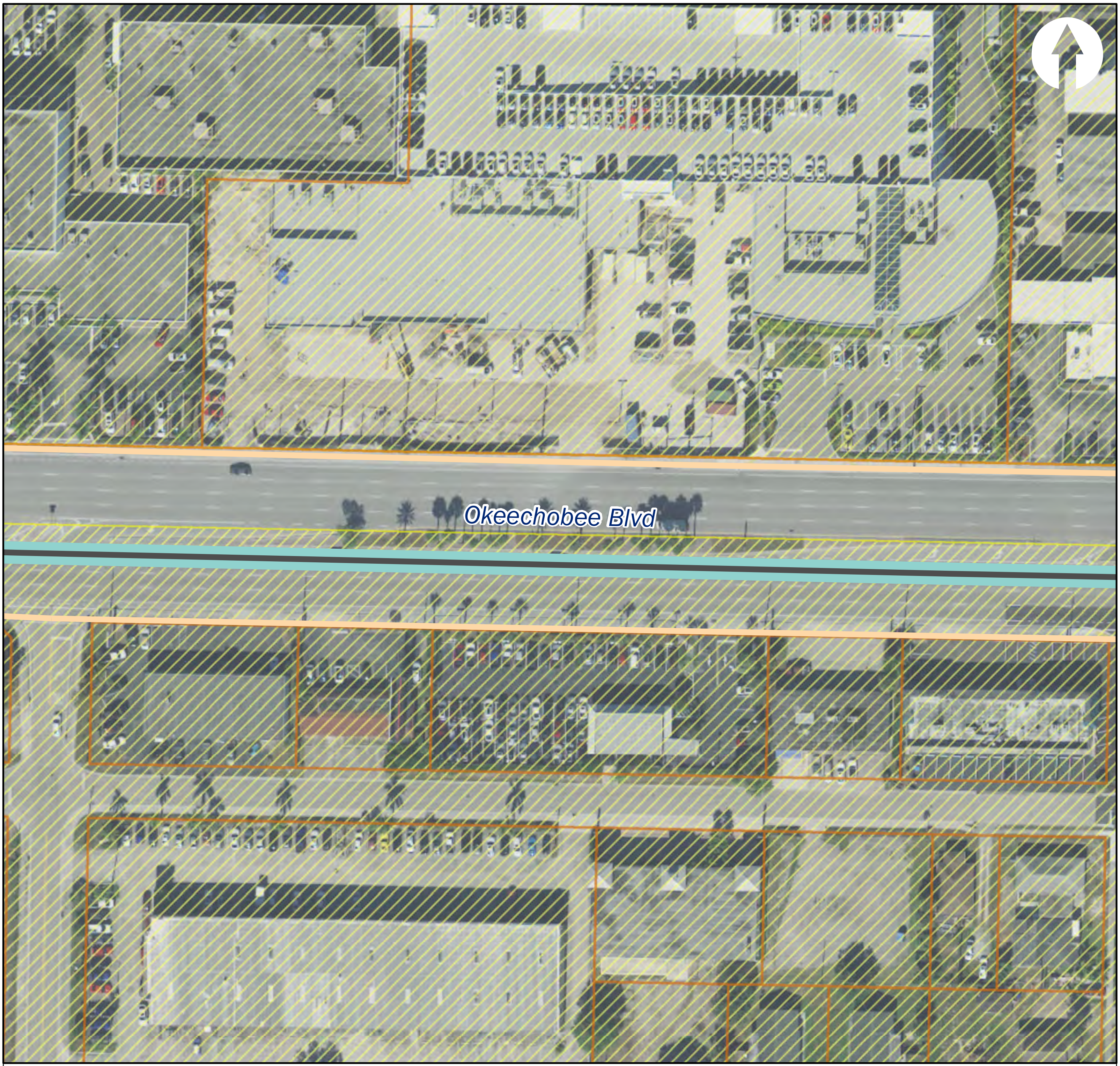
Golden Lakes
Palm Beach Int'l Airport
West Palm Beach
Greenacres
Palm Springs
80
98
95
441
Lake Worth Rd



Legend

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- Recreation
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Parcels
- Parcels

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- TIP FY 2021-2025

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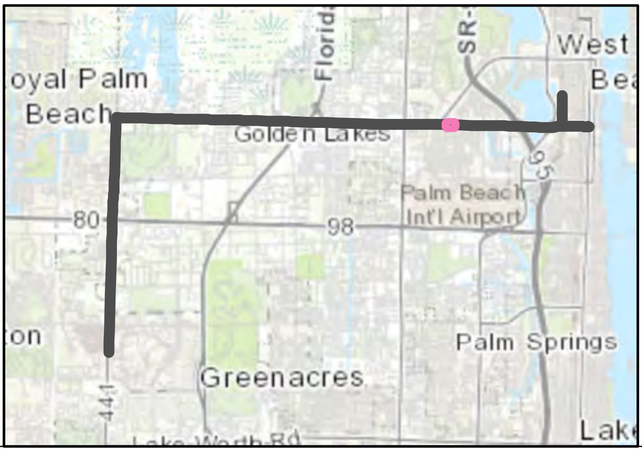
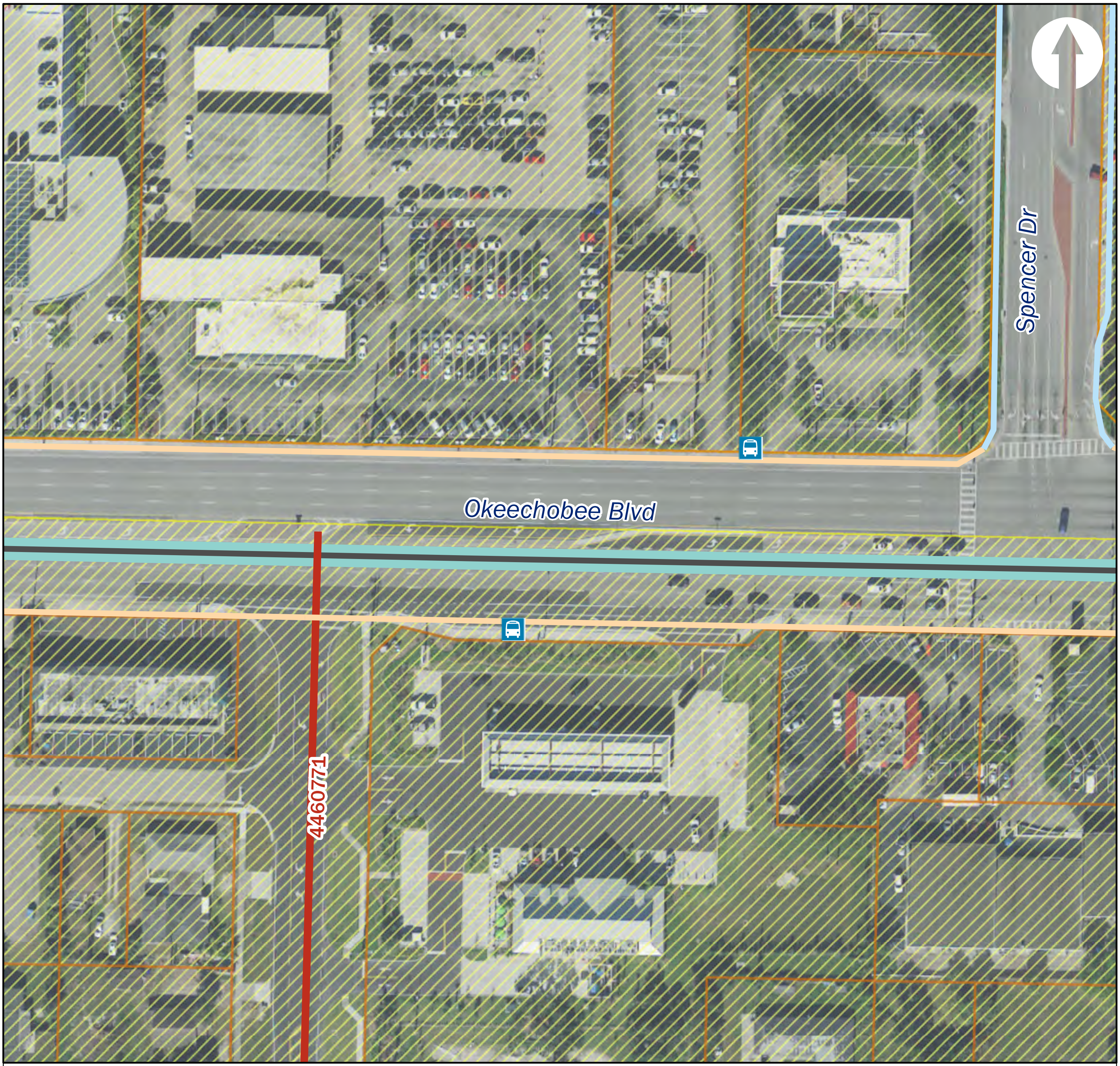
Bicycle Facilities
- Designated Bike Lane
- Sharrow

0 100 200 Feet





Legend

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- Recreation
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Parcels
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- TIP FY 2021-2025

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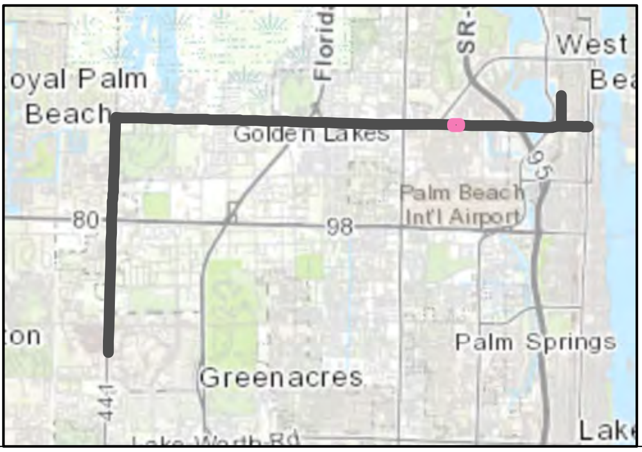
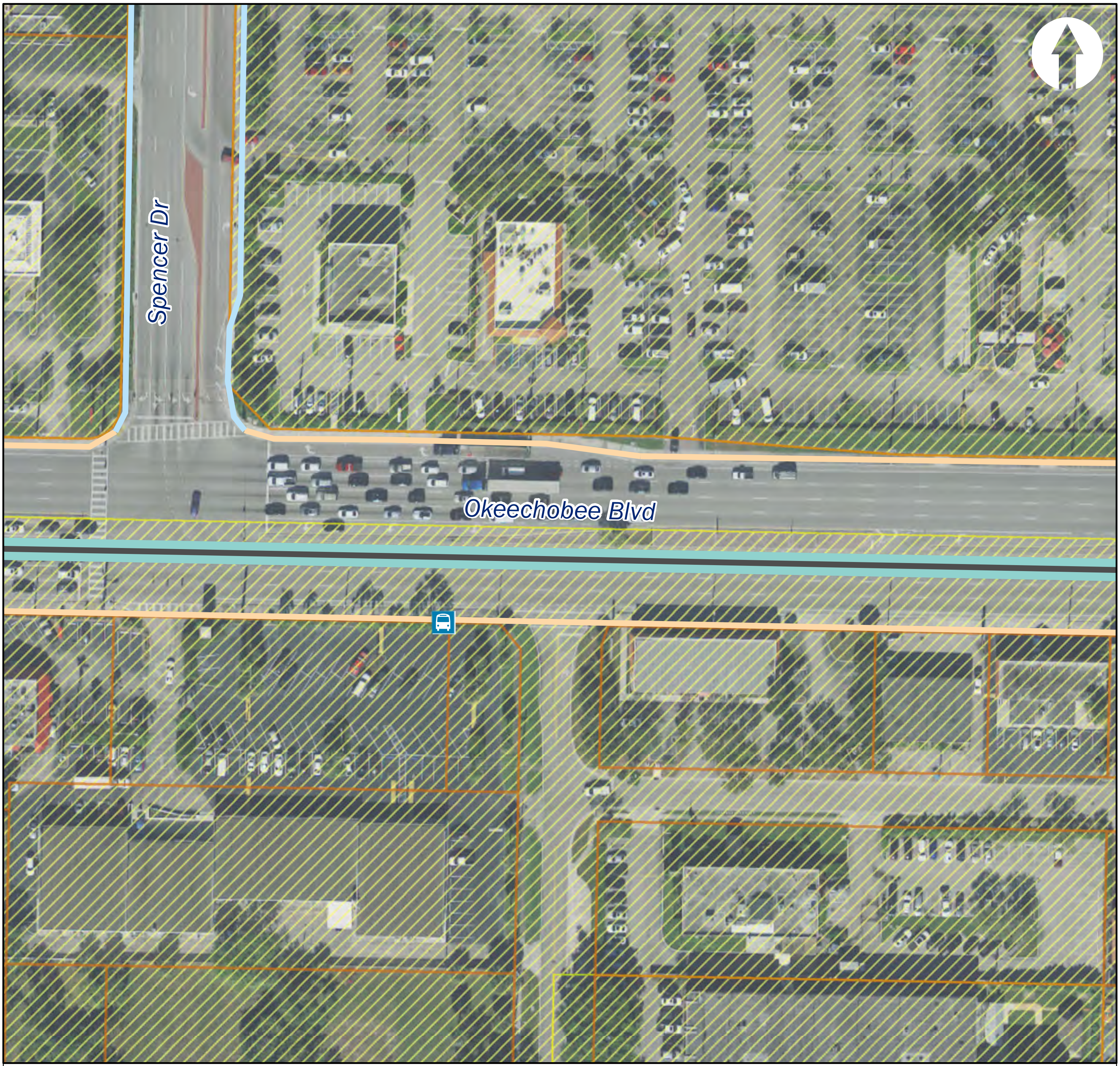
- Sharrow

0 100 200 Feet




Spencer Dr
Okeechobee Blvd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
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TIP FY 2021-2025
TIP FY 2021-2025
TIP FY 2021-2025
Sidewalk Facilities
Pathway
Shared Use Path
Sidewalk
Bicycle Facilities
Designated Bike Lane
Sharrow
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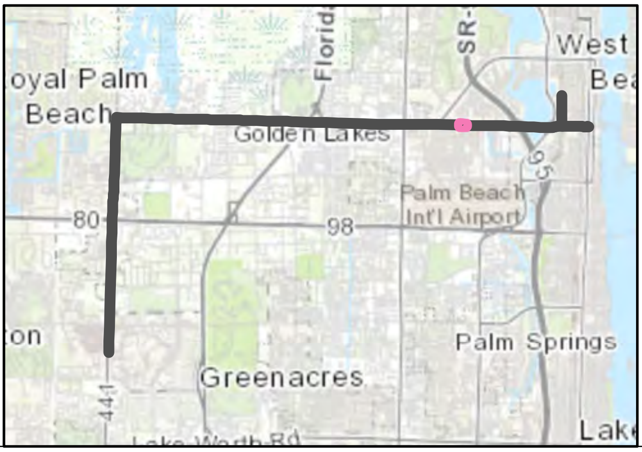
oyal Palm
Beach
Golden Lakes
West
Palm Beach
Int'l Airport
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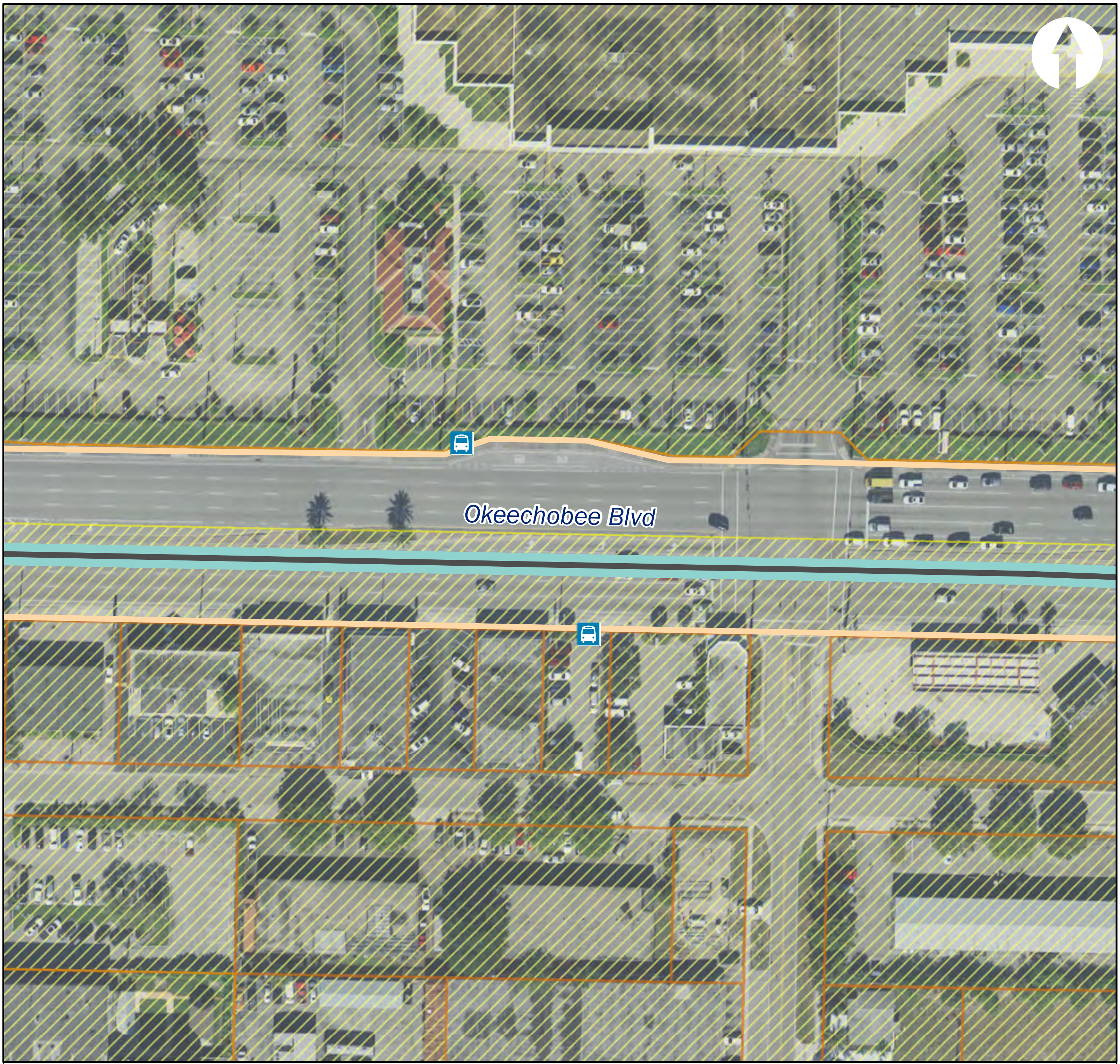
95
Greenacres
Palm Springs
441



Legend

Future Land Use
- Conservation
- Commercial
- Industrial
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- Recreation
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Parcels
- Parcels

Palm Tran
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TIP FY 2021-2025
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- TIP FY 2021-2025

Sidewalk Facilities
- Pathway
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- Sidewalk

Bicycle Facilities
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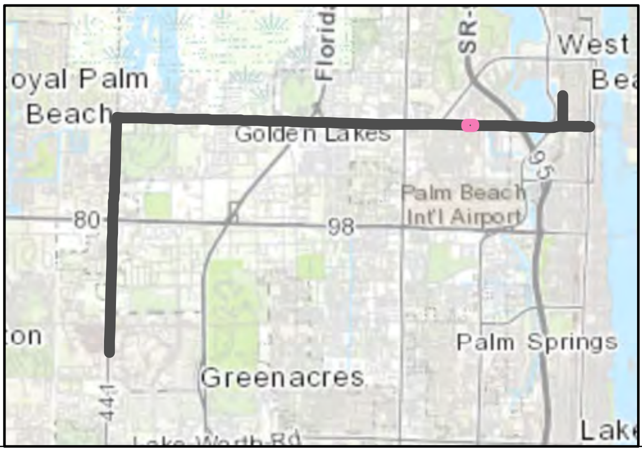
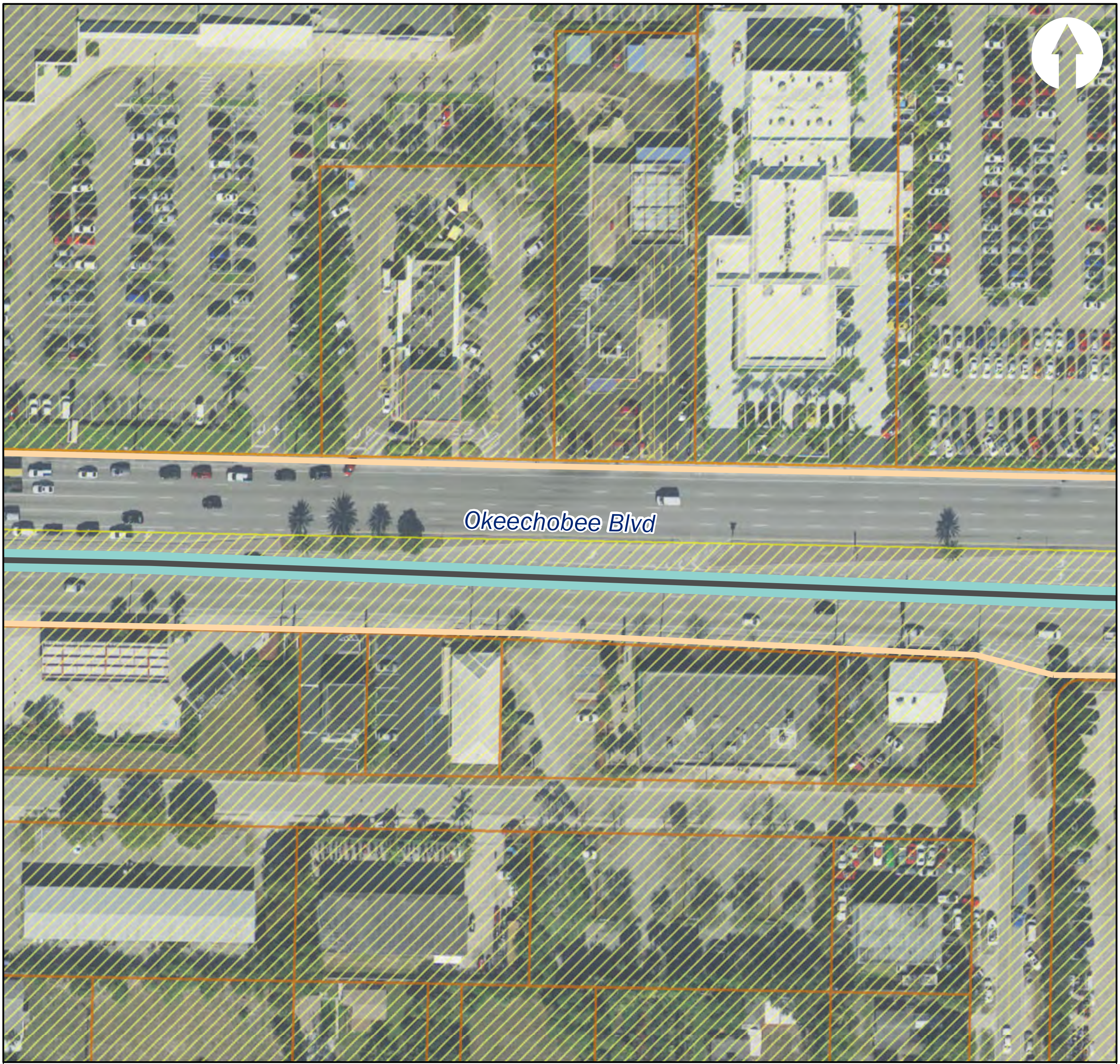
0 100 200 Feet





Legend

Future Land Use
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- Recreation
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Parcels
- Parcels

Palm Tran
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TIP FY 2021-2025
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Sidewalk Facilities
- Pathway
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Bicycle Facilities
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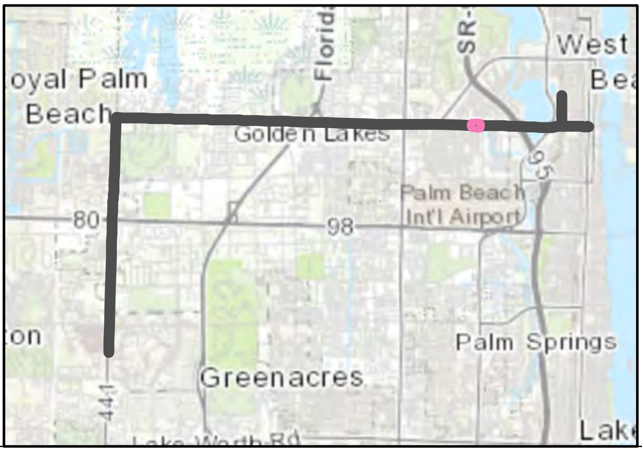
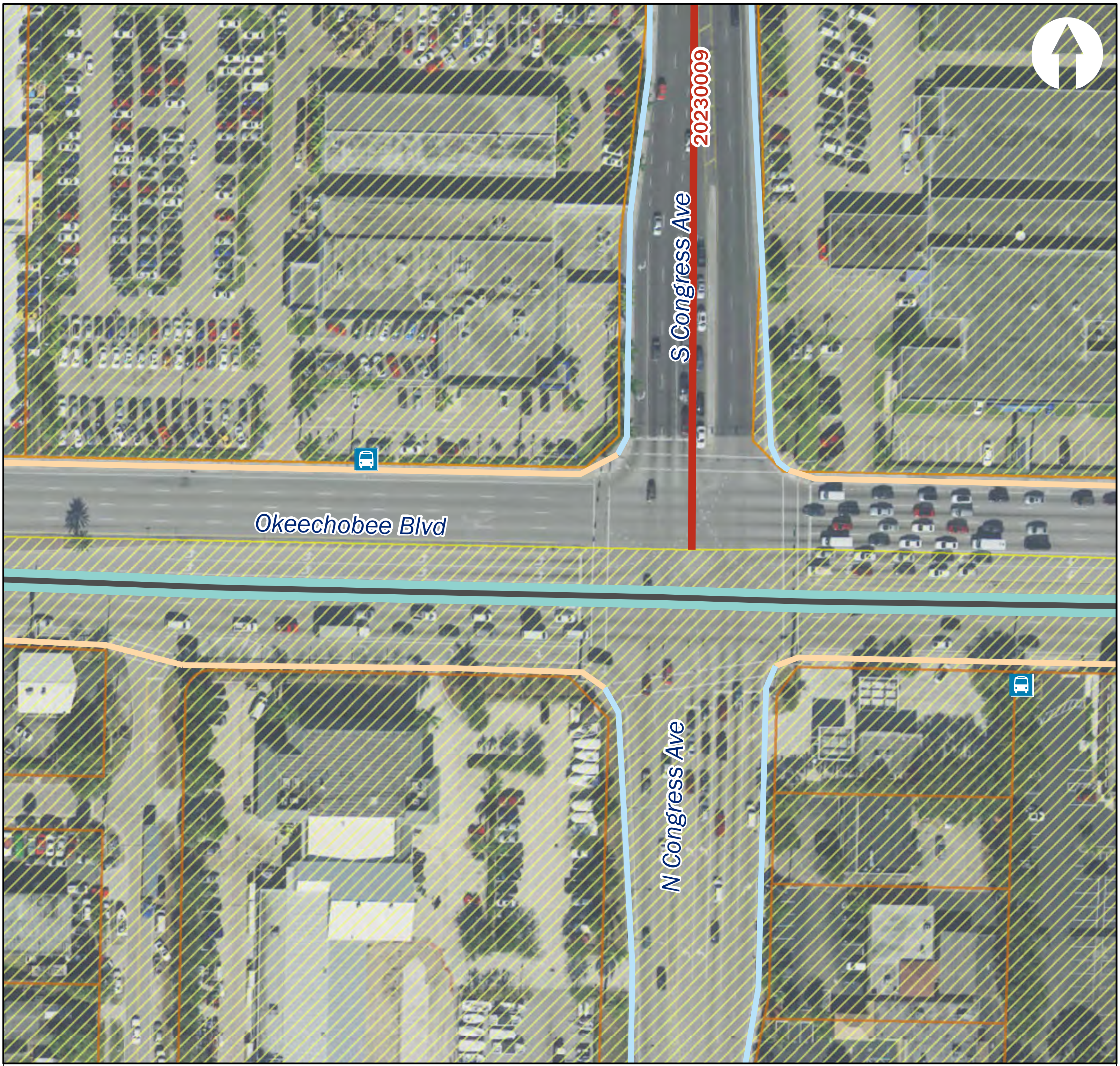
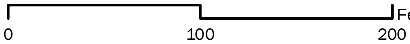
0 100 200 Feet

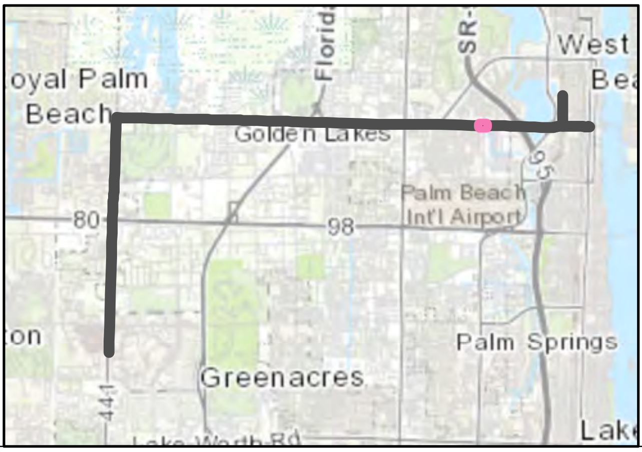


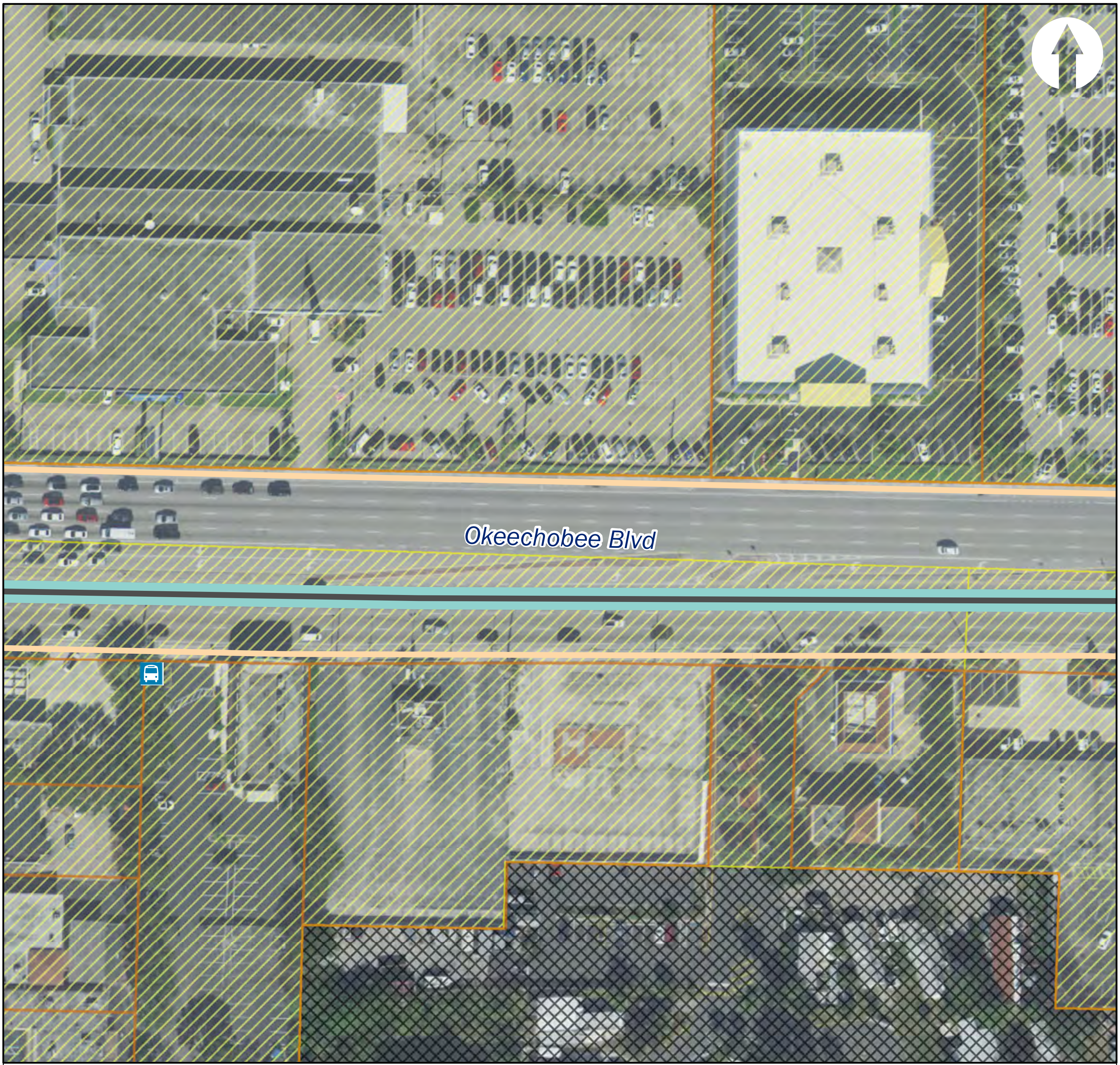


Legend

Future Land Use	Parcels	TIP FY 2021-2025	Sidewalk Facilities
Conservation	Parcels	TIP FY 2021-2025	Pathway
Commercial	**Palm Tran**	TIP FY 2021-2025	Shared Use Path
Industrial	Palm Tran		Sidewalk
Institutional	**Number of Lanes**		**Bicycle Facilities**
Mixed-Use	4 Lanes		Designated Bike Lane
Recreation	6 Lanes		Sharrow
Residential	8 Lanes		







Legend

Future Land Use
- Conservation
- Commercial
- Industrial
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- Mixed-Use
- Recreation
- Residential

Parcels
- Parcels

Palm Tran
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TIP FY 2021-2025
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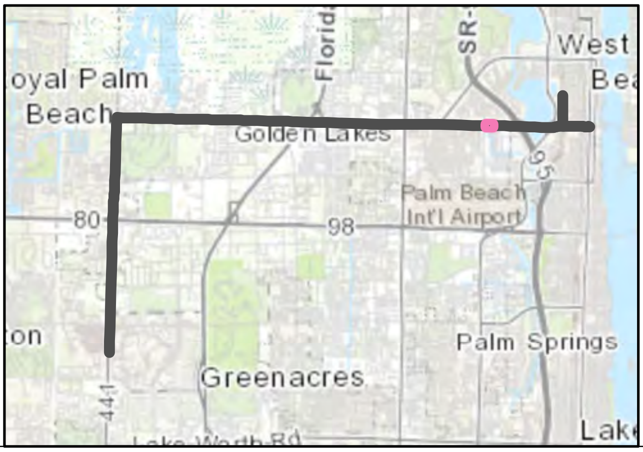
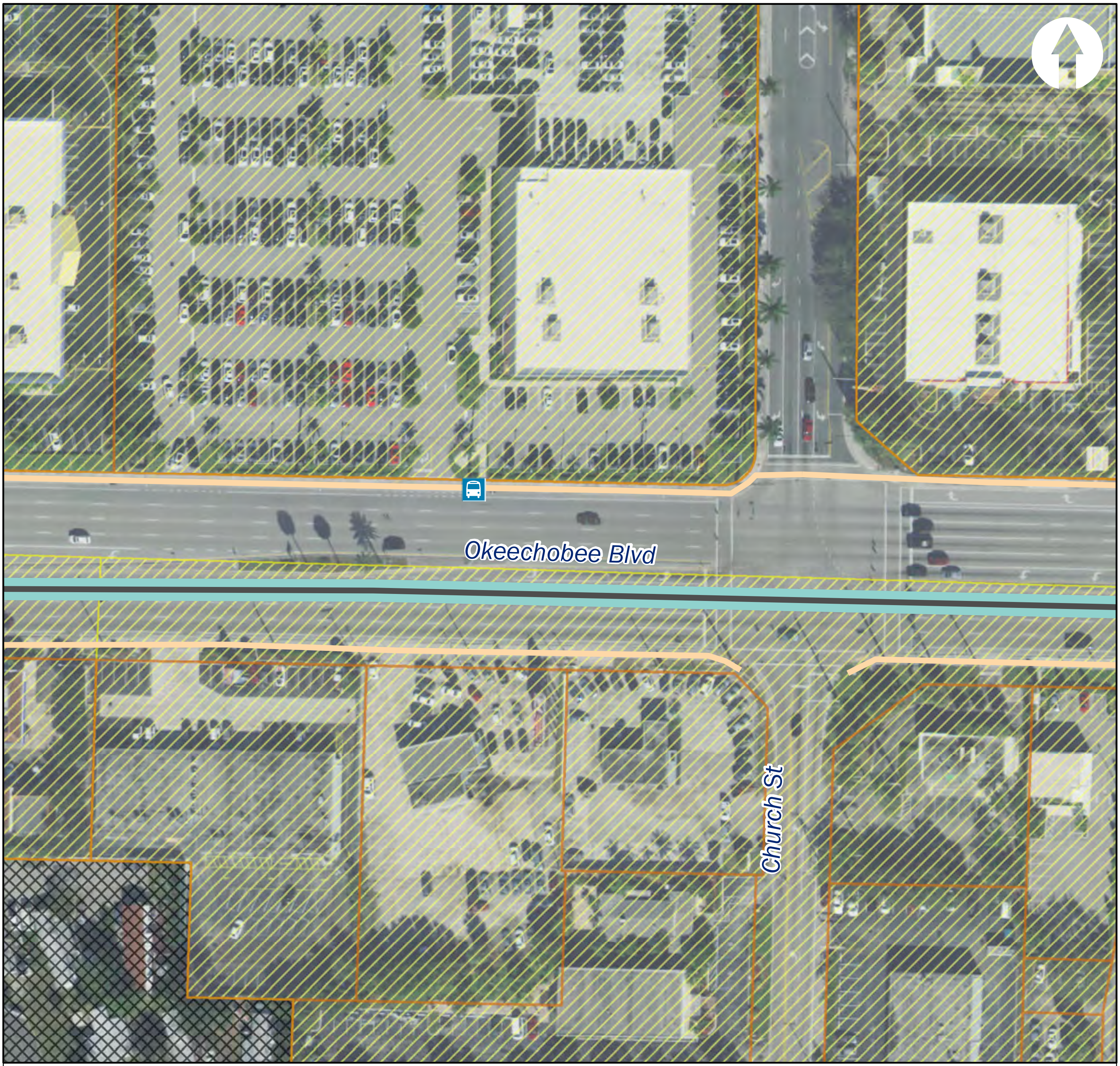
- TIP FY 2021-2025

Sidewalk Facilities
- Pathway
- Shared Use Path
- Sidewalk

Bicycle Facilities
- Designated Bike Lane
- Sharrow

0 100 200 Feet





Legend

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- Recreation
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Parcels
- Parcels

Palm Tran
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TIP FY 2021-2025
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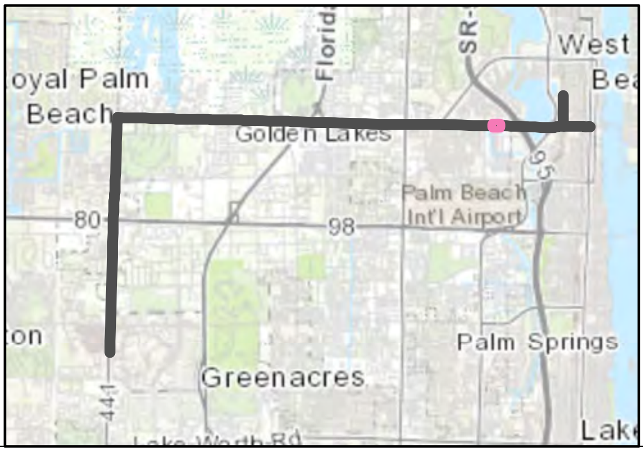
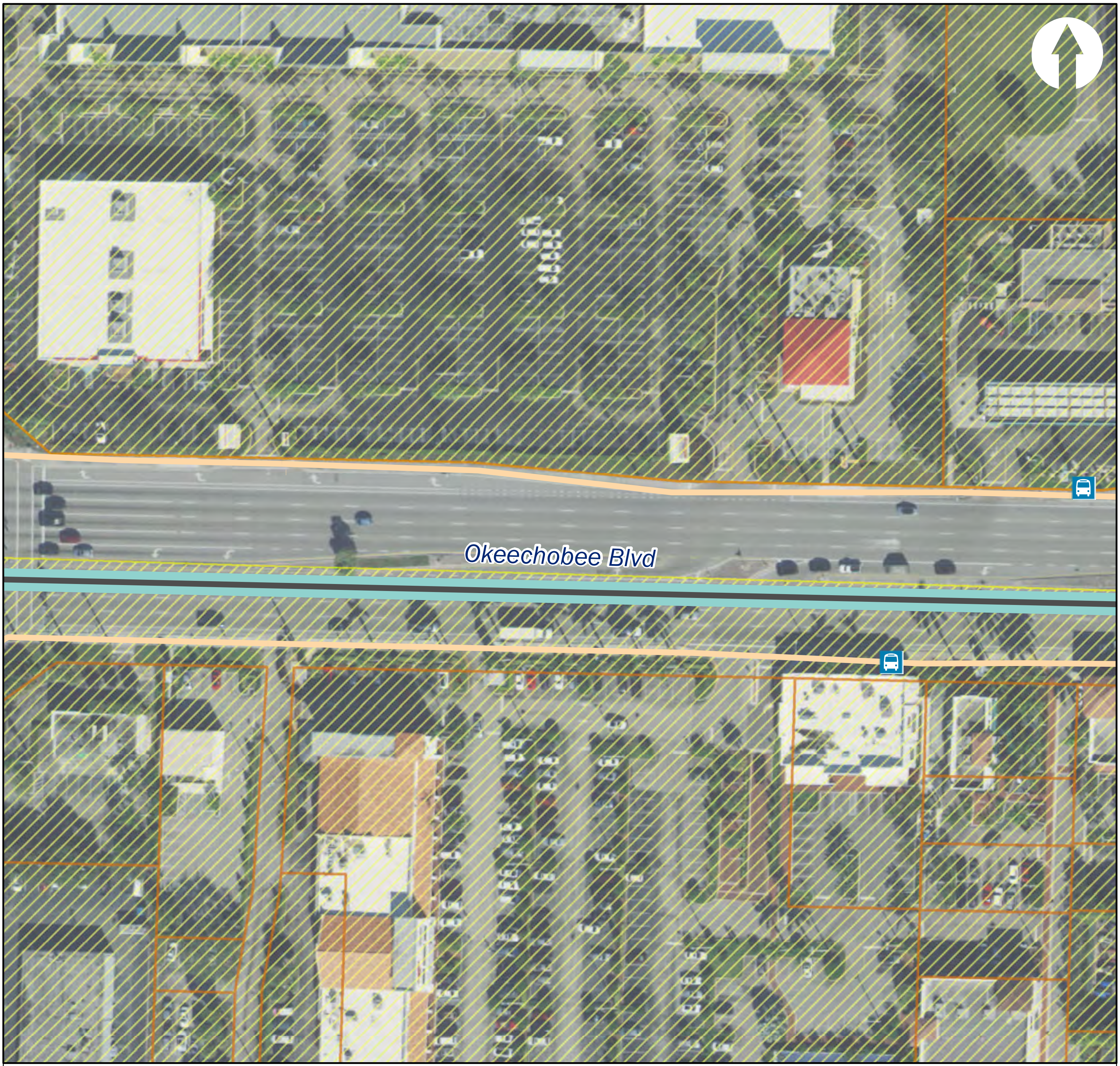
0 100 200 Feet





Legend

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Palm Tran
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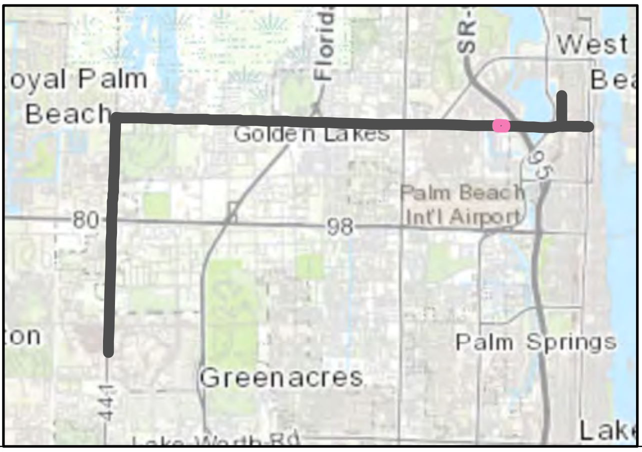
0 100 200 Feet




Okeechobee Blvd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
Number of Lanes
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TIP FY 2021-2025
TIP FY 2021-2025
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Feet
oyal Palm
Beach
Golden Lakes
Palm Beach
Int'l Airport
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441
Greenacres
Palm Springs
Lak

Legend

Future Land Use
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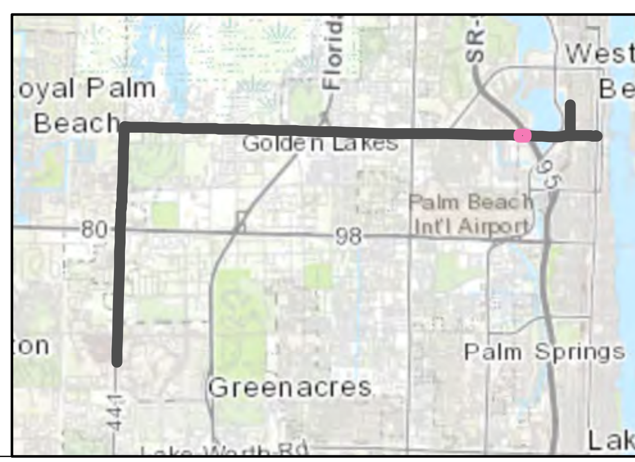
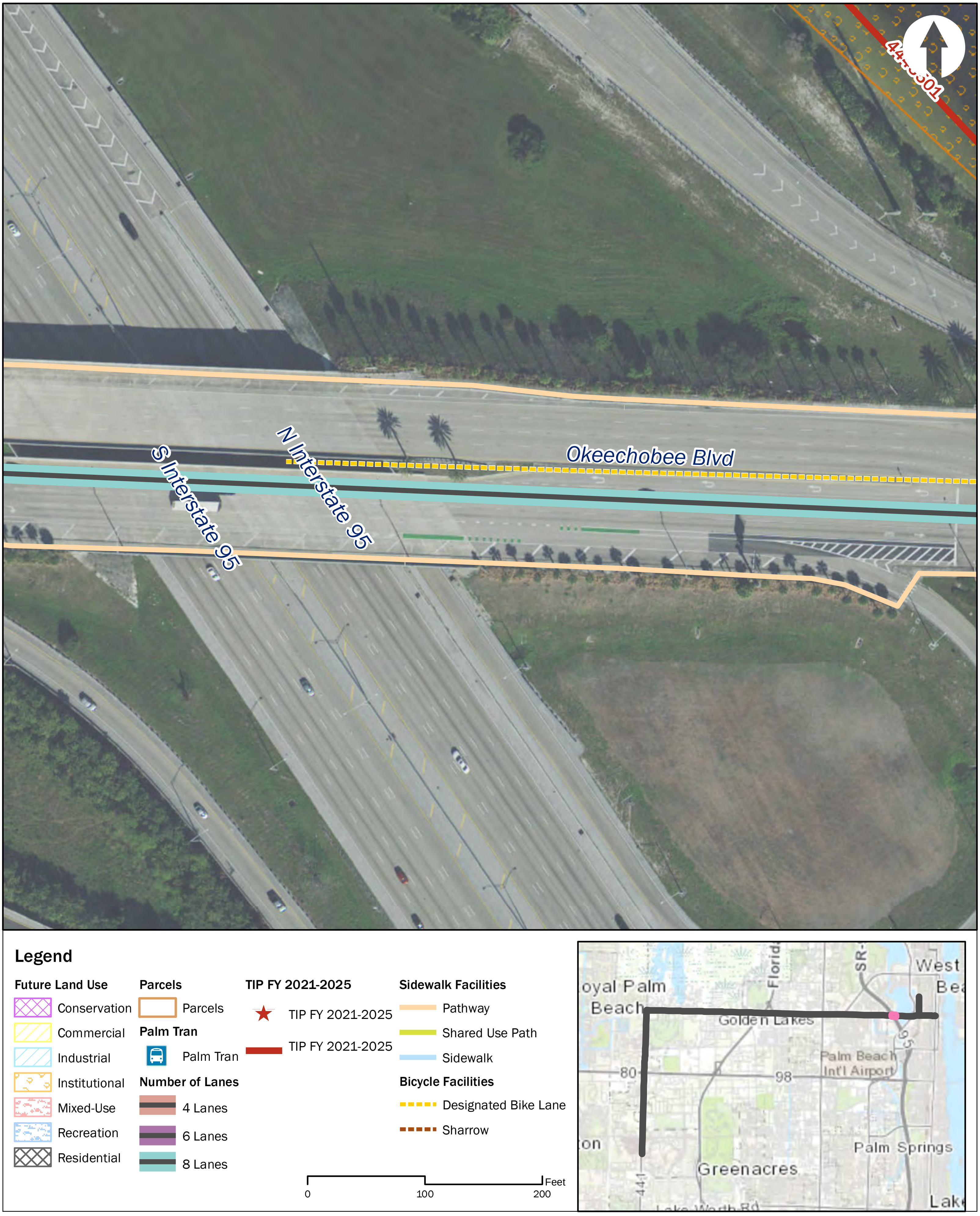
0 100 200 Feet




Okeechobee Blvd
N Interstate 95
S Interstate 95
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
Palm Tran
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TIP FY 2021-2025
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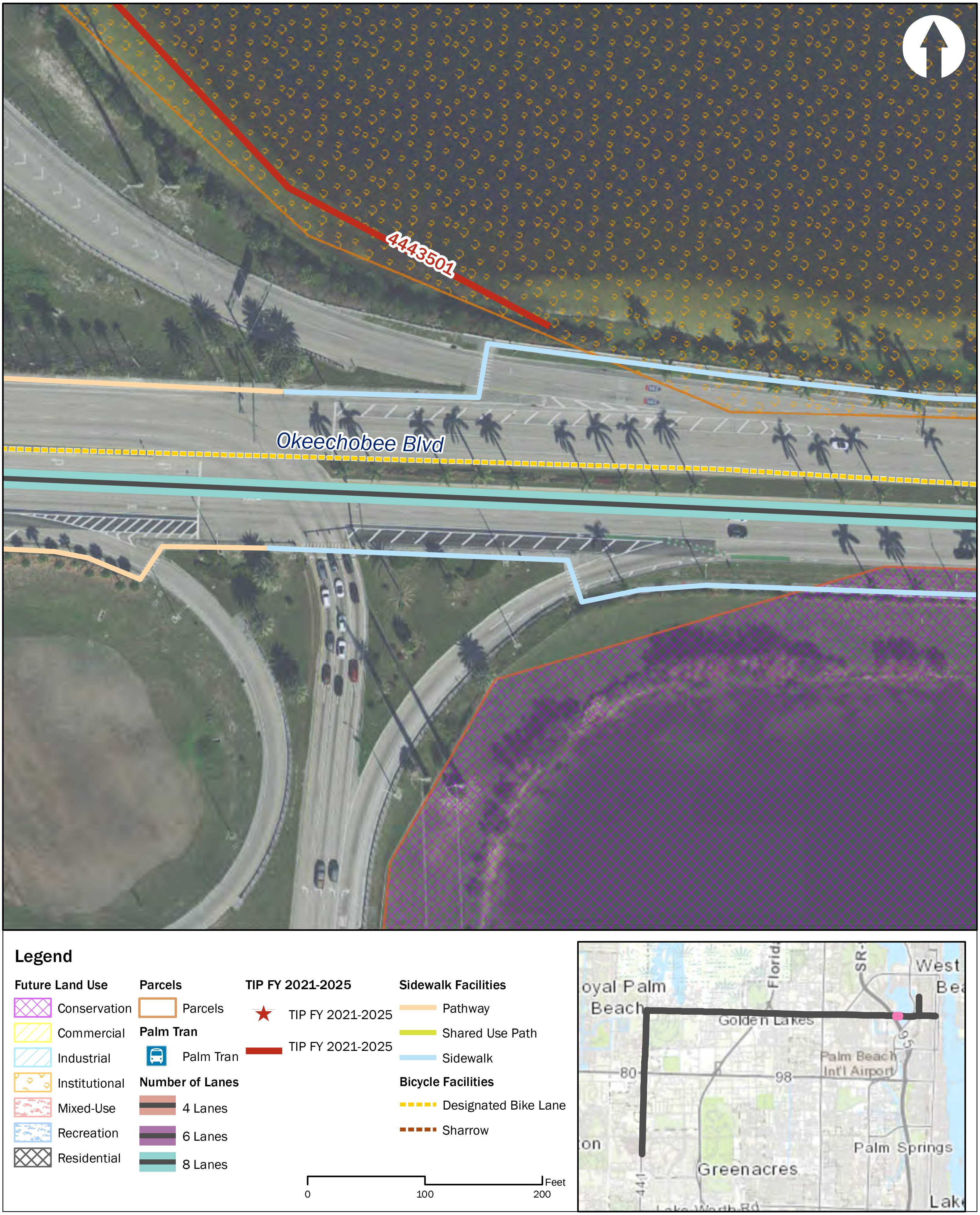
Feet
Golden Lakes
Palm Beach Int'l Airport
Palm Springs
Greenacres


4443501
Okeechobee Blvd
Legend
Future Land Use
Conservation
Commercial
Industrial
Institutional
Mixed-Use
Recreation
Residential
Parcels
Parcels
Palm Tran
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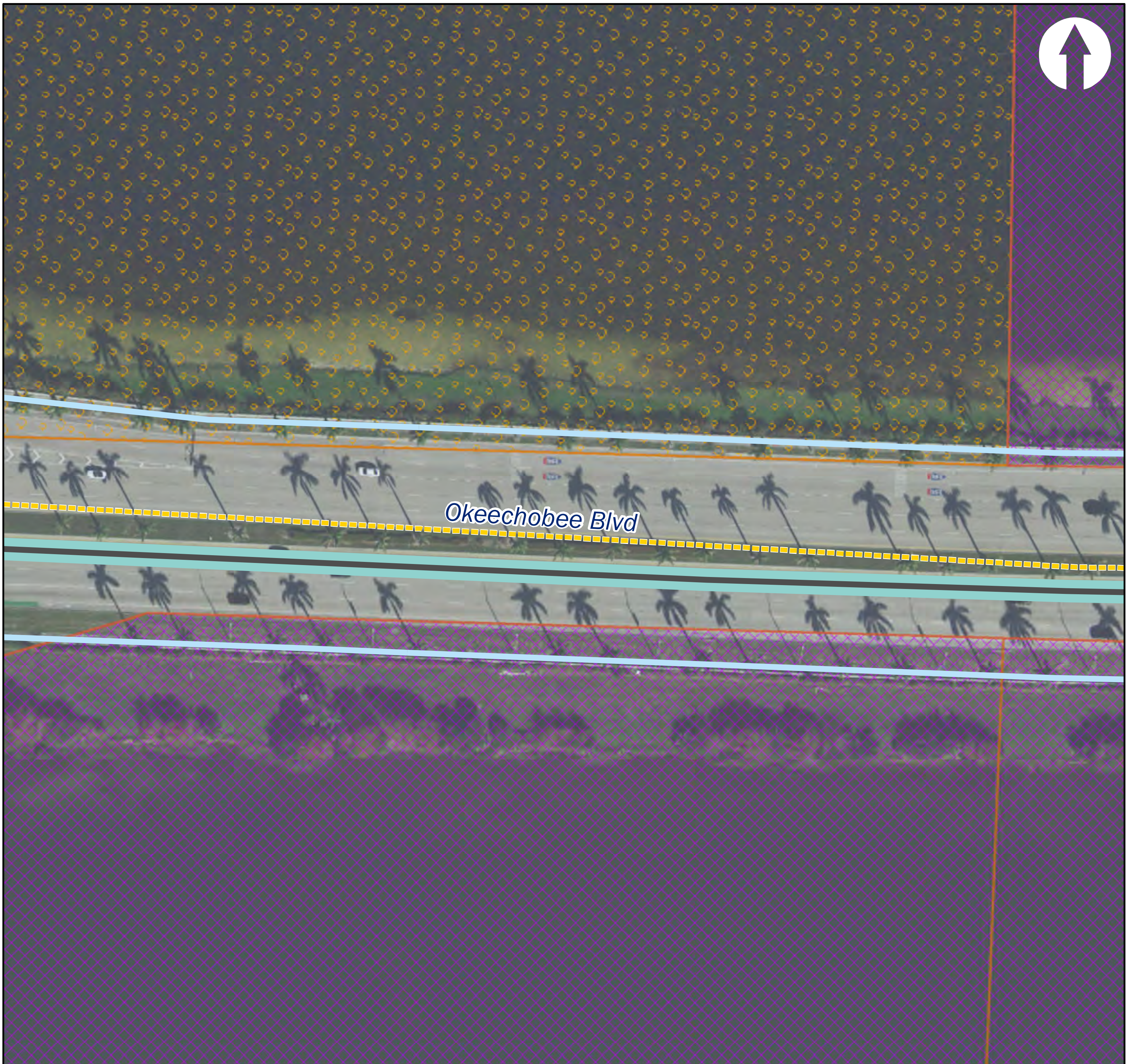

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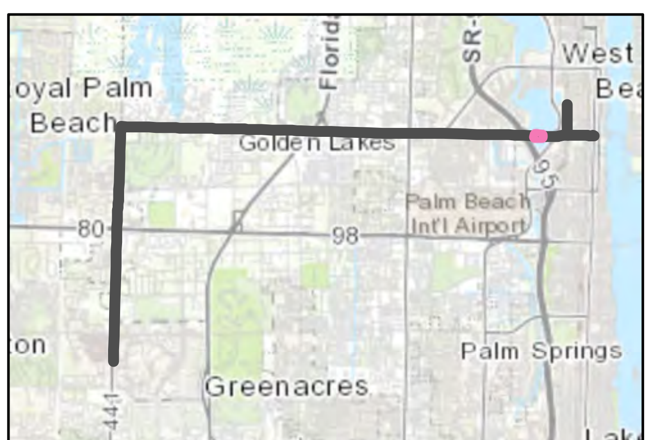

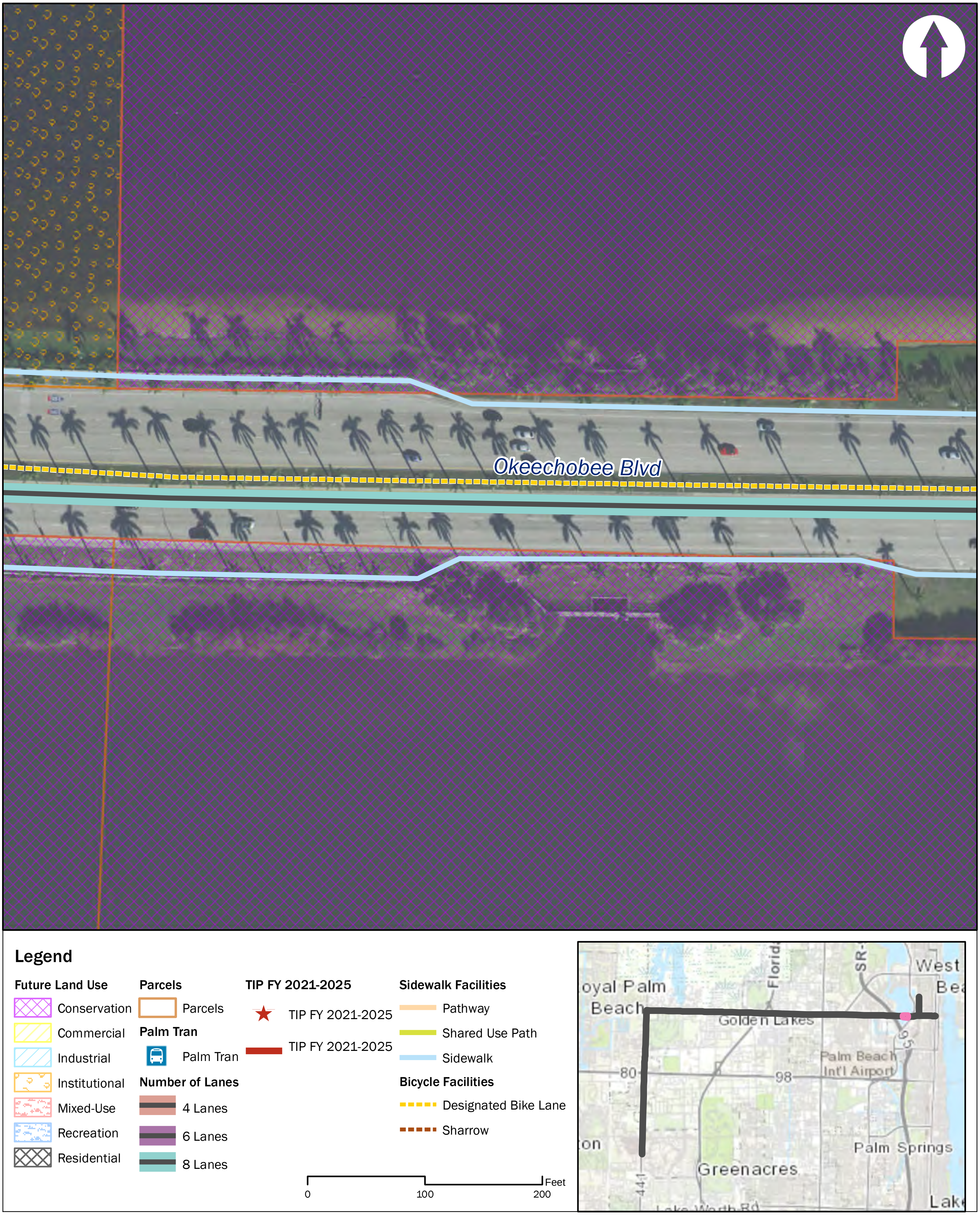
Okeechobee Blvd
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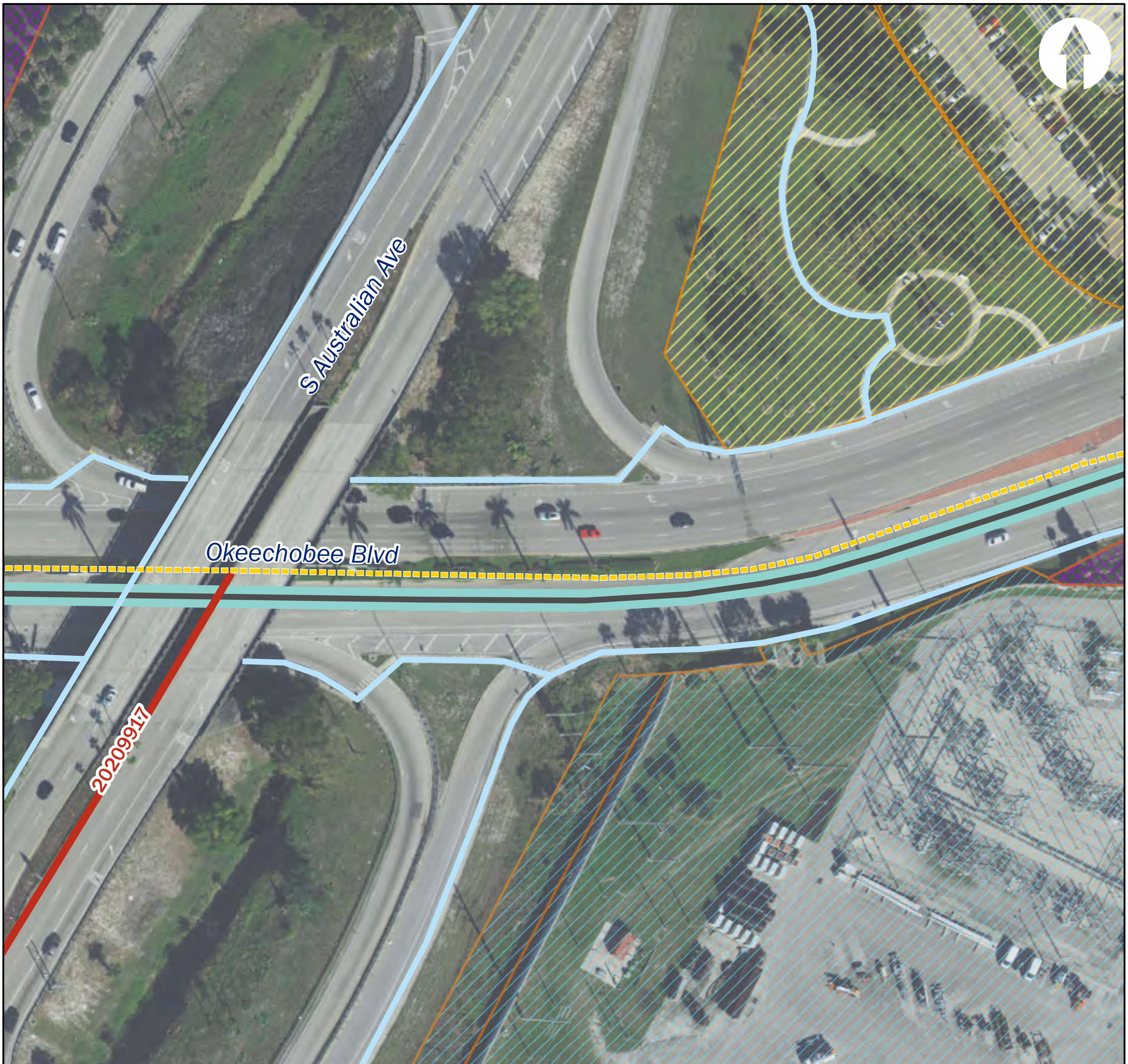

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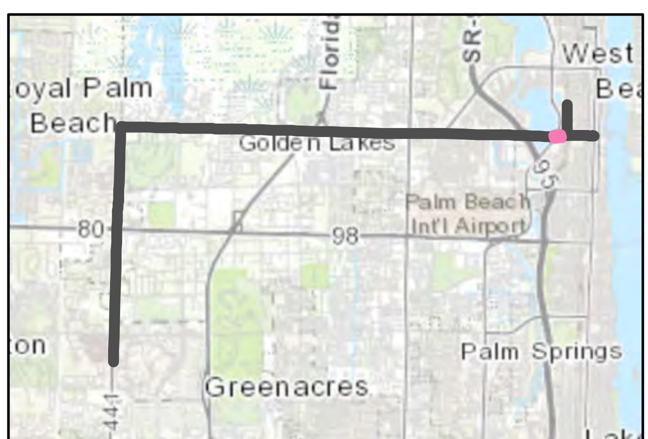
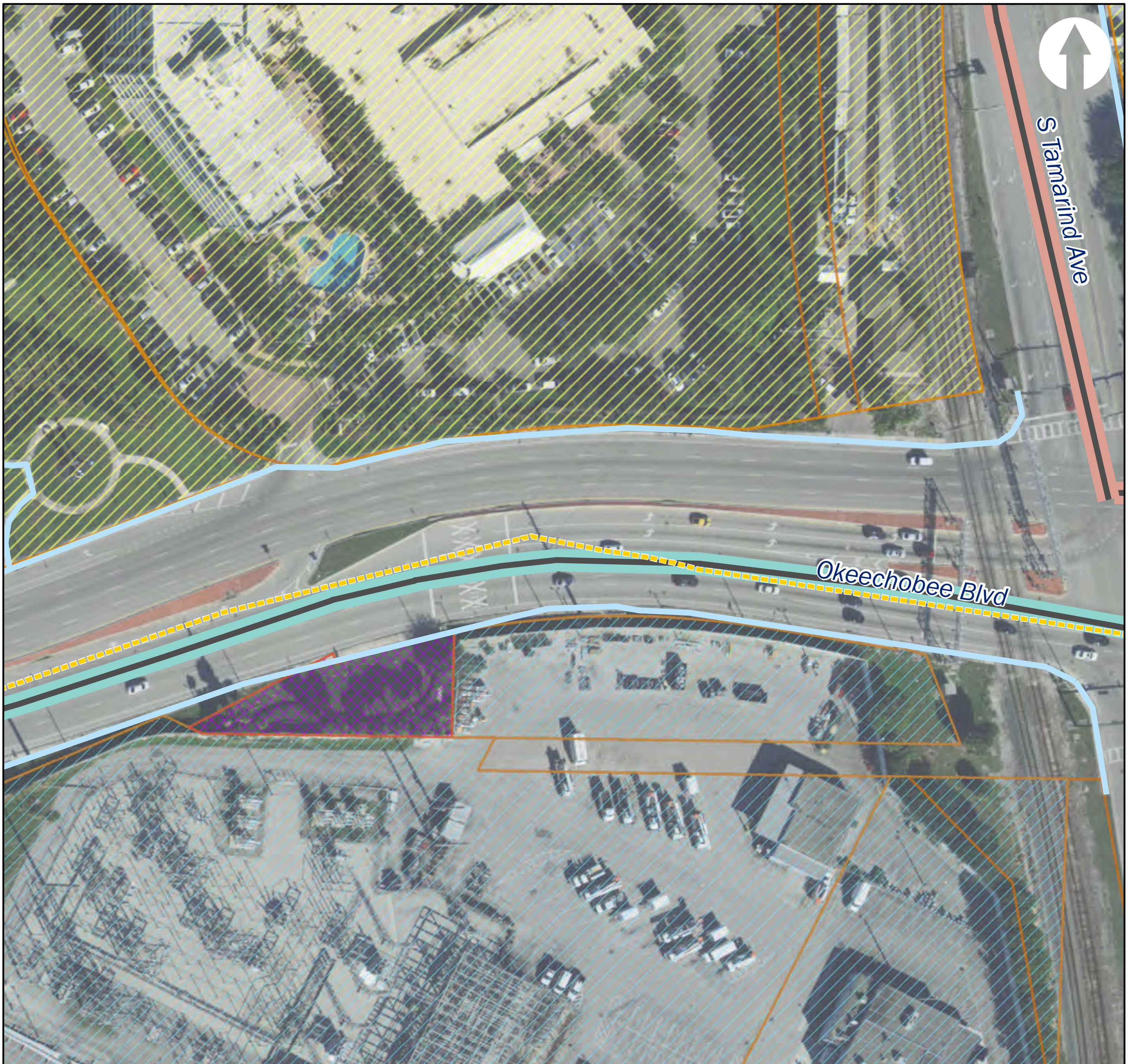
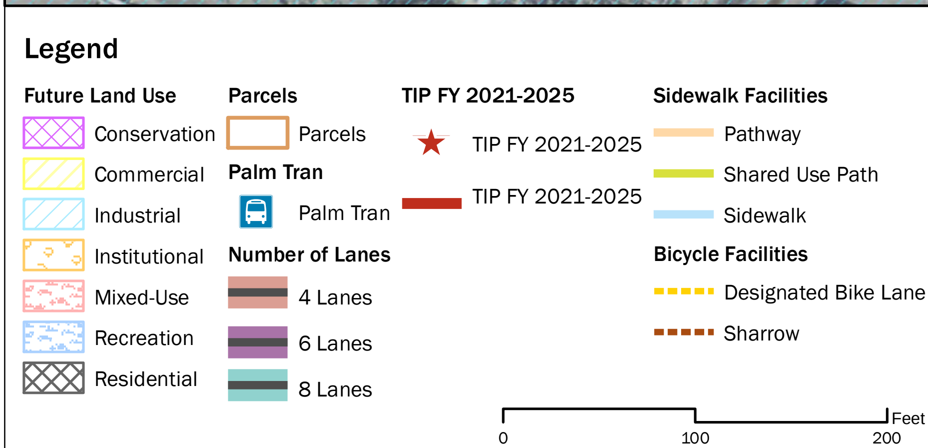



S Tamarind Ave
Okeechobee Blvd


Legend
Future Land Use
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Sidewalk Facilities
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Bicycle Facilities
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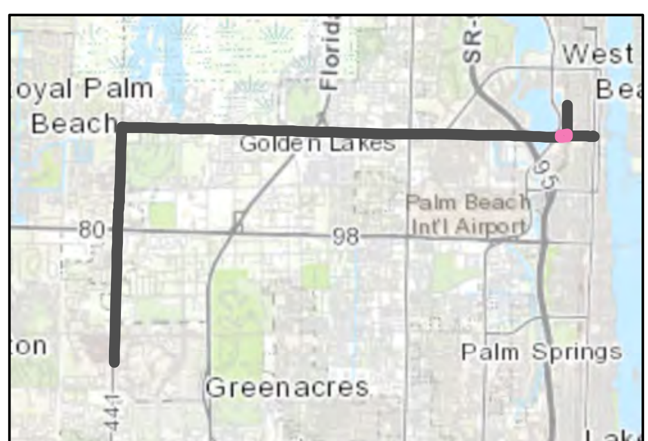
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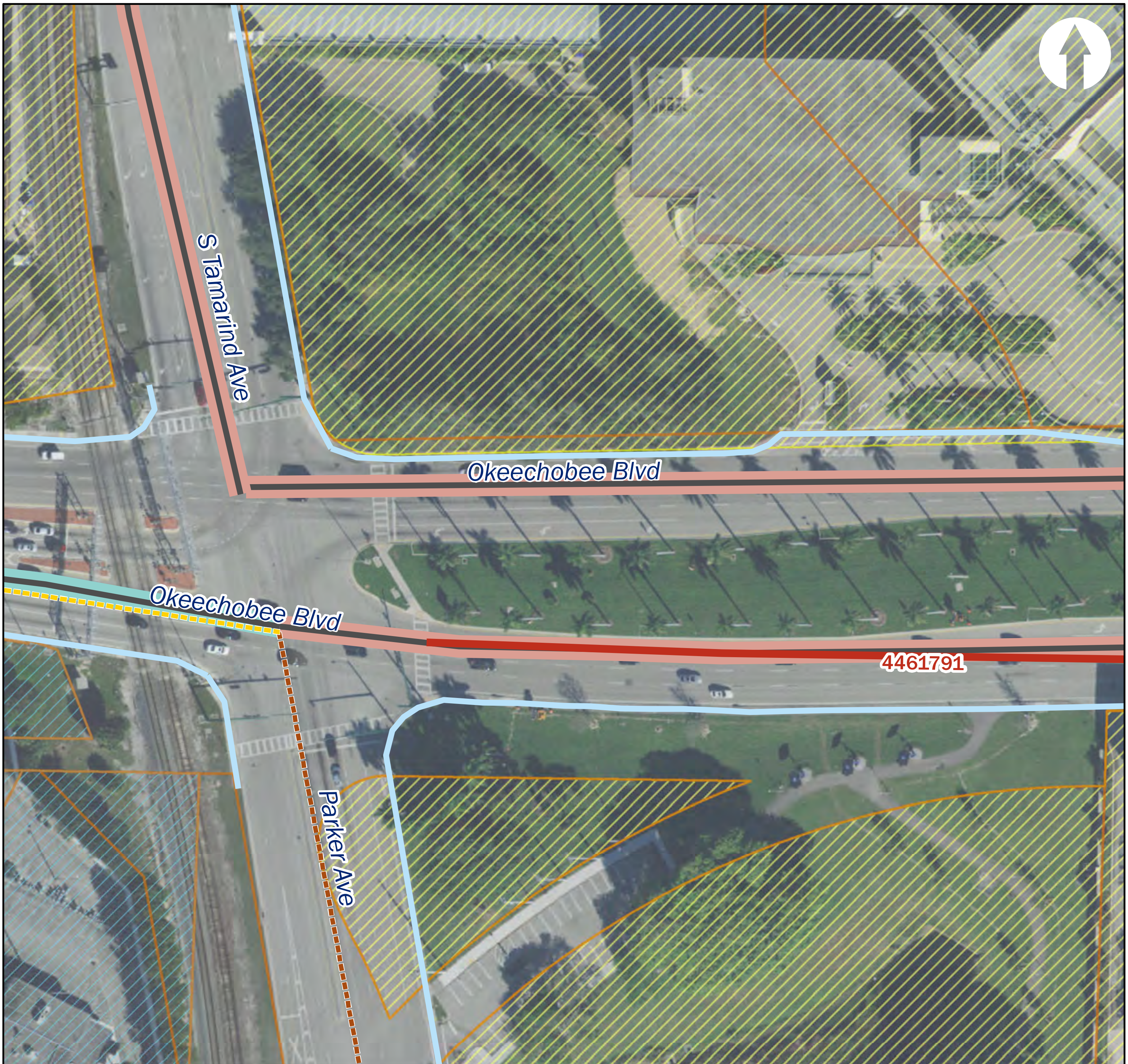

Legend

Future Land Use
- Conservation
- Commercial
- Industrial
- Institutional
- Mixed-Use
- Recreation
- Residential

Parcels
- Parcels

Palm Tran
- Palm Tran

Number of Lanes
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TIP FY 2021-2025
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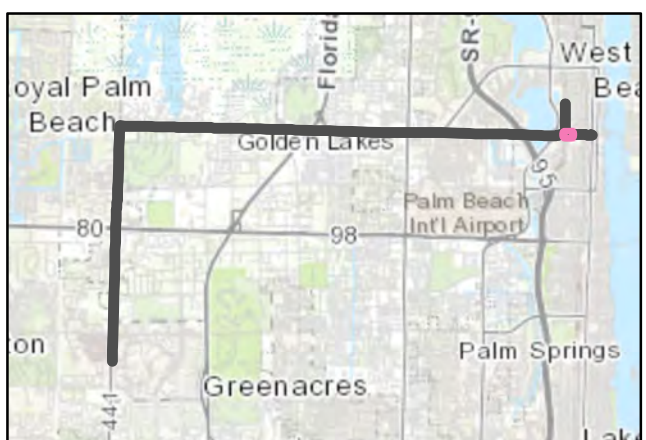

Legend

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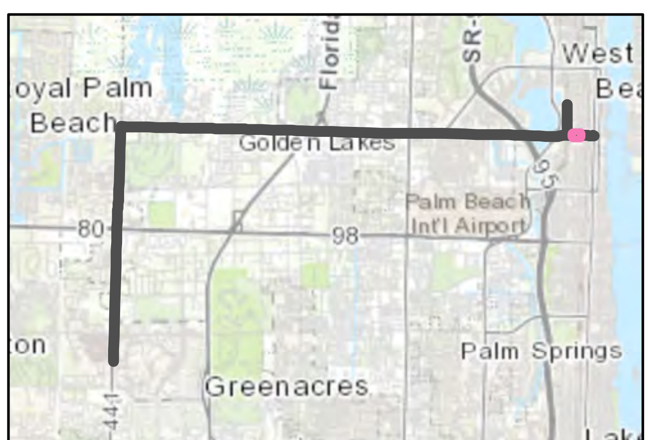

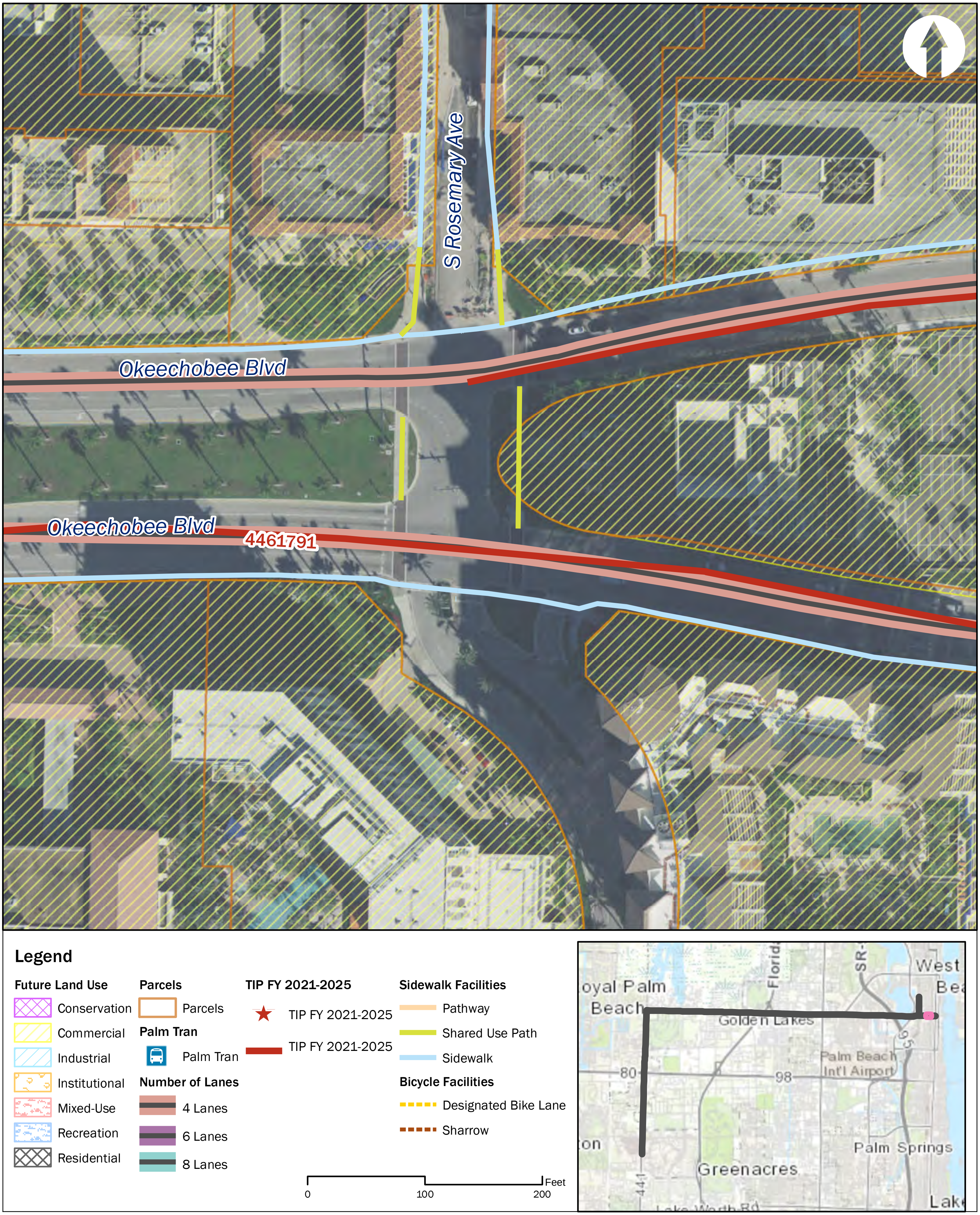
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Mixed-Use
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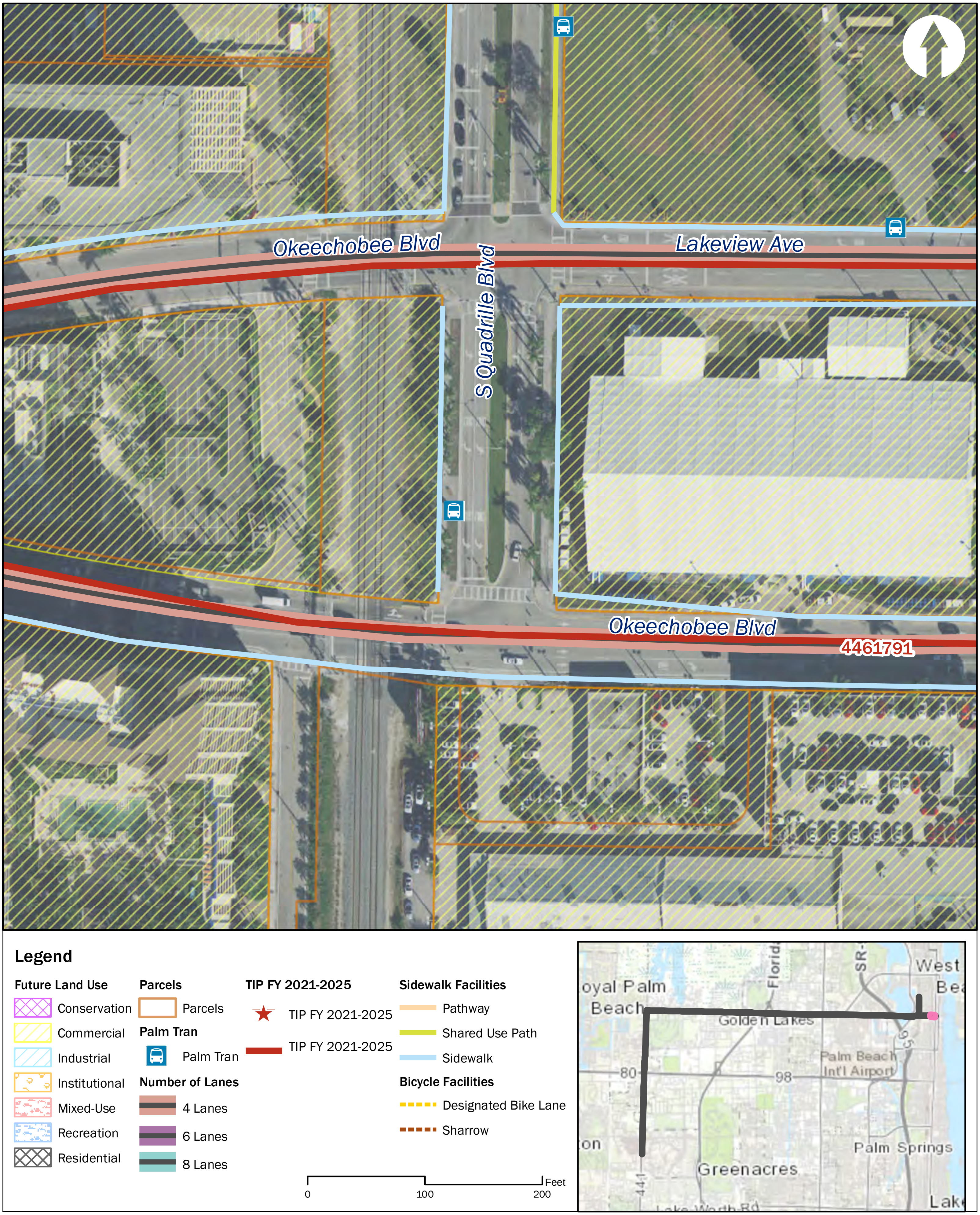
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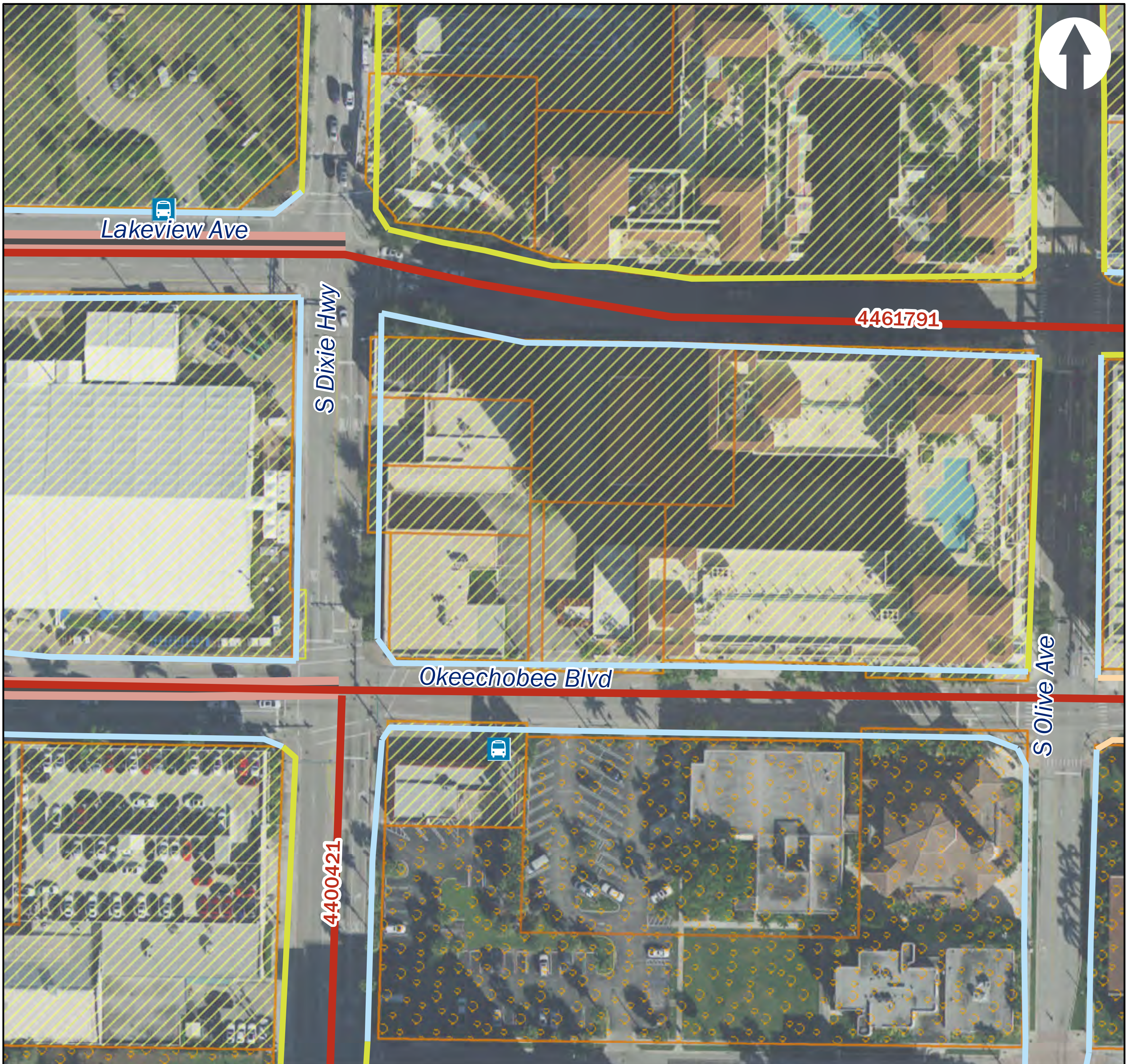
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Okeechobee Blvd
S Olive Ave
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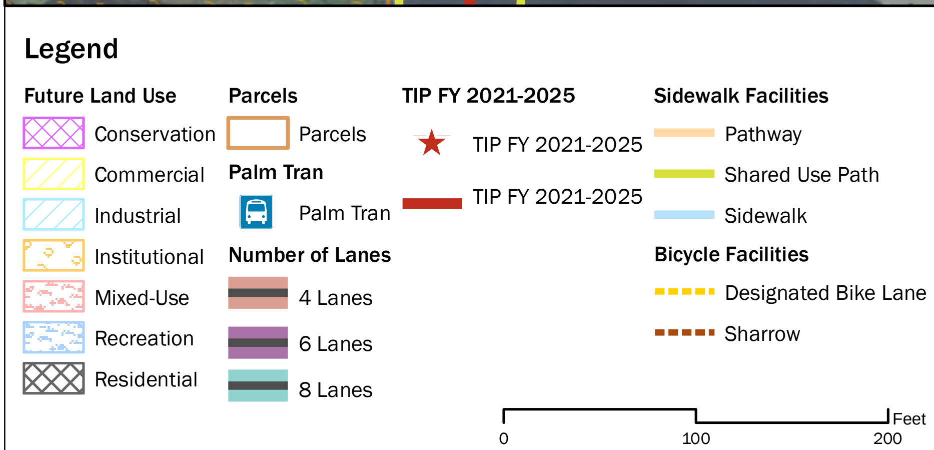
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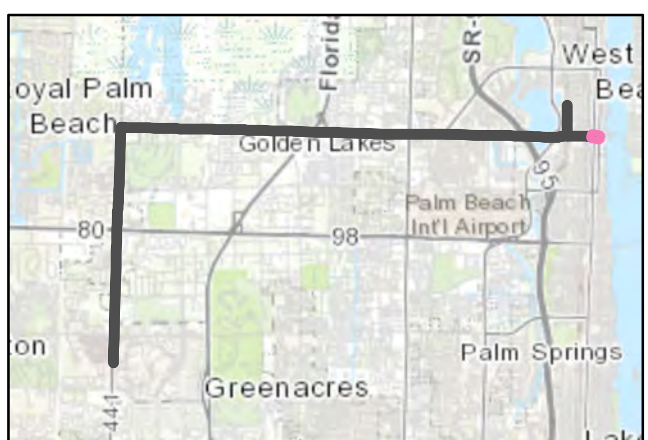
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Palm Springs
Greenacres
441
Lake Worth Rd

Legend

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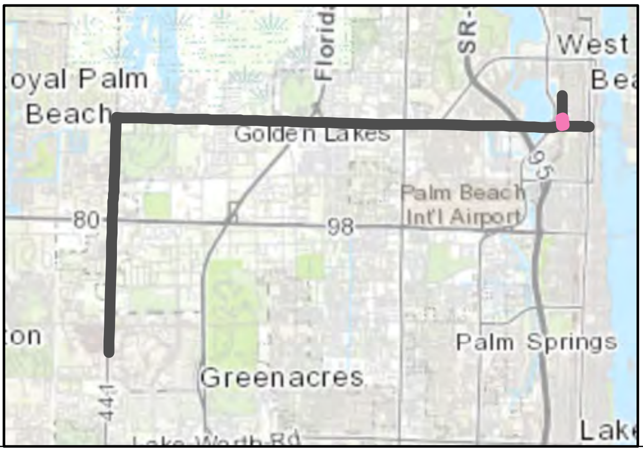

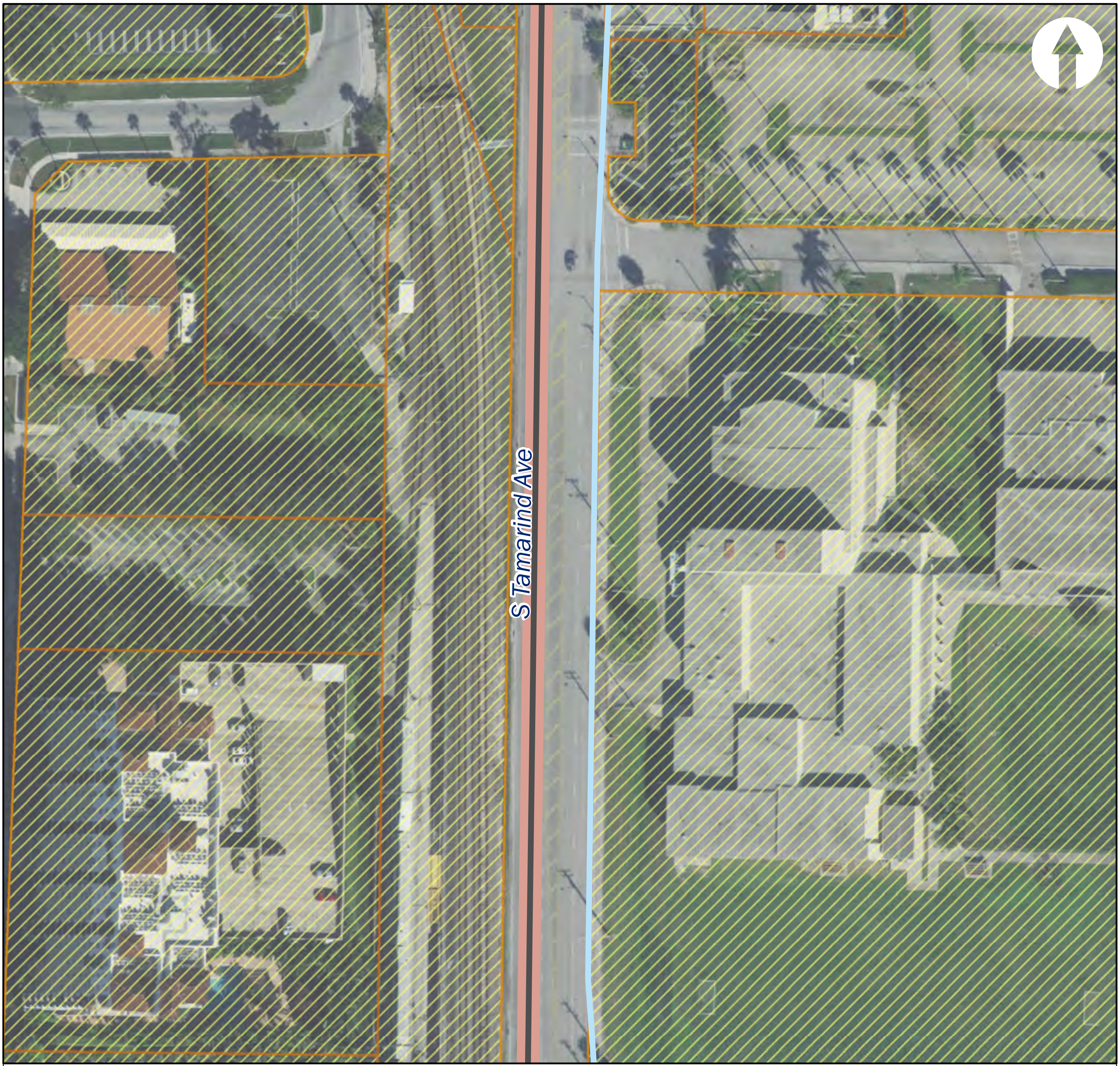

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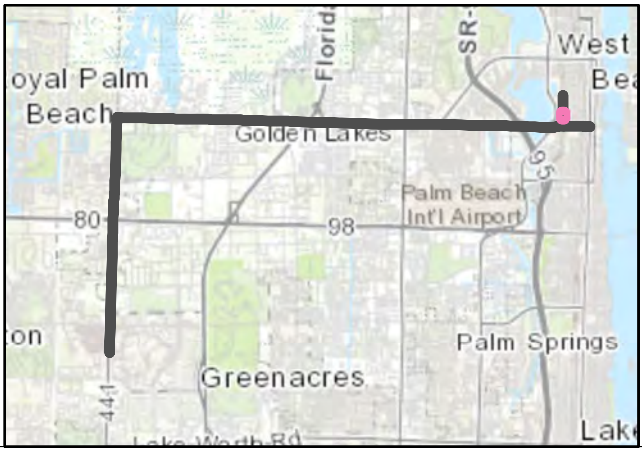

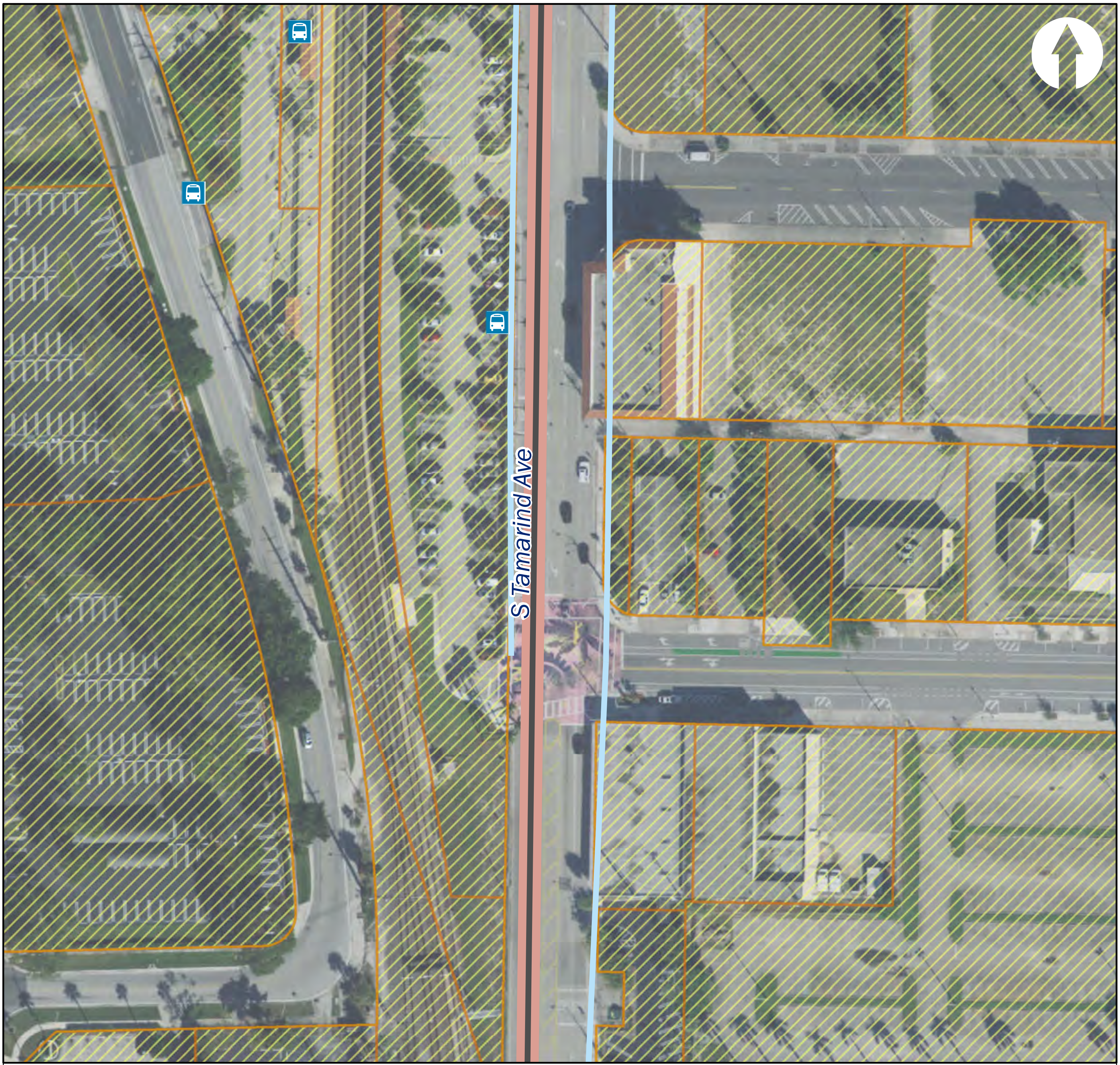

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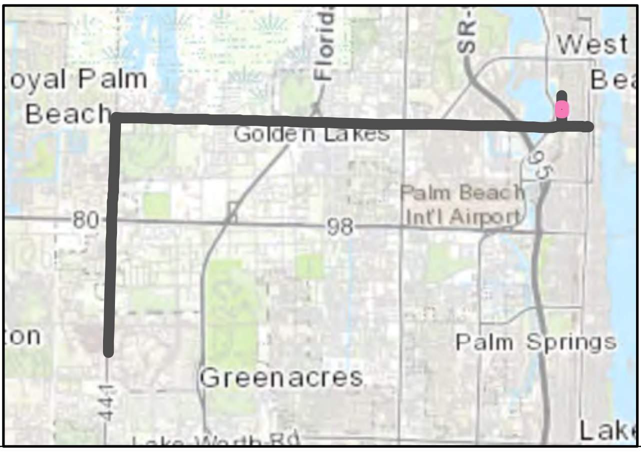

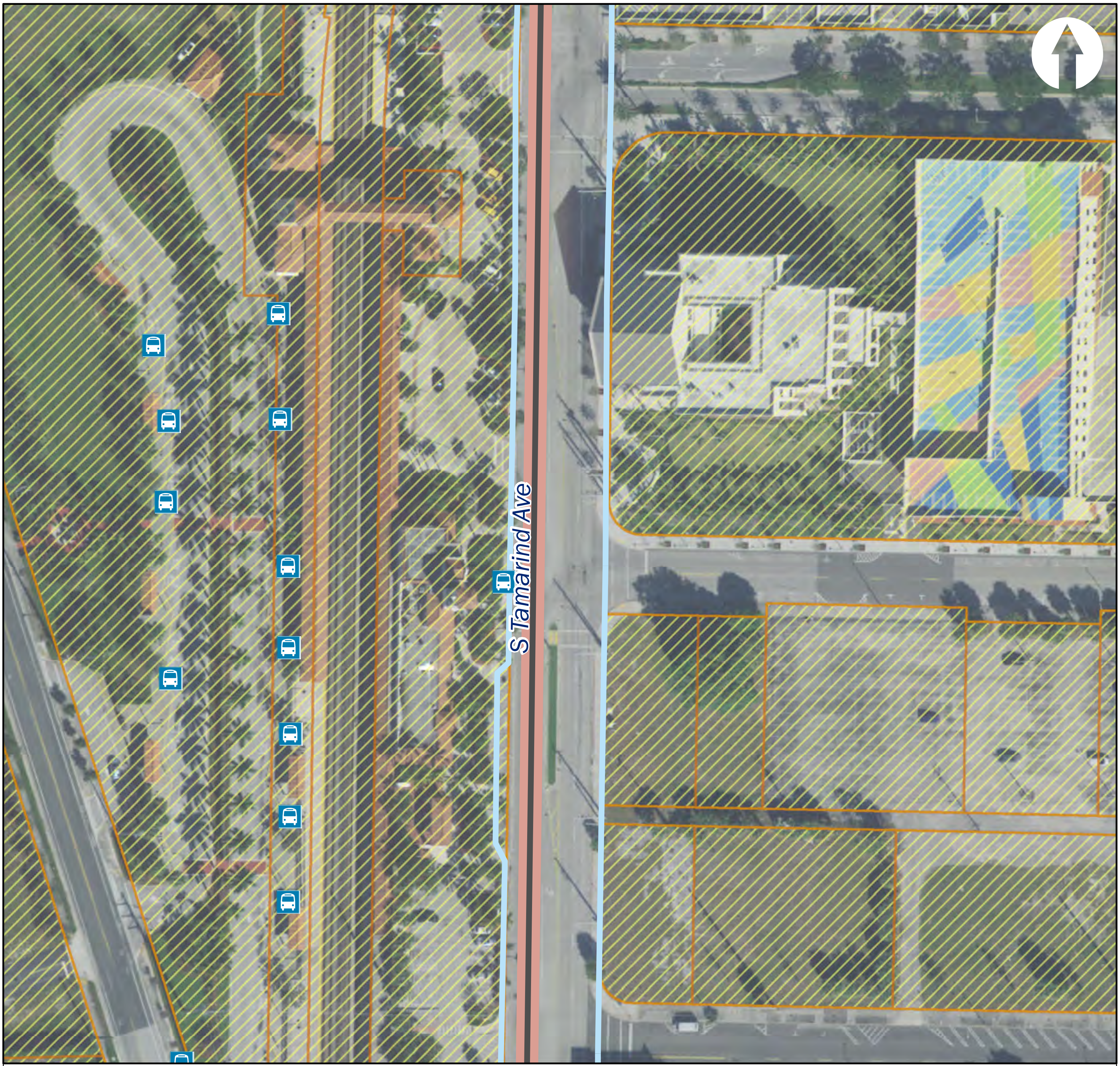

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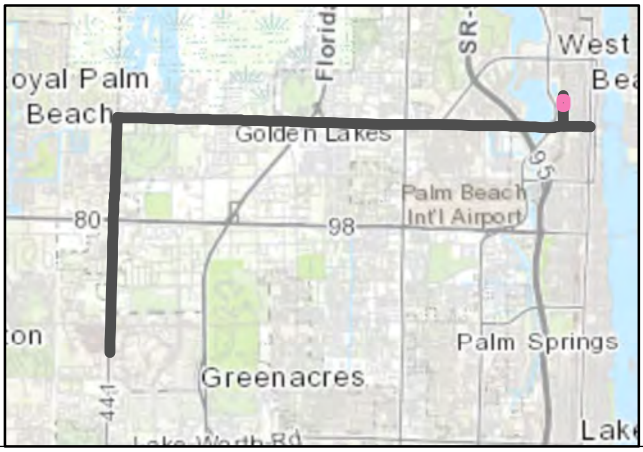

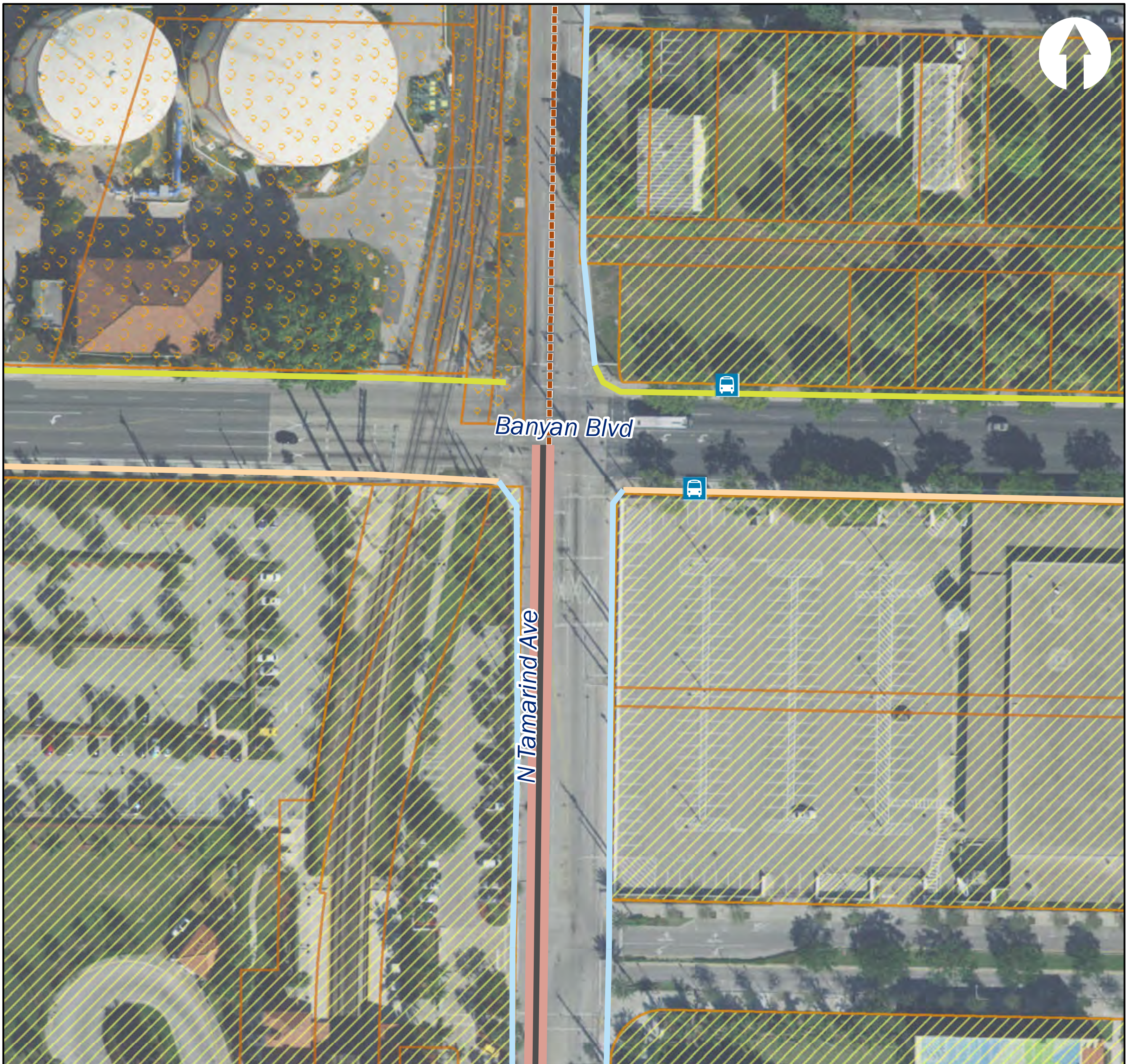

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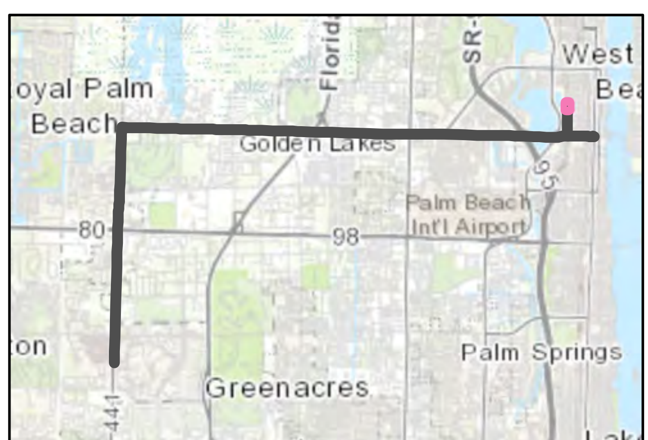
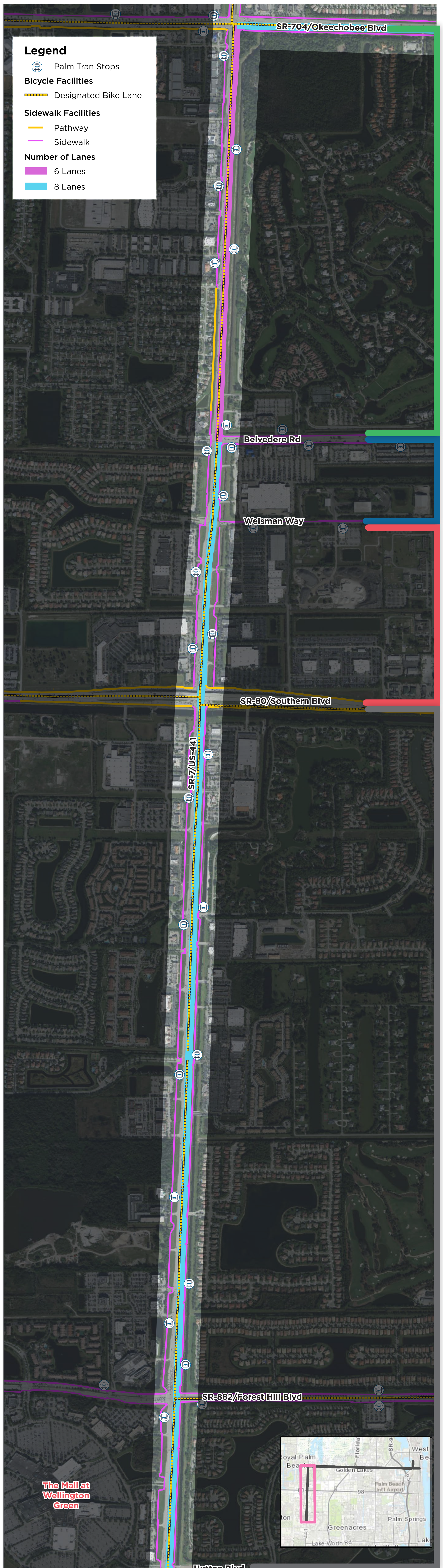


Appendix C

30”x40” E-Size Graphics Board

PALM BEACH Transportation Planning Agency

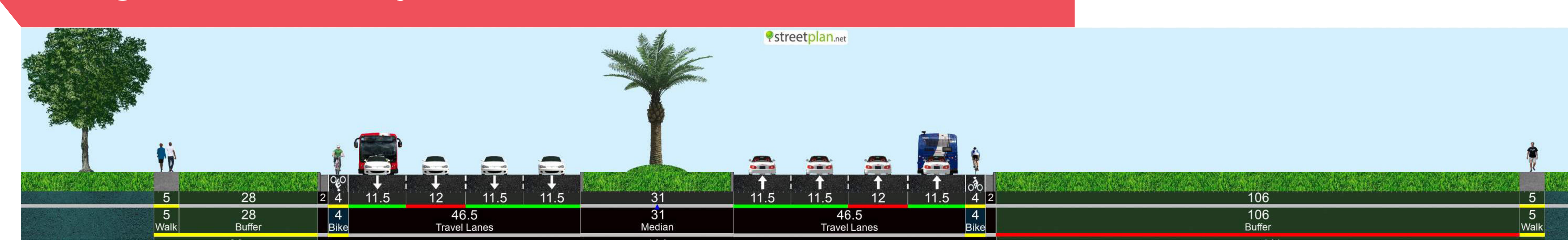
Okeechobee Boulevard Multimodal Corridor Study (MCS)
SR-7 from Wellington Mall to SR-704 (Okeechobee Boulevard)
Existing Conditions



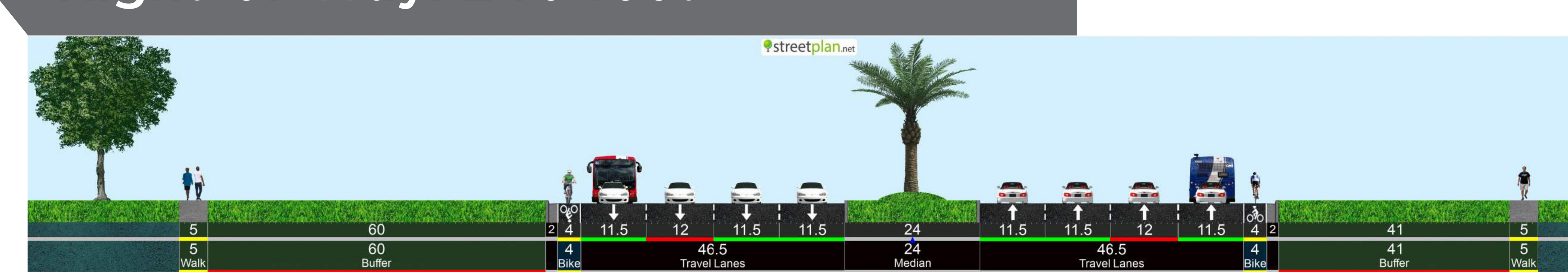
Belvedere Rd to Okeechobee Blvd
Right-of-Way: 190 feet

Weisman Way to Belvedere Rd
Right-of-Way: 190 feet

Southern Blvd to Weisman Way
Right-of-Way: 280 feet



Wellington Mall to Southern Blvd
Right-of-Way: 240 feet

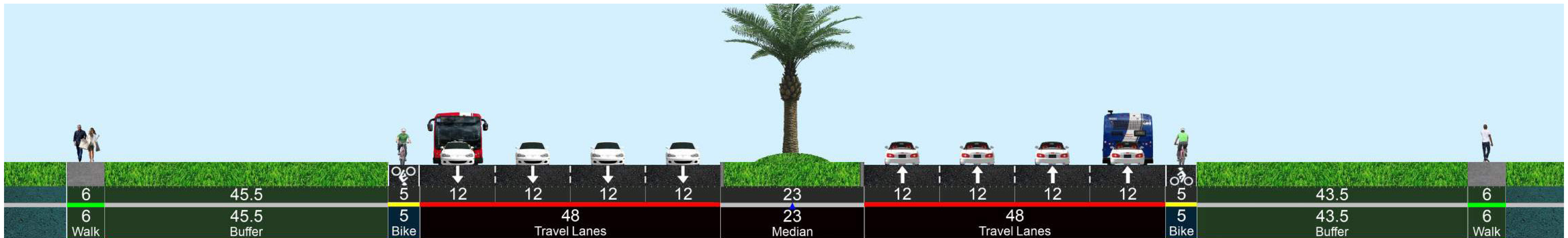


PALM BEACH Transportation Planning Agency

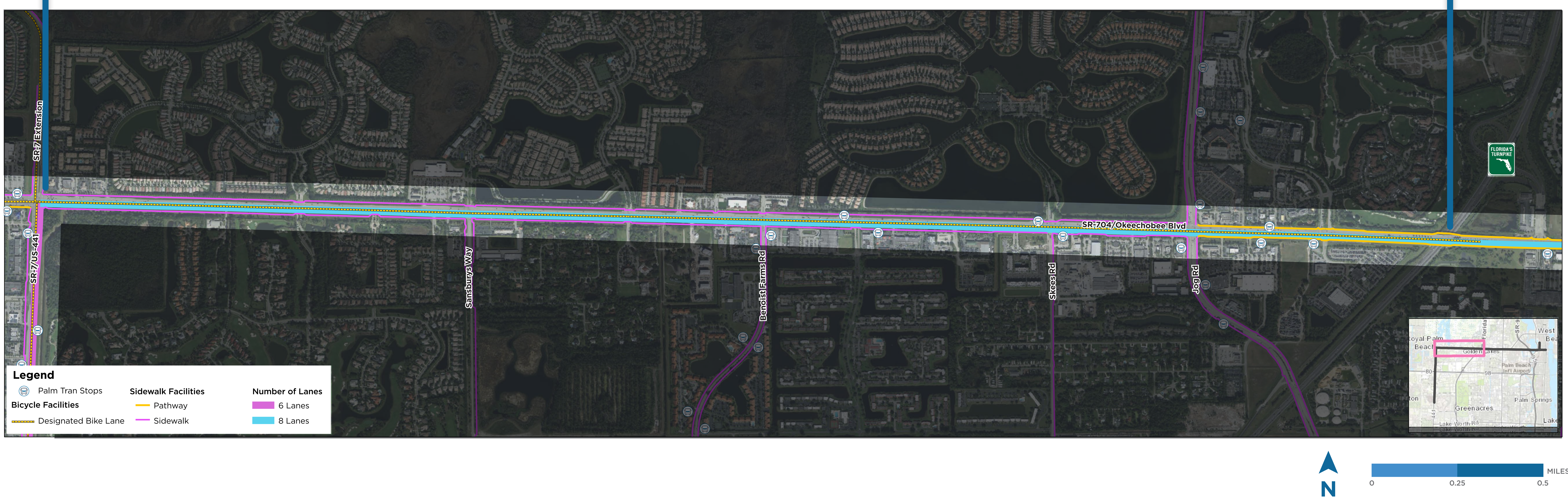
Okeechobee Boulevard Multimodal Corridor Study (MCS)

SR-704 (Okeechobee Boulevard) from SR-7 to Florida's Turnpike

Existing Conditions



SR-7 to Florida's Turnpike
Right-of-Way: 230 feet

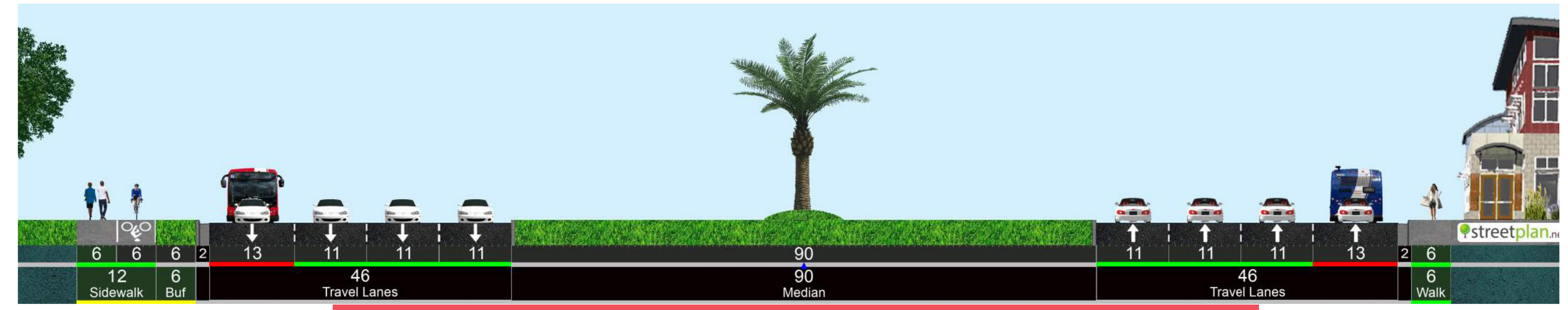


Palm Beach Transportation Planning Agency

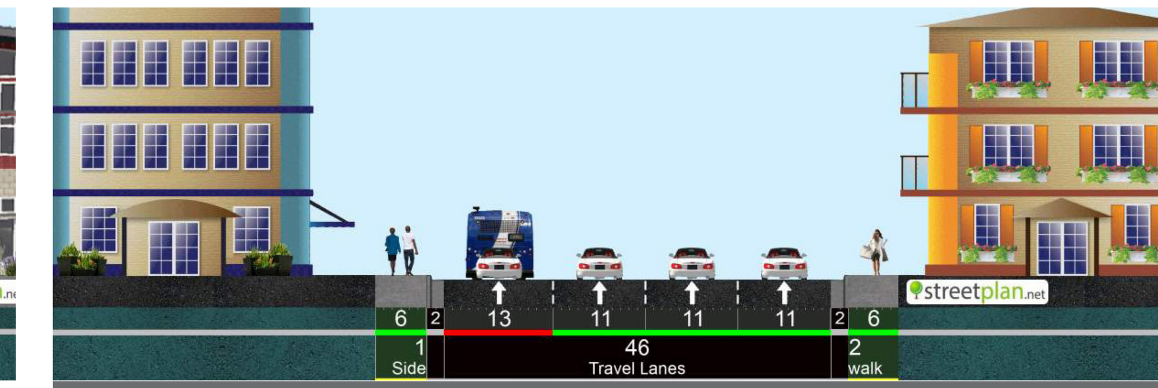
Okeechobee Boulevard Multimodal Corridor Study (MCS)

SR-704 (Okeechobee Boulevard) from Florida's Turnpike to US-1/Intermodal Center

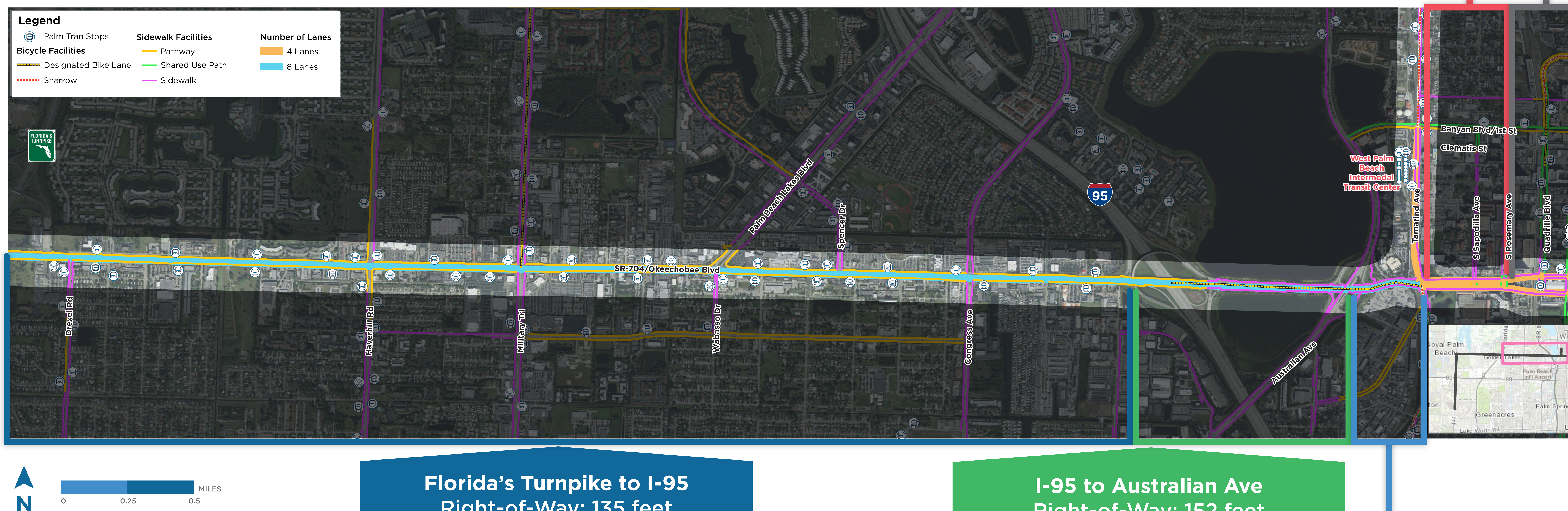
Existing Conditions



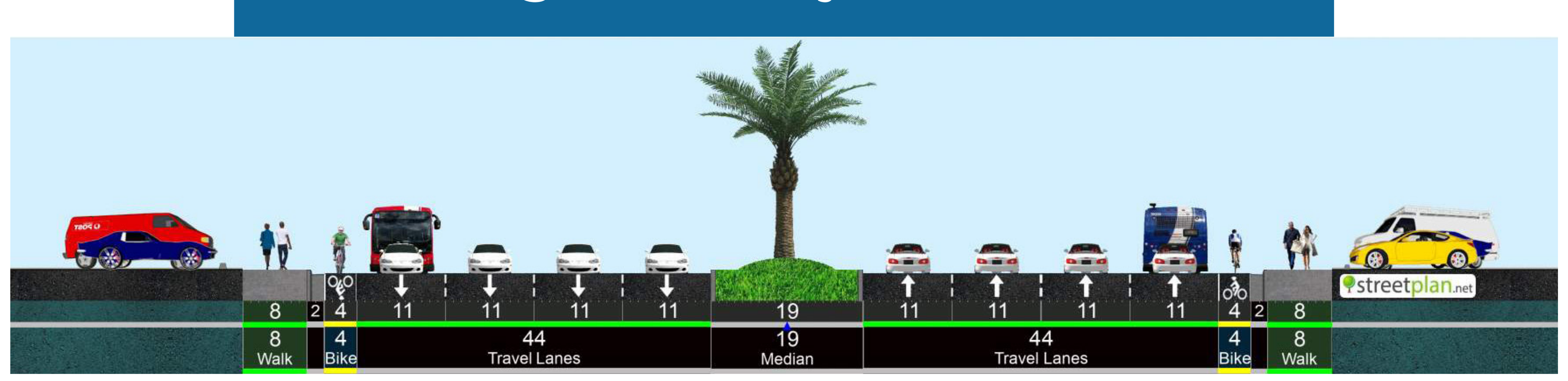
Tamarind Ave to Rosemary Ave
Right-of-Way: 200 feet



Okeechobee Blvd/Lakeview Ave pair
Right-of-Way: 62 feet



Florida's Turnpike to I-95
Right-of-Way: 135 feet



I-95 to Australian Ave
Right-of-Way: 152 feet

Australian Ave to Tamarind Ave
Right-of-Way: 144 feet

Appendix D

Baseline Traffic Evaluation

Street Name	From	To	SERPM 2015	SERPM 2045	Posted Speed (MPH)	Number of Lanes (bi-directional)	One-Way (Y/N)	SERPM Annual Growth Rate	FDOT Count Station Number	FDOT Count Station Location	AADT Year	2019 AADT	Peak Hour Direction	Peak Hour AADT	Calculated AADT 2045	Calculated Peak Hour AADT 2045	Class	2019 (Base Year) LOS	2045 (LRTP Horizon Year) LOS	2019 (Base Year) Peak Hour LOS	2045 (LRTP Horizon Year) Peak Hour LOS
SR-7/US 441	Stribling Way	Forest Hill Blvd	61,497	79,926	45	8	N	0.88%	930721	S of Forest Hill Blvd	2019	61,000	N	2,546	76,600	3,200	Class I	C	C	C	C
SR-7/US 441[A]	Forest Hill Blvd	Southern Blvd	56,786	78,982	45	8	N	0.88%	930037	S of SR 80/Southern Blvd C-13	2019	65,500	S	2,798	82,300	3,510	Class I	C	C	C	C
SR-7/US 441[A]	Southern Blvd	Belvedere Rd	48,365	70,008	45	8	N	0.88%	930514	N of SR 80/Southern Blvd	2019	56,000	S	2,576	70,300	3,240	Class I	C	C	C	C
SR-7/US 441[A]	Belvedere Rd	Okeechobee Blvd	28,010	48,645	45	6	N	0.88%	930034	S of Okeechobee Blvd/SR 704	2019	42,000	N	1,996	52,700	2,510	Class I	C	C	C	C
Okeechobee Blvd[B]	Wildcat Way	SR-7/US 441	45,520	53,109	50	8	N	0.52%	937064	On Okeechobee Blvd from Wildcat Way	2019	44,500	E	2,203	50,900	2,520	Class I	C	C	C	C
Okeechobee Blvd	SR-7/US 441	Sansburys Way	49,348	68,546	50	8	N	1.10%	930754	E of SR 7/441 E	2019	52,500	E	3,342	69,800	4,440	Class I	C	C	C	F
Okeechobee Blvd	Sansburys Way	N Jog Rd	72,753	88,495	50	8	N	0.66%	937261	Benoist Farms Rd to Skees Rd	2019	62,000	E	4,028	73,600	4,780	Class I	C	C	C	F
Okeechobee Blvd	N Jog Rd	Okeechobee Toll Plaza	66,400	70,213	45	8	N	0.19%	930696	W of Florida's Turnpike Entrance	2019	68,000	E	4,144	71,400	4,350	Class I	C	C	C	F
Okeechobee Blvd	Okeechobee Toll Plaza	Military Trl	80,148	90,295	45	8	N	0.40%	930745	E of Florida's Turnpike Entrance	2019	66,500	E	3,860	73,800	4,280	Class I	C	C	C	F
Okeechobee Blvd	Military Trl	Palm Beach Lakes Blvd/Wabasso Dr	74,389	83,691	45	8	N	0.39%	930456	E of SR 809/Military Trl	2019	65,500	W	3,329	72,500	3,680	Class I	C	C	C	C
Okeechobee Blvd	Palm Beach Lakes Blvd/Wabasso Dr	Congress Ave	42,053	48,468	45	8	N	0.47%	935277	E of Tallahassee Dr	2019	53,000	E	2,777	59,900	3,140	Class I	C	C	C	C
Okeechobee Blvd	Congress Ave	I-95	60,346	68,387	45	8	N	0.42%	935410	W of I-95	2019	57,000	W	2,626	63,600	2,930	Class I	C	C	C	C
Okeechobee Blvd	I-95	S Australian Ave	70,028	77,087	45	8	N	0.32%	935412	E of I-95	2019	77,500	W	3,957	84,200	4,300	Class I	C	F	C	F
Okeechobee Blvd	S Australian Ave	Tamarind Ave	72,118	81,755	45	8	N	0.42%	935117	E of Australian Ave	2019	70,000	W	3,206	78,100	3,580	Class I	C	C	C	C
Okeechobee Blvd[C]	Tamarind Ave	S Rosemary Ave	74,439	81,072	45	8	N	0.28%	935120		2015	48,783	W	2,415	53,100	2,630	Class I	C	C	C	C
Okeechobee Blvd (WB)	S Dixie Hwy	S Rosemary Ave	28,462	32,052	40	4	Y	0.40%	935322	.150 mile W of S Dixie Hwy	2019	23,500	W	2,238	26,100	2,480	Class I	C	F	C	C
Okeechobee Blvd (EB)	S Rosemary Ave	S Dixie Hwy	28,425	31,243	40	4	Y	0.32%	935122	.150 mile W of S Dixie Hwy	2019	22,000	E	2,144	23,900	2,330	Class I	C	D	C	C
Tamarind Ave	Okeechobee Blvd	Banyan Blvd	21,283	24,741	30	4	N	0.50%	933503	N of Okeechobee Blvd	2019	19,200	N	1,389	21,900	1,580	Class II	D	D	D	D

[A] A standard growth rate of 0.88% was used for the SERPM Annual Growth Rate of SR-7 between Forest Hill Blvd and Okeechobee Blvd due to the large difference between the SERPM 2015 base model volume and 2019 AADT volumes.

[B] Peak hour is estimated using K-Factor (K) of 0.09 and D-Factor (D) of 0.55 due to lack of directional traffic count.

[C] Palm Beach TPA Adjusted 2045 Two-Way Daily Traffic Volumes and utilized 2015 counts, which are the latest available traffic count numbers. Peak hour is estimated using K-Factor (K) of 0.09 and D-Factor (D) of 0.55 due to lack of directional traffic count.

Appendix E

Alternatives Definition Typical Sections

PALM BEACH Transportation Planning Agency

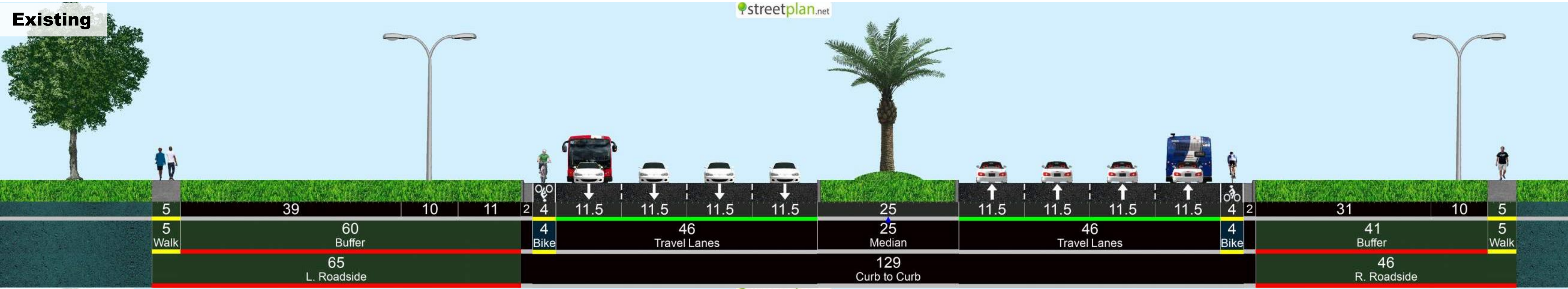
Okeechobee Boulevard Multimodal Corridor Study (MCS)

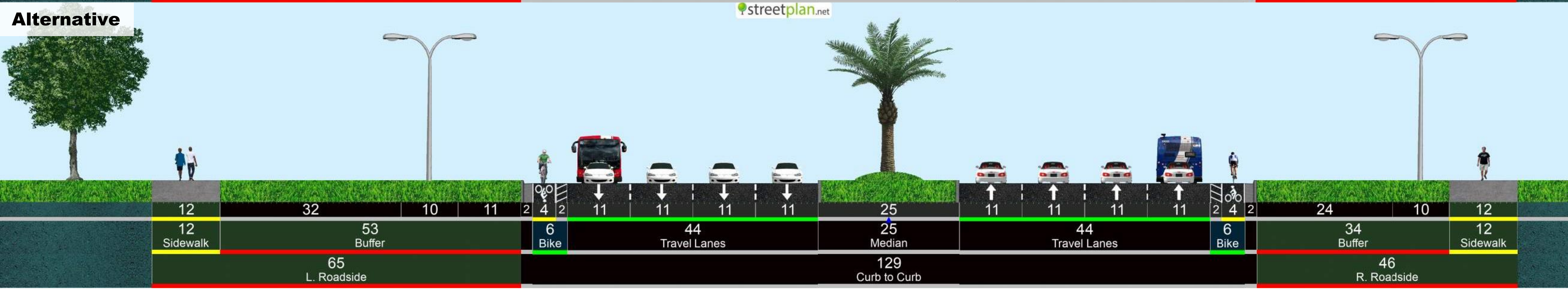
Task 2.7 Alternatives Definition

October 2020

Mixed Traffic Bus

SR-7 from Wellington Mall to Southern Blvd

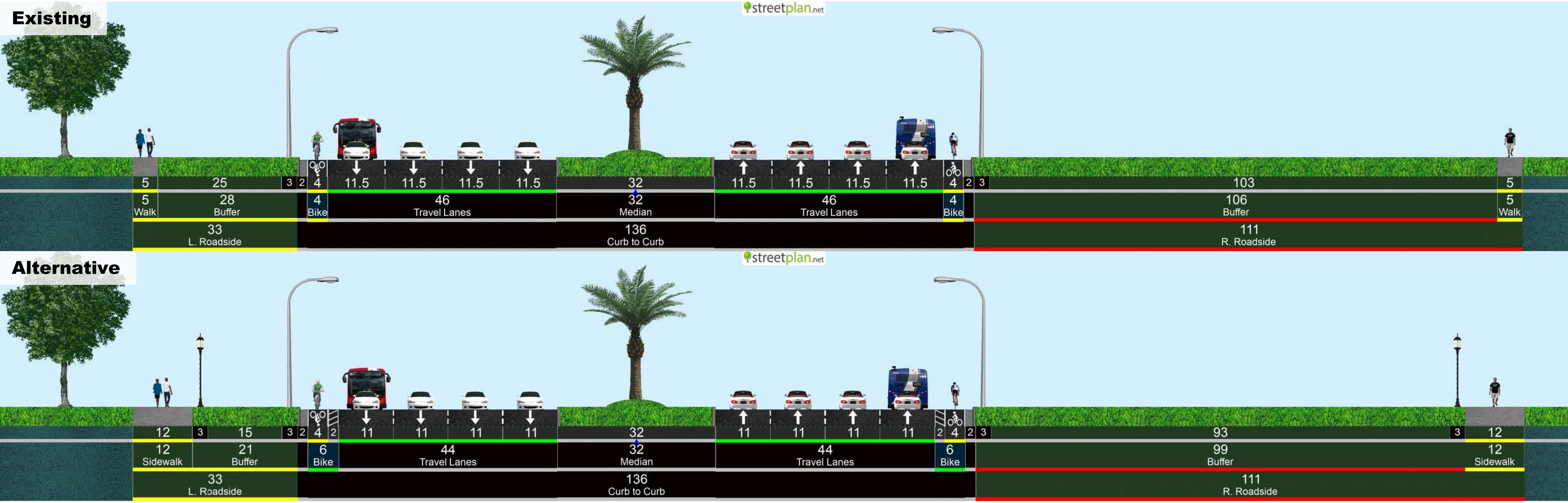




240 feet of right-of-way

Mixed Traffic Bus

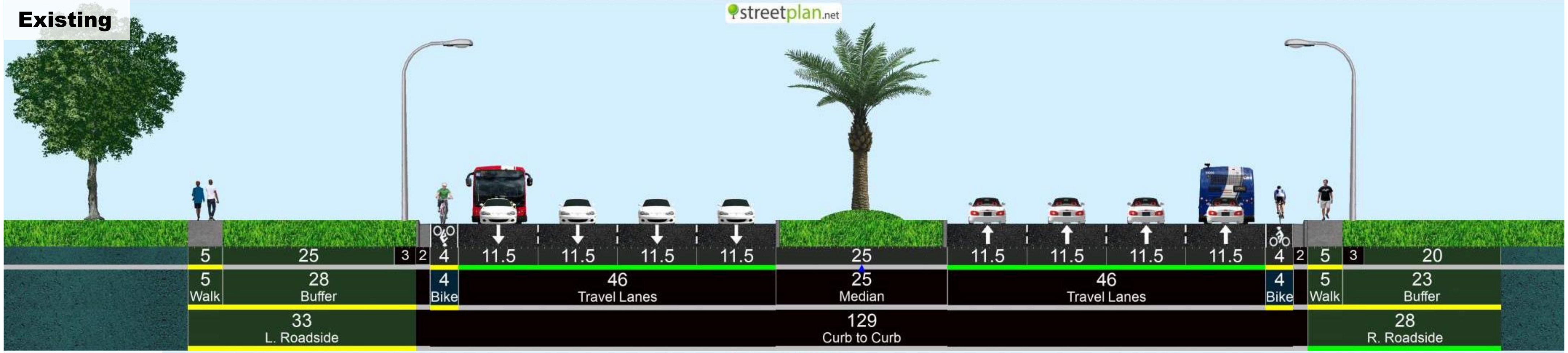
SR-7 from Southern Blvd to Weisman Way

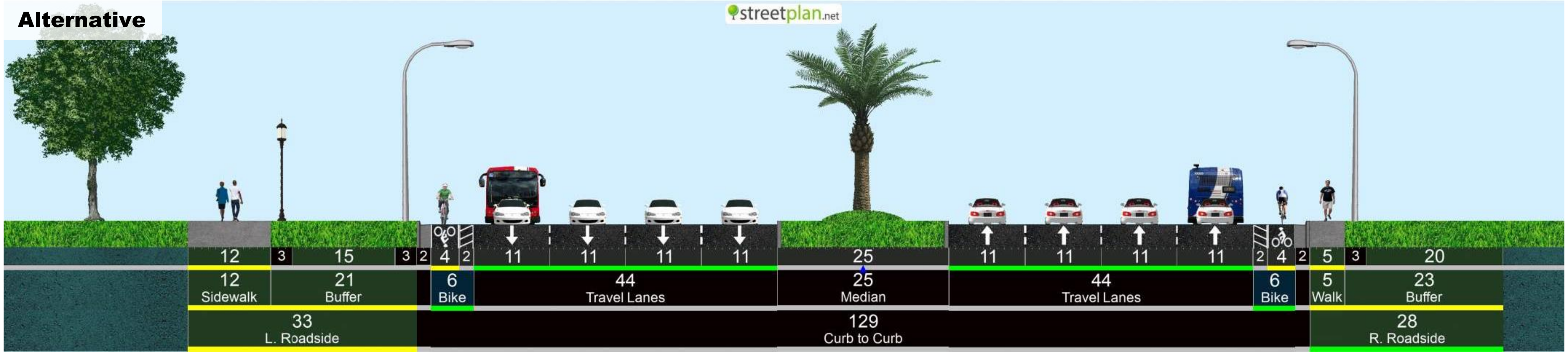


280 feet of right-of-way

Mixed Traffic Bus

SR-7 from Weisman Way to Belvedere Rd

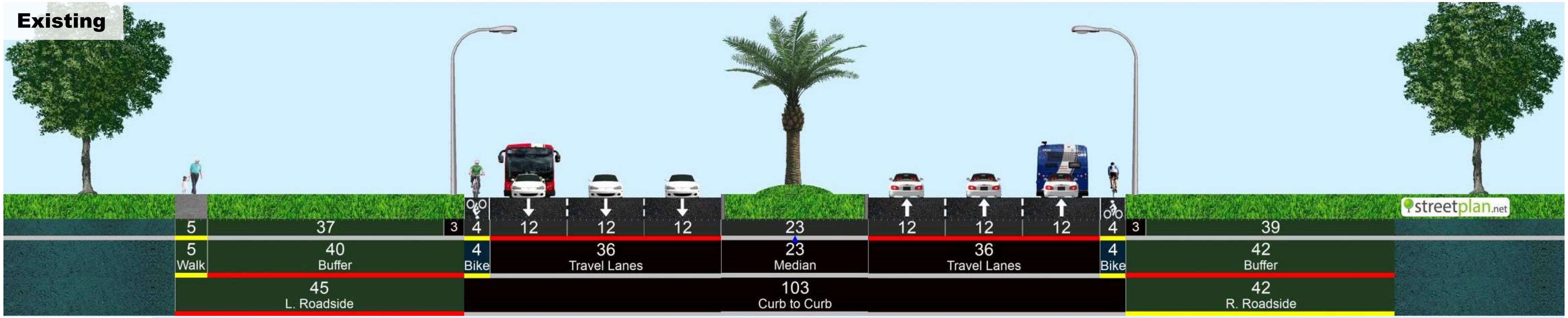


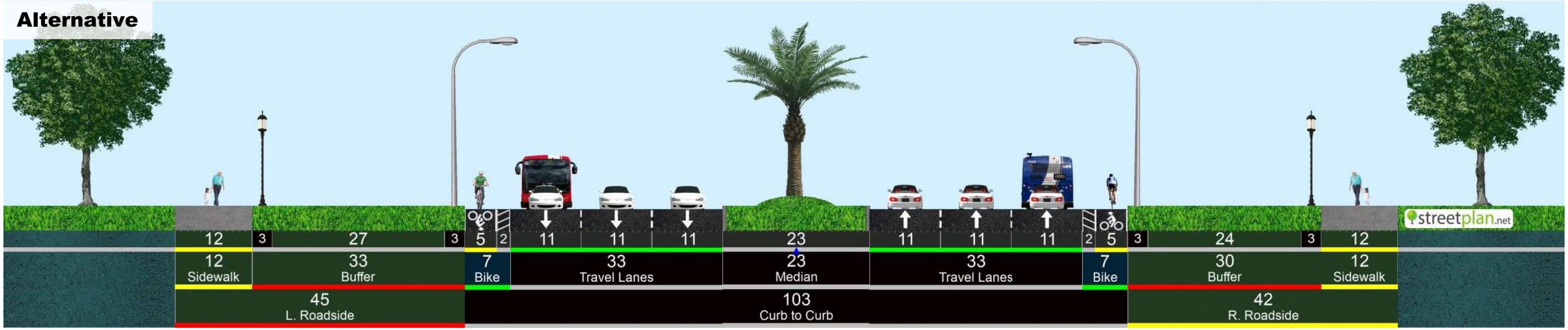


190 feet of right-of-way

Mixed Traffic Bus

SR-7 from Belvedere Rd to Okeechobee Blvd

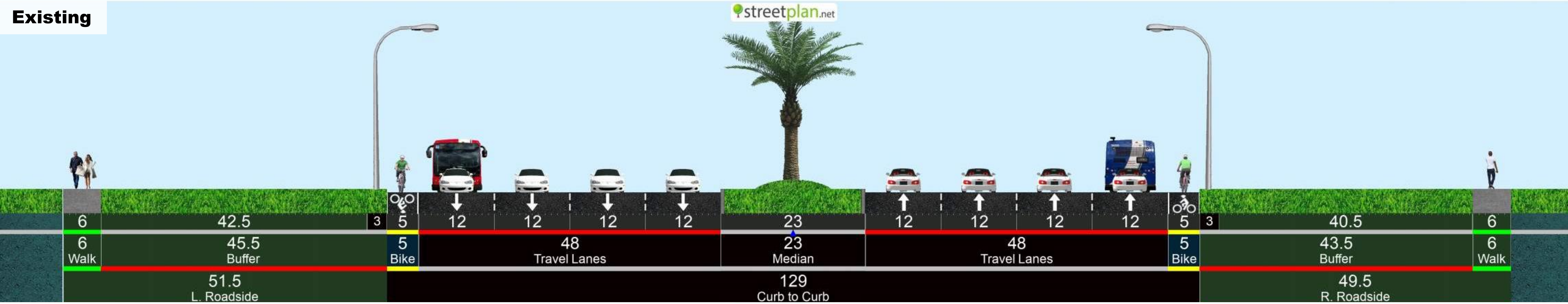




190 feet of right-of-way

Okeechobee Blvd from SR-7 to Florida's Turnpike

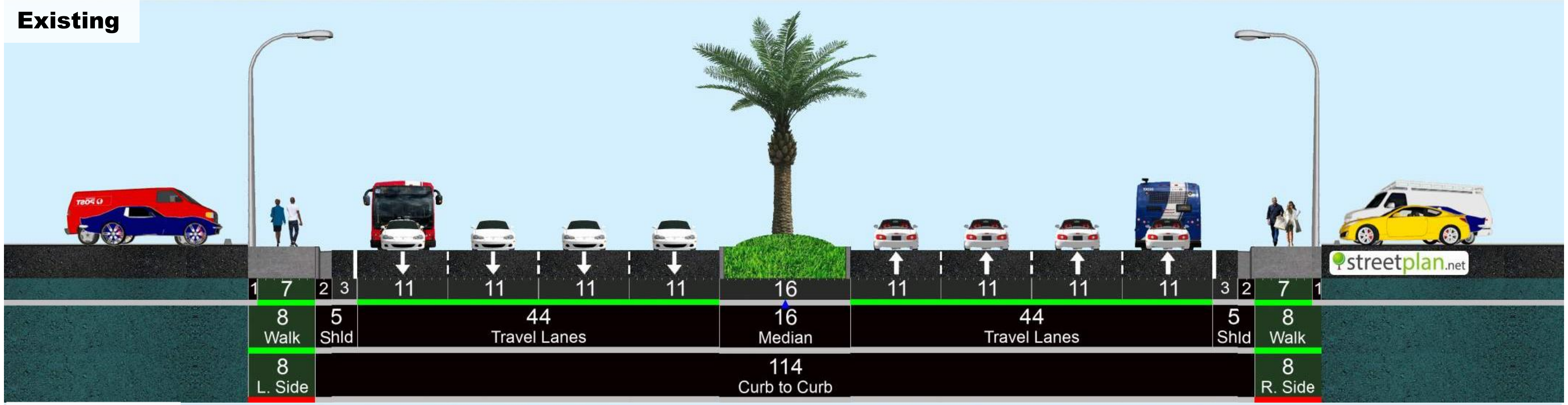
Existing

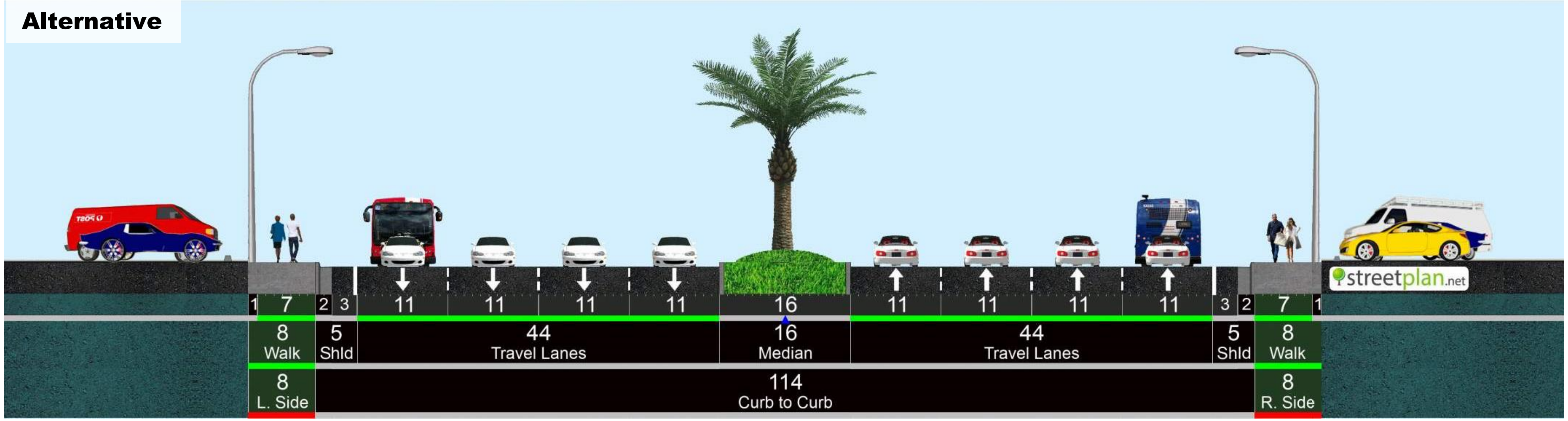


Alternative

230 feet of right-of-way

Okeechobee Blvd from Florida's Turnpike to I-95

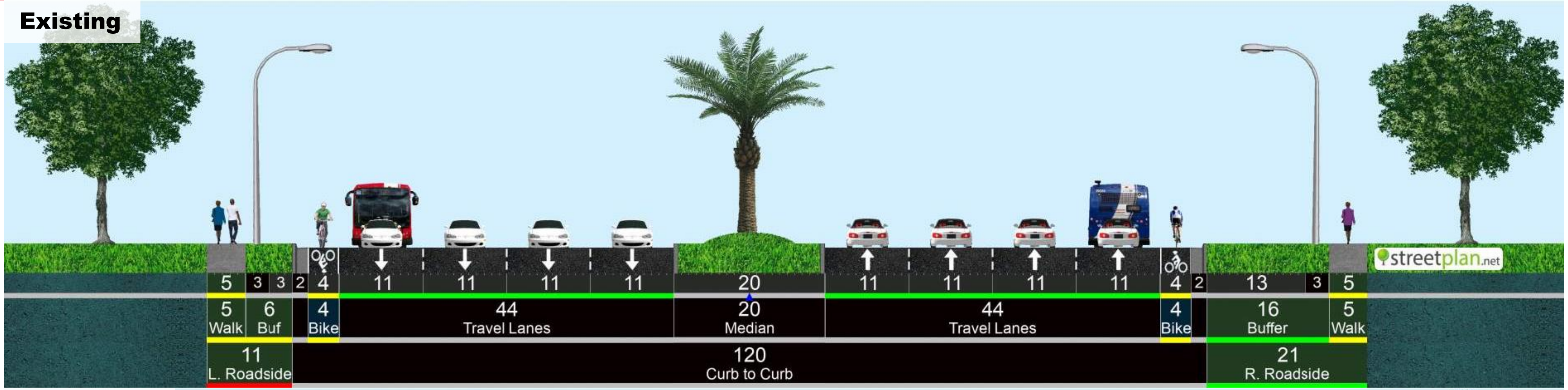


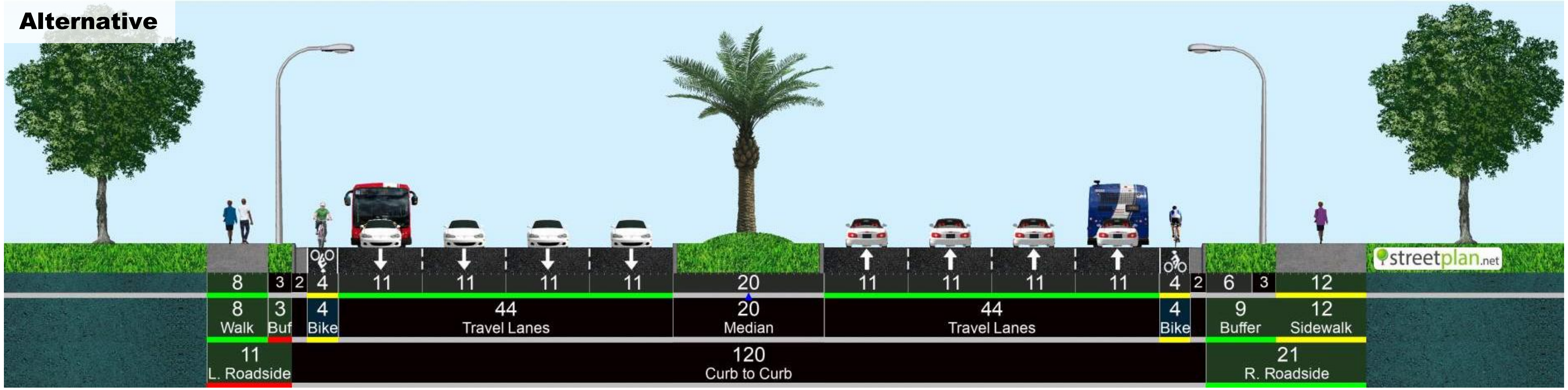


130 feet of right-of-way

Mixed Traffic Bus

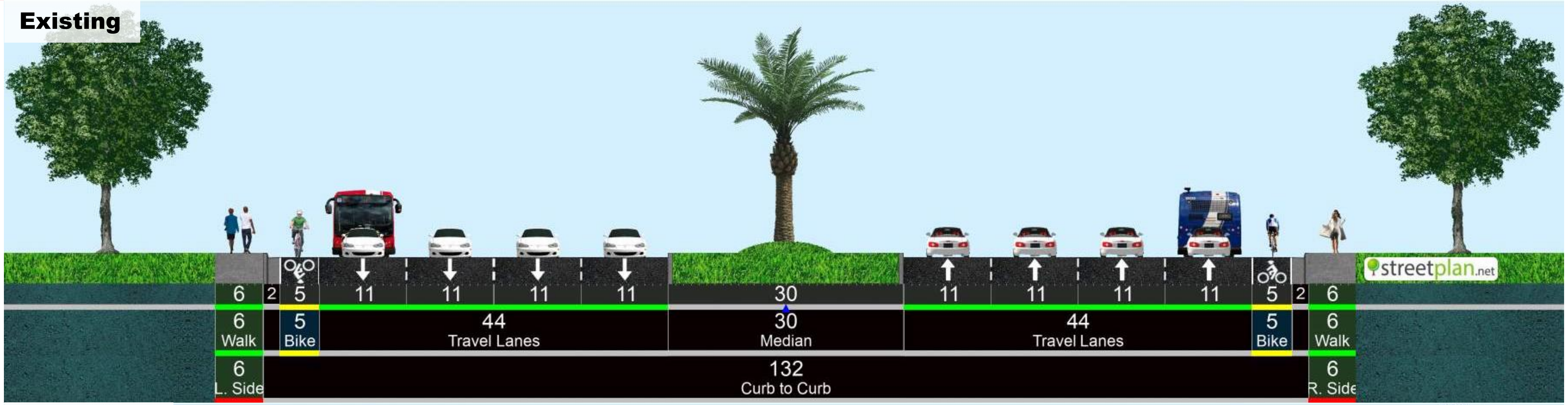
Okeechobee Blvd from I-95 to Australian Ave

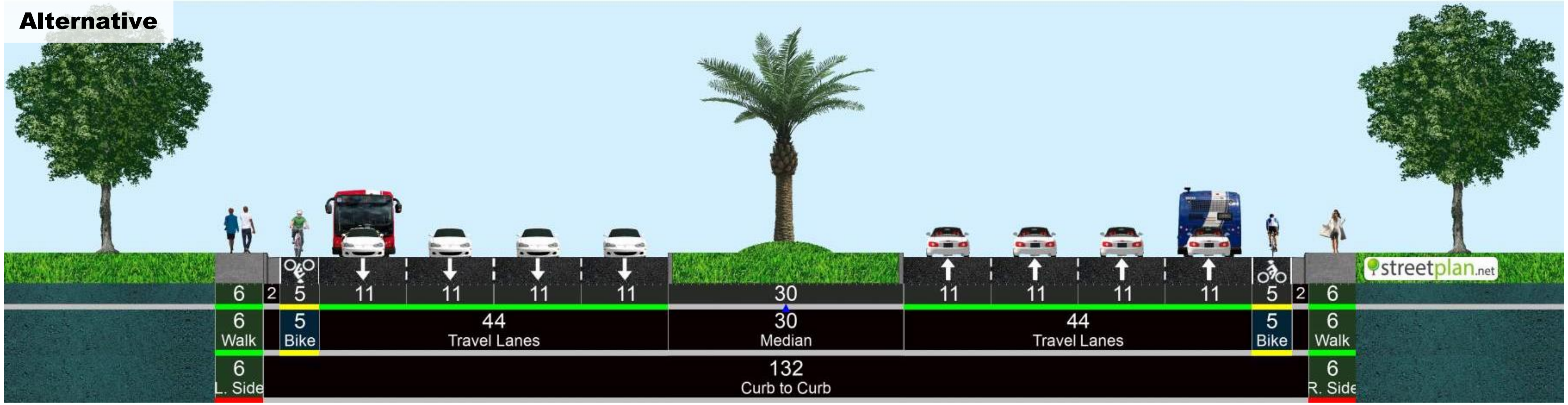




152 feet of right-of-way

Okeechobee Blvd from Australian Ave to Tamarind Ave

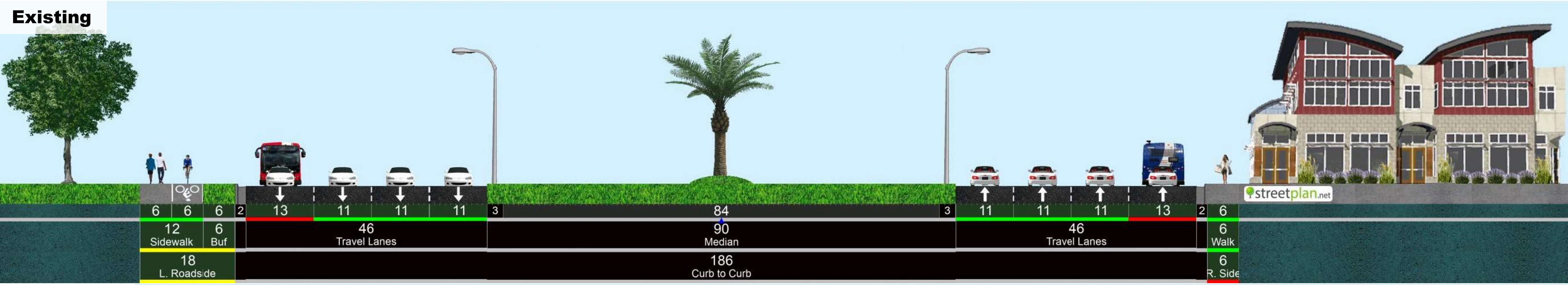




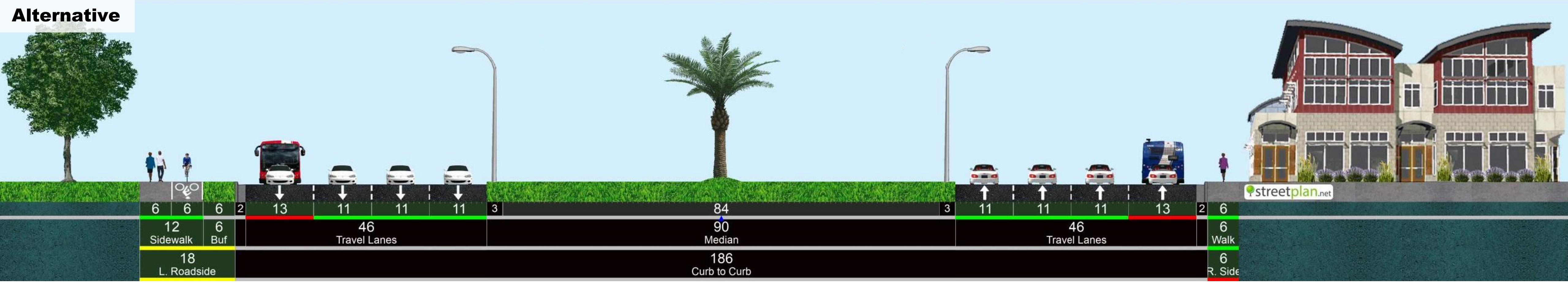
144 feet of right-of-way

Okeechobee Blvd from Tamarind Ave to Rosemary Ave

Existing



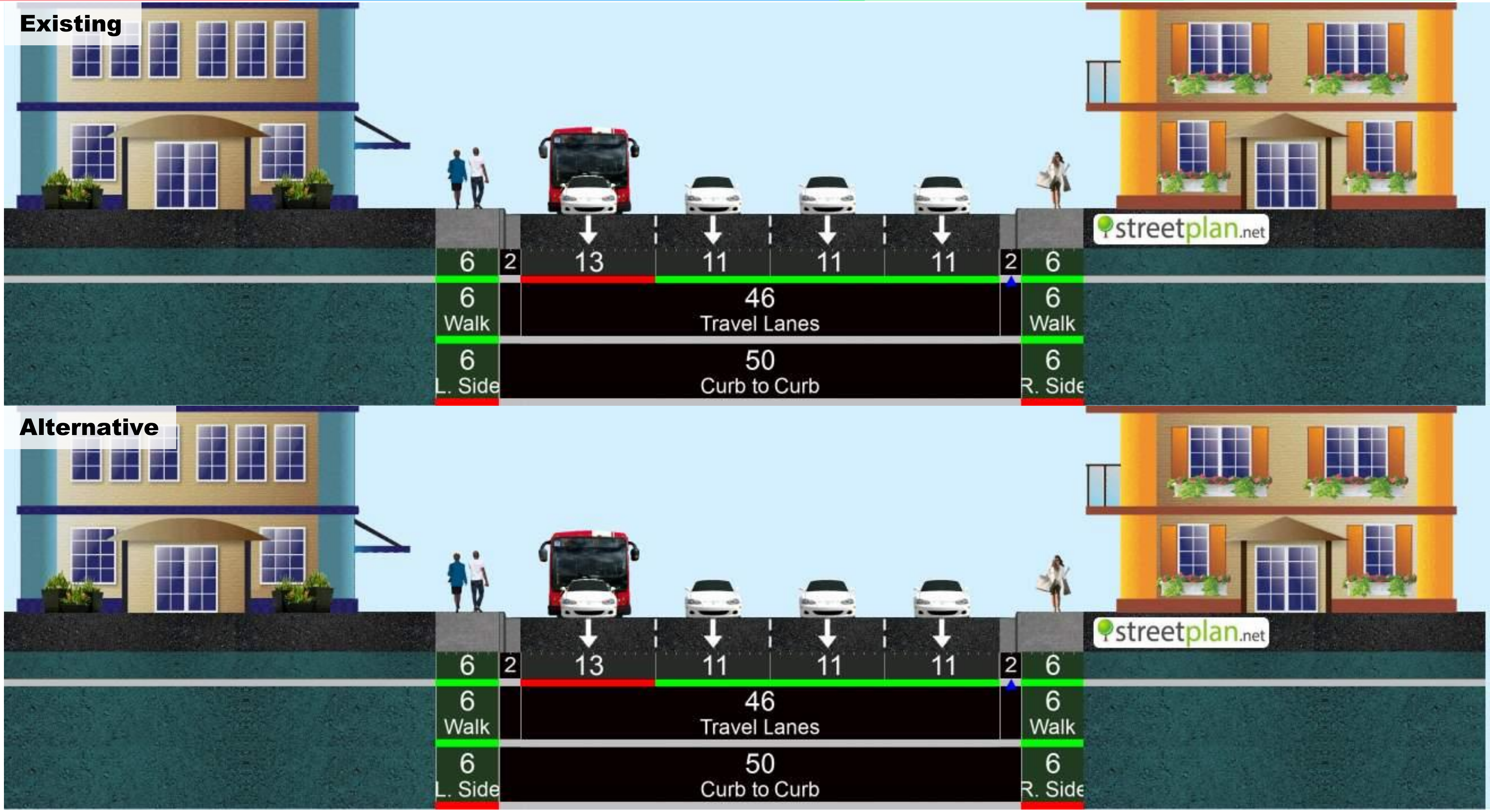
Alternative



210 feet of right-of-way

Mixed Traffic Bus

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)

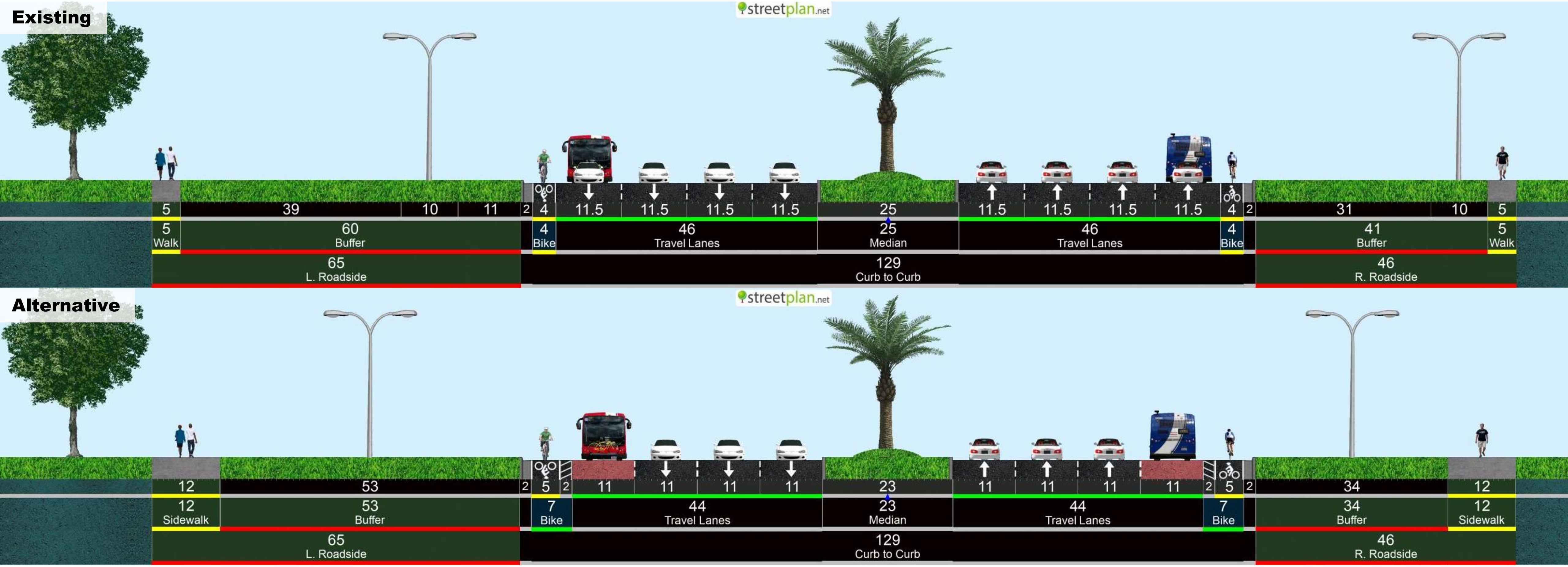


62 feet of right-of-way

Mixed Traffic Bus

Business Access Transit (BAT) Lanes

SR-7 from Wellington Mall to Southern Blvd

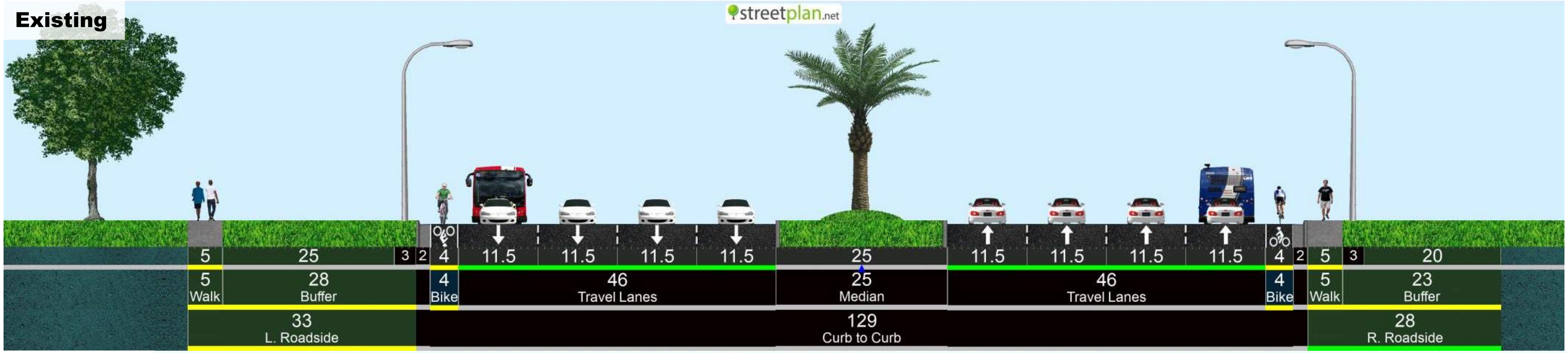


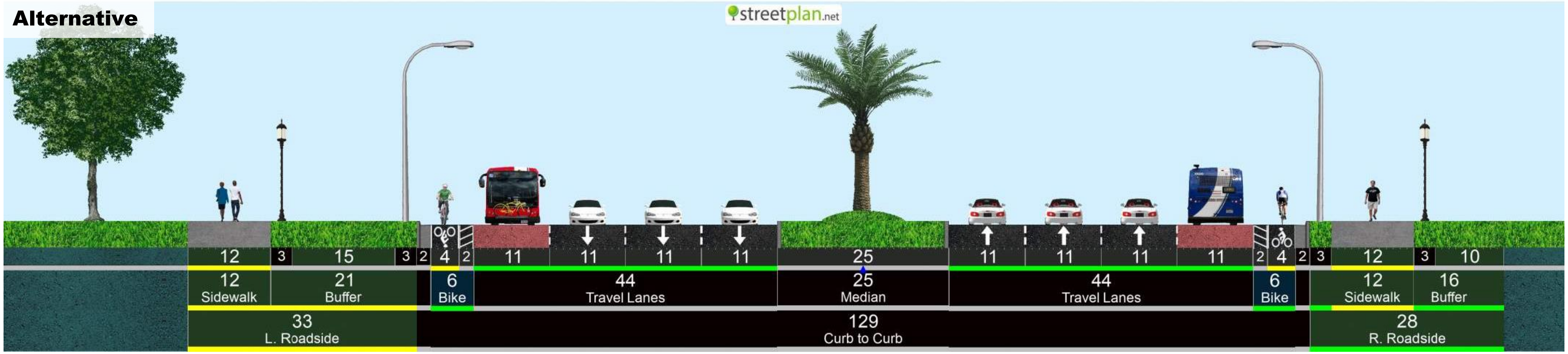
240 feet of right-of-way

SR-7 from Southern Blvd to Weisman Way

280 feet of right-of-way

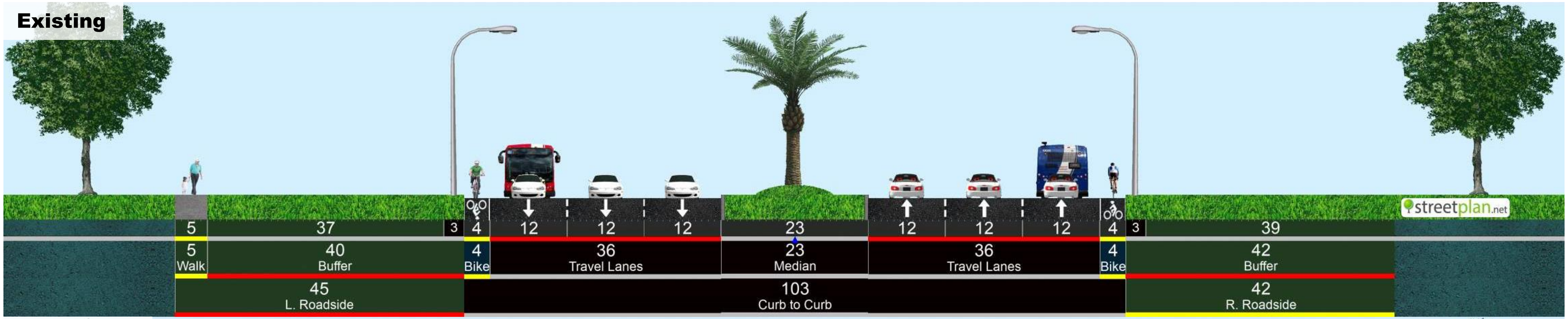
SR-7 from Weisman Way to Belvedere Rd

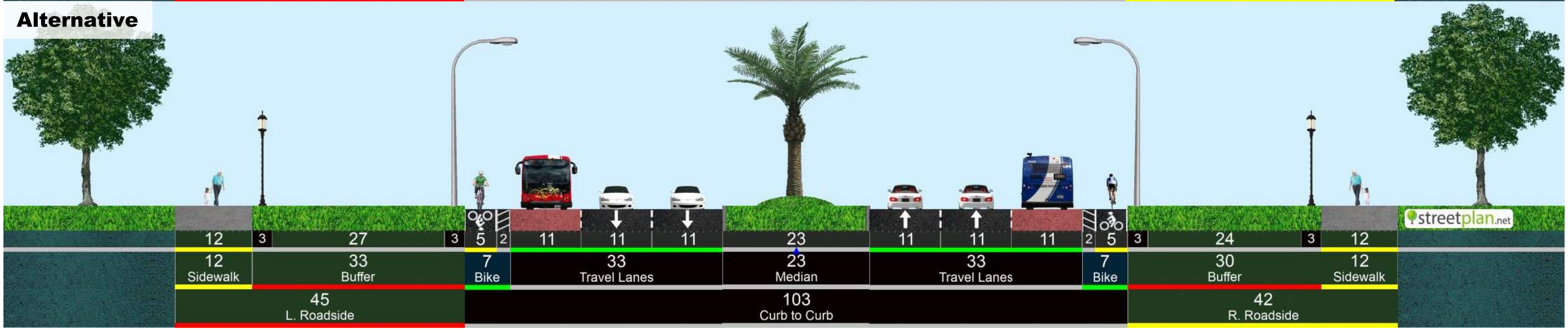




190 feet of right-of-way

SR-7 from Belvedere Rd to Okeechobee Blvd



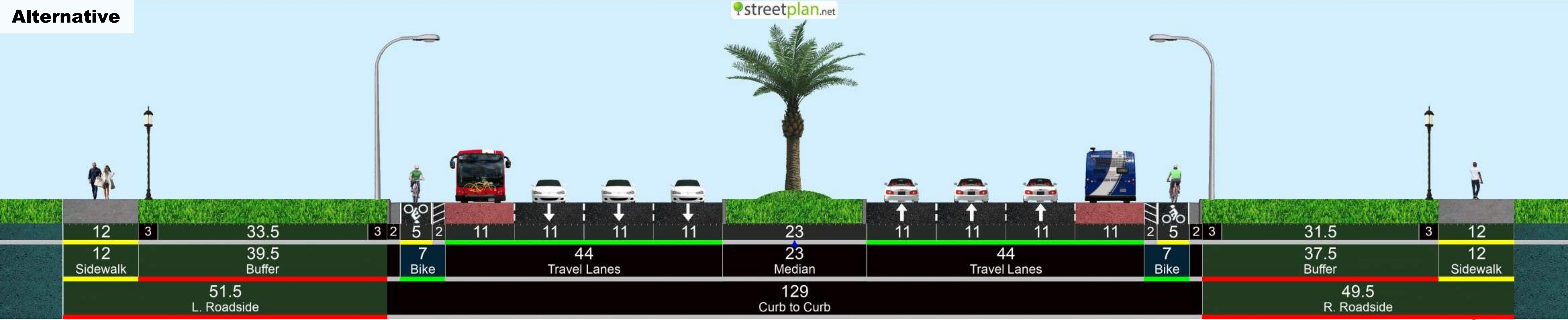


190 feet of right-of-way

Okeechobee Blvd from SR-7 to Florida's Turnpike

Existing

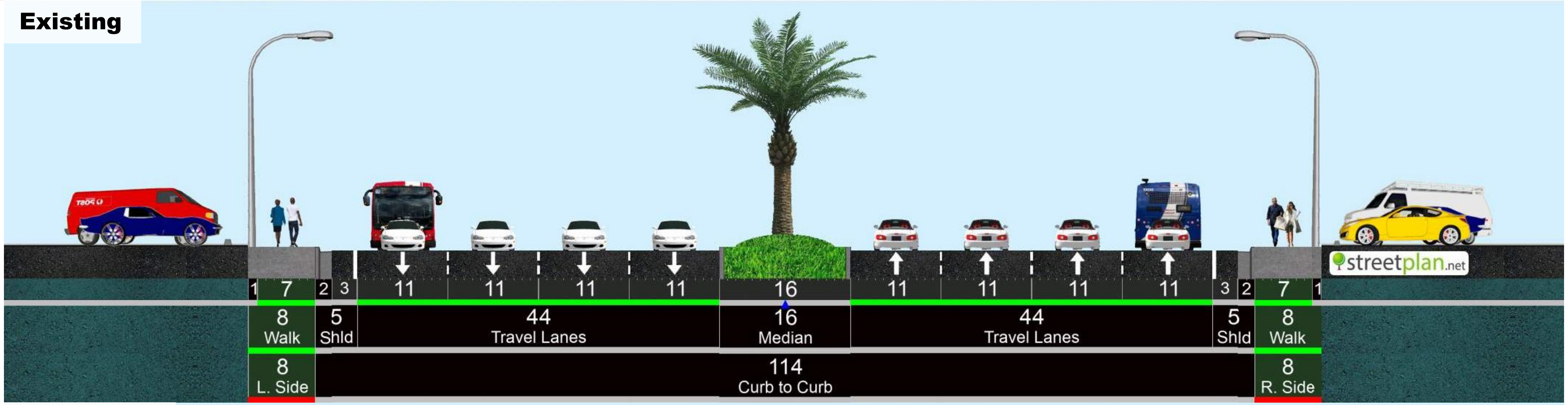
Alternative



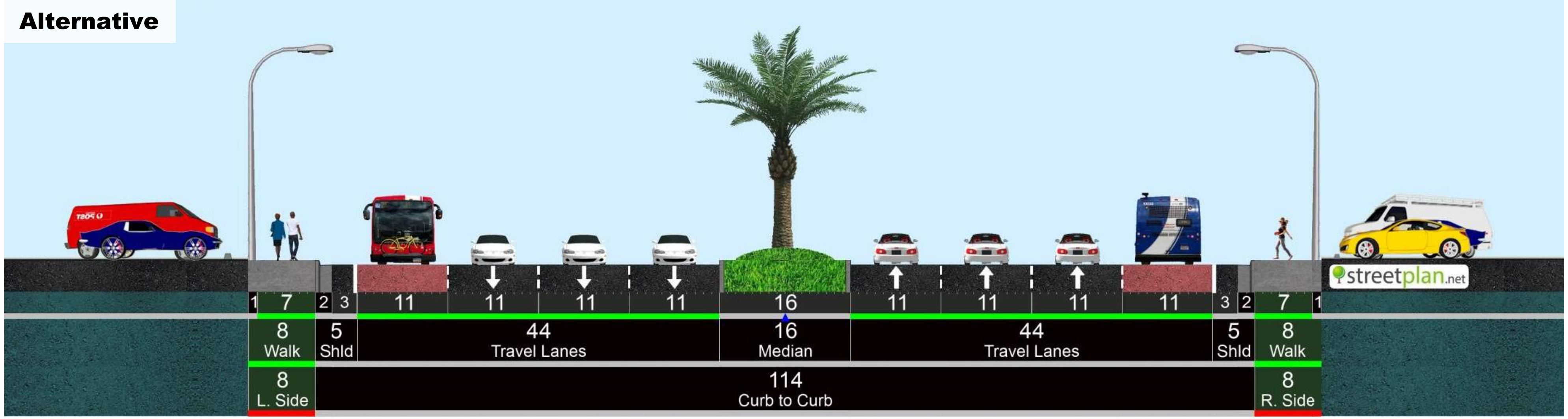
230 feet of right-of-way

Okeechobee Blvd from Florida's Turnpike to I-95

Existing

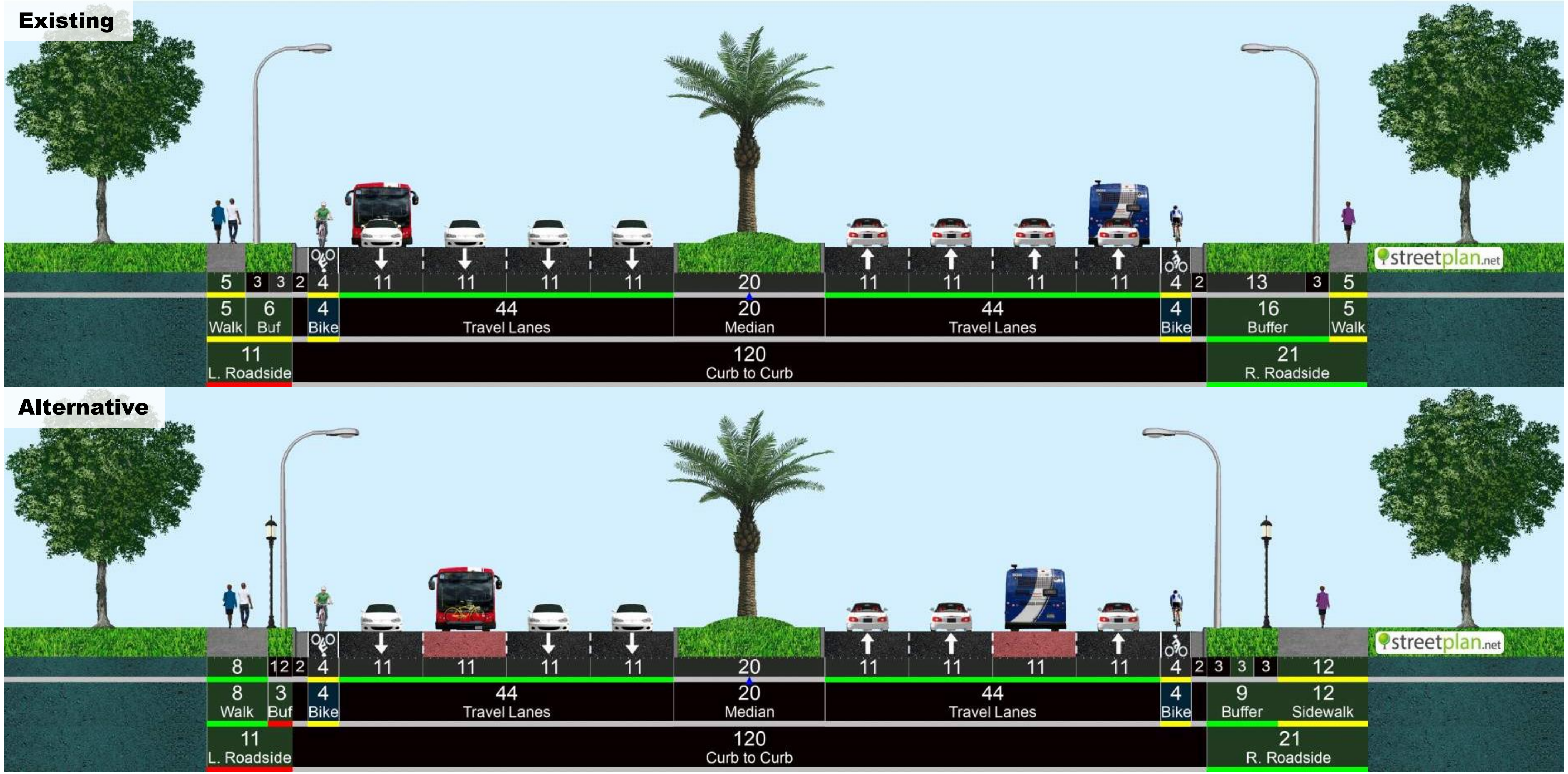


Alternative



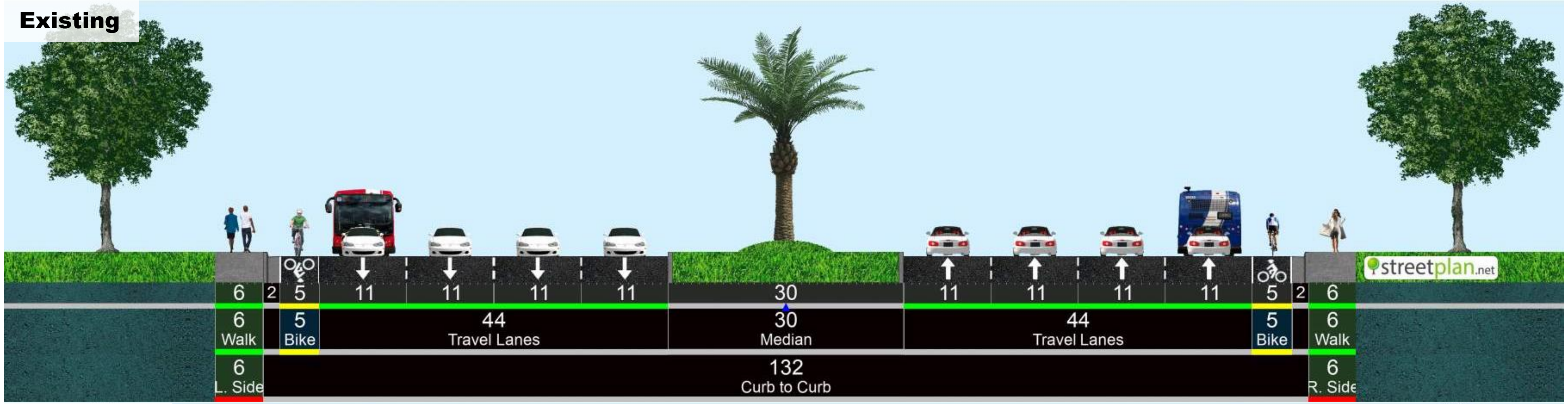
130 feet of right-of-way

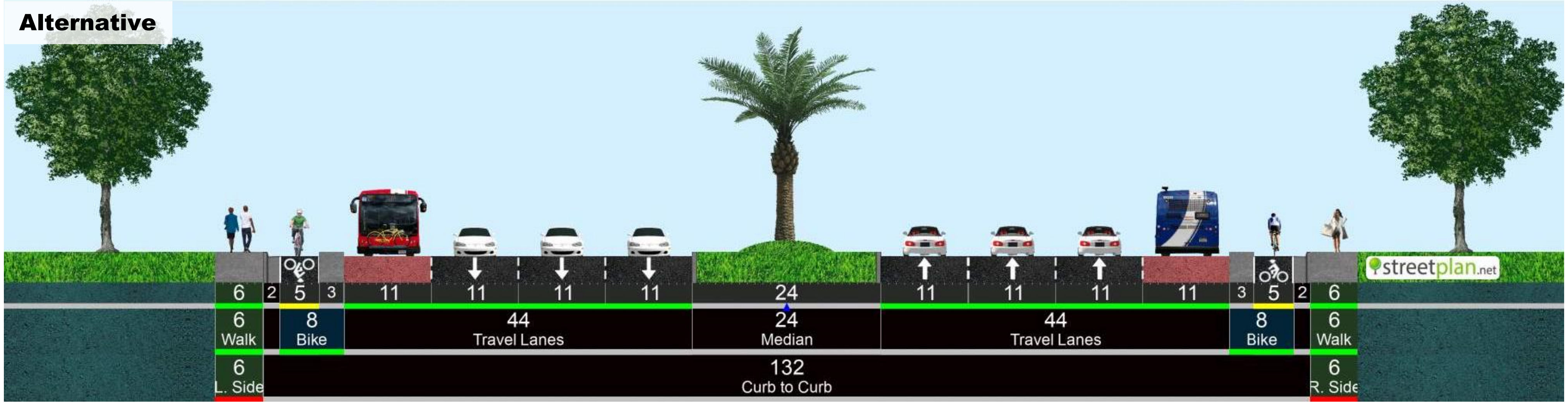
Okeechobee Blvd from I-95 to Australian Ave



152 feet of right-of-way

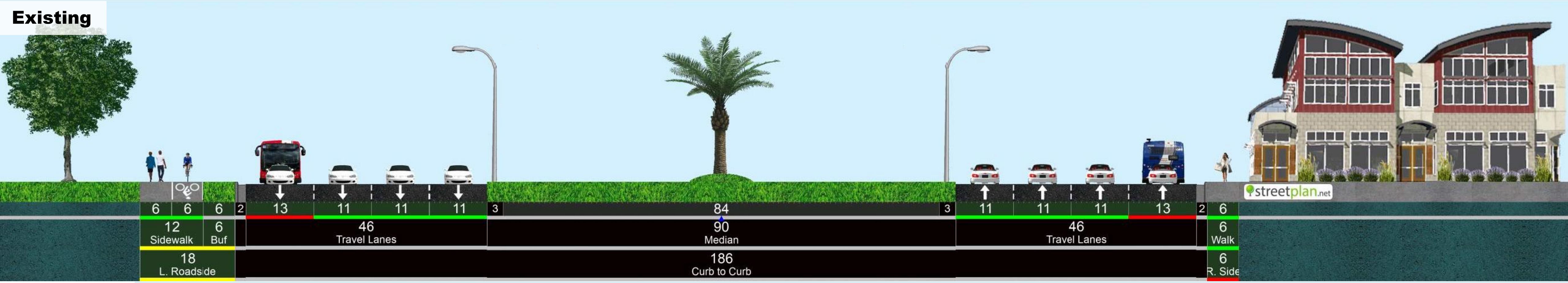
Okeechobee Blvd from Australian Ave to Tamarind Ave





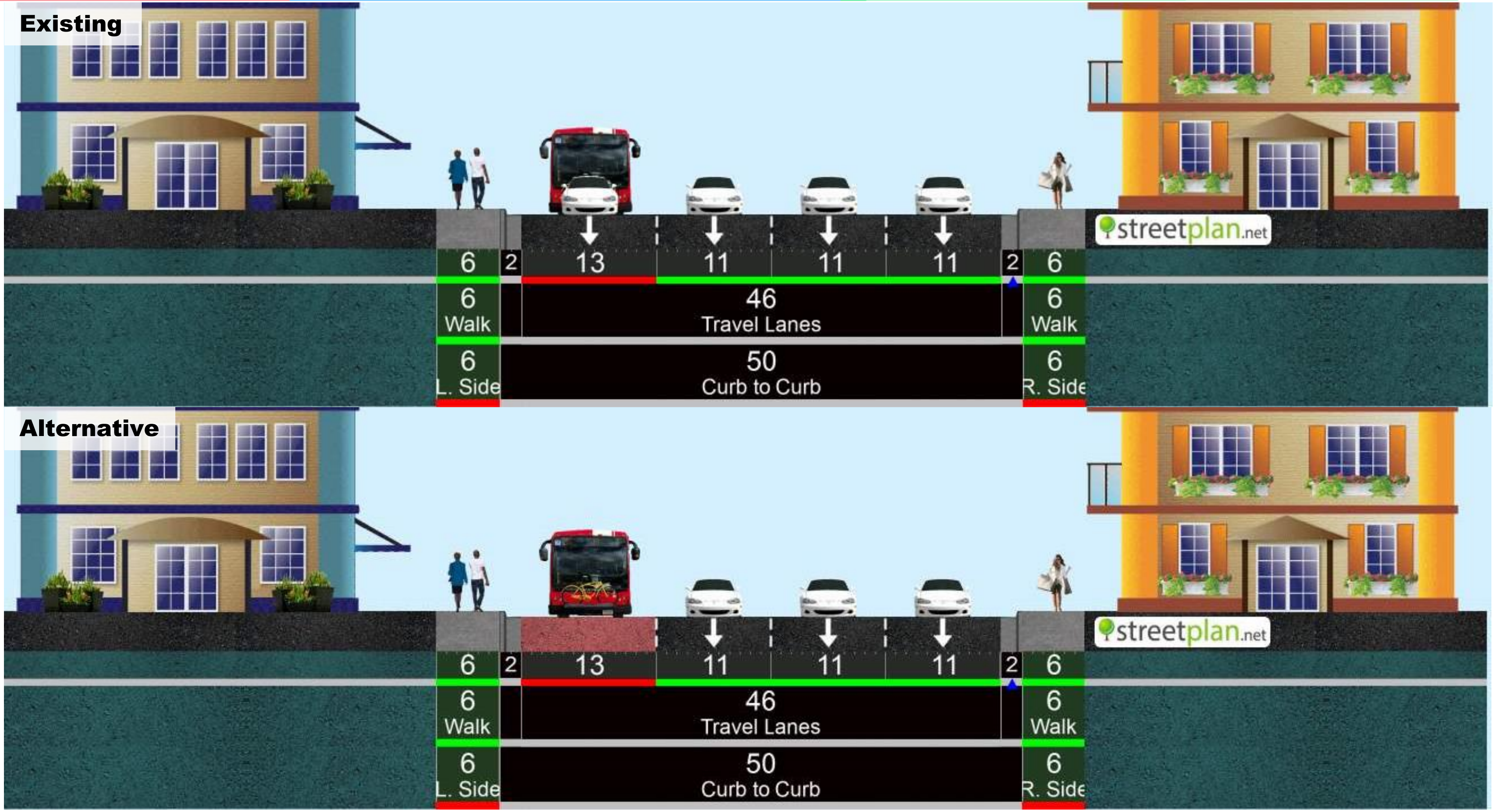
144 feet of right-of-way

Okeechobee Blvd from Tamarind Ave to Rosemary Ave



210 feet of right-of-way

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)

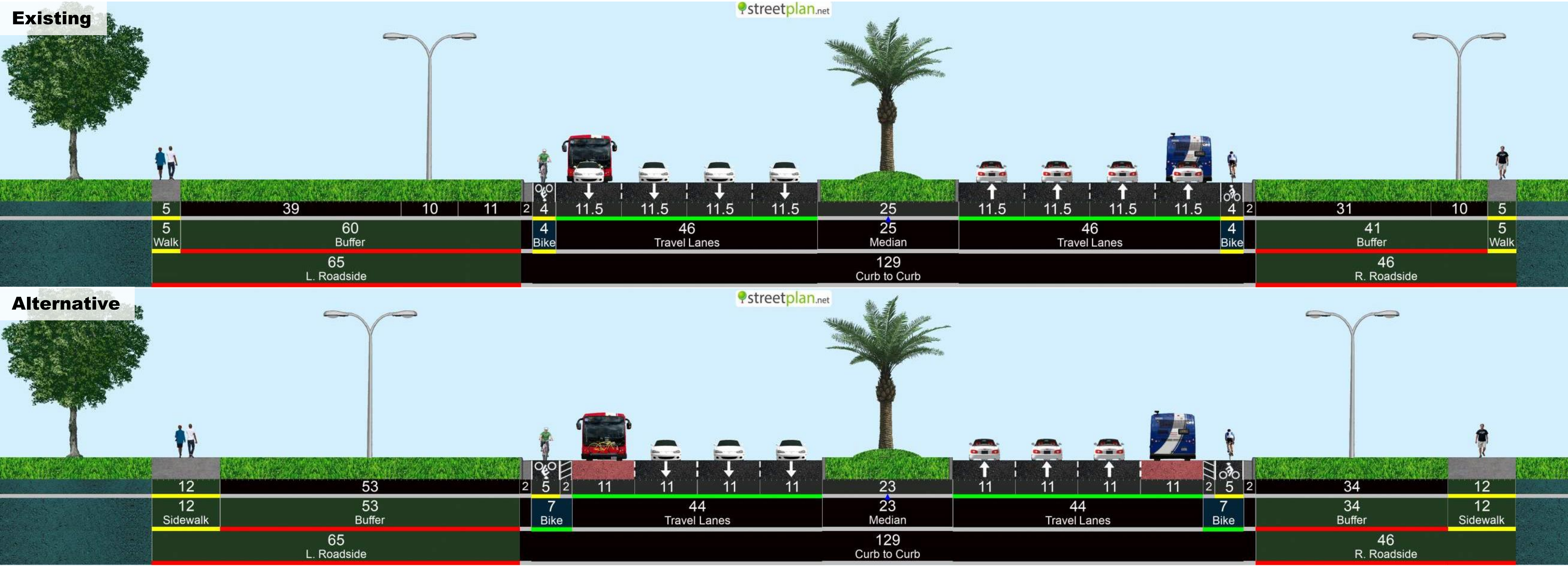


62 feet of right-of-way

Reversible Lanes

with BAT Lanes

SR-7 from Wellington Mall to Southern Blvd



240 feet of right-of-way

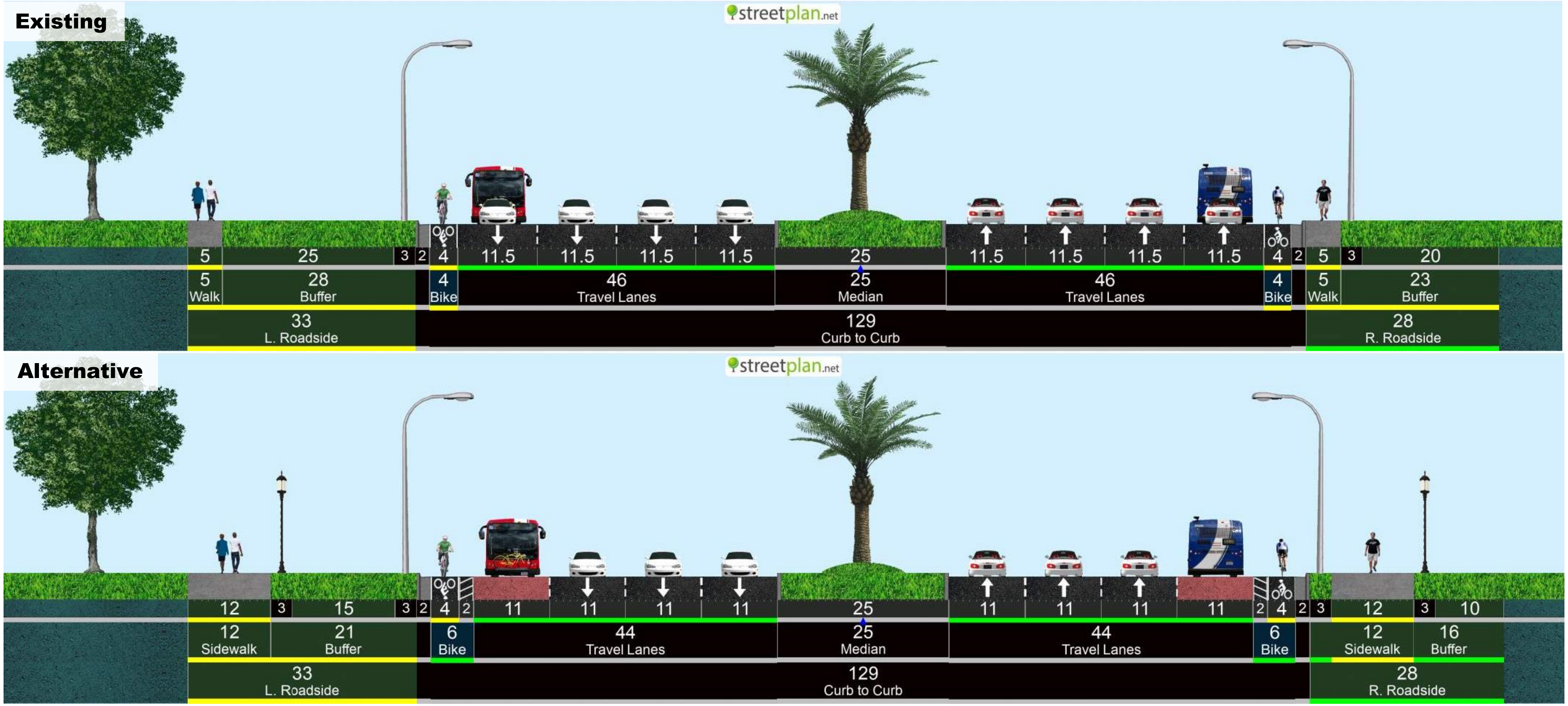
SR-7 from Southern Blvd to Weisman Way

Existing

Alternative

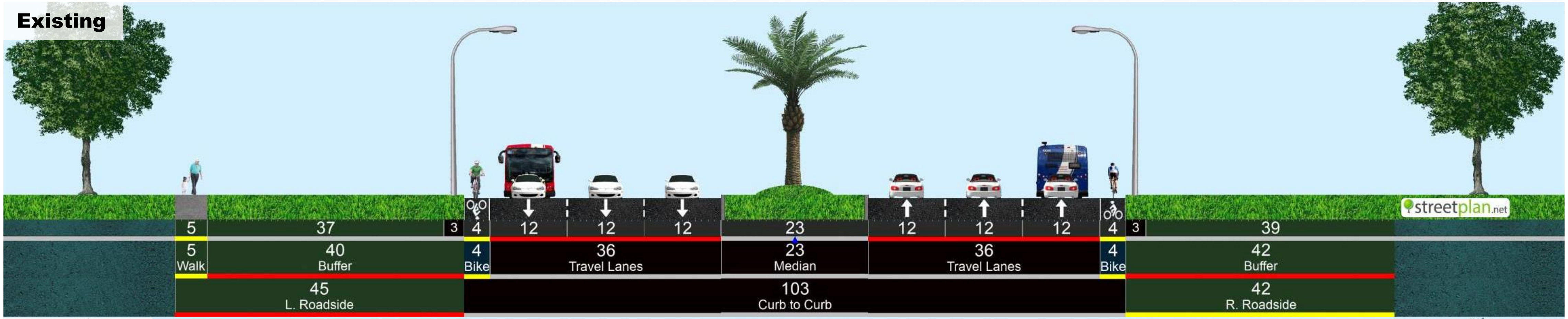
280 feet of right-of-way

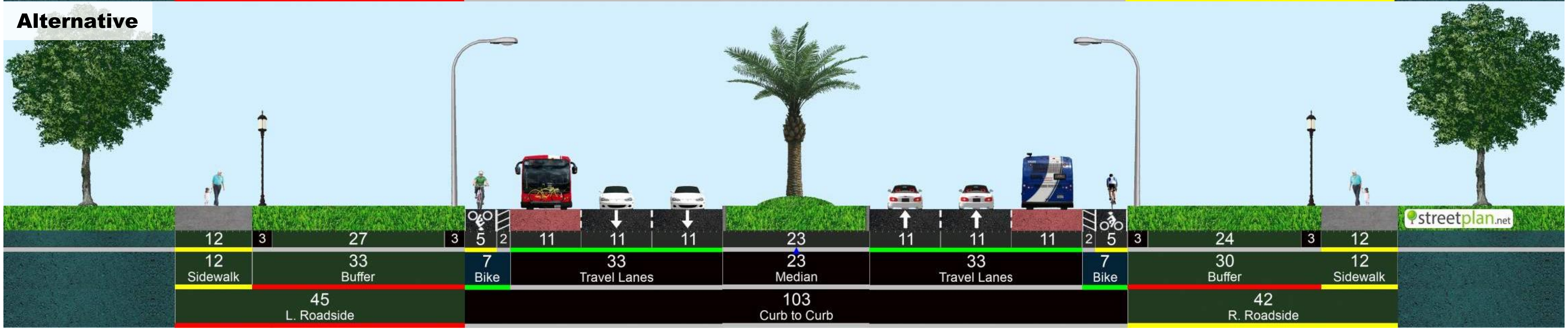
SR-7 from Weisman Way to Belvedere Rd



190 feet of right-of-way

SR-7 from Belvedere Rd to Okeechobee Blvd

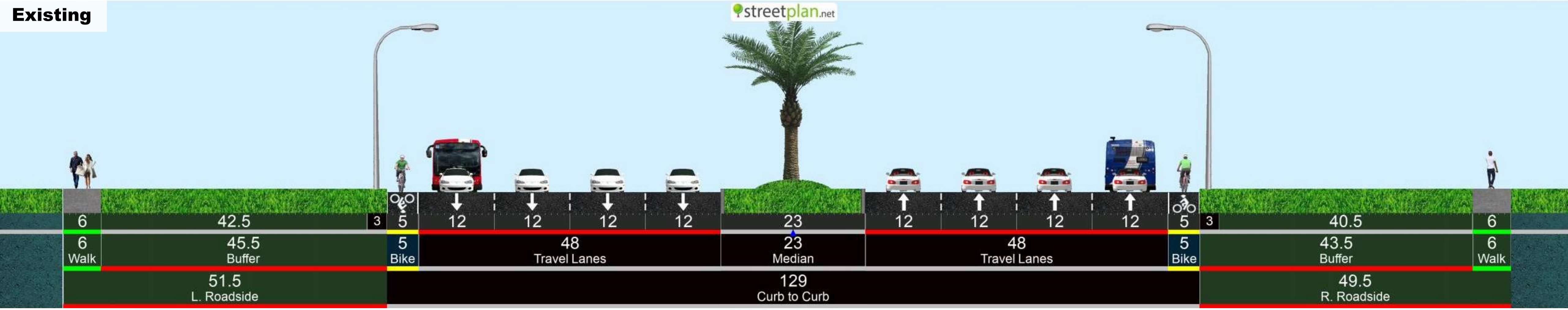




190 feet of right-of-way

Okeechobee Blvd from SR-7 to Florida's Turnpike

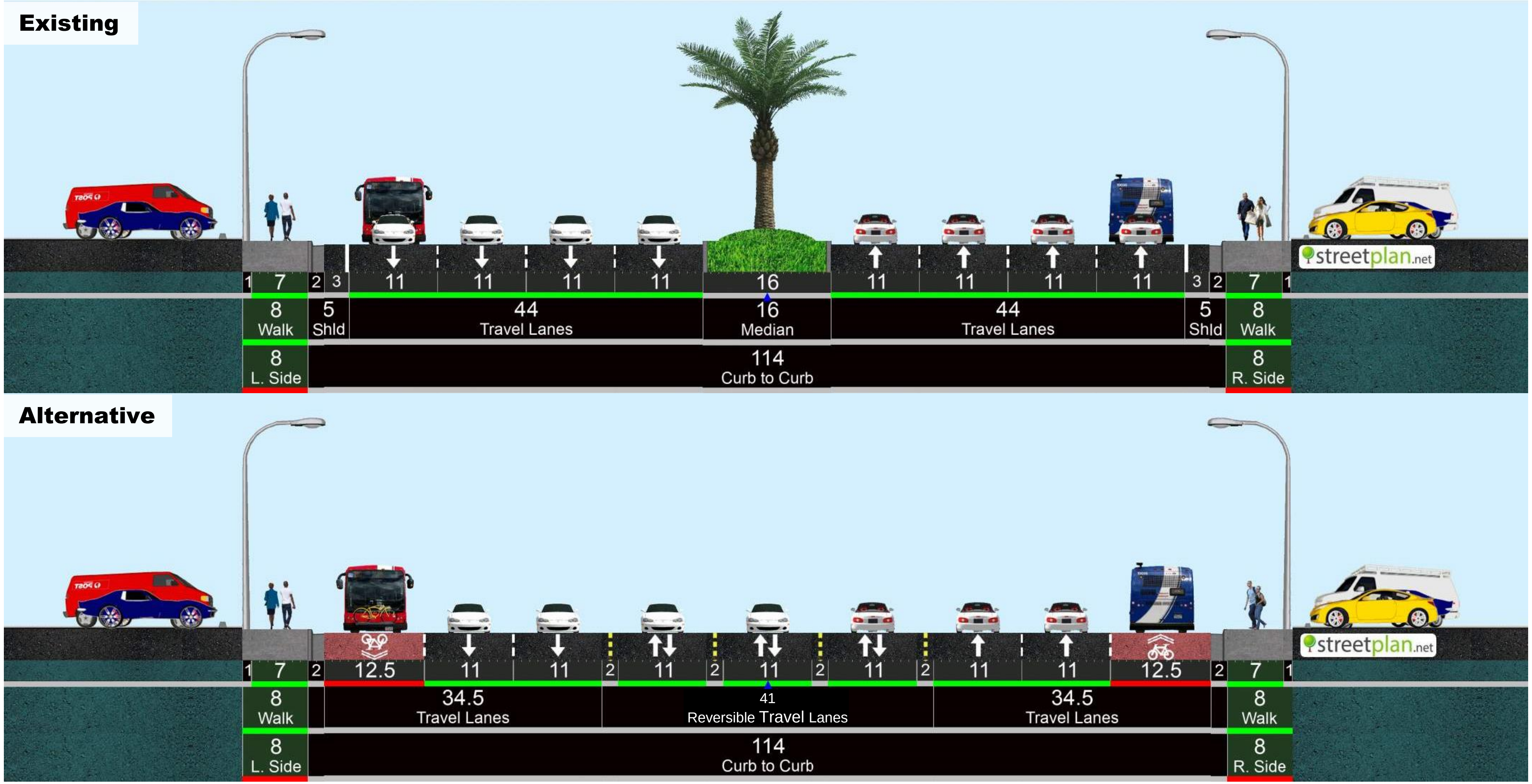
Existing



Alternative

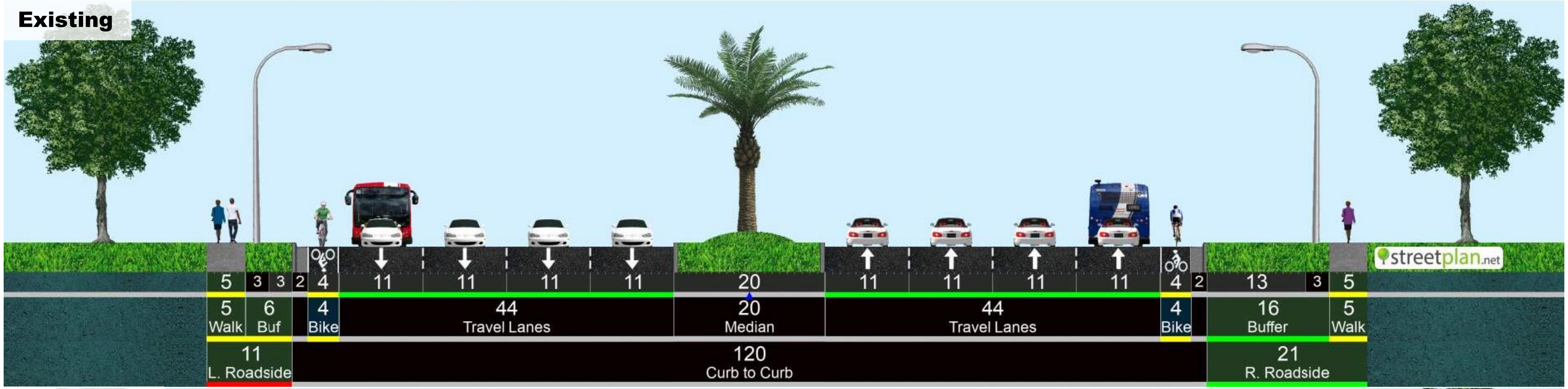
230 feet of right-of-way

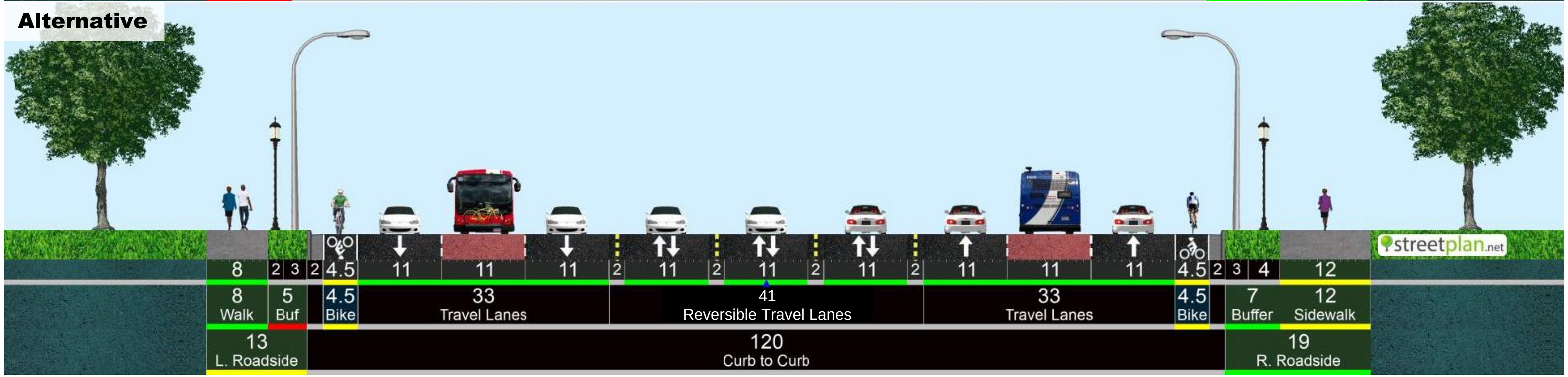
Okeechobee Blvd from Florida's Turnpike to I-95



130 feet of right-of-way

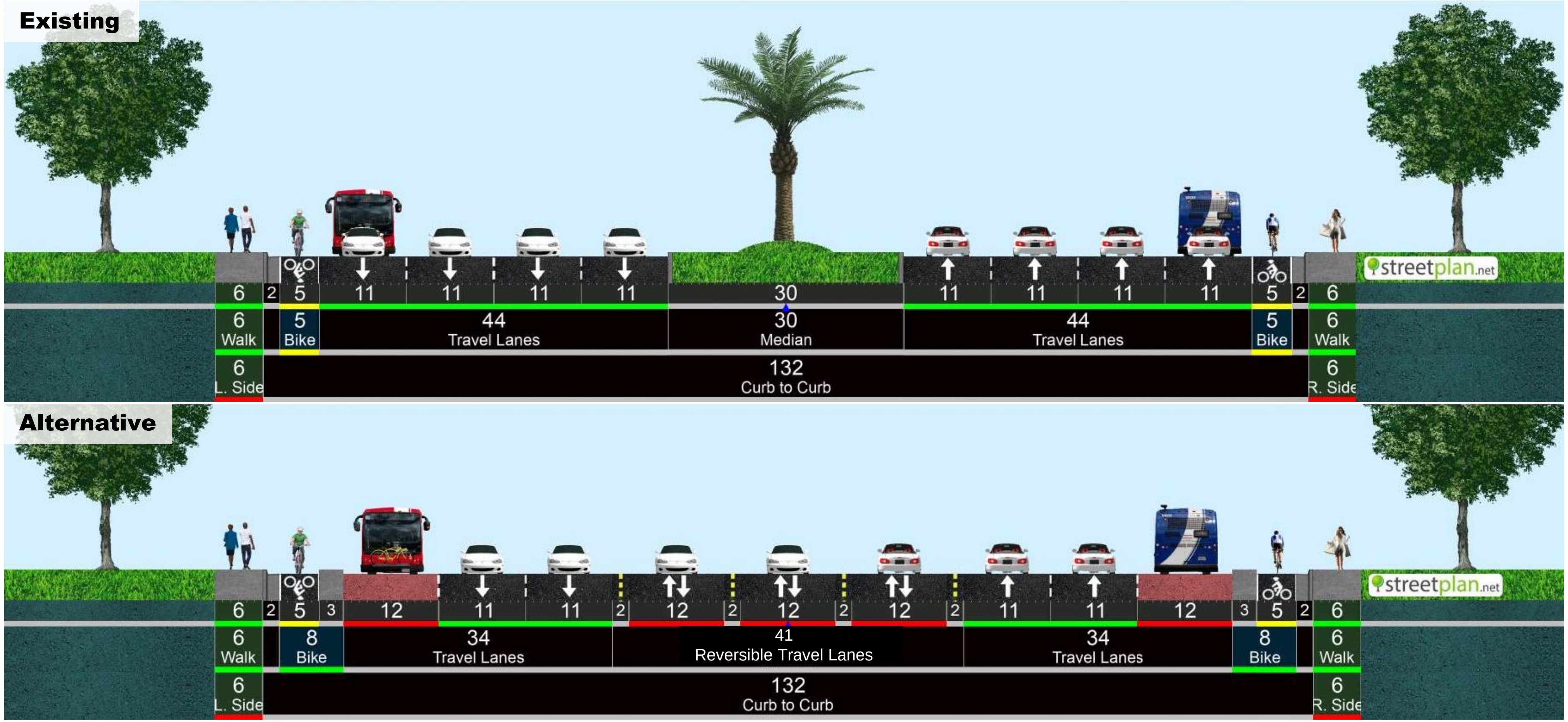
Okeechobee Blvd from I-95 to Australian Ave





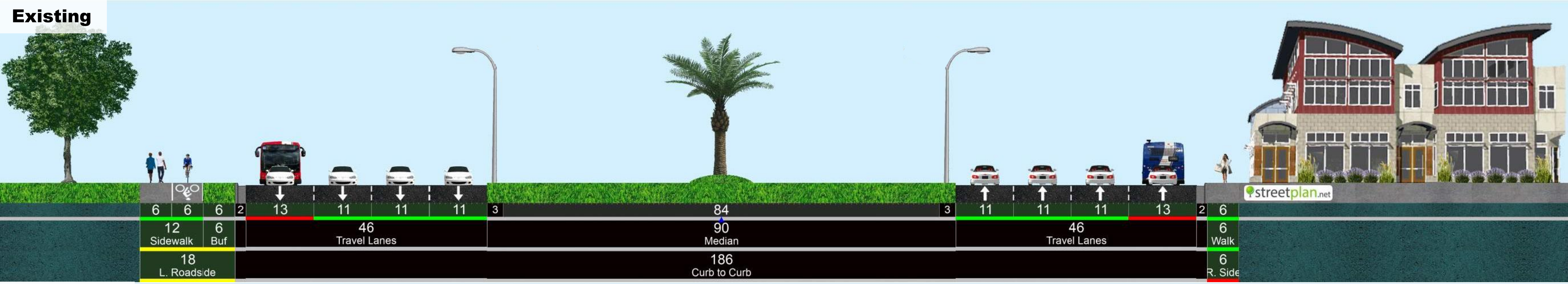
152 feet of right-of-way

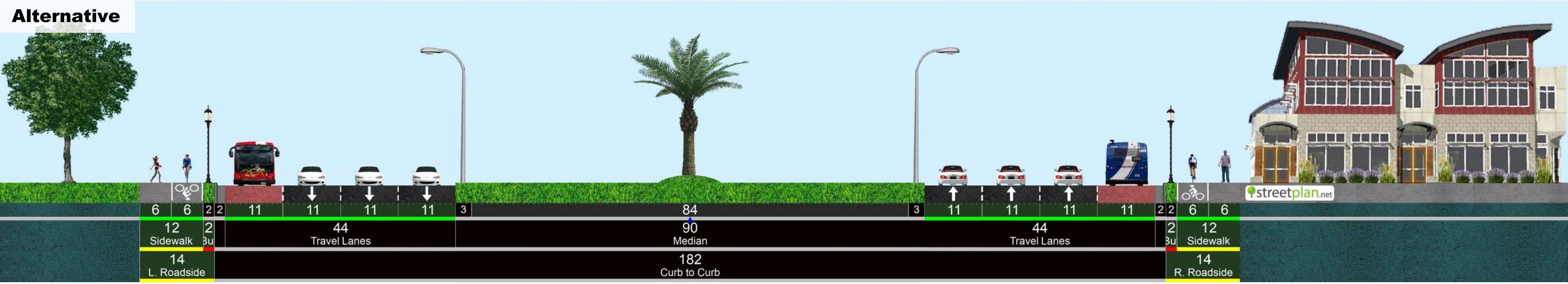
Okeechobee Blvd from Australian Ave to Tamarind Ave



144 feet of right-of-way

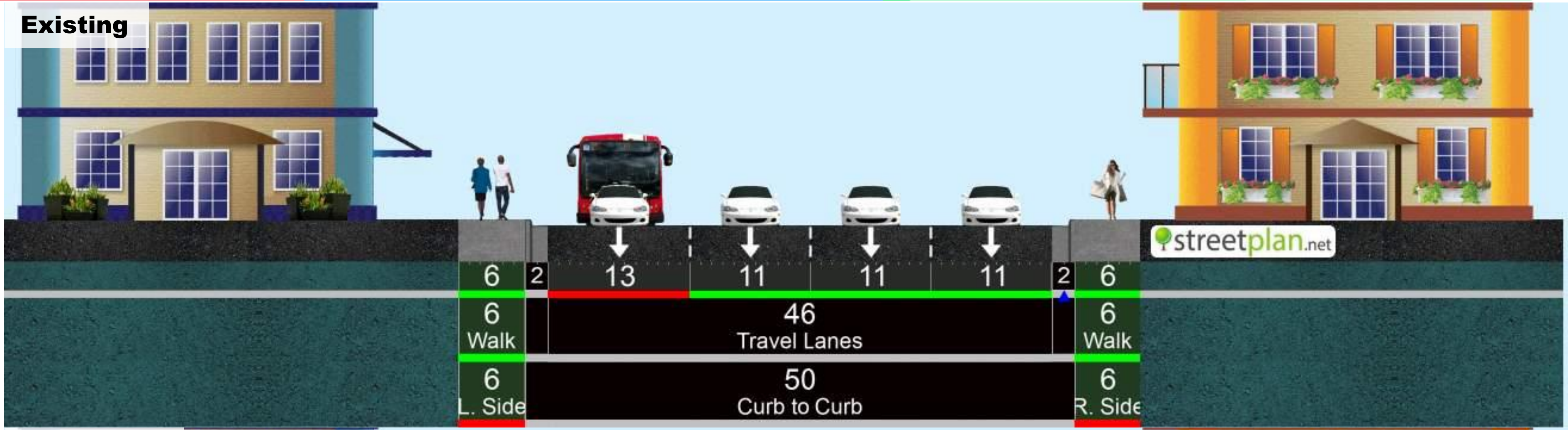
Okeechobee Blvd from Tamarind Ave to Rosemary Ave

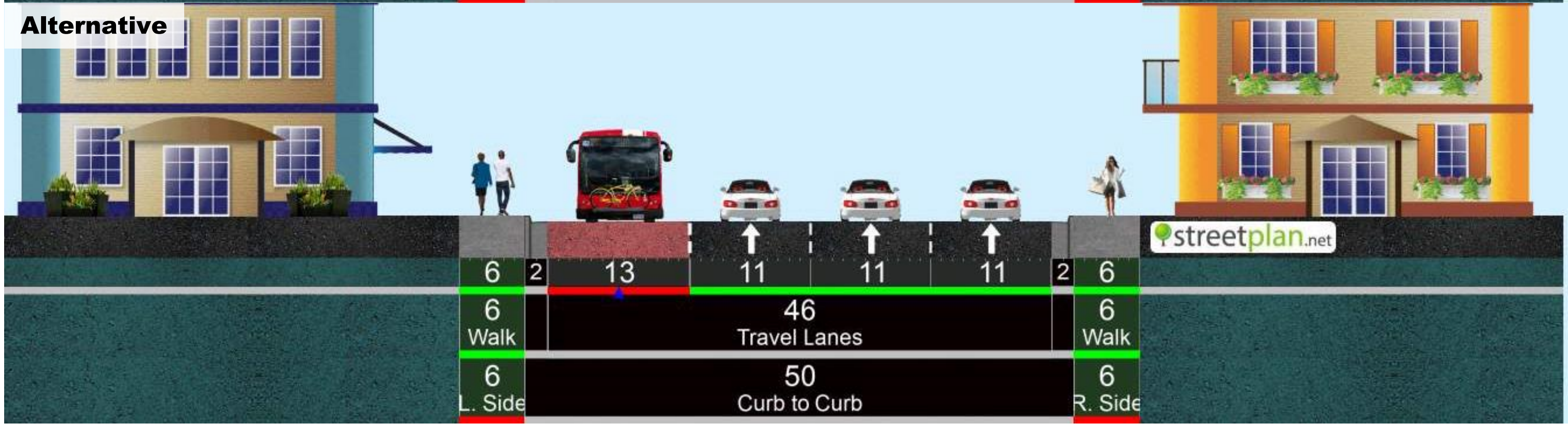




210 feet of right-of-way

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)

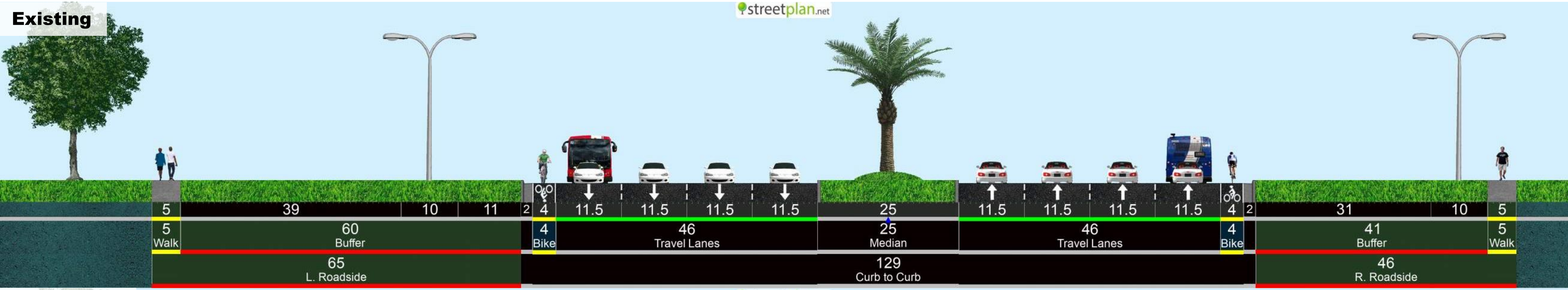


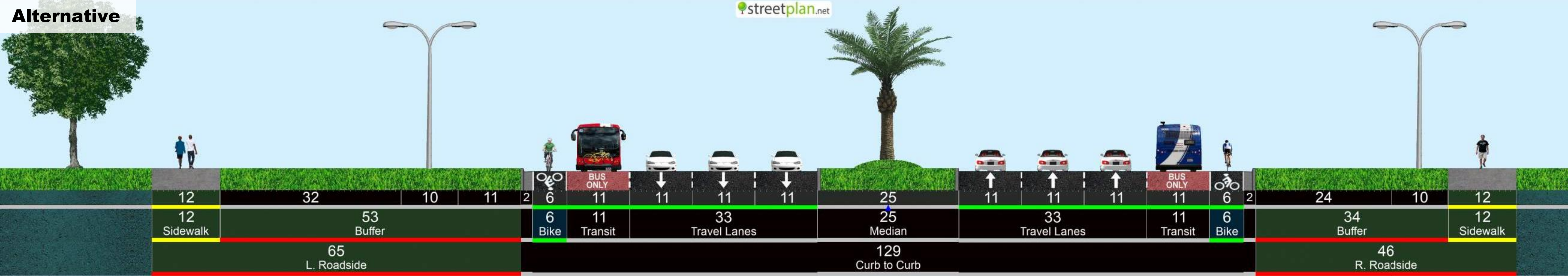


62 feet of right-of-way

Dedicated Lane Bus Rapid Transit (BRT)

SR-7 from Wellington Mall to Southern Blvd



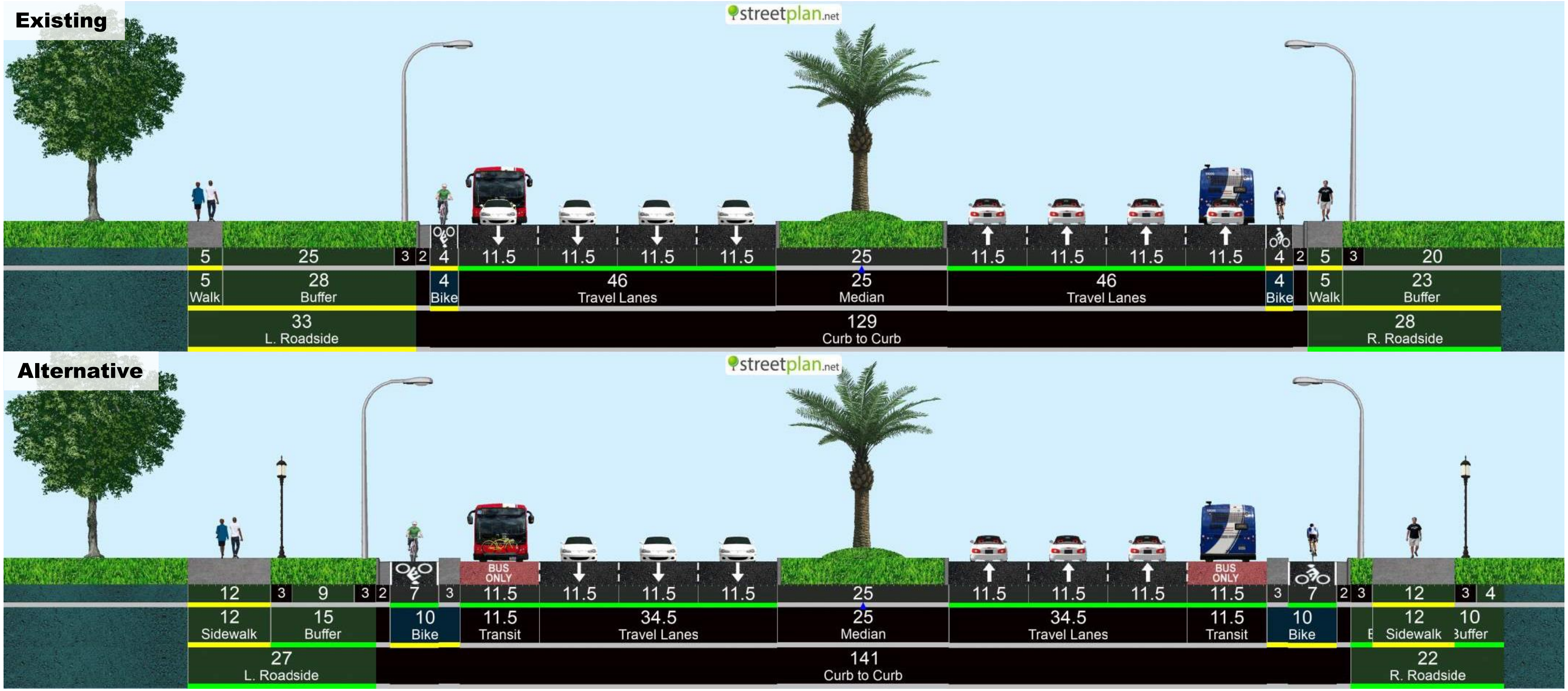


240 feet of right-of-way

SR-7 from Southern Blvd to Weisman Way

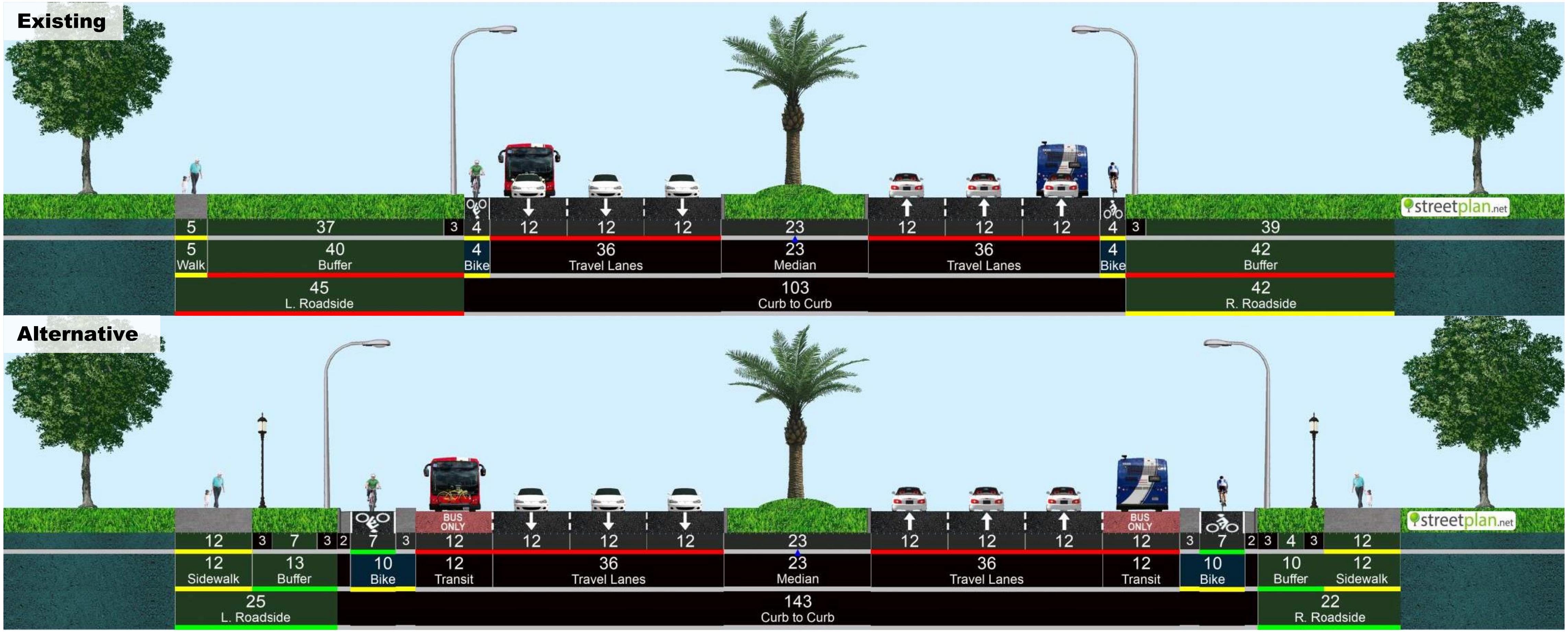
280 feet of right-of-way

SR-7 from Weisman Way to Belvedere Rd



190 feet of right-of-way

SR-7 from Belvedere Rd to Okeechobee Blvd



190 feet of right-of-way

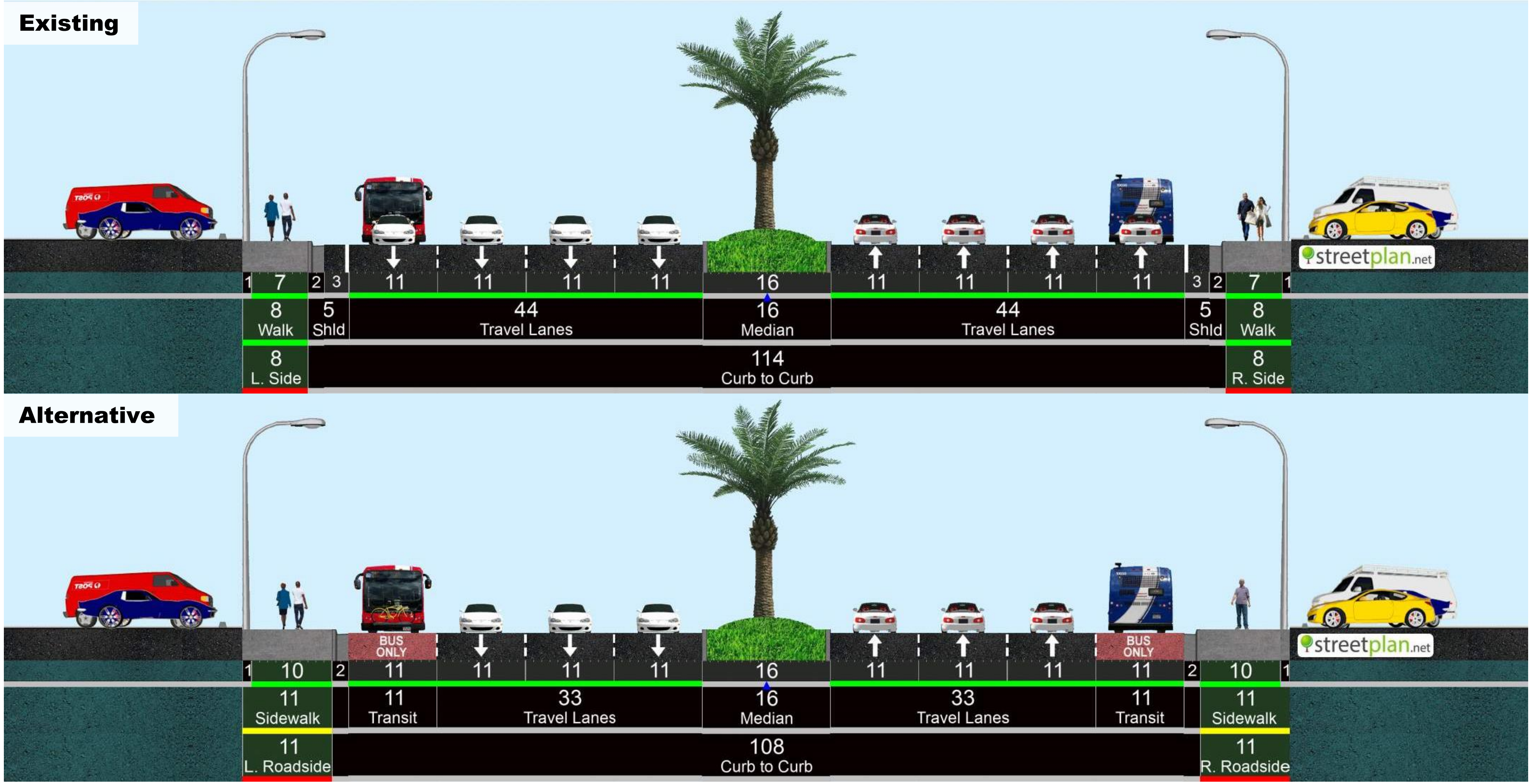
Okeechobee Blvd from SR-7 to Florida's Turnpike

Existing

Alternative

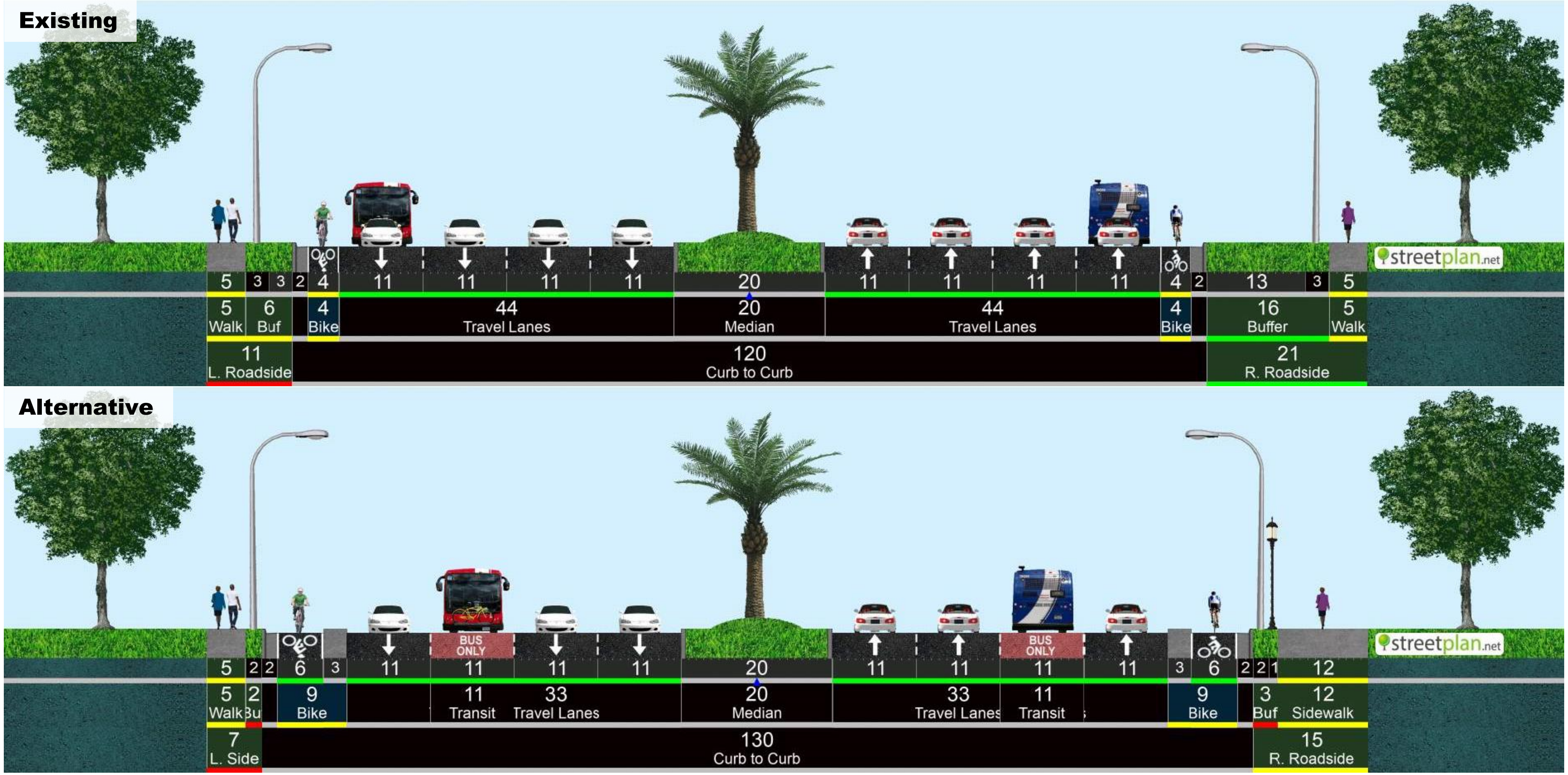
230 feet of right-of-way

Okeechobee Blvd from Florida's Turnpike to I-95



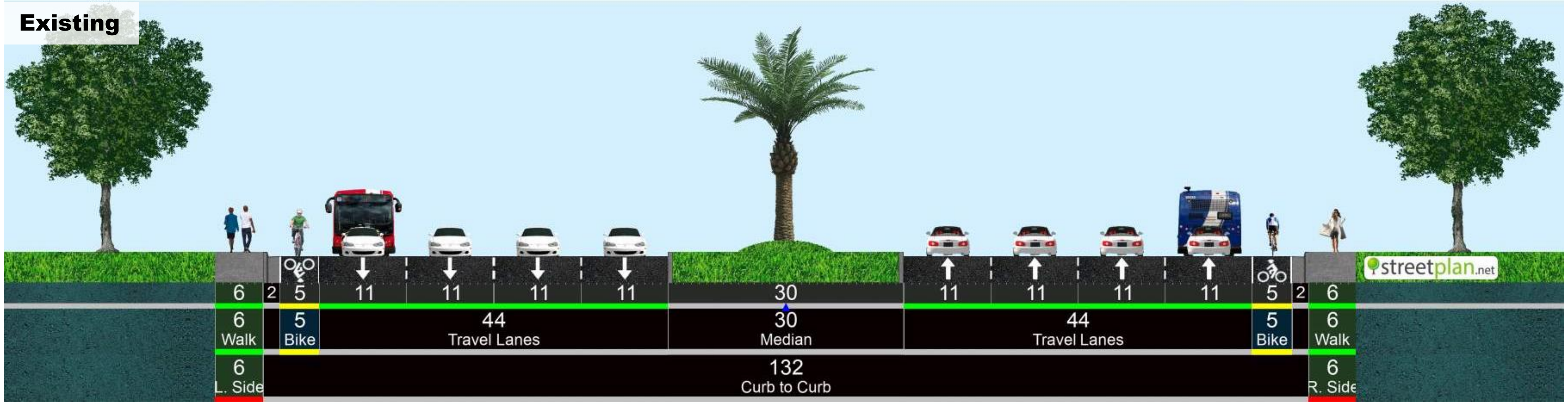
130 feet of right-of-way

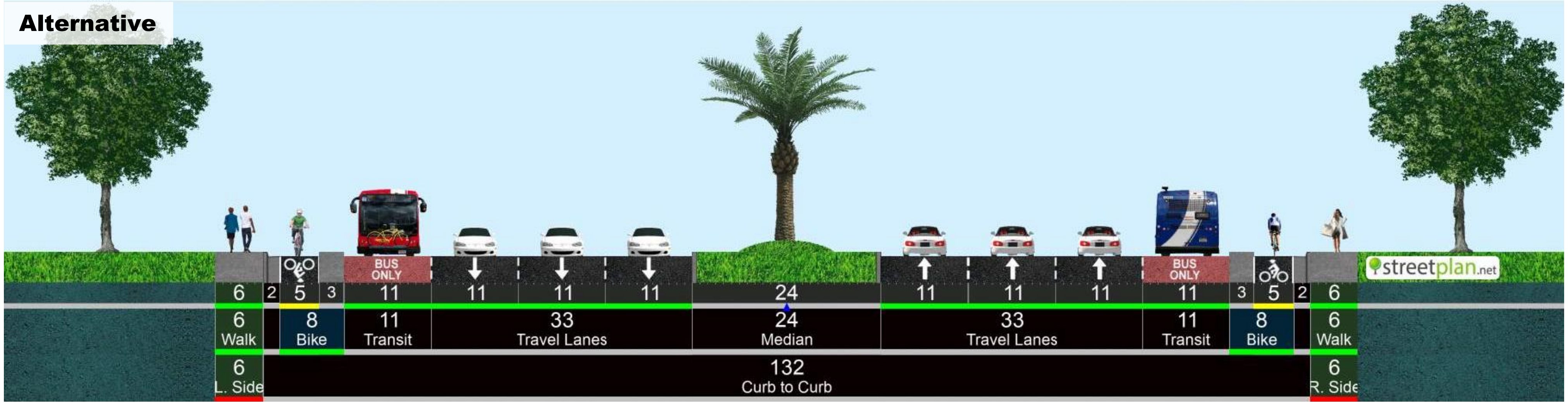
Okeechobee Blvd from I-95 to Australian Ave



152 feet of right-of-way

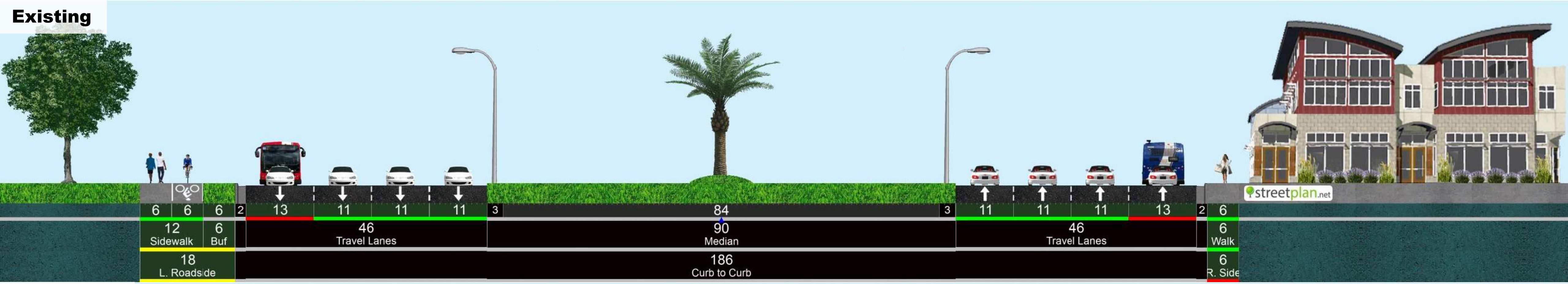
Okeechobee Blvd from Australian Ave to Tamarind Ave





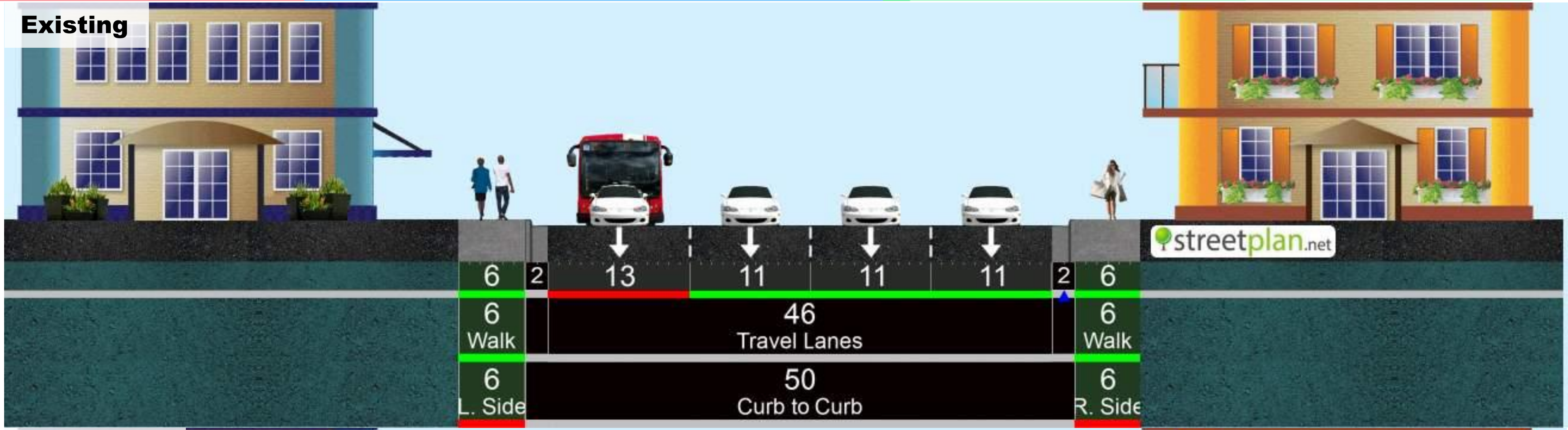
144 feet of right-of-way

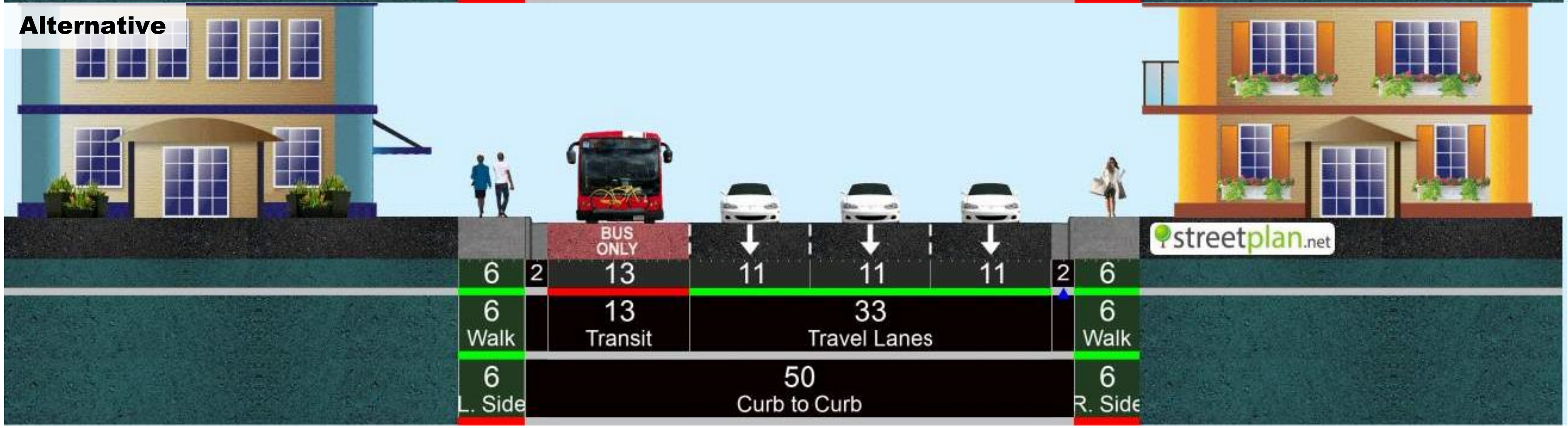
Okeechobee Blvd from Tamarind Ave to Rosemary Ave



210 feet of right-of-way

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)

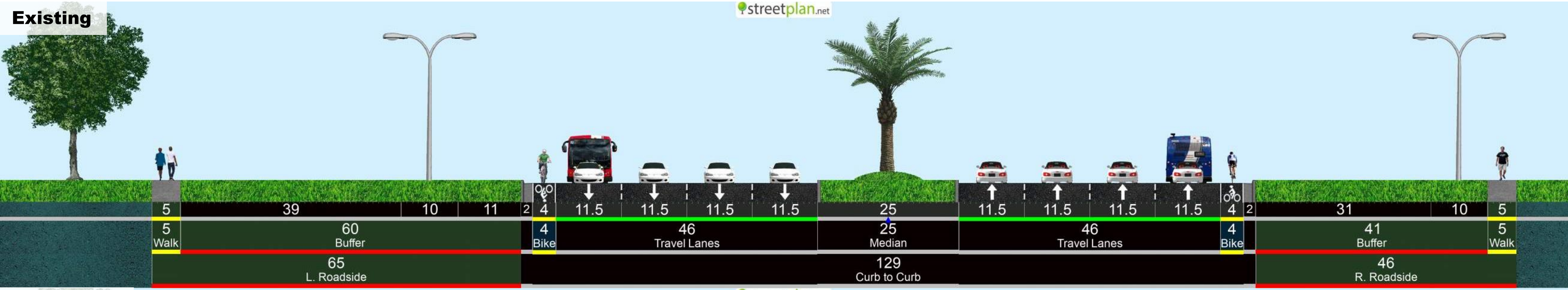


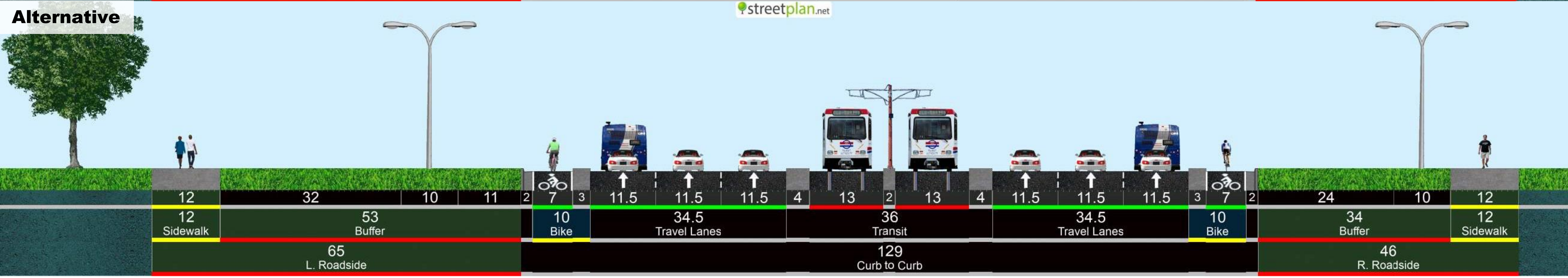


62 feet of right-of-way

Dedicated Lane Light Rail Transit (LRT)

SR-7 from Wellington Mall to Southern Blvd



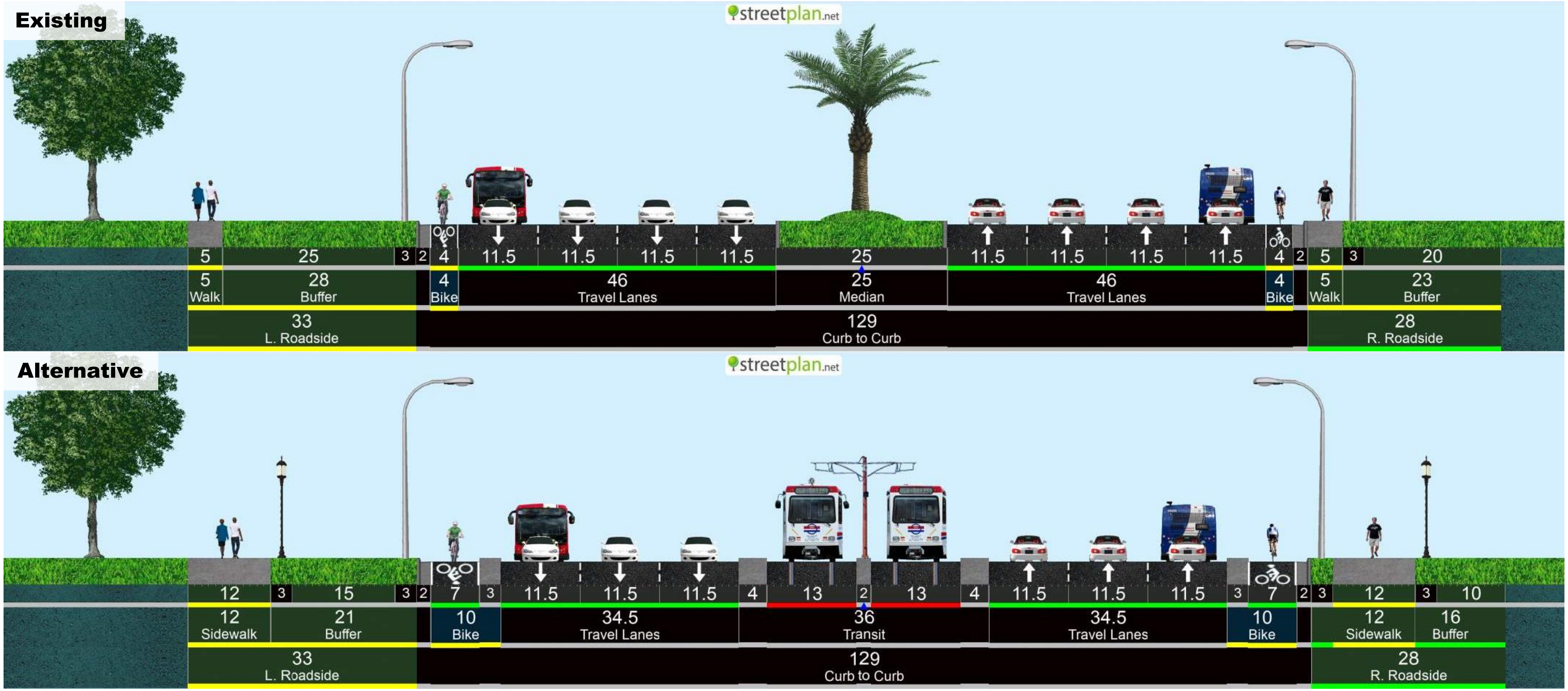


240 feet of right-of-way

SR-7 from Southern Blvd to Weisman Way

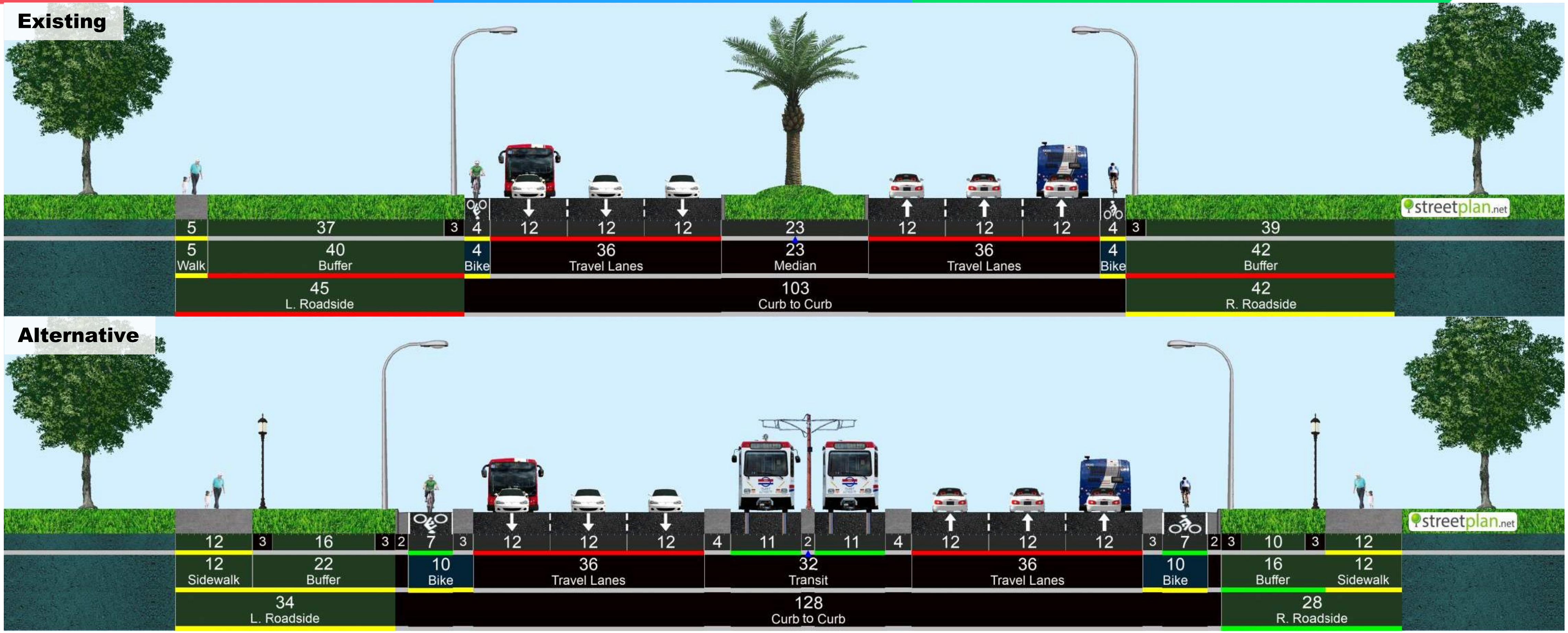
280 feet of right-of-way

SR-7 from Weisman Way to Belvedere Rd



190 feet of right-of-way

SR-7 from Belvedere Rd to Okeechobee Blvd



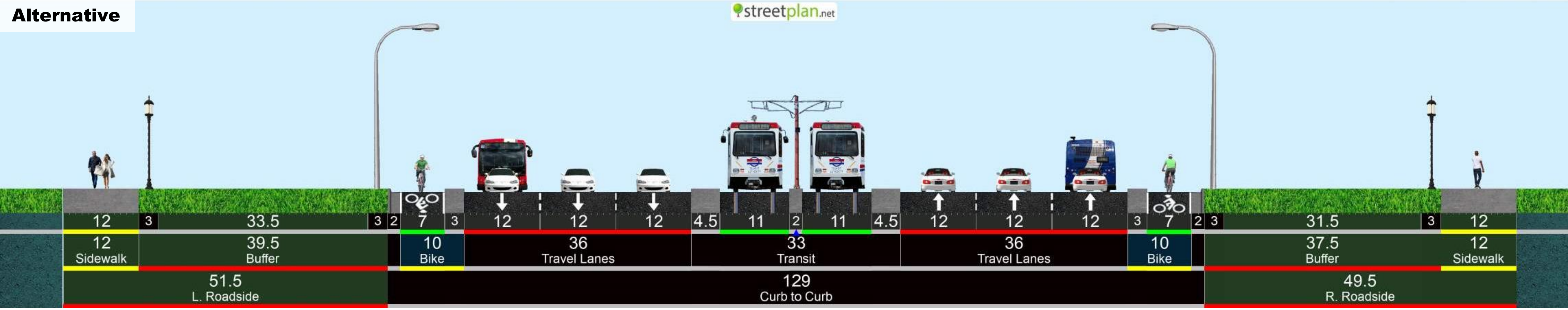
190 feet of right-of-way

Dedicated Lane LRT

Okeechobee Blvd from SR-7 to Florida's Turnpike

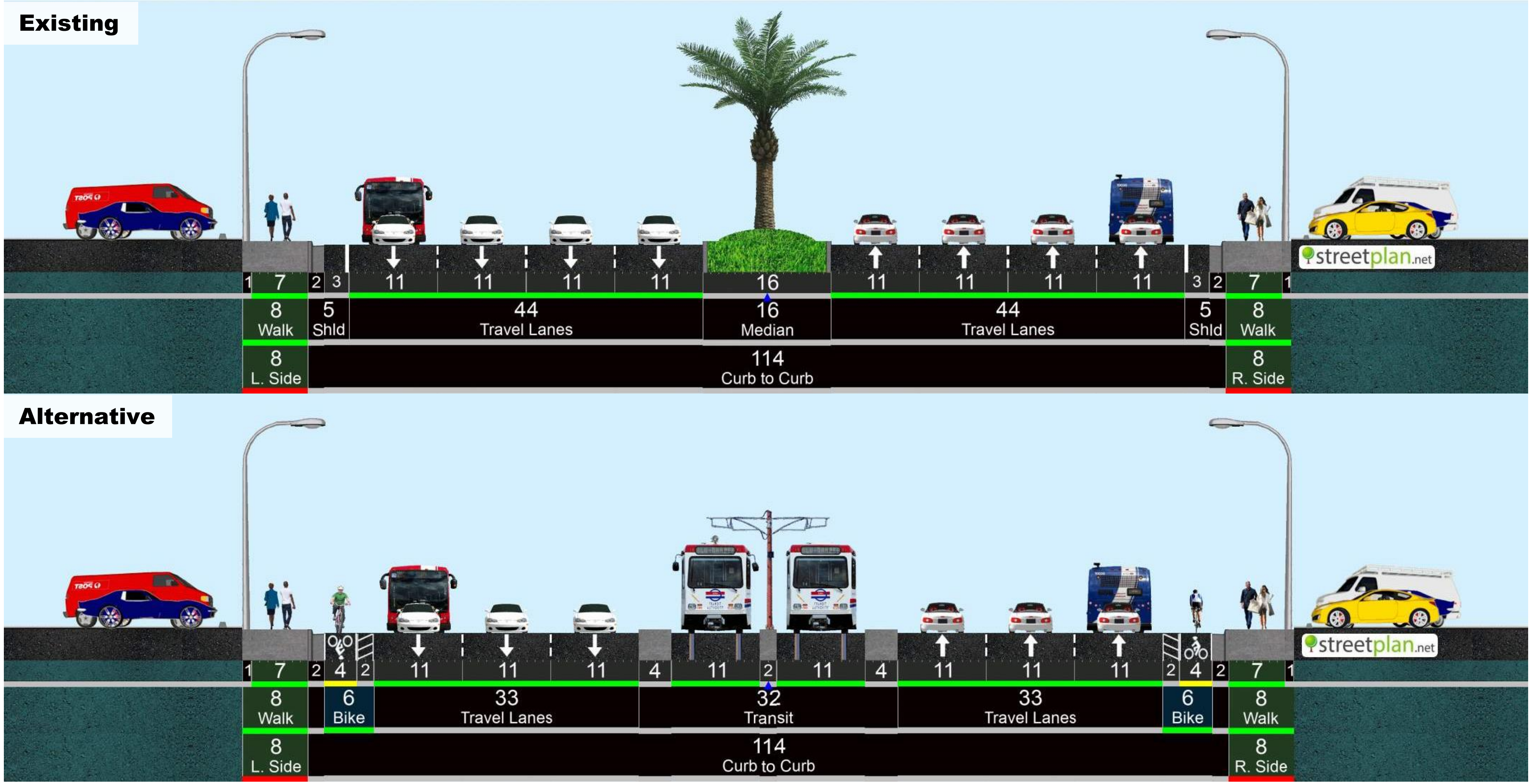
Existing

Alternative



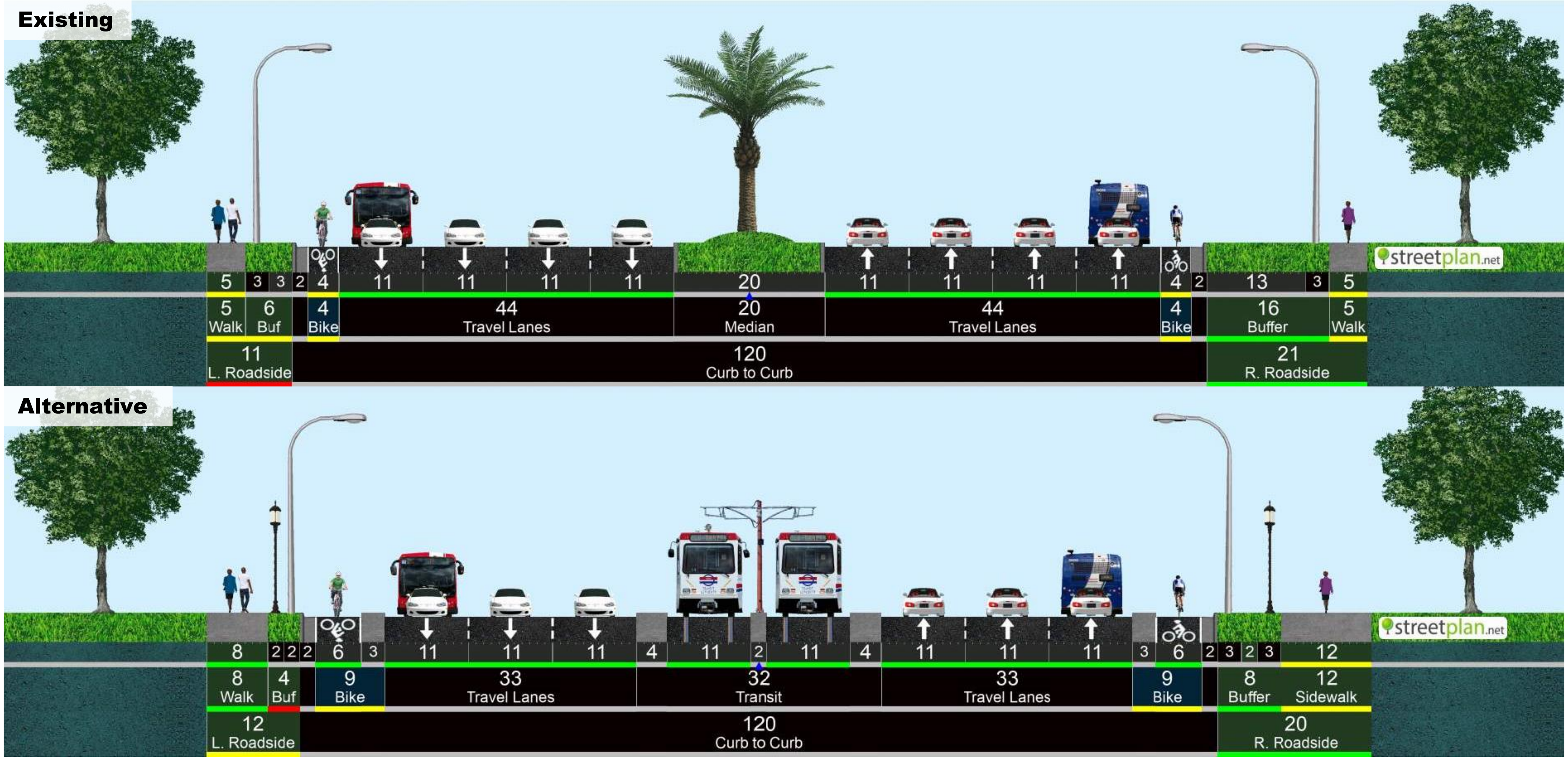
230 feet of right-of-way

Okeechobee Blvd from Florida's Turnpike to I-95



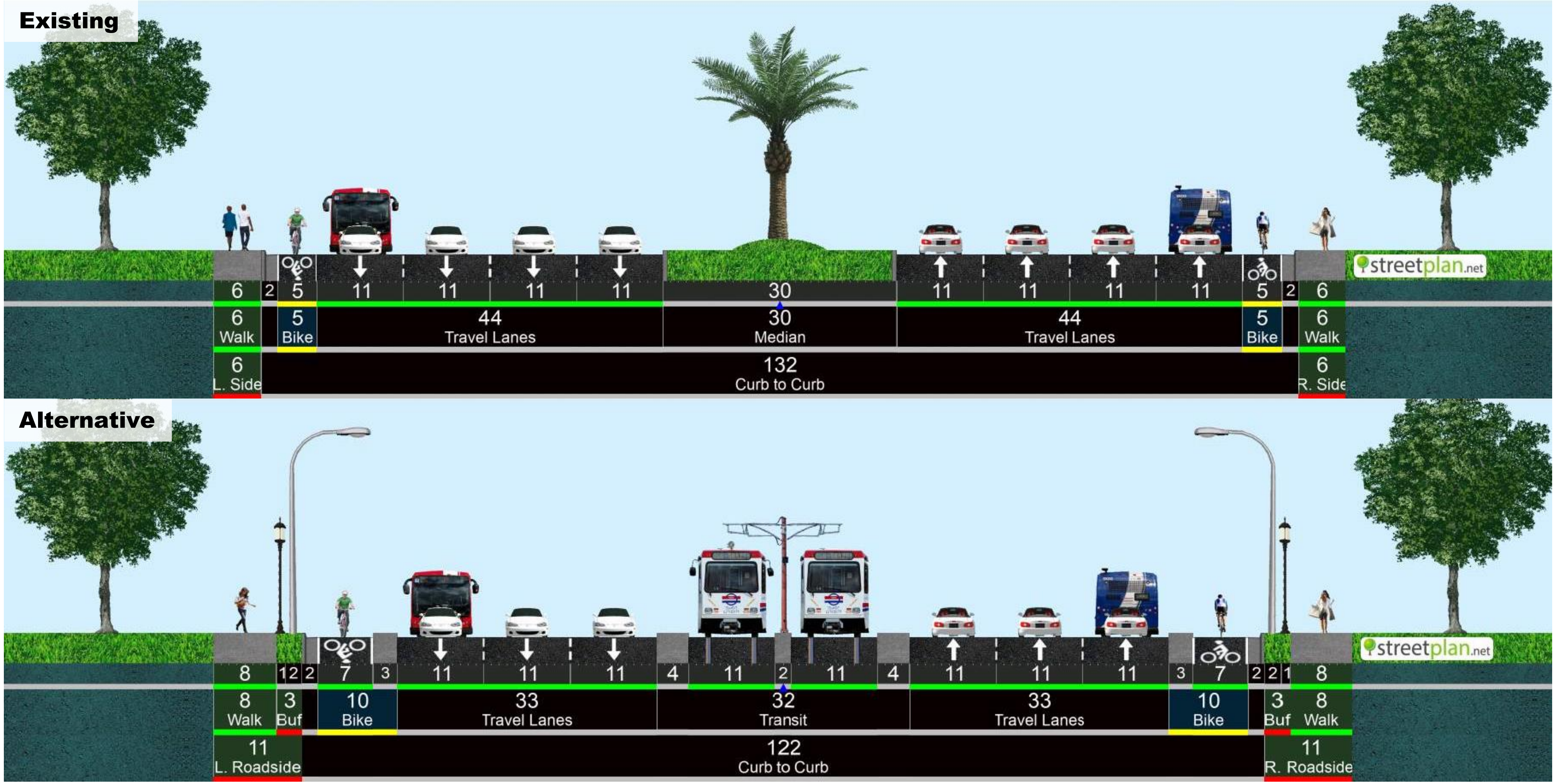
130 feet of right-of-way

Okeechobee Blvd from I-95 to Australian Ave



152 feet of right-of-way

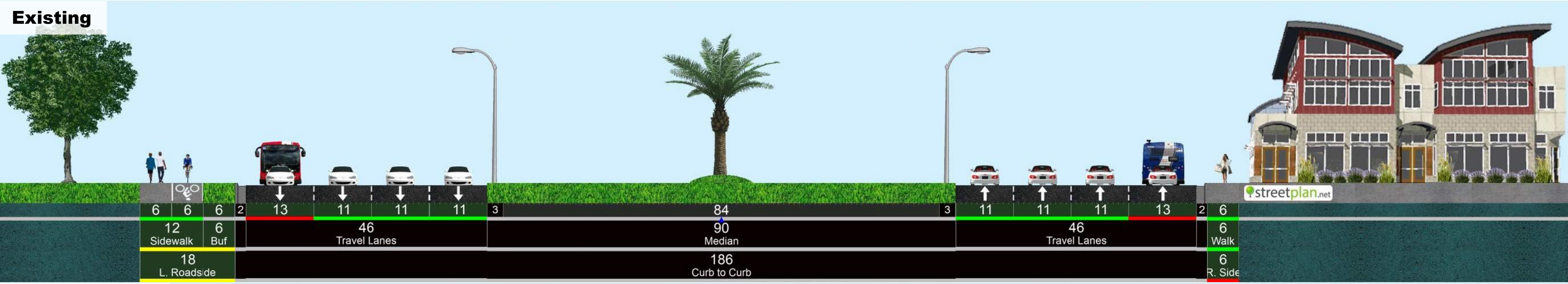
Okeechobee Blvd from Australian Ave to Tamarind Ave



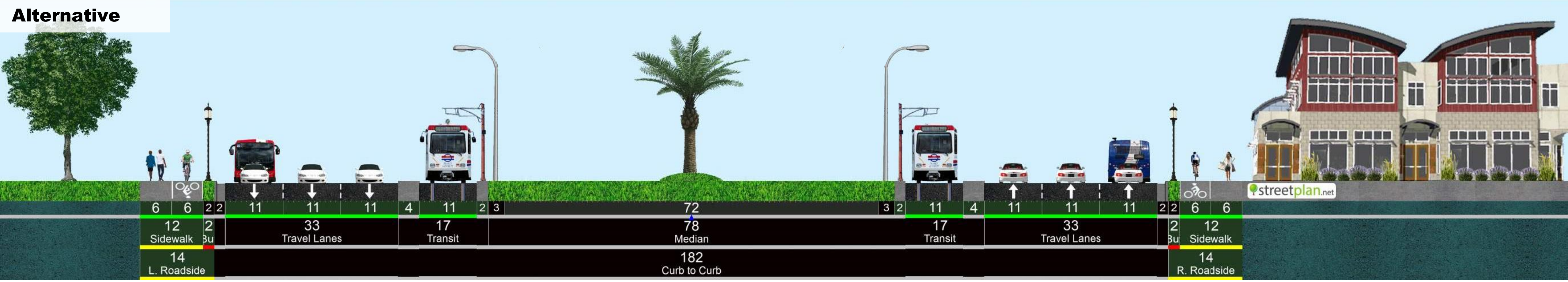
144 feet of right-of-way

Okeechobee Blvd from Tamarind Ave to Rosemary Ave

Existing

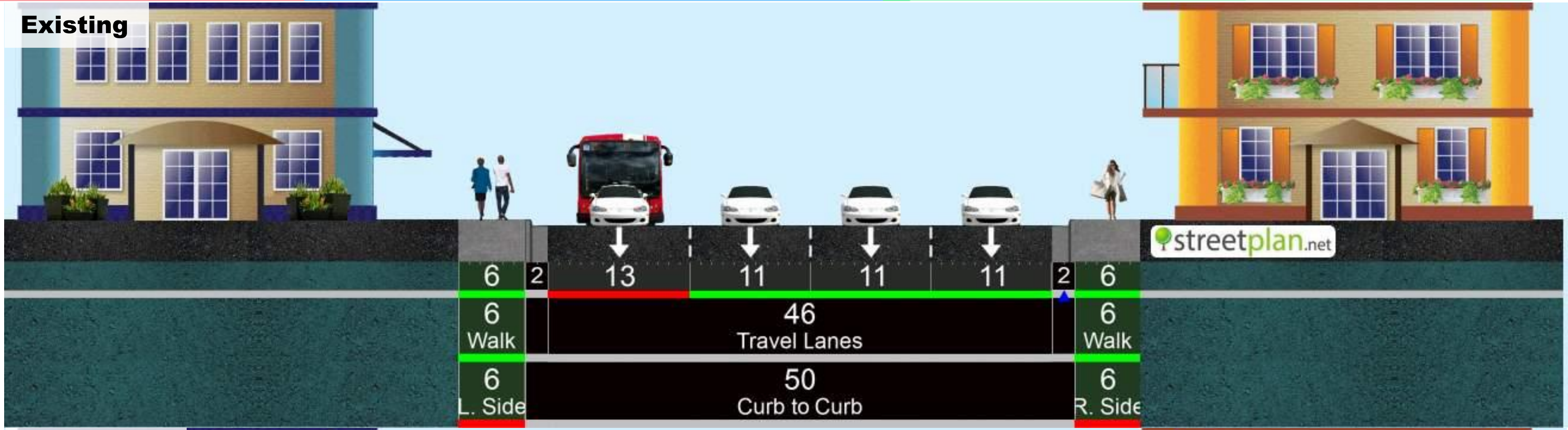


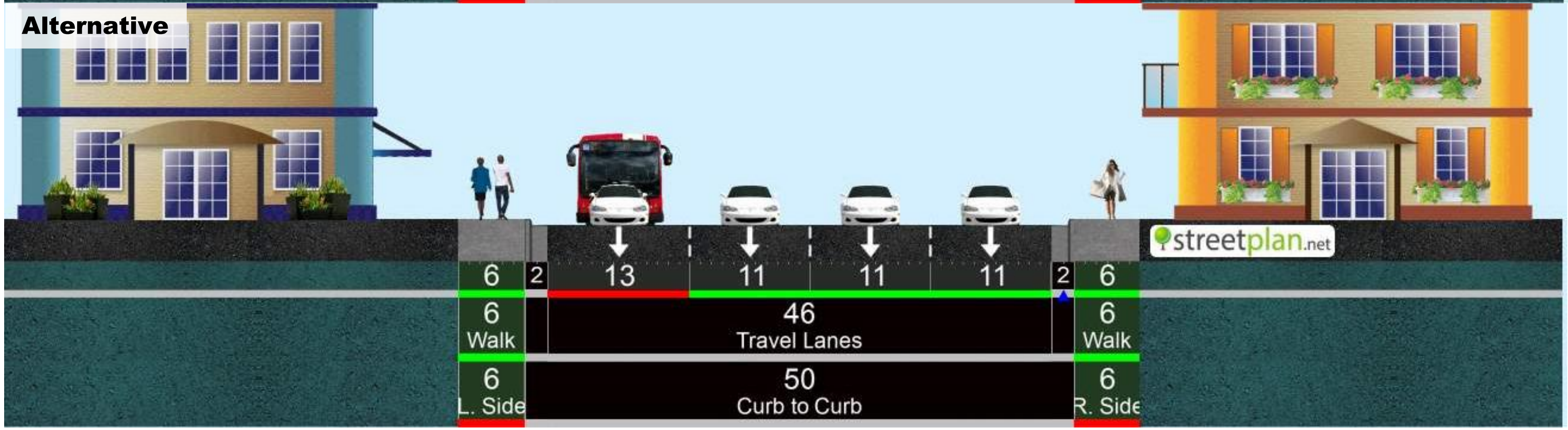
Alternative



210 feet of right-of-way

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)



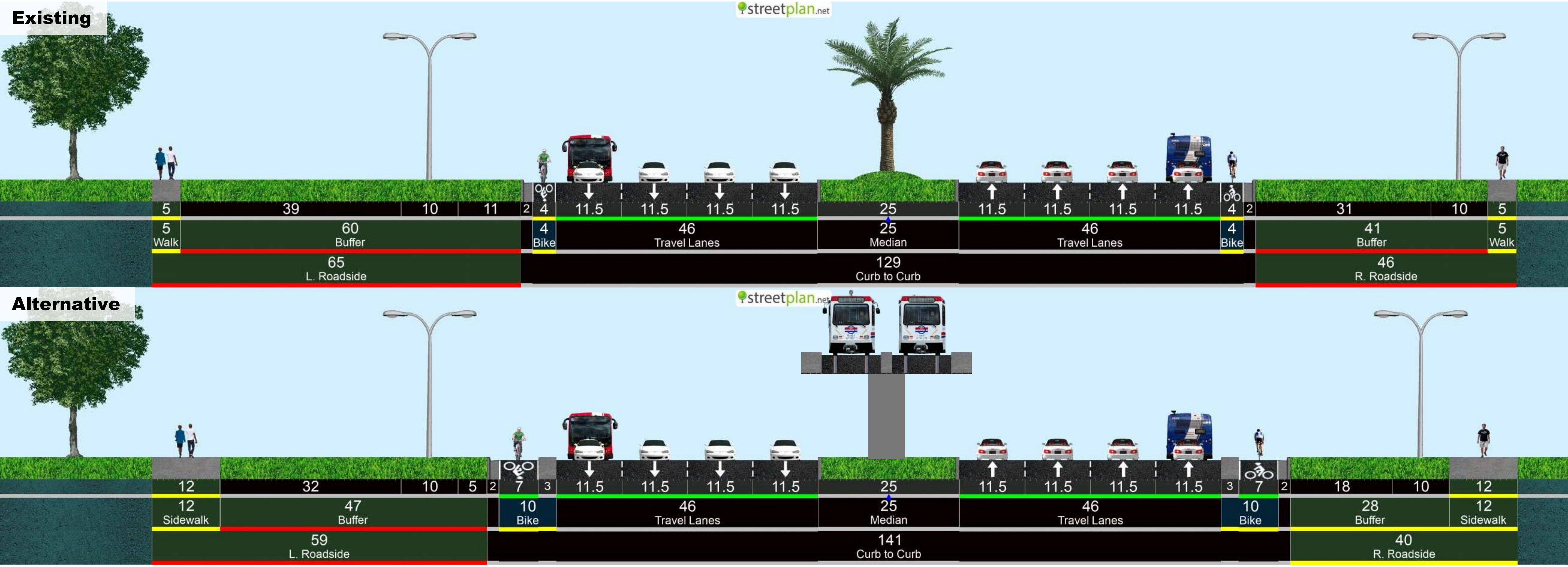


62 feet of right-of-way

Elevated LRT

Minimum vertical clearance for Elevated LRT is 16.5 feet per Florida Department of Transportation (FDOT) Design Manual (FDM) Table 260.6.1. The reference of the vertical clearance is not just for an elevated LRT but for any structure over a roadway.

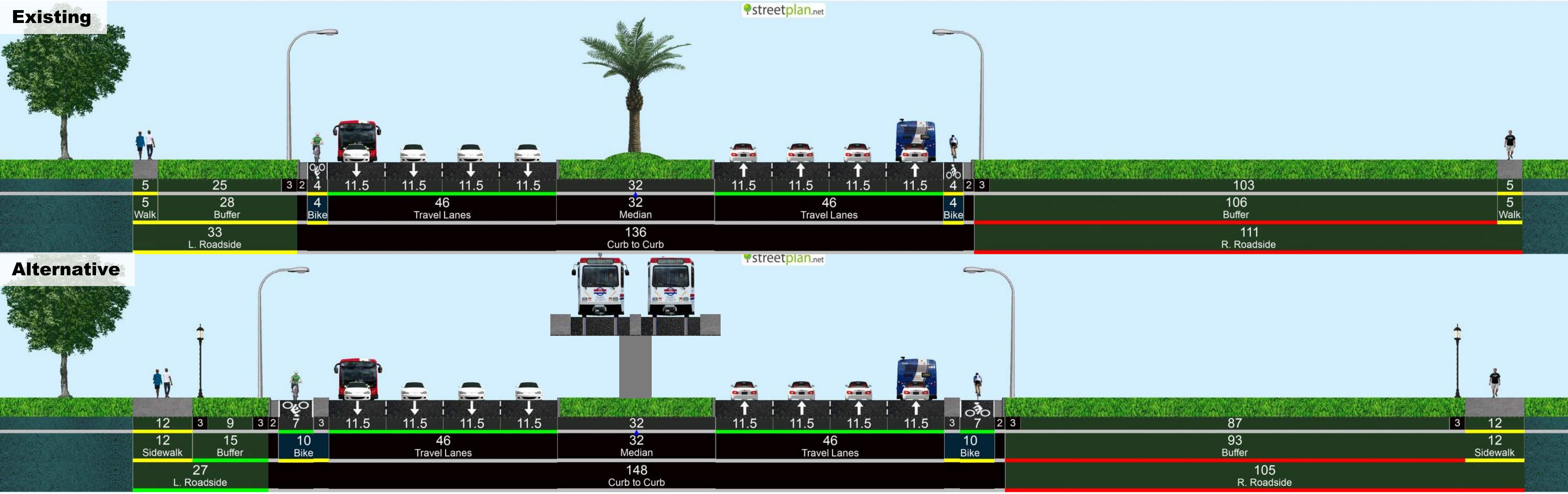
SR-7 from Wellington Mall to Southern Blvd



240 feet of right-of-way

Elevated LRT

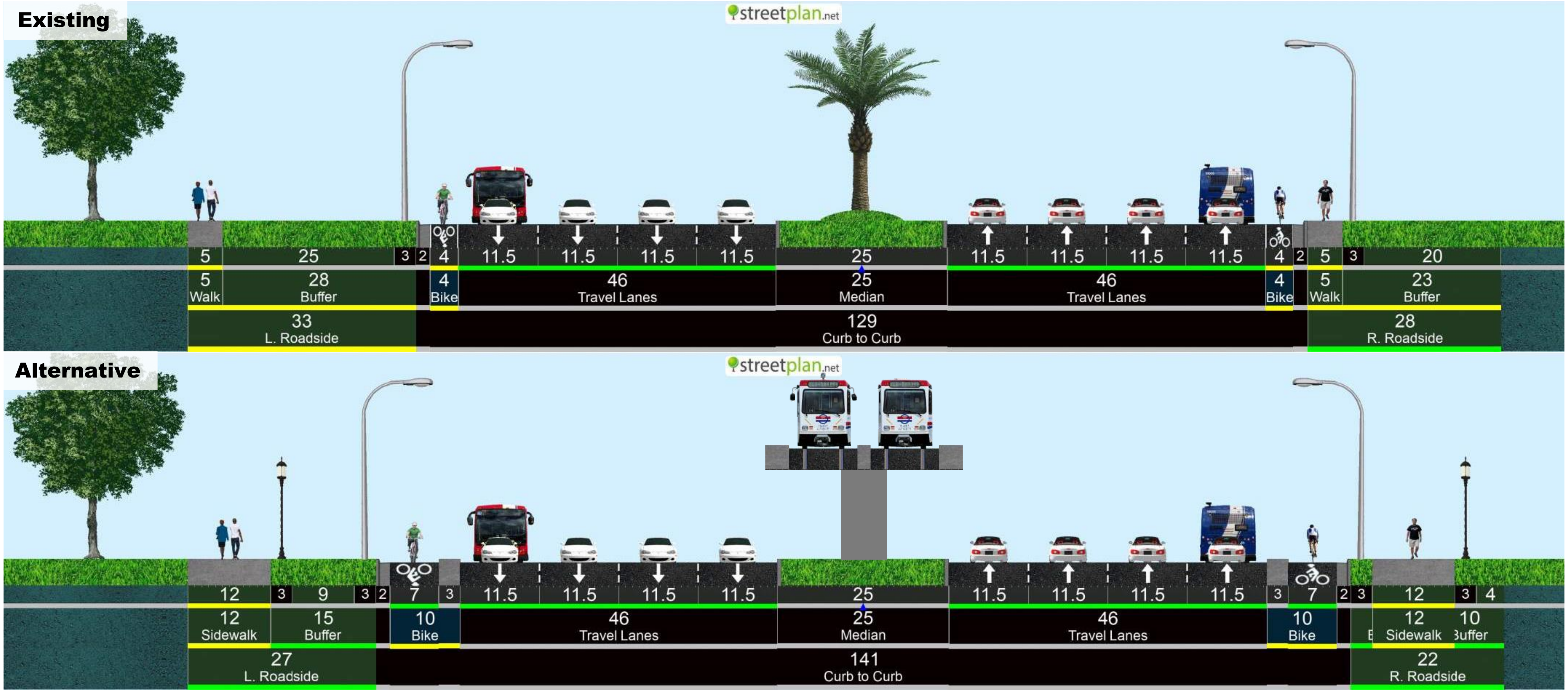
SR-7 from Southern Blvd to Weisman Way



280 feet of right-of-way

Elevated LRT

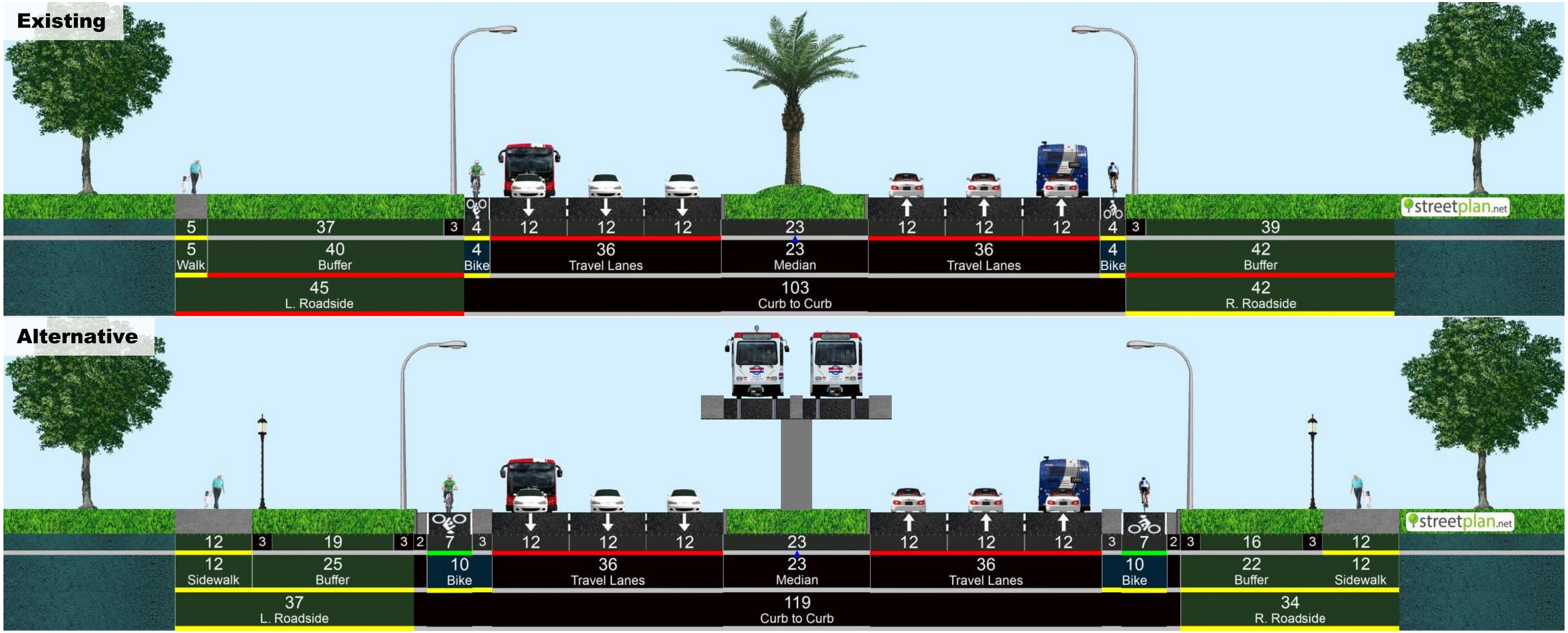
SR-7 from Weisman Way to Belvedere Rd



190 feet of right-of-way

Elevated LRT

SR-7 from Belvedere Rd to Okeechobee Blvd



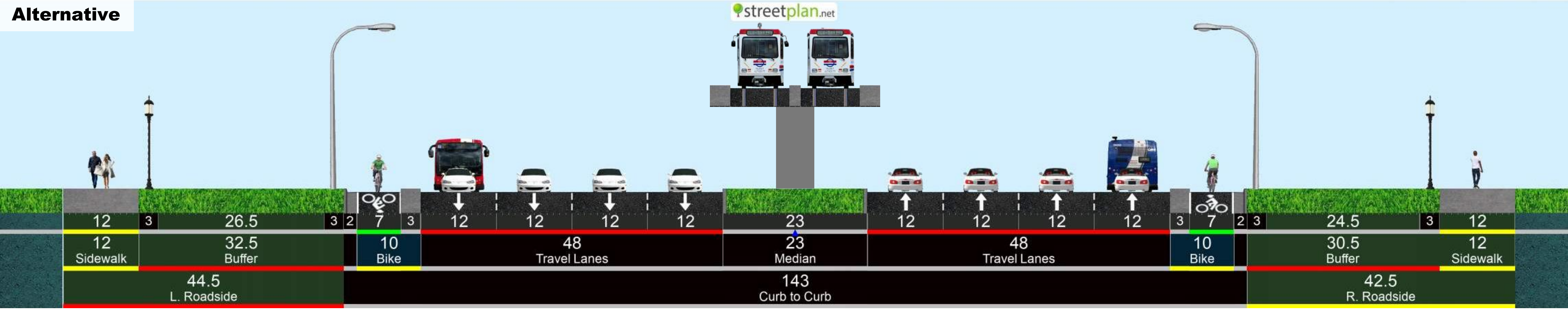
190 feet of right-of-way

Elevated LRT

Okeechobee Blvd from SR-7 to Florida's Turnpike

Existing

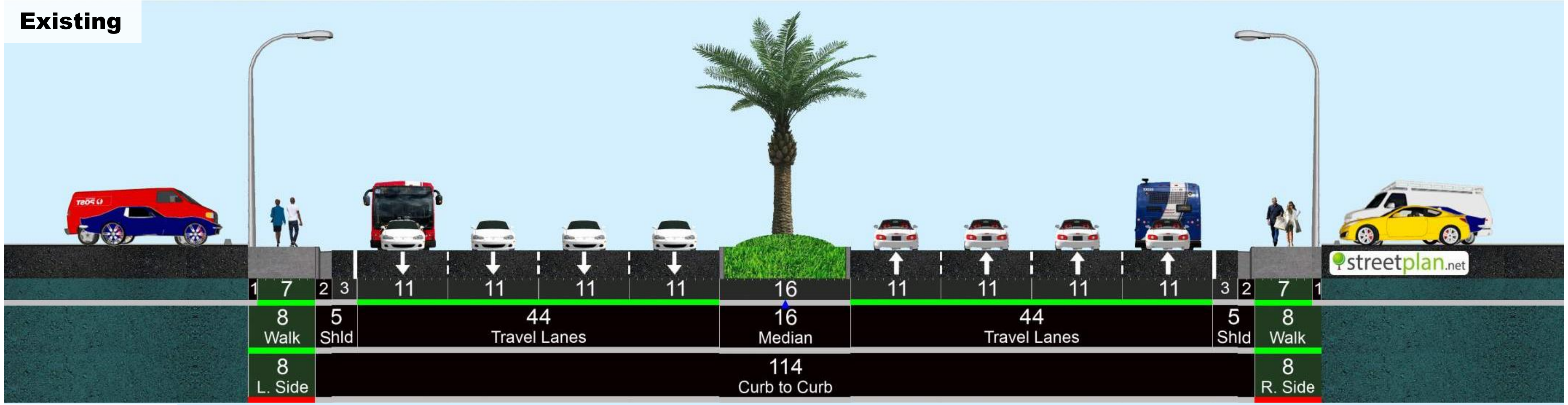
Alternative

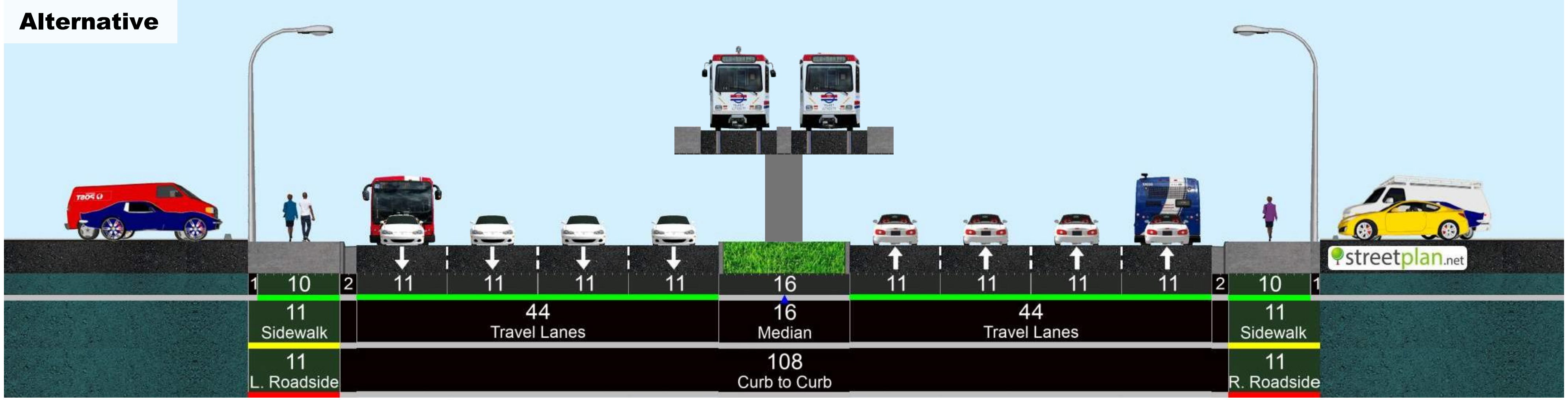


230 feet of right-of-way

Elevated LRT

Okeechobee Blvd from Florida’s Turnpike to I-95

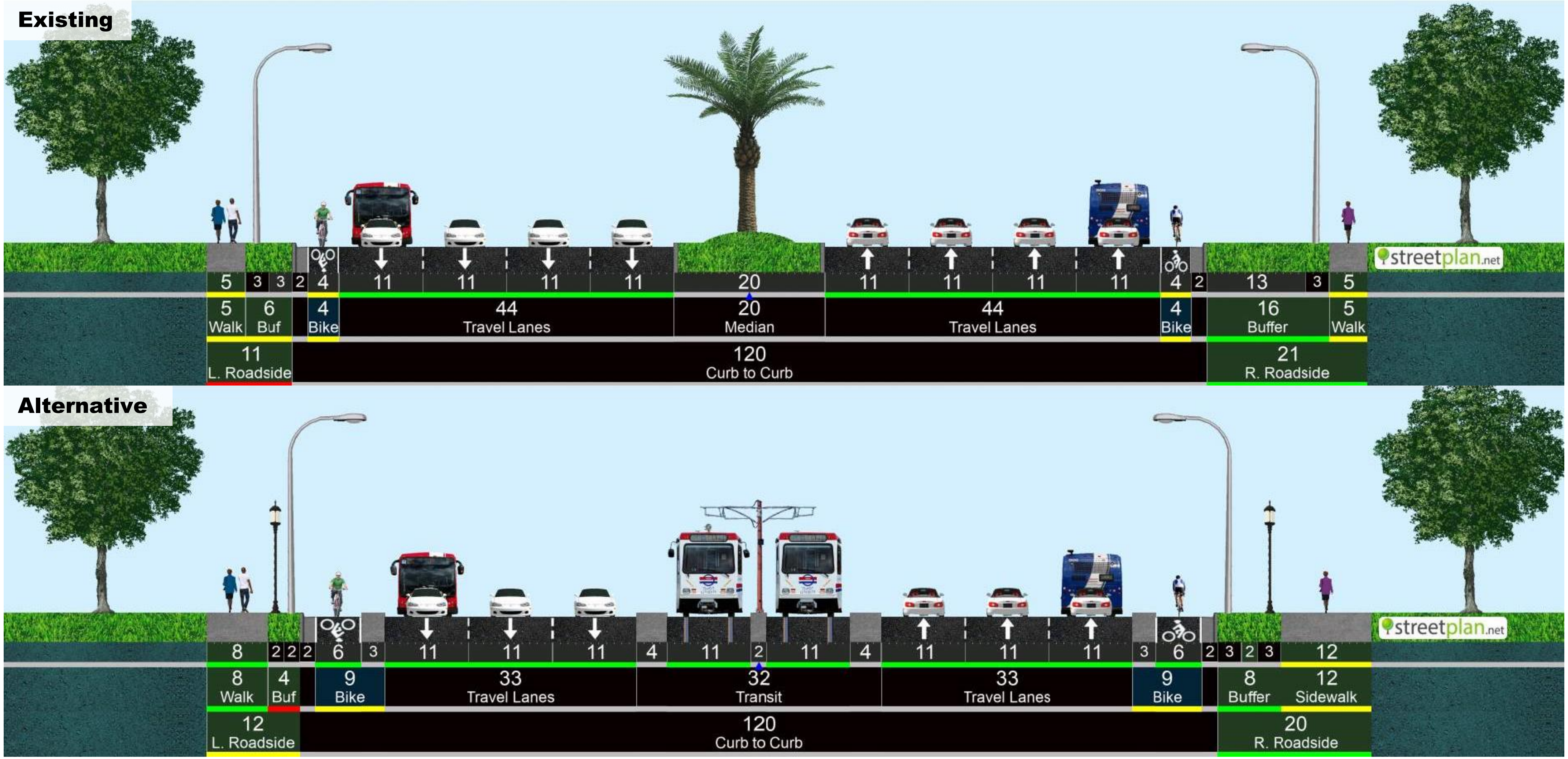




130 feet of right-of-way

Elevated LRT

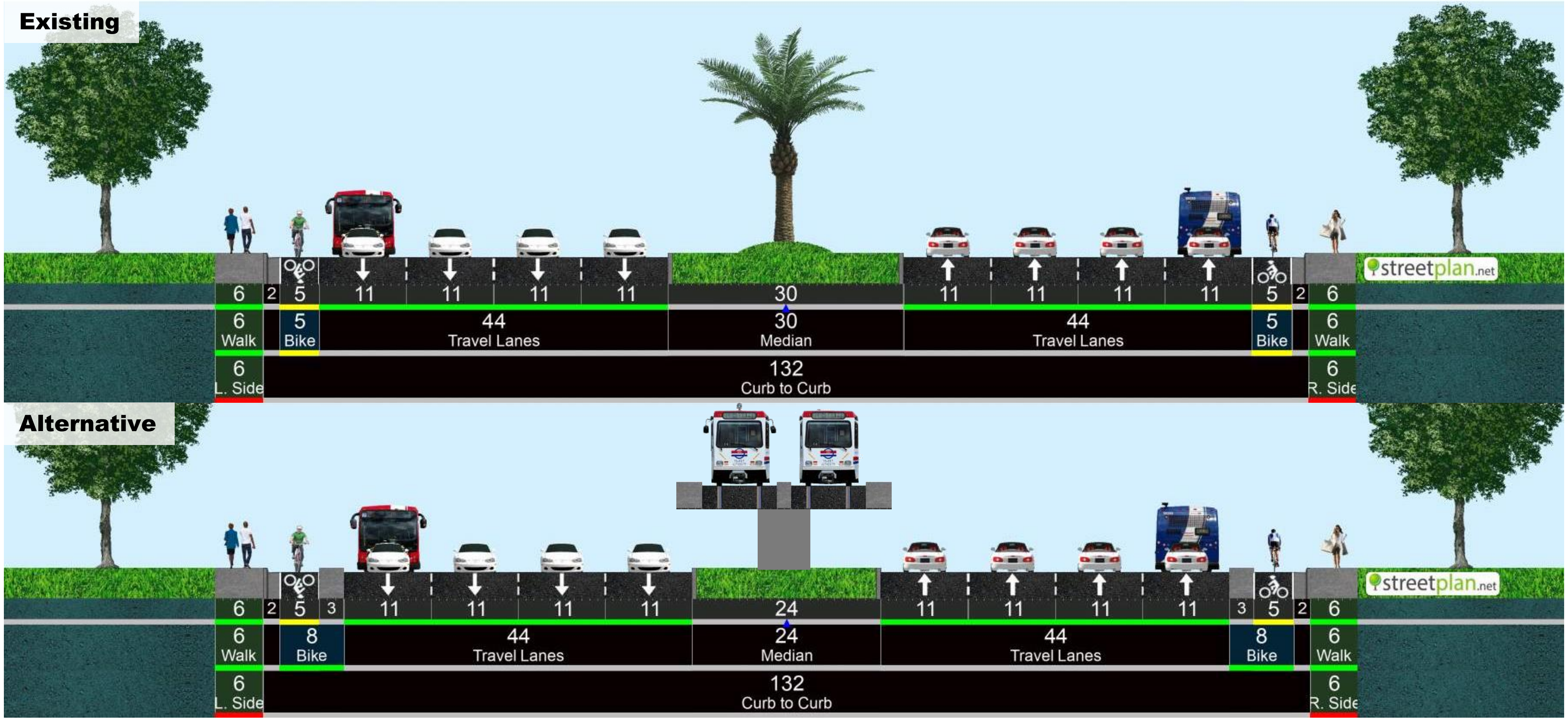
Okeechobee Blvd from I-95 to Australian Ave



152 feet of right-of-way

Elevated LRT

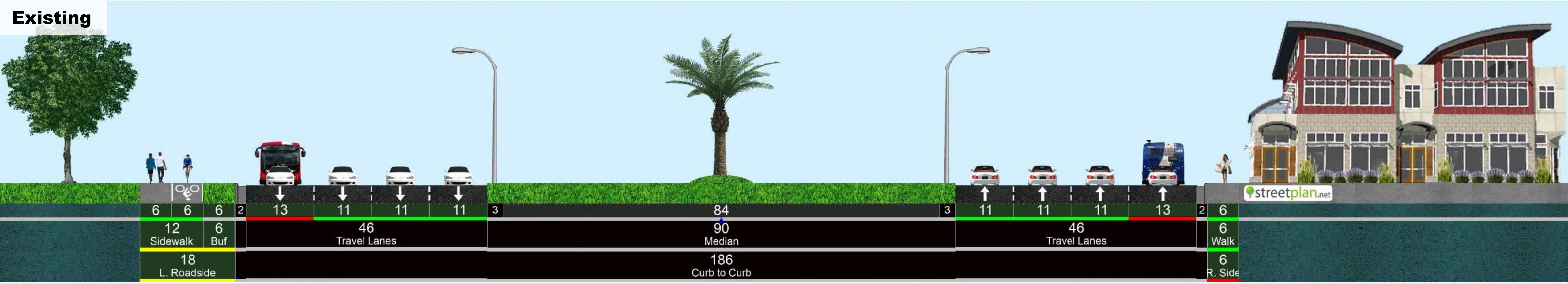
Okeechobee Blvd from Australian Ave to Tamarind Ave



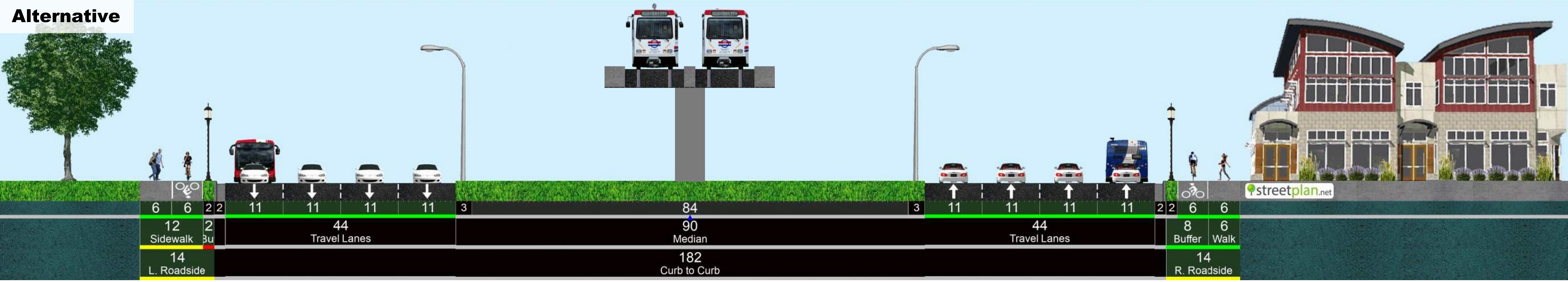
144 feet of right-of-way

Okeechobee Blvd from Tamarind Ave to Rosemary Ave

Existing



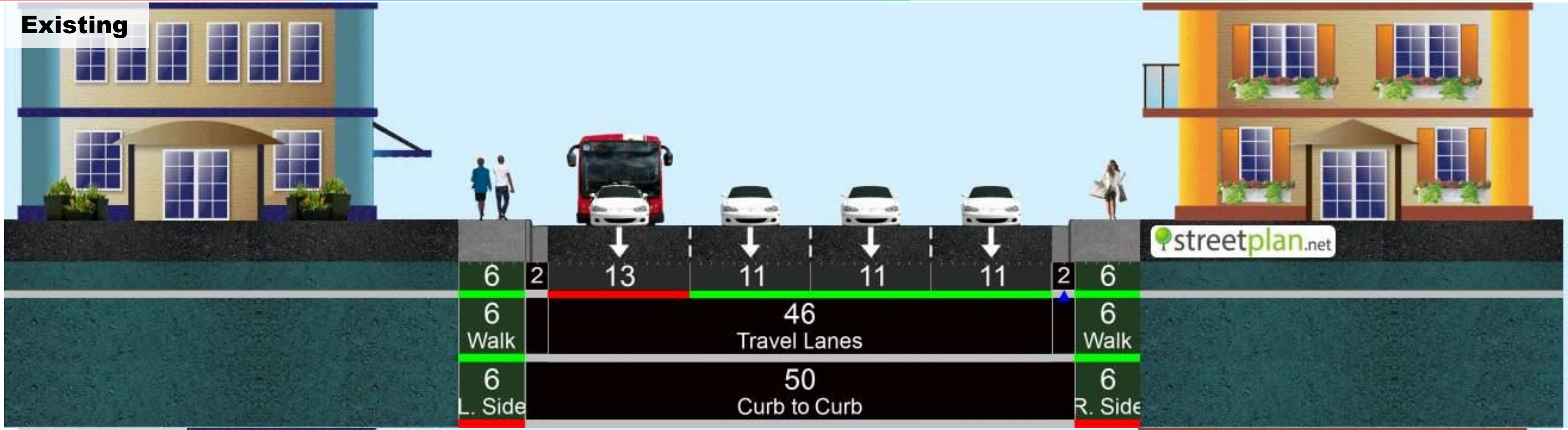
Alternative

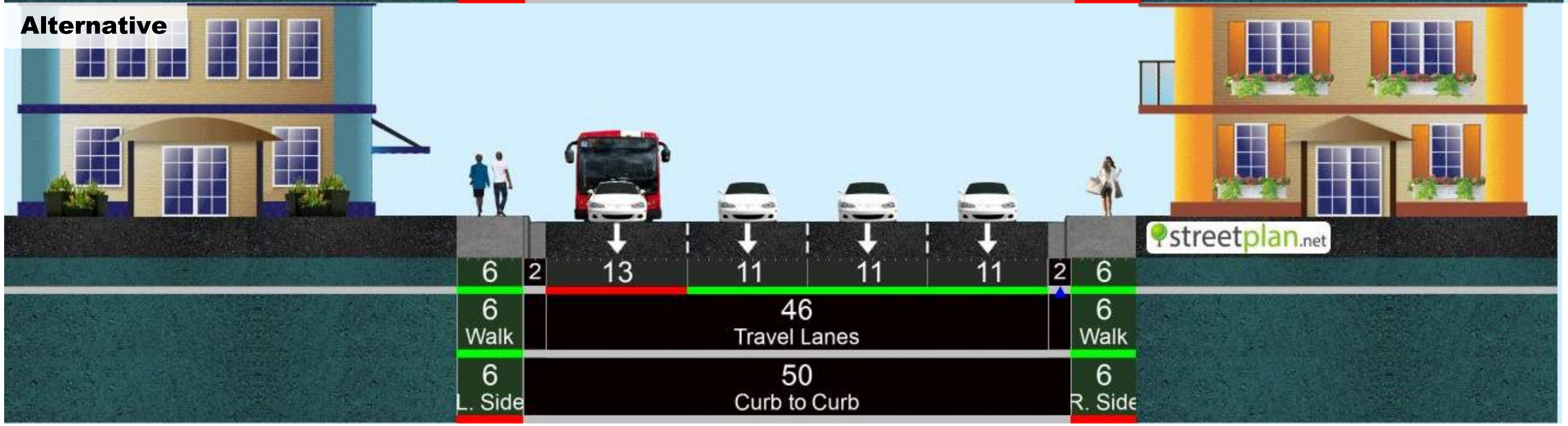


210 feet of right-of-way

Elevated LRT

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)





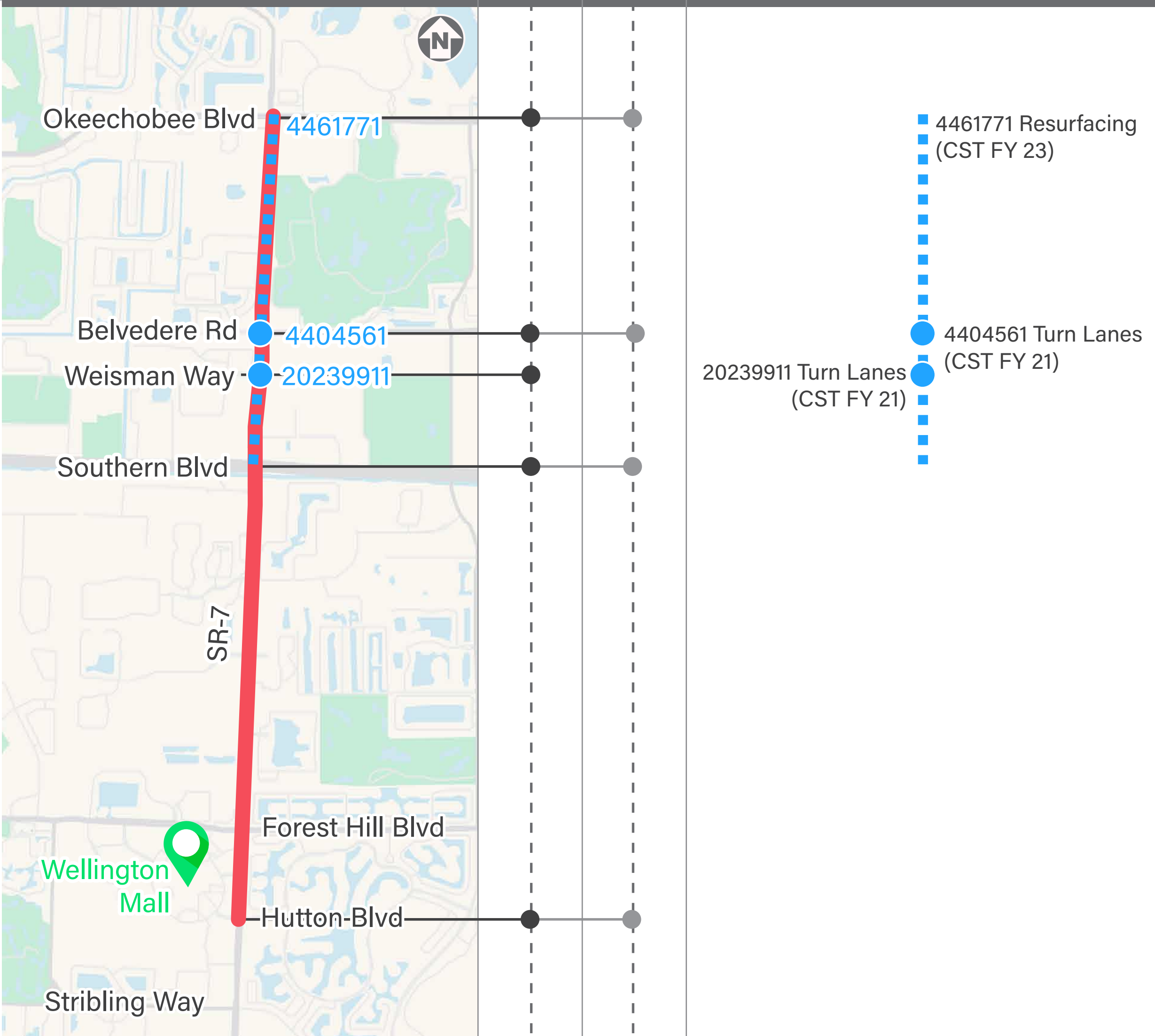
62 feet of right-of-way

Appendix F

Prioritization of Proposed Multimodal Improvements

Section Termini	Project Termini	Study Corridor / TIP Projects	Description

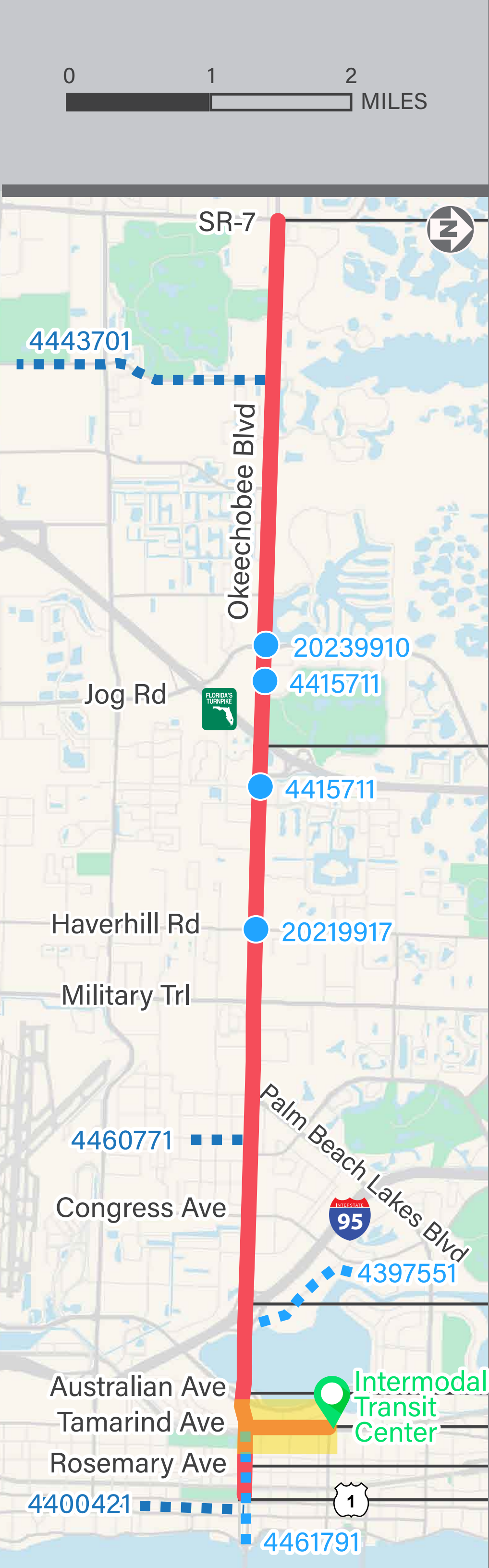
0 0.5 1 MILES



Description	Feasibility	Cost	Benefit	Phase
Add shared use path and pedestrian lighting	●	●	●	2
Resurfacing to convert outside lane into BAT lane, add buffered bicycle lane				1
Partial reconstruction to convert outside lane to BAT lane, add buffered bicycle lane and shared use path	●	●	●	2

LEGEND

	Complexity	Cost	Benefit
●	Turn lane modifications and/or restriping	Resurfacing	Significant increase in person movement
●	Lane repurposing	Partial reconstruction	Add new modal facilities and adding physical separation
●	Significant additional planning process may be required (public-private partnerships/ environmental impacts)	Full reconstruction	Enhancement of existing facilities with no physical separation



Section Termini	Project Termini	Study Corridor / TIP Projects / Nearby TIP Projects	Description	Feasibility	Cost	Benefit	Phase
		4443701 Bike Lane/Sidewalk (CST FY 22)	Add shared use path and pedestrian lighting	●	●	●	2
		20239910 Turn Lanes (CST FY 23); 4415711 Bus Shelters (CST FY 22)	Full reconstruction to convert median to LRT facility, add curb and gutter and separated bicycle lane				3
		4415711 Bus Shelters (CST FY 22); 20219917 Turn Lanes (CST FY 23); 4460771 Sidewalk (CST FY 23); 4397551 Add Right Turn Lanes (CST FY 21)	Partial reconstruction to convert median to LRT facility, add buffered bicycle lane	●	●	●	3
			Add shared use path and pedestrian lighting	●	●	●	2
			Partial reconstruction to convert median into LRT facility, add separated bicycle lane				3
			Full reconstruction to convert median into LRT facility, add separated bicycle lane, shared use path, street and pedestrian lighting	●	●	●	3
			Reconstruction to convert outside of median into LRT facility, raised separated bicycle lane, pedestrian lighting	●	●	●	3
			– – –	– – –	– – –	– – –	– – –
		4400421 L to 3L (CST FY 21); 4461791 Resurfacing (CST FY 24)	Resurfacing to convert outside lane into BAT lane	●	●	●	1

Appendix G

Design Option Typical Sections

PALM BEACH
Transportation
Planning Agency

Okeechobee Boulevard Multimodal Corridor Study (MCS)

Task 3.7 Design Option

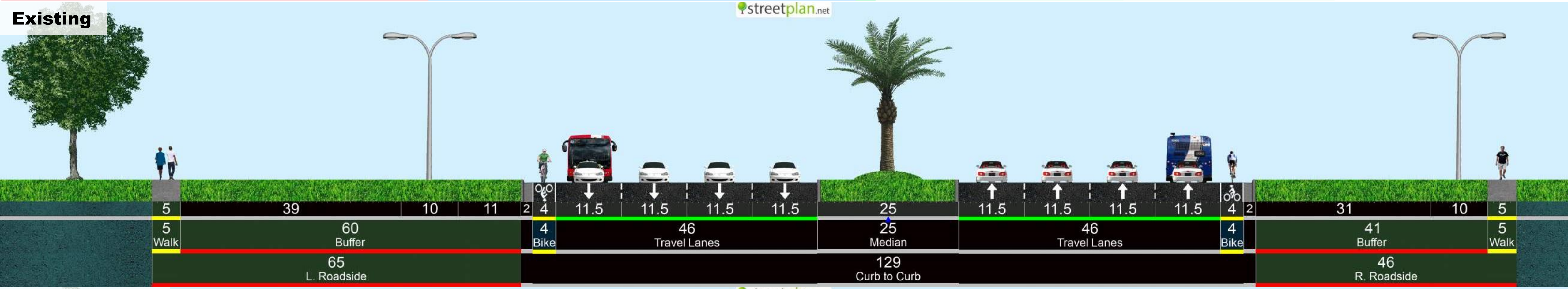
December 2020

State Road 7

Business Access Transit (BAT) Lanes

SR-7 from Wellington Mall to Southern Blvd

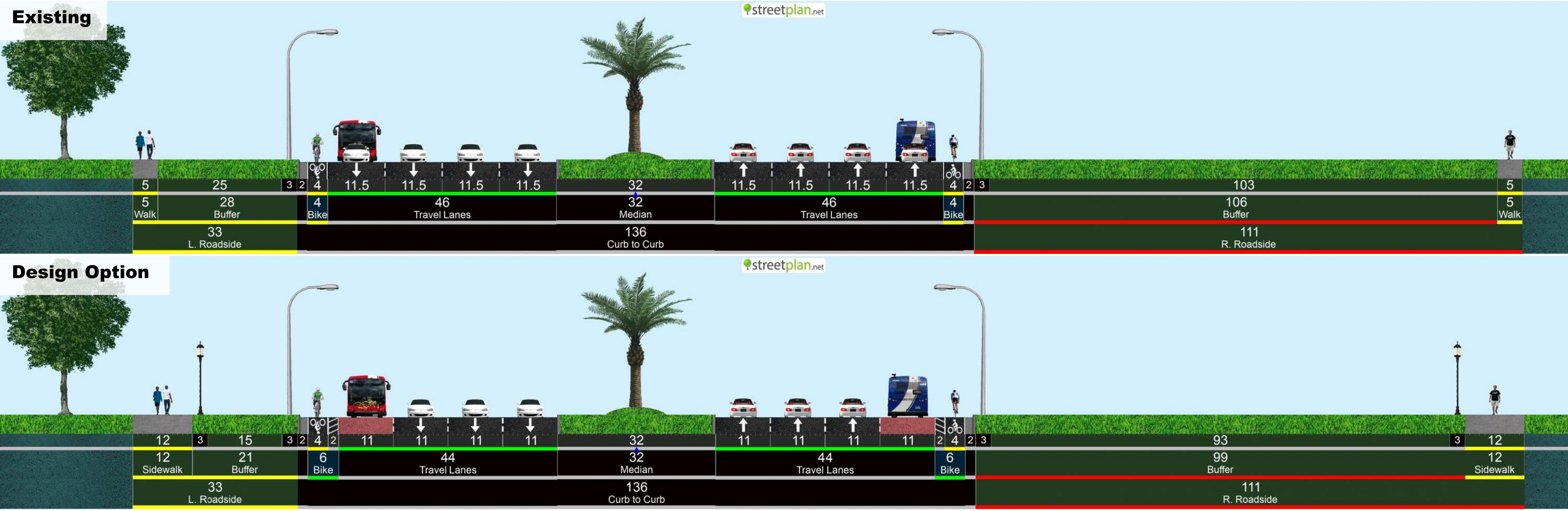
Existing



Design Option

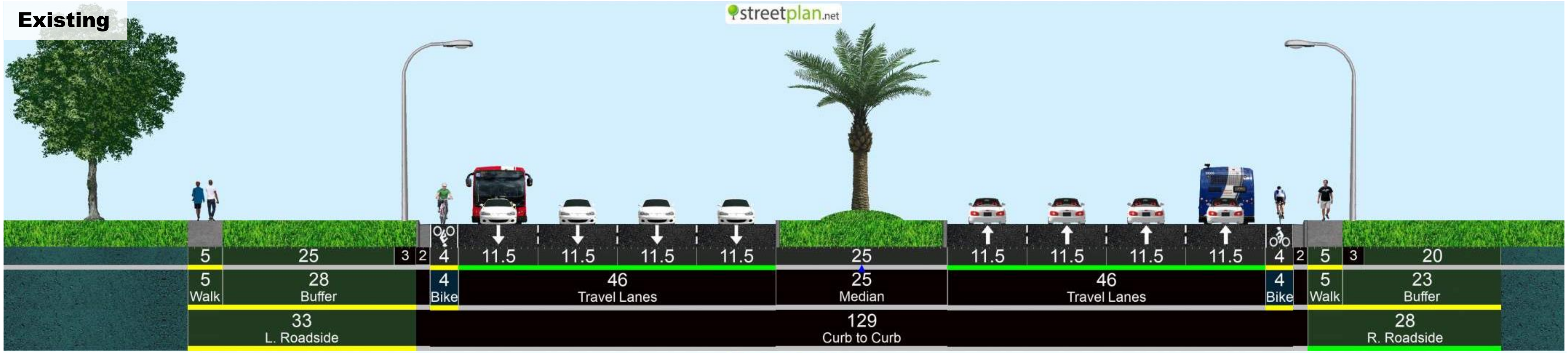
240 feet of right-of-way

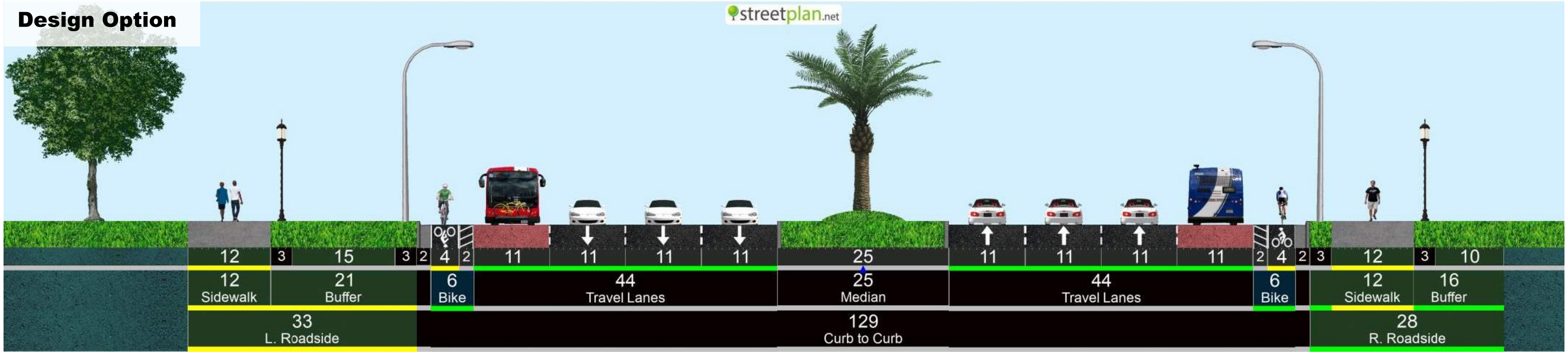
SR-7 from Southern Blvd to Weisman Way



280 feet of right-of-way

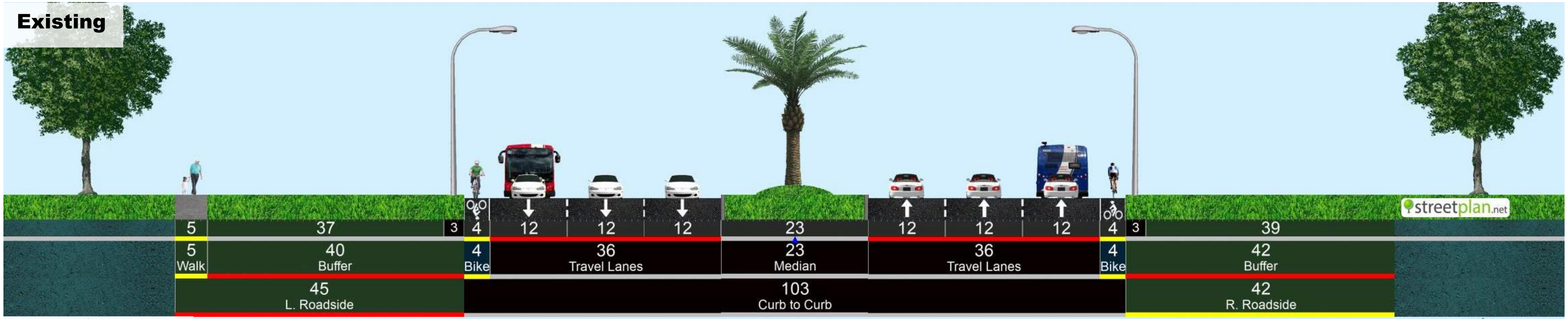
SR-7 from Weisman Way to Belvedere Rd

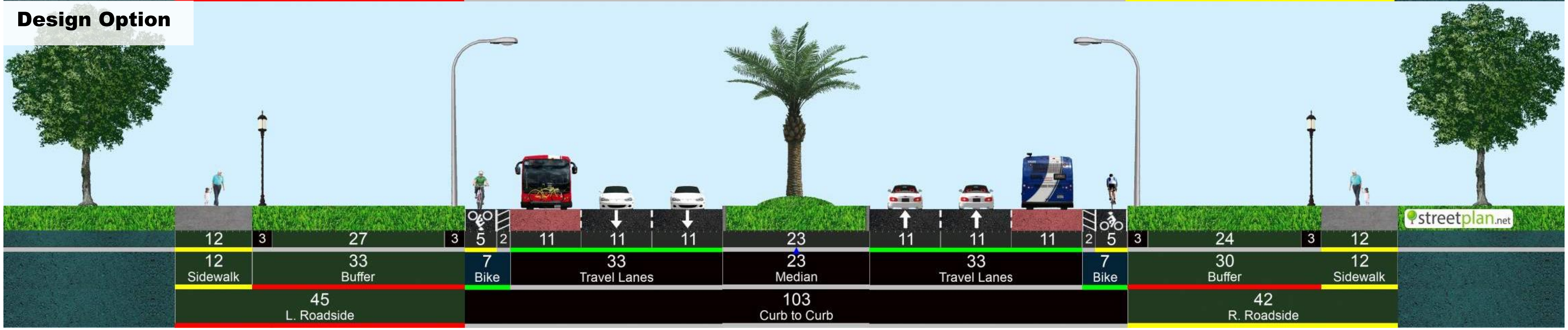




190 feet of right-of-way

SR-7 from Belvedere Rd to Okeechobee Blvd





190 feet of right-of-way

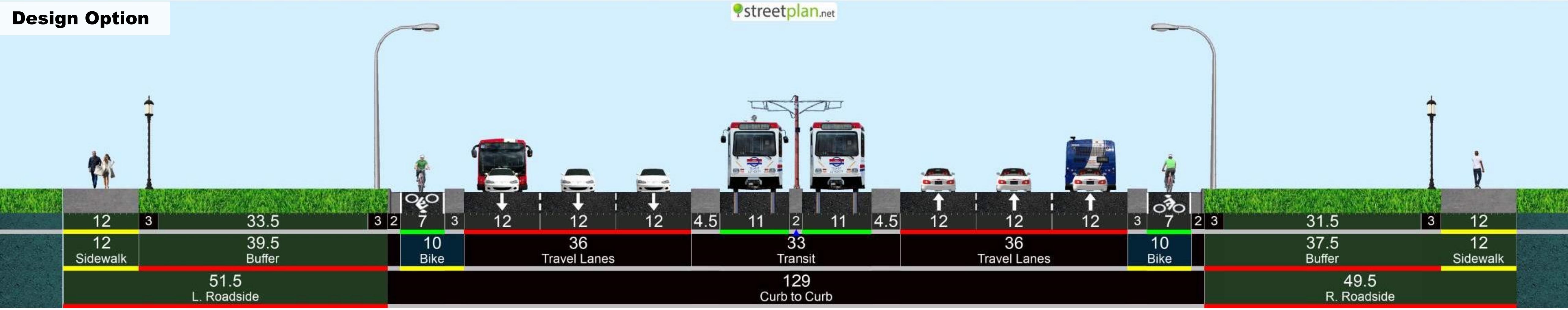
Okeechobee Blvd

Dedicated Lane
Light Rail Transit (LRT)

Okeechobee Blvd from SR-7 to Florida’s Turnpike

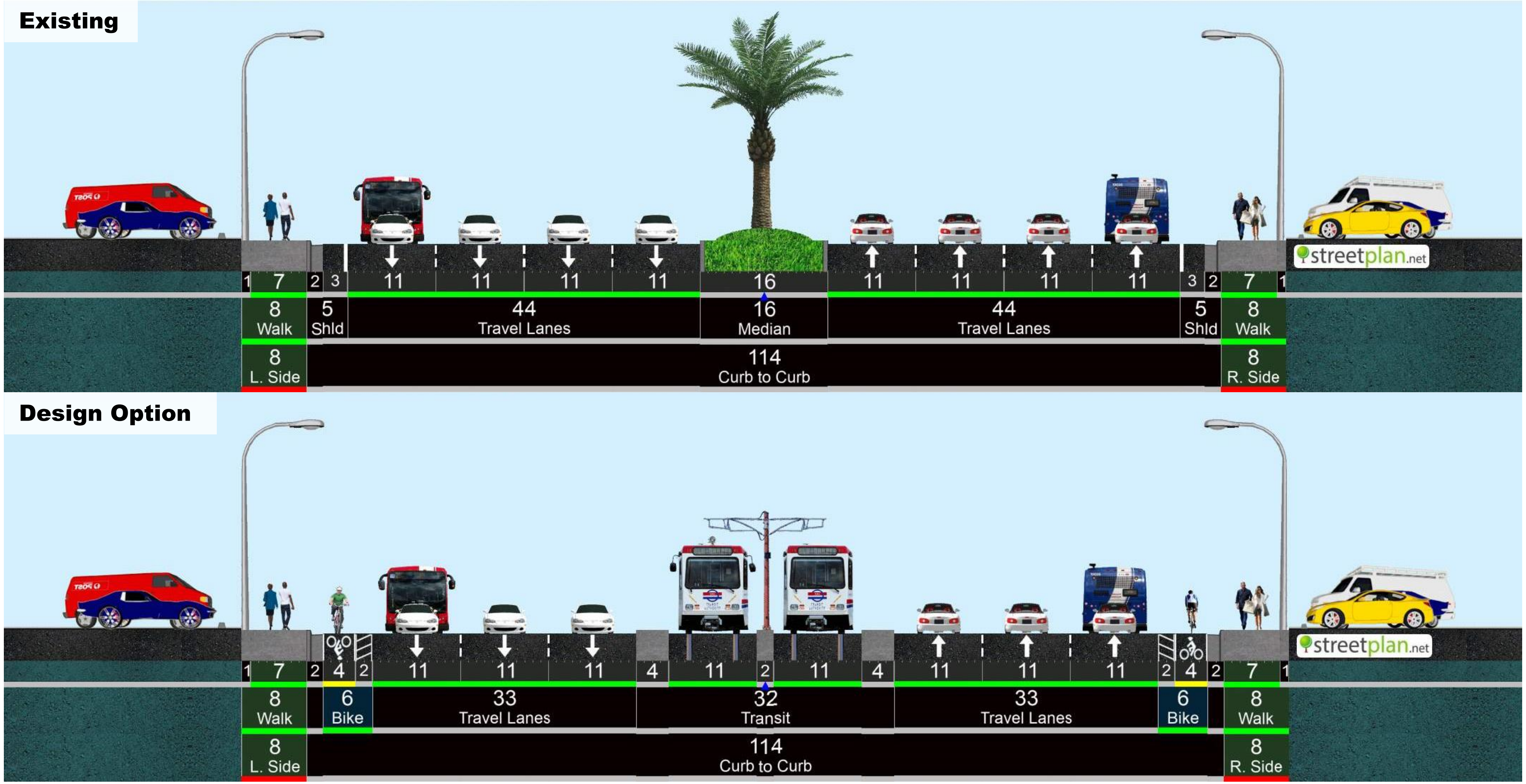
Existing

Design Option



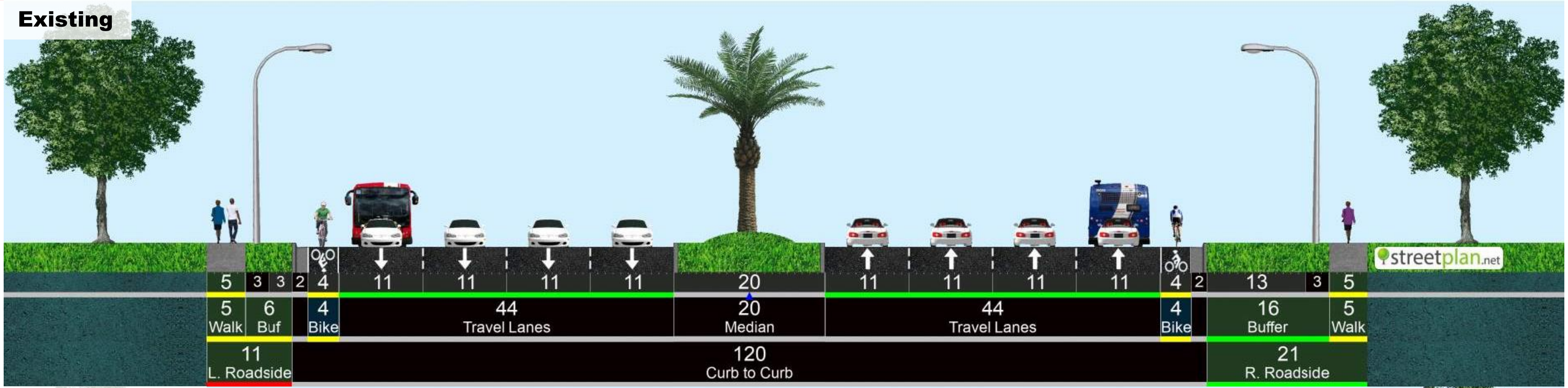
230 feet of right-of-way

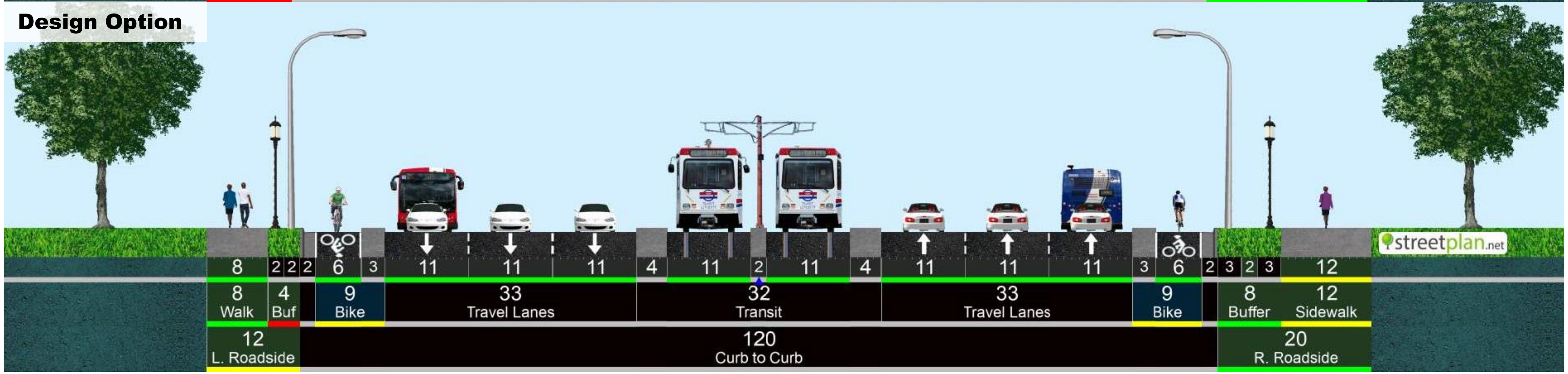
Okeechobee Blvd from Florida's Turnpike to I-95



130 feet of right-of-way

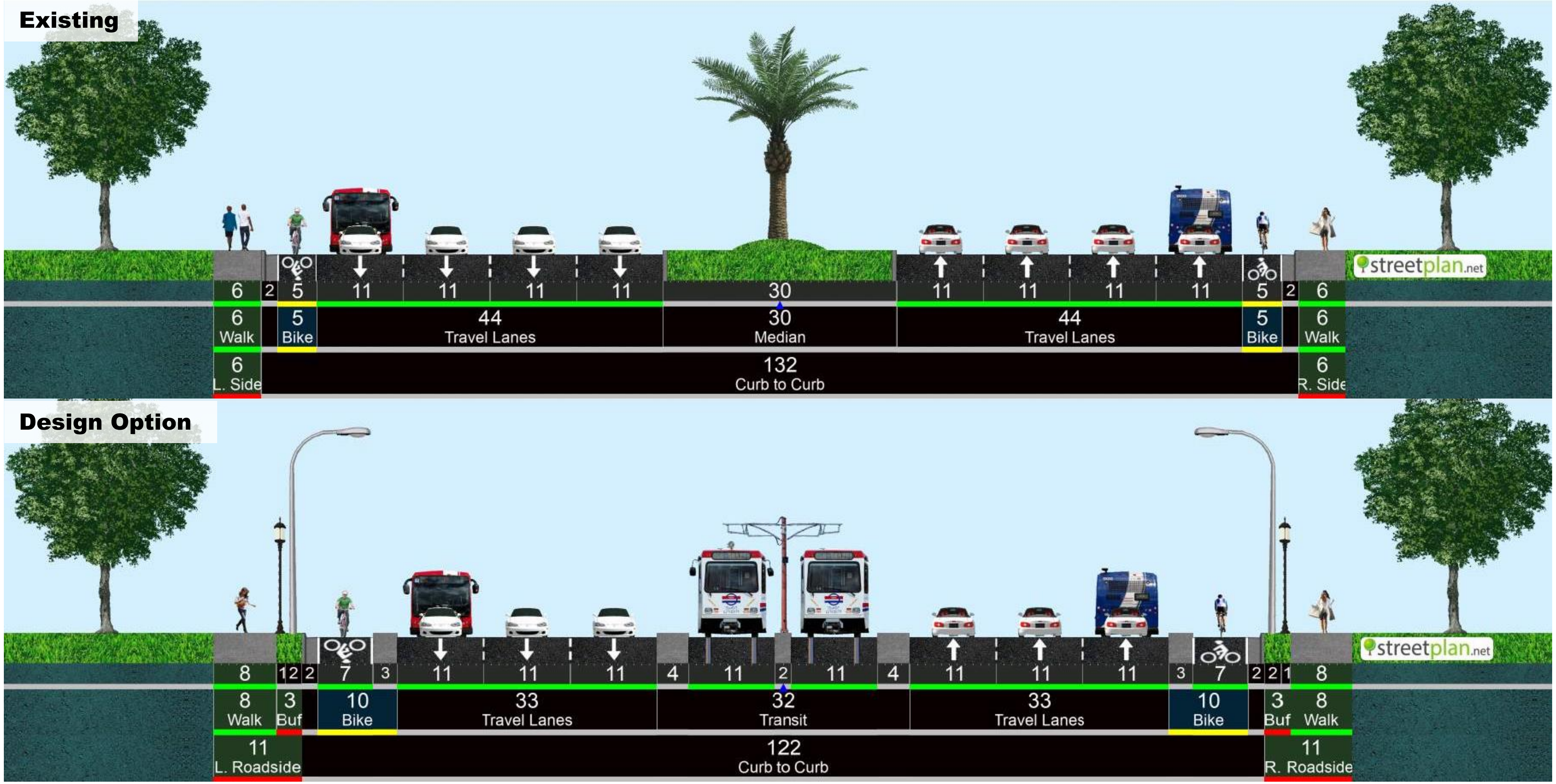
Okeechobee Blvd from I-95 to Australian Ave





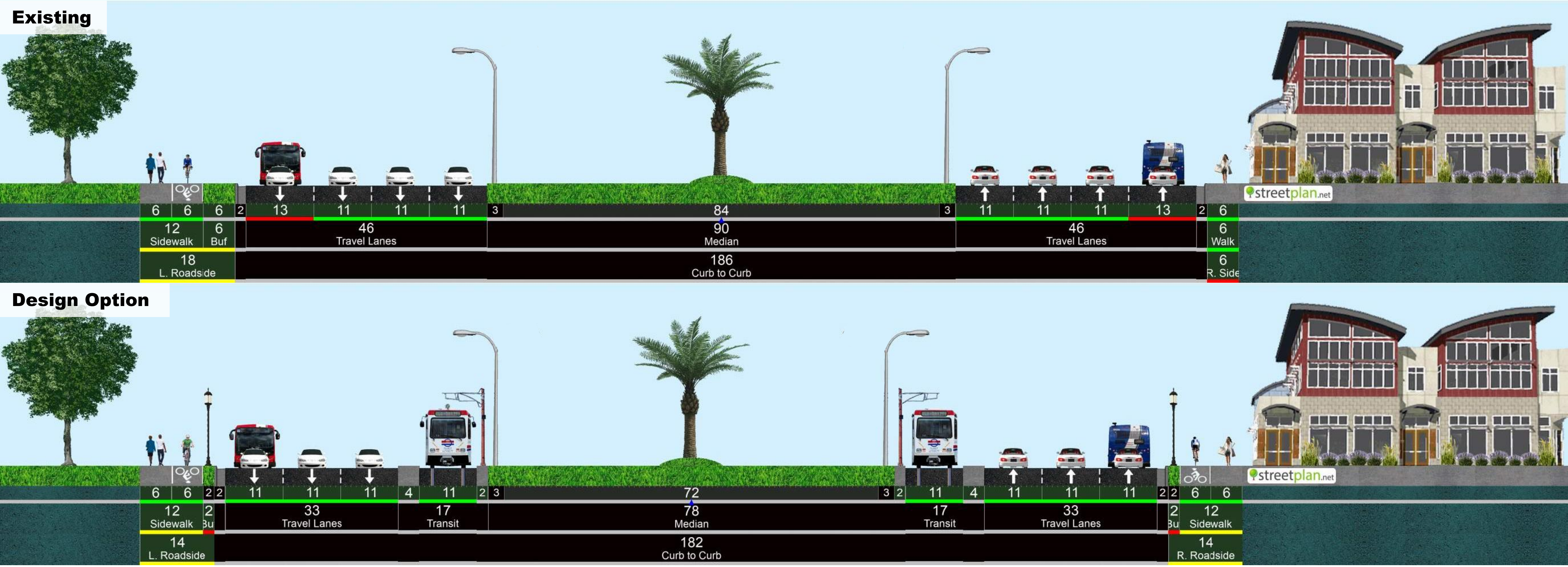
152 feet of right-of-way

Okeechobee Blvd from Australian Ave to Tamarind Ave



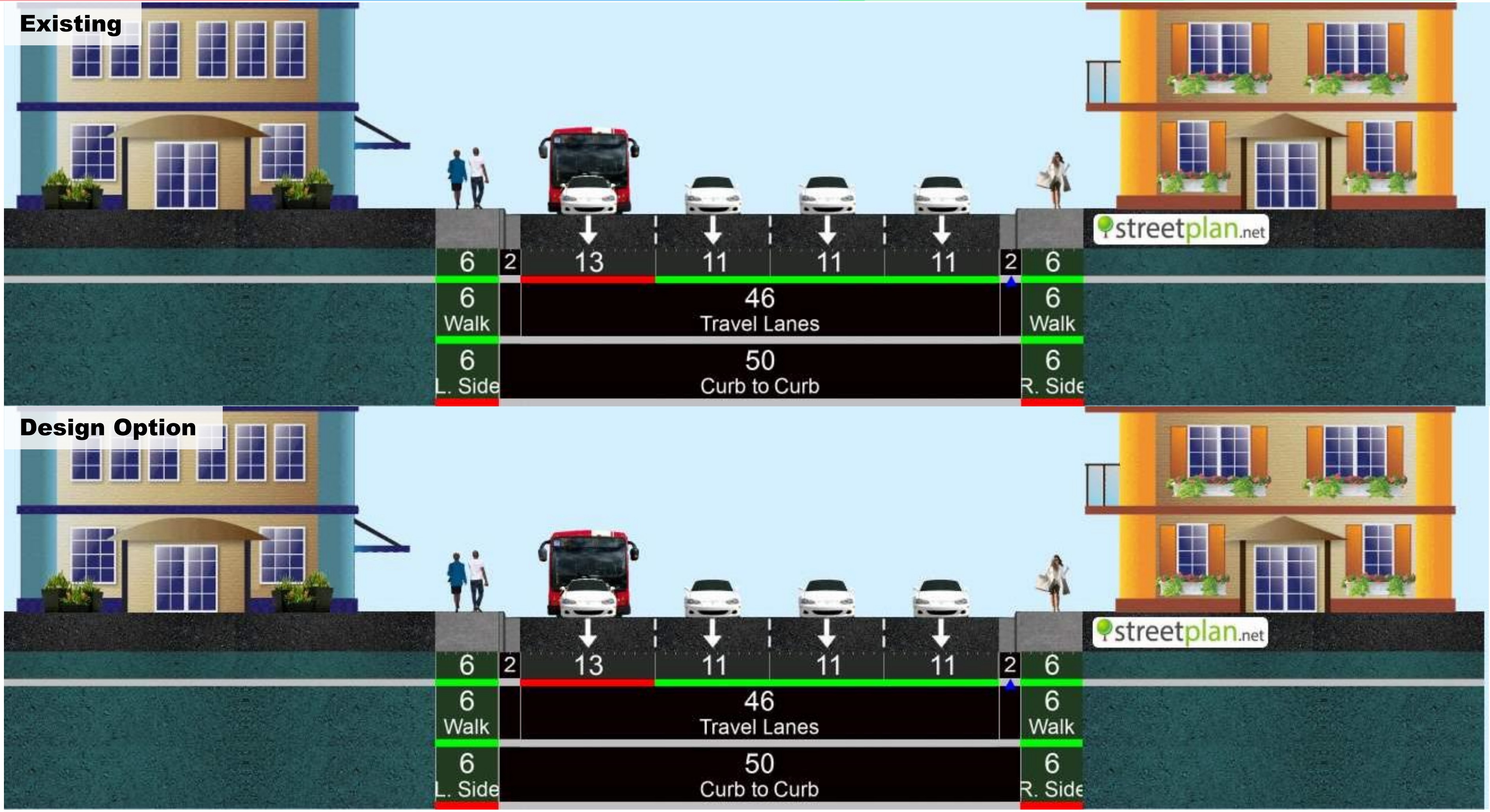
144 feet of right-of-way

Okeechobee Blvd from Tamarind Ave to Rosemary Ave



210 feet of right-of-way

Okeechobee Blvd from Rosemary Ave to US-1 (Pair)



62 feet of right-of-way

Appendix H

Crash Modification Factor (CMF) Summary Table

Street Names	Design Option	Applicable Crash Modification Factors		
		CMF ID	Description	Value and Rating
SR-7 from Wellington Mall to Southern Blvd/SR-80	- Widen sidewalks - Buffered bicycle lanes - Lane repurposing and BAT lanes - Reduce lane width	9120	Median treatments for ped/bike safety	0.86 14% crash reduction 4 stars[1]
		8699	Increase bike lane width	0.99 1% crash reduction 3 stars[1]
		7274	Implement transit lane priority (at transit-serviced locations)	0.806 19.4% crash reduction 4 stars[1]
SR-7 from Southern Blvd/SR-80 to Weisman Way	- Widen sidewalks - Pedestrian lighting - Buffered bicycle lanes - Lane repurposing and BAT lanes - Reduce lane width	9120	Median treatment for ped/bike safety	0.86 14% crash reduction 4 stars[1]
		8699	Increase bike lane width	0.99 1% crash reduction 3 stars[1]
SR-7 from Weisman Way to Belvedere Rd	- Widen sidewalks - Pedestrian lighting - Add buffer/green space between roadway and sidewalk - Buffered bicycle lanes - Lane repurposing and BAT lanes - Reduce lane width	9120	Median treatment for ped/bike safety	0.86 14% crash reduction 4 stars[1]
		8699	Increase bike lane width	0.99 1% crash reduction 3 stars[1]
SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704	- Widen sidewalk on west side - Add sidewalk on east side - Pedestrian lighting - Buffered bicycle lanes - Lane repurposing and BAT lanes - Reduce lane width	9120	Median treatment for ped/bike safety	0.86 14% crash reduction 4 stars[1]
		8699	Increase bike lane width	0.99 1% crash reduction 3 stars[1]
Okeechobee Blvd/SR-704 from SR-7 to Florida's Turnpike	- Widen sidewalk - Pedestrian lighting - Cycle track - Lane repurposing and LRT	2128	Install bicycle tracks	0.90 10% crash reduction 3 stars[1]
Okeechobee Blvd/SR-704 from Florida's Turnpike to I-95	- Buffered bicycle lanes - Lane repurposing and LRT	8699	Increase bike lane width	0.99 1% crash reduction 3 stars[1]
Okeechobee Blvd/SR-704 from I-95 to Australian Ave	- Widen sidewalk - Cycle track - Lane repurposing and LRT	2128	Install bicycle tracks	0.90 10% crash reduction 3 stars[1]
Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave	- Widen sidewalk - Add buffer/green space - Cycle track - Lane repurposing and LRT	2128	Install bicycle tracks	0.90 10% crash reduction 3 stars[1]
Okeechobee Blvd/SR-704 from Tamarind Ave to Rosemary Ave	- Add buffer/green space - Add shared use path on north side - Lane repurposing and LRT			
Okeechobee Blvd/SR-704 from Rosemary Ave to US-1	No change			

Notes: [1] Star ratings are provided by CMF Clearinghouse to indicate the quality or confidence in the results of the studies used to produce a CMF.
Additional details are provided at http://www.cmfclearinghouse.org/sqr.cfm

CMF / CRF Details

CMF ID: 2128

Install bicycle tracks

Description: Bicycle tracks are about 2-2.5 meters wide.

Prior Condition: No bike facilities

Category: Bicyclists

Study: *Bicycle Tracks and Lanes: a Before-After Study*, Jensen, 2008

Star Quality Rating:	[View score details]

Crash Modification Factor (CMF)	
Value:	0.9
Adjusted Standard Error:	
Unadjusted Standard Error:	0.092

Crash Reduction Factor (CRF)	
Value:	10 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	4.18

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	5000 to 28000
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	1976 to 2004
Municipality:	Copenhagen, Denmark
State:	
Country:	

Type of Methodology Used:	Simple before/after
Sample Size Used:	Mile-years
Before Sample Size Used:	77 Mile-years
After Sample Size Used:	77 Mile-years

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	

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CMF / CRF Details

CMF ID: 2159

Install bicycle lanes

Description:

Prior Condition: No bike facilities

Category: Bicyclists

Study: ***Bicycle Tracks and Lanes: a Before-After Study*, Jensen, 2008**

Star Quality Rating:	[View score details]

Crash Modification Factor (CMF)	
Value:	1.05
Adjusted Standard Error:	
Unadjusted Standard Error:	0.084

Crash Reduction Factor (CRF)	
Value:	-5 *(This value indicates an **increase** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	7.44

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Urban
Traffic Volume:	5000 to 28000
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	1976 to 2004
Municipality:	Copenhagen, Denmark
State:	
Country:	

Type of Methodology Used:	Simple before/after
Sample Size Used:	Mile-years
Before Sample Size Used:	21 Mile-years
After Sample Size Used:	21 Mile-years

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	

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CMF / CRF Details

CMF ID: 7274

Implement transit lane priority (at transit-serviced locations)

Description: Implement lane priority measures for trams at transit locations

Prior Condition: Without lane priority

Category: Transit

Study: *Road Safety Impacts of Tram/Streetcar Priority Measures - A Before-After Study Using Empirical Bayes Method*, Naznin et al., 2015

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.806
Adjusted Standard Error:	
Unadjusted Standard Error:	0.091

Crash Reduction Factor (CRF)	
Value:	19.4 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	

Unadjusted Standard Error:	9.1

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	4600 to 30000 *Annual Average Daily Traffic (AADT)*
Time of Day:	Not specified
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2000 to 2013
Municipality:	
State:	

Country:	Australia
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov-01-2015
Comments:	

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 8699

Increase bike lane width

Description:

Prior Condition: Roadway with narrower bike lane width

Category: Bicyclists

Study: *Evaluation of Safety Effectiveness of Multiple Cross Sectional Features on Urban Arterials, Park and Abdel-Aty, 2016*

Star Quality Rating:	3 of 5 stars [View score details]

Crash Modification Factor (CMF)	
Value:	CMFunction: $$CMF = \exp\{0.0395 \times (U_{BLW} - Base_{U_{BLW}})\}$$ Where: $U_{BLW} = \ln\{47.24 + 11.859\,(PropBikeLaneWidth - 7) + 3.7\,(PropBikeLaneWidth - 7)^2\}$ $Base_{U_{BLW}} = \ln\{47.24 + 11.859\,(ExistBikeLaneWidth - 7) + 3.7\,(ExistBikeLaneWidth - 7)^2\}$ Where: $PropBikeLaneWidth$ = Proposed bicycle lane width in feet $ExistBikeLaneWidth$ = Base, or existing, bicycle lane width in feet
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	*(This value indicates an **increase** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Principal Arterial Other
Number of Lanes:	2-8
Road Division Type:	All
Speed Limit:	20-65
Area Type:	Urban
Traffic Volume:	1000 to 94500 *Annual Average Daily Traffic (AADT)*
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	2008 to 2012
Municipality:	

State:	FL
Country:	USA
Type of Methodology Used:	Regression cross-section
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov-06-2017
Comments:	This CMF is for KABCO crashes. CMF applies to urban arterials.

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CMF / CRF Details

CMF ID: 9120

Median treatment for ped/bike safety

Description: Install various median treatment: median fencing, sidewalk fencing, median brick planters, pedestrian islands

Prior Condition: ***No Prior Condition(s)***

Category: Roadside

Study: [***Analyzing the Impact of Median Treatments on Pedestrian/Bicyclist Safety, Zhang et al., 2017***]

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.86
Adjusted Standard Error:	
Unadjusted Standard Error:	0.04

Crash Reduction Factor (CRF)	
Value:	14 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	

Unadjusted Standard Error:	4

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	Divided by Median
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	1998 to 2016
Municipality:	
State:	MD

Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jan-17-2018
Comments:	For all crashes, not just ped/bike related.

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Appendix I

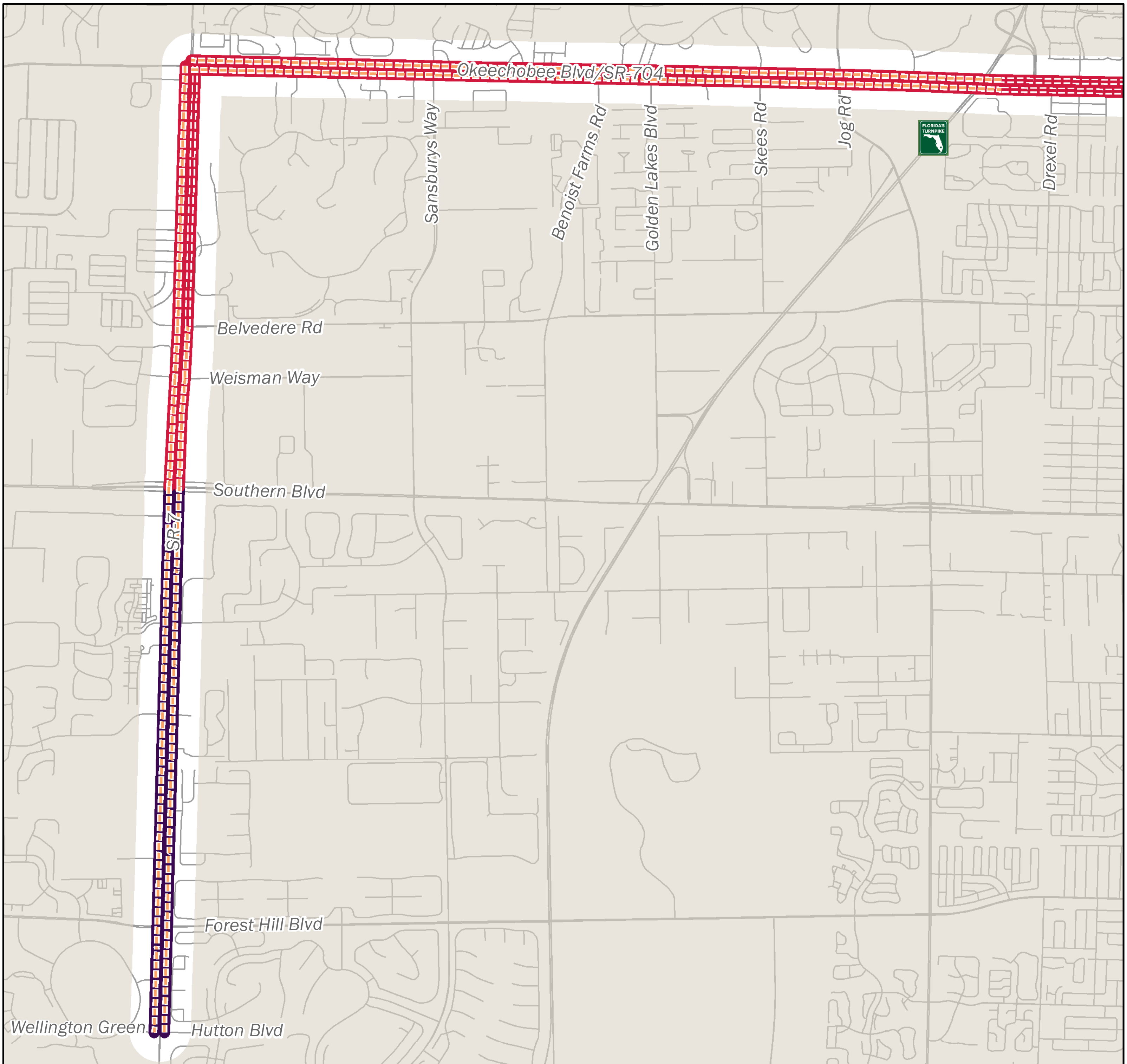
Multimodal Level of Service (MMLOS) Summary Table/Maps

Street Names	Posted Speed Limit / Roadway Class	Area Type	Auto Outside Lane Width	Bike Pavement Condition	Sidewalk Roadway Separation	Bus Frequency (Buses/hour in peak direction)	Amenities	Bus Stop	Bus Routes	Min Headways (Weekday, Minutes)
SR-7 from Wellington Mall to Southern Blvd/SR-80	50 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	3	Excellent	Typical	40, 43, 46, 52, 62	35, 30, 21, 60, and 20
SR-7 from Southern Blvd/SR-80 to Weisman Way	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	2	Poor	Typical	43 and 52	30 and 60
SR-7 from Weisman Way to Belvedere Rd (NB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Adjacent	2	Poor	Typical	43	30
SR-7 from Weisman Way to Belvedere Rd (SB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide (SB)	2	Poor	Typical	43	30
SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704 (NB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	No sidewalk (NB)	1	Poor	Typical	52	60
SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704 (SB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	1	Poor	Typical	52	60
Okeechobee Blvd/SR-704 from SR-7 to Florida's Turnpike	50 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	2	Excellent	Typical	43, 44, and 63	30, 60, and 60
Okeechobee Blvd/SR-704 from Florida's Turnpike to I-95	45 MPH / Class 1	Large Urbanized	Typical	Desirable (No Bicycle Lane)	Adjacent	2	Fair	Typical	43	30
Okeechobee Blvd/SR-704 from I-95 to Australian Ave	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Typical	-	-	-	-	-
Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave (EB)	35 MPH / Class 2	Large Urbanized	Typical	Desirable	Adjacent	-	-	-	-	-
Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave (WB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Adjacent	-	-	-	-	-
Okeechobee Blvd/SR-704 from Tamarind Ave to Rosemary Ave	35 MPH / Class 2	Large Urbanized	Typical	Desirable (No Bicycle Lane)	Adjacent	-	-	-	-	-
Okeechobee Blvd/SR-704 from Rosemary Ave to US-1 (EB)	35 MPH / Class 2	Large Urbanized	Typical	Desirable (No Bicycle Lane)	Adjacent	-	-	-	-	-
Okeechobee Blvd/SR-704 from Rosemary Ave to US-1 (WB)	35 MPH / Class 2	Large Urbanized	Typical	Desirable (No Bicycle Lane)	Adjacent	-	-	-	-	-

Street Names	Posted Speed Limit / Roadway Class	Area Type	Auto Outside Lane Width	Bike Pavement Condition	Sidewalk Roadway Separation	Existing Bus Frequency (Buses/hour in peak direction)	Design Option Transit Frequency	Amenities	Bus Stop	Bus Routes	Min Headways (Weekday, Minutes)	Design Option Headway
SR-7 from Wellington Mall to Southern Blvd/SR-80	50 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	3	4	Excellent	Typical	40, 43, 46, 52, and 62	35, 30, 21, 60, and 20	15
SR-7 from Southern Blvd/SR-80 to Weisman Way	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	2	4	Excellent	Typical	43 and 52	30 and 60	15
SR-7 from Weisman Way to Belvedere Rd	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	2	4	Excellent	Typical	43	30	15
SR-7 from Belvedere Rd to Okeechobee Blvd/SR-704	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	1	4	Excellent	Typical	52	60	15
Okeechobee Blvd/SR-704 from SR-7 to Florida's Turnpike	50 MPH / Class 1	Large Urbanized	Typical	Desirable	Wide	2	6	Excellent	Typical	43, 44, and 63	30, 60, and 60	10
Okeechobee Blvd/SR-704 from Florida's Turnpike to I-95	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Adjacent	2	6	Excellent	Typical	43	30	10
Okeechobee Blvd/SR-704 from I-95 to Australian Ave (EB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Typical	-	6	Excellent	Typical	-	-	10
Okeechobee Blvd/SR-704 from I-95 to Australian Ave (WB)	45 MPH / Class 1	Large Urbanized	Typical	Desirable	Typical	-	6	Excellent	Typical	-	-	10
Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave (EB)	35 MPH / Class 2 (EB)	Large Urbanized	Typical	Desirable	Typical	-	6	Excellent	Typical	-	-	10
Okeechobee Blvd/SR-704 from Australian Ave to Tamarind Ave (WB)	45 MPH / Class 1 (WB)	Large Urbanized	Typical	Desirable	Typical	-	6	Excellent	Typical	-	-	10
Okeechobee Blvd/SR-704 from Tamarind Ave to Rosemary Ave	35 MPH / Class 2	Large Urbanized	Typical	Desirable	Adjacent	-	6	Excellent	Typical	-	-	10
Okeechobee Blvd/SR-704 from Rosemary Ave to US-1 (EB)	35 MPH / Class 2	Large Urbanized	Typical	Desirable	Adjacent	-	-	-	-	-	-	-
Okeechobee Blvd/SR-704 from Rosemary Ave to US-1 (WB)	35 MPH / Class 2	Large Urbanized	Typical	Desirable	Adjacent	-	-	-	-	-	-	-

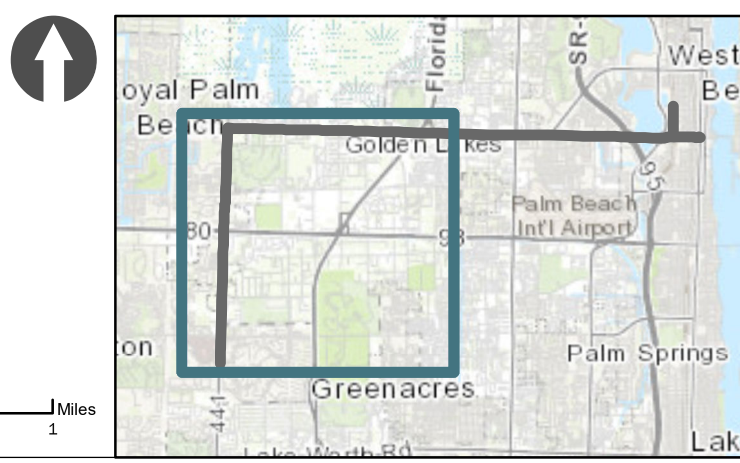
Okeechobee Boulevard Multimodal Corridor Study (MCS)

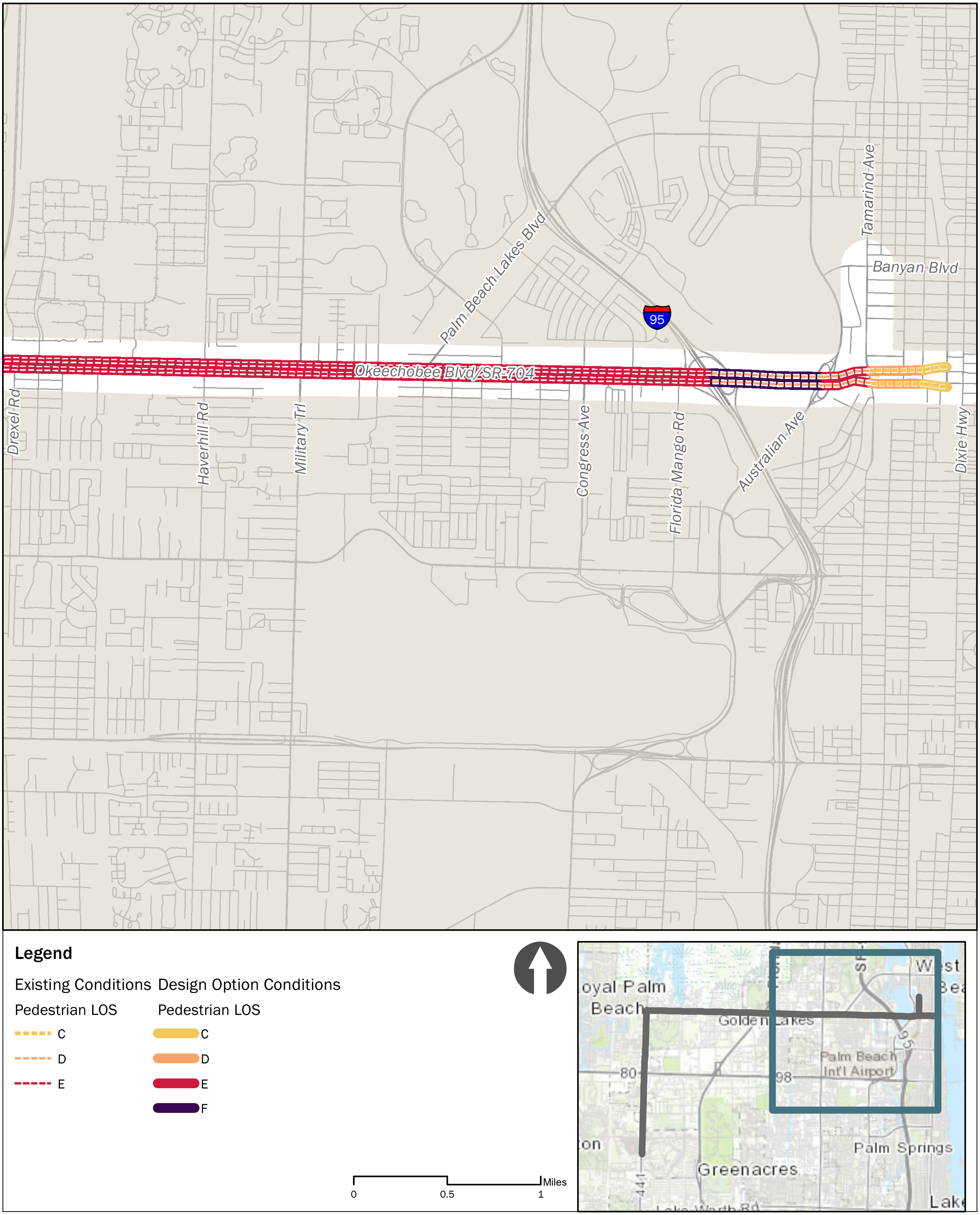
Task 3.4



Legend

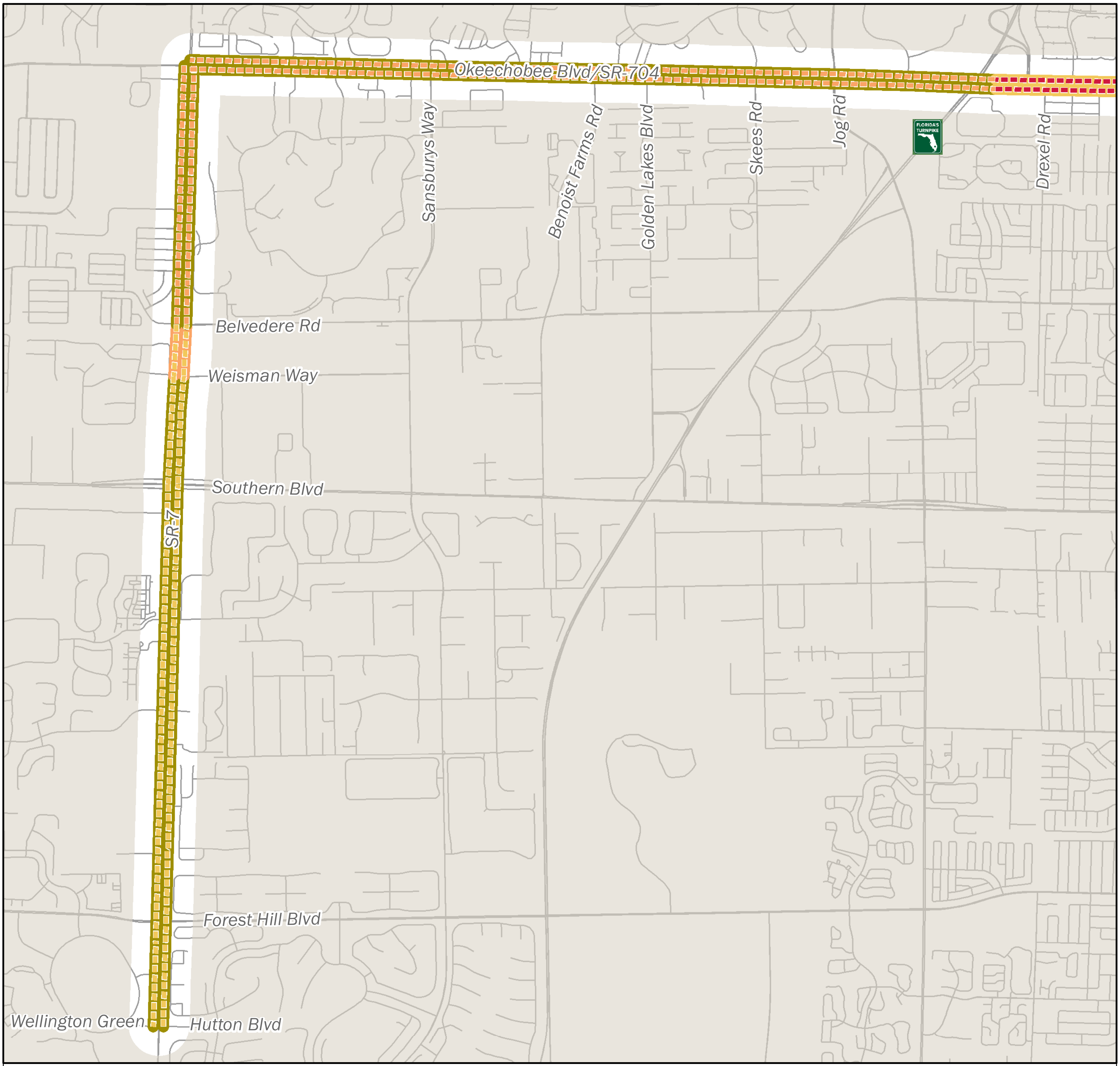
Existing Conditions	Design Option Conditions
Pedestrian LOS	Pedestrian LOS
D	E
E	F

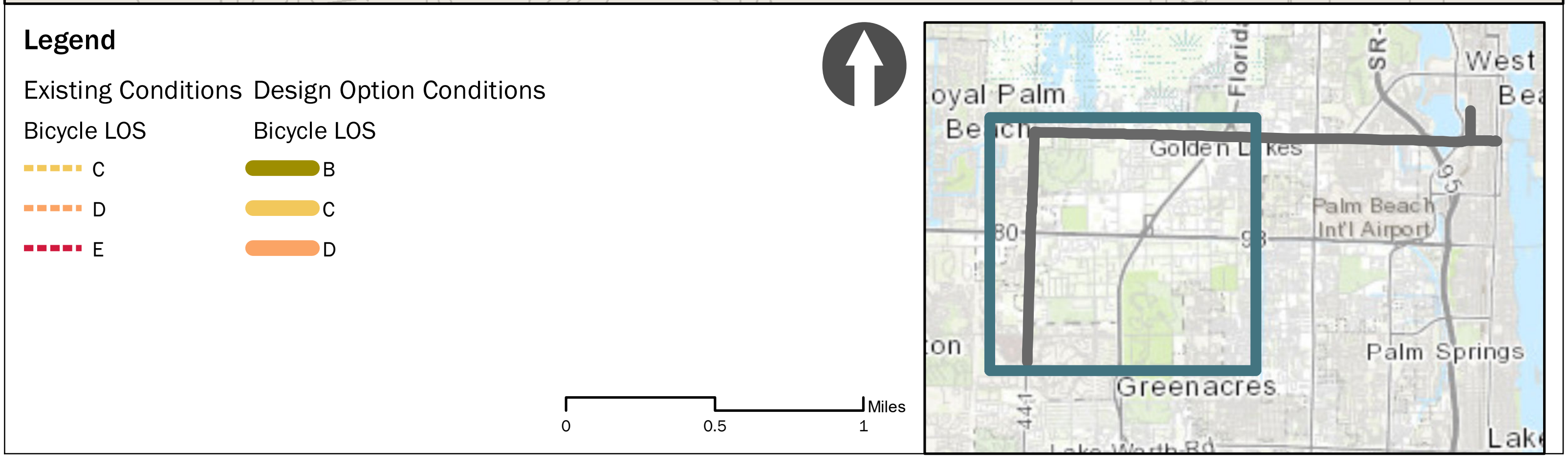


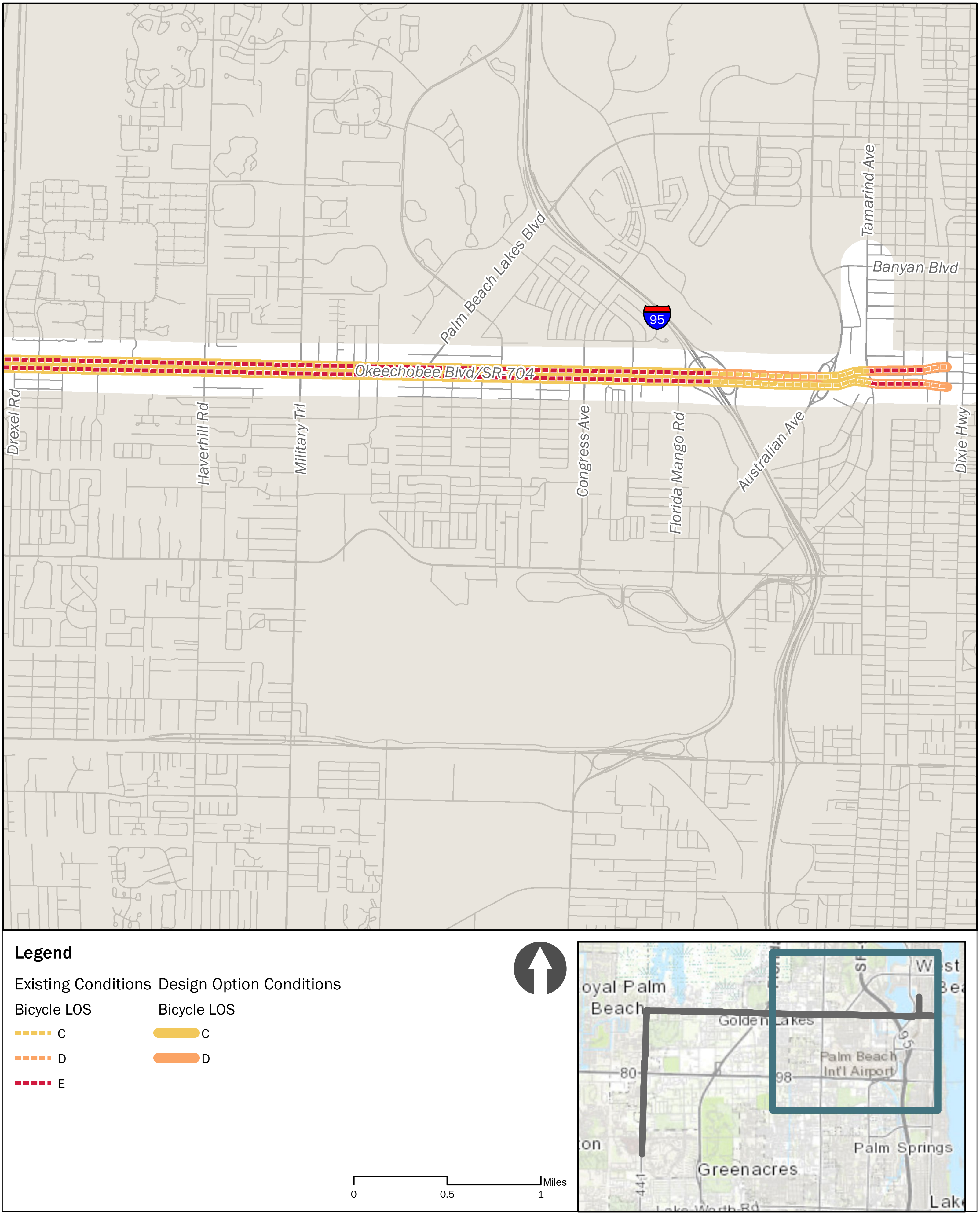

Tamarind Ave
Banyan Blvd
Palm Beach Lakes Blvd
95
Okeechobee Blvd/SR-704
Drexel Rd
Haverhill Rd
Military Trl
Congress Ave
Florida Mango Rd
Australian Ave
Dixie Hwy
Legend
Existing Conditions
Pedestrian LOS
C
D
E
Design Option Conditions
Pedestrian LOS
C
D
E
F
0
0.5
1
Miles
oyal Palm
Beach
Golden Lakes
West
Bea
80
98
Palm Beach
Int'l Airport
95
Palm Springs
Greenacres
441
Lake

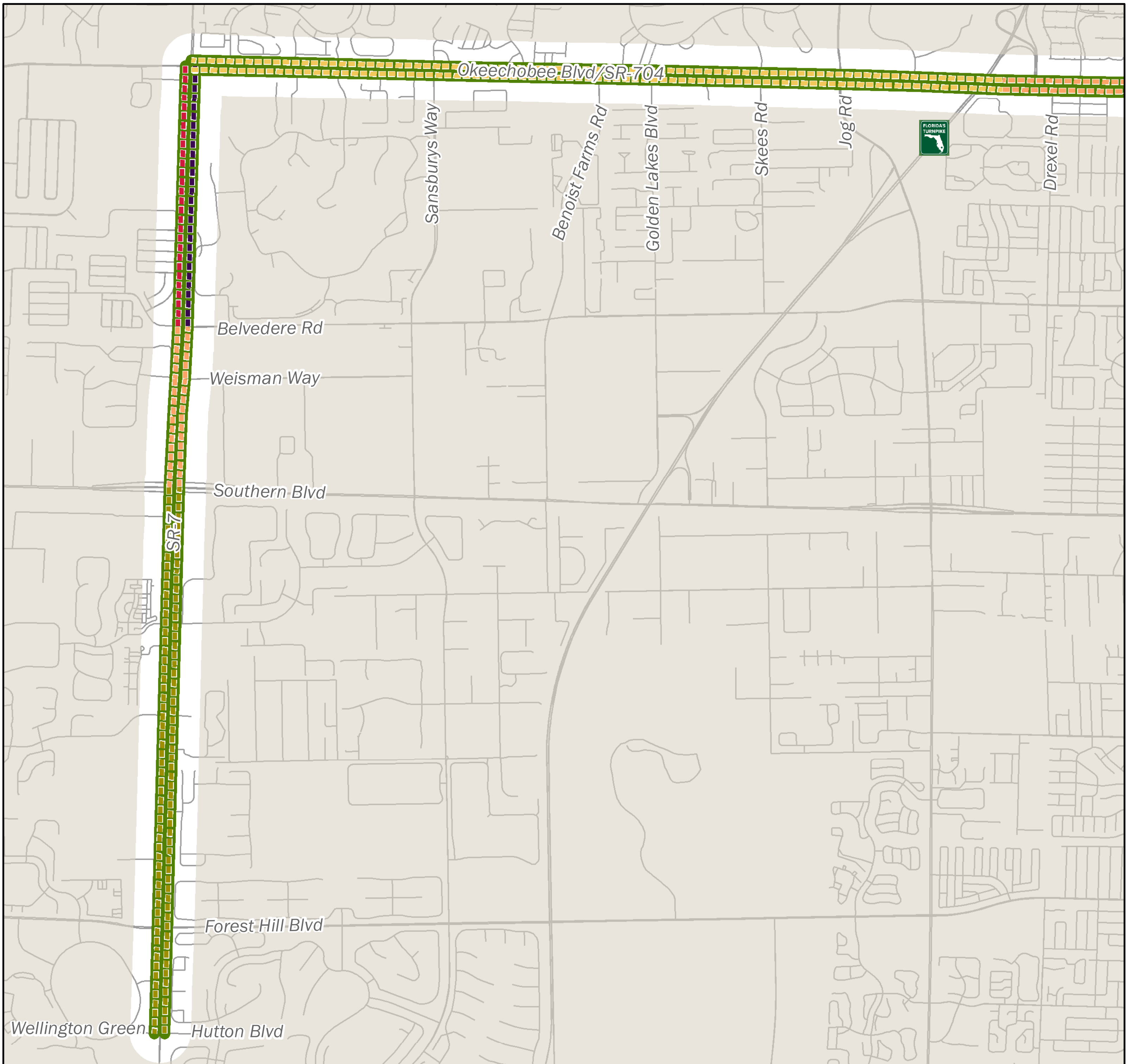
Okeechobee Boulevard Multimodal Corridor Study (MCS)

Task 3.4





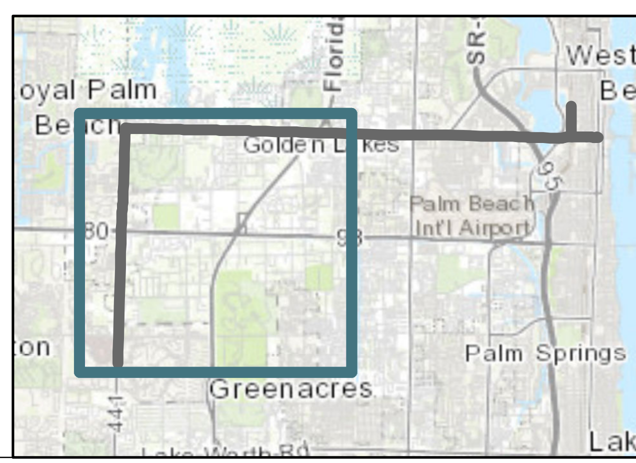

Palm Beach Lakes Blvd
Tamarind Ave
Banyan Blvd
95
Okeechobee Blvd/SR 704
Drexel Rd
Haverhill Rd
Military Trl
Congress Ave
Florida Mango Rd
Australian Ave
Dixie Hwy
Legend
Existing Conditions
Bicycle LOS
C
D
E
Design Option Conditions
Bicycle LOS
C
D
0
0.5
1
Miles
oyal Palm Beach
Golden Lakes
West Pa
Palm Beach Int'l Airport
98
80
95
441
Palm Springs
Greenacres
Lake Worth Rd



Legend

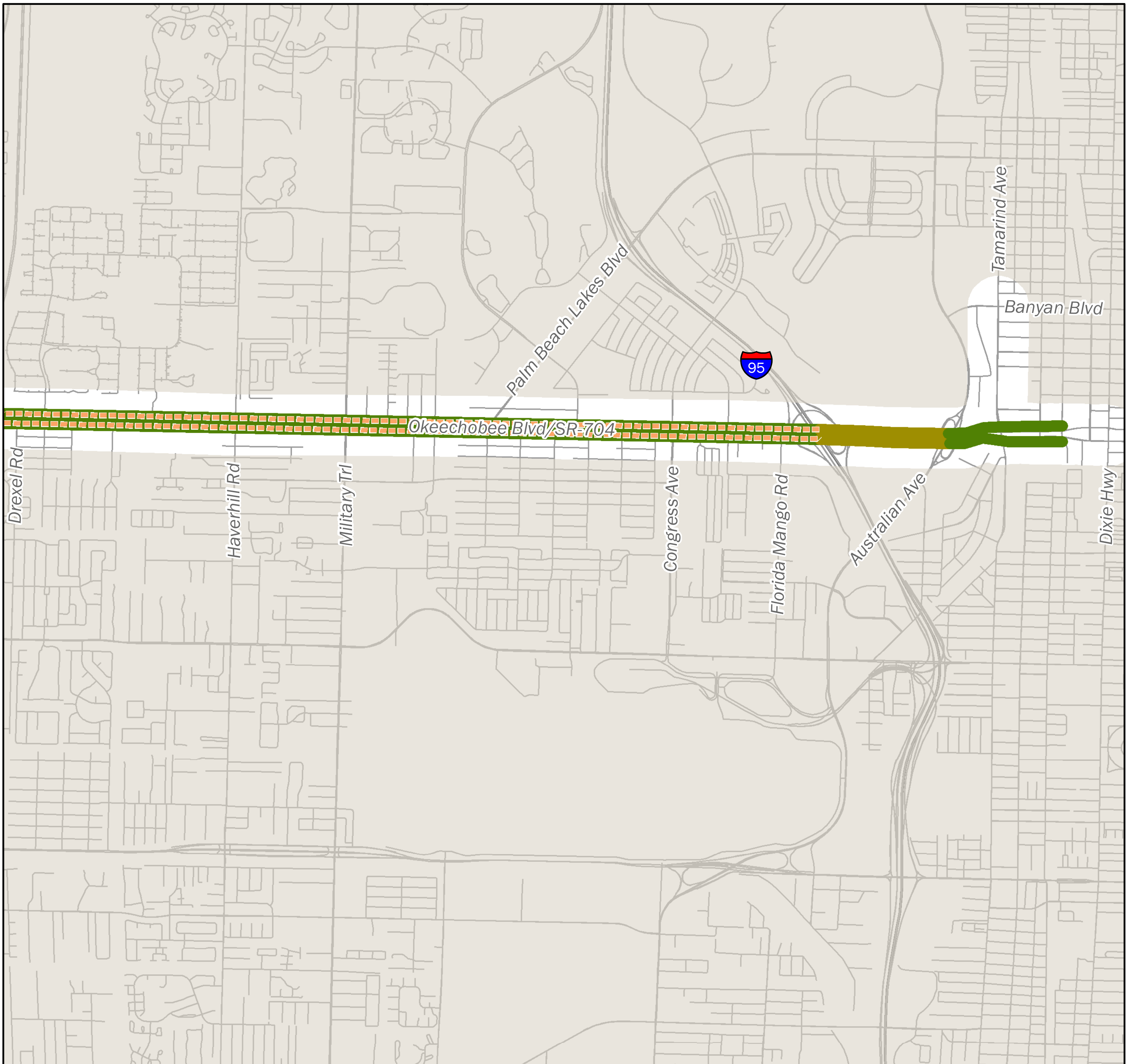
Existing Conditions	Design Option Conditions
Bus/Transit LOS	Bus/Transit LOS
B	A
C	
D	
E	
F	

0 0.5 1 Miles



Okeechobee Boulevard Multimodal Corridor Study (MCS)

Task 3.4



Legend

Existing Conditions Bus/Transit LOS

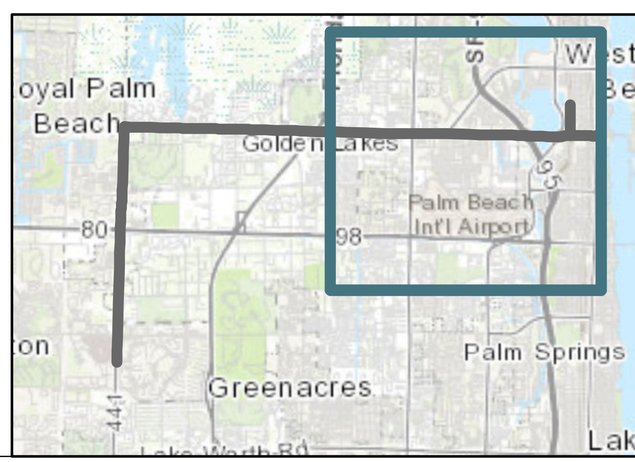
D

Design Option Conditions Bus/Transit LOS

A

B

0 0.5 1 Miles



ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Wellington Mall to Southern B	Study Period	Standard K
Date Prepared	12/17/2020 13:54:49	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 1.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	3.5	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	13500	65500	3236	4	50	55	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2848	3793	1.669	392.15	F	#	16.23	E

Arterial Length	2.5682	Weighted g/C	0.45	FFS Delay	402.39	Threshold Delay	56.11	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Wide	No	3	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.12	C	N/A	N/A				4.13	D	4.94	B

Bicycle LOS	3.12	C	Pedestrian LOS	4.13	D	Bus LOS	4.94	B

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Southern Blvd to Weisman Way	Study Period	Standard K
Date Prepared	12/18/2020 15:38:05	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 2.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	2600	56000	2767	4	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2435	3595	1.505	297.83	F	#	5.39	F

Arterial Length	0.5038	Weighted g/C	0.45	FFS Delay	301.00	Threshold Delay	235.69	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Wide	No	2	0.8	Poor	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.42	C	N/A	N/A				3.66	D	2.15	D

Bicycle LOS	3.42	C	Pedestrian LOS	3.66	D	Bus LOS	2.15	D

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Weisman Way to Belvedere Rd	Study Period	Standard K
Date Prepared	12/18/2020 15:53:30	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 3.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1300	56000	2767	4	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2435	3595	1.505	297.83	F	#	2.91	F

Arterial Length	0.2576	Weighted g/C	0.45	FFS Delay	300.71	Threshold Delay	266.92	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Adjacent	No	2	0.8	Poor	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.38	C	N/A	N/A				3.71	D	2.15	D

Bicycle LOS	3.38	C	Pedestrian LOS	3.71	D	Bus LOS	2.15	D

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
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Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Weisman Way to Belvedere Rd	Study Period	Standard K
Date Prepared	12/18/2020 15:53:30	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 3B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1300	56000	2767	4	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2435	3595	1.505	297.83	F	#	2.91	F

Arterial Length	0.2576	Weighted g/C	0.45	FFS Delay	300.71	Threshold Delay	266.92	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Wide	No	2	0.8	Poor	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.38	C	N/A	N/A				3.59	D	2.15	D

Bicycle LOS			Pedestrian LOS			Bus LOS		
	3.38	C		3.59	D		2.15	D

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Belvedere Rd to Okeechobee Blv	Study Period	Standard K
Date Prepared	12/18/2020 16:00:48	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 4B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	7.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	6300	42000	2075	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	1826	3510	1.156	118.28	F	#	20.70	D

Arterial Length	1.2045	Weighted g/C	0.45	FFS Delay	123.55	Threshold Delay	0.00	Auto Speed	###

Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	No	N/A	No	1	0.8	Poor	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			No			N/A			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	4.05	D	N/A	N/A				4.88	E	0.92	F

Bicycle LOS	4.05	D	Pedestrian LOS	4.88	E	Bus LOS	0.92	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Belvedere Rd to Okeechobee Blv	Study Period	Standard K
Date Prepared	12/18/2020 16:00:48	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Southbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 4.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	7.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	6300	42000	2075	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	1826	3510	1.156	118.28	F	#	20.70	D

Arterial Length	1.2045	Weighted g/C	0.45	FFS Delay	123.55	Threshold Delay	0.00	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Wide	No	1	0.8	Poor	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	4.05	D	N/A	N/A				3.69	D	1.08	E

Bicycle LOS	4.05	D	Pedestrian LOS	3.69	D	Bus LOS	1.08	E

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from SR-7 to FL Turnpike	Study Period	Standard K
Date Prepared	12/18/2020 16:09:30	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 5.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	15000	68000	3360	4	50	55	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2957	3723	1.765	454.61	F	#	15.74	E

Arterial Length	2.8523	Weighted g/C	0.45	FFS Delay	466.32	Threshold Delay	81.82	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Wide	No	2	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.55	D	N/A	N/A				4.20	D	3.29	C

Bicycle LOS	3.55	D	Pedestrian LOS	4.20	D	Bus LOS	3.29	C

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from FL Turnpike to I-95	Study Period	Standard K
Date Prepared	12/18/2020 16:15:13	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 6.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	2.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	15000	65500	3236	4	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2848	3699	1.711	418.65	F	#	16.14	E

Arterial Length	2.8523	Weighted g/C	0.45	FFS Delay	431.48	Threshold Delay	65.57	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	No	N/A	Yes	Adjacent	No	2	0.8	Fair	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	4.60	E	N/A	N/A				4.28	E	2.54	D

Bicycle LOS	4.60	E	Pedestrian LOS	4.28	E	Bus LOS	2.54	D

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from I-95 to Australian	Study Period	Standard K
Date Prepared	12/18/2020 16:20:44	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 7.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	4.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	3000	77500	3829	4	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3370	3609	2.075	826.35	F	#	2.39	F

Arterial Length	0.5795	Weighted g/C	0.45	FFS Delay	830.62	Threshold Delay	755.62	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Typical	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.49	C	N/A	N/A				4.24	D	0.00	F

Bicycle LOS	3.49	C	Pedestrian LOS	4.24	D	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Australian to Tamar	Study Period	Standard K
Date Prepared	12/18/2020 16:27:27	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 8A.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	0.549	% Heavy Vehicles	3.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1400	70000	3459	4	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3044	3434	1.911	352.50	F	#	2.62	F

Arterial Length	0.2765	Weighted g/C	0.44	FFS Delay	356.39	Threshold Delay	303.68	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	2.95	C	N/A	N/A				3.81	D	0.00	F

Bicycle LOS	2.95	C	Pedestrian LOS	3.81	D	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Australian to Tamar	Study Period	Standard K
Date Prepared	12/18/2020 16:27:27	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Westbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 8B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	3.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1400	70000	3459	4	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3044	3653	1.796	220.48	F	#	4.10	F

Arterial Length	0.2765	Weighted g/C	0.44	FFS Delay	223.62	Threshold Delay	187.41	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.14	C	N/A	N/A				4.10	D	0.00	F

Bicycle LOS	3.14	C	Pedestrian LOS	4.10	D	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Tamarind to Rosemar	Study Period	Standard K
Date Prepared	12/18/2020 16:34:52	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 9.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	0.549	% Heavy Vehicles	3.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1400	48783	2410	4	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2121	3434	1.371	212.70	F	#	4.15	F

Arterial Length	0.2765	Weighted g/C	0.44	FFS Delay	215.97	Threshold Delay	163.26	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	4.49	E	N/A	N/A				3.45	C	0.00	F

Bicycle LOS	4.49	E	Pedestrian LOS	3.45	C	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Rosemary Ave to US1	Study Period	Standard K
Date Prepared	12/18/2020 16:45:20	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 10A.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	0.999	% Heavy Vehicles	2.4	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	600	22000	1978	4	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	1741	3486	1.131	88.96	F	0.89	4.37	F

Arterial Length	0.1250	Weighted g/C	0.44	FFS Delay	92.72	Threshold Delay	68.33	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.95	D	N/A	N/A				3.08	C	0.00	F

Bicycle LOS	3.95	D	Pedestrian LOS	3.08	C	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Rosemary Ave to US1	Study Period	Standard K
Date Prepared	12/18/2020 16:45:20	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Westbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_Existing 10B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	Pretimed
D	0.999	% Heavy Vehicles	1.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	600	23500	2113	4	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	1859	3521	1.188	116.71	F	#	3.44	F

Arterial Length	0.1250	Weighted g/C	0.44	FFS Delay	120.50	Threshold Delay	96.11	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.84	D	N/A	N/A				3.16	C	0.00	F

Bicycle LOS	3.84	D	Pedestrian LOS	3.16	C	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Wellington Mall to Southern B	Study Period	Standard K
Date Prepared	12/17/2020 13:54:49	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 1.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	3.5	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	13500	82300	4066	3	50	55	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3578	3793	2.097	894.74	F	#	8.56	F

Arterial Length	2.5682	Weighted g/C	0.45	FFS Delay	912.73	Threshold Delay	566.45	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	Yes	34.00	Yes	Wide	No	7	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.35	C	1.86	B				5.29	F	6.34	A

Bicycle LOS	1.86	B	Pedestrian LOS	5.29	F	Bus LOS	6.34	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Southern Blvd to Weisman Way	Study Period	Standard K
Date Prepared	12/18/2020 15:38:05	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 2.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	2600	70300	3474	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3057	3595	1.890	552.02	F	#	3.06	F

Arterial Length	0.5038	Weighted g/C	0.45	FFS Delay	556.63	Threshold Delay	491.33	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	Yes	21.00	Yes	Wide	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.65	D	2.08	B				4.66	E	8.39	A

Bicycle LOS	2.08	B	Pedestrian LOS	4.66	E	Bus LOS	8.39	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Weisman Way to Belvedere Rd	Study Period	Standard K
Date Prepared	12/18/2020 15:53:30	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 3.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1300	70300	3474	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3057	3595	1.890	552.02	F	#	1.62	F

Arterial Length	0.2576	Weighted g/C	0.45	FFS Delay	555.64	Threshold Delay	521.85	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	Yes	3.00	Yes	Typical	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.61	D	3.79	D				4.60	E	8.39	A

Bicycle LOS	3.61	D	Pedestrian LOS	4.60	E	Bus LOS	8.39	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	SR-7 from Belvedere Rd to Okeechobee Blv	Study Period	Standard K
Date Prepared	12/18/2020 16:00:48	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Northbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 4.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	7.2	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	6300	52700	2604	2	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2292	3510	1.451	268.55	F	#	11.87	F

Arterial Length	1.2045	Weighted g/C	0.45	FFS Delay	279.36	Threshold Delay	124.36	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	Yes	24.00	Yes	Typical	No	5	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	4.30	E	1.94	B				4.97	E	6.99	A

Bicycle LOS		Pedestrian LOS		Bus LOS	
1.94	B	4.97	E	6.99	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from SR-7 to FL Turnpike	Study Period	Standard K
Date Prepared	12/18/2020 16:09:30	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 5.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	5	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	15000	71400	3528	3	50	55	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3105	3723	1.853	520.65	F	#	14.19	F

Arterial Length	2.8523	Weighted g/C	0.45	FFS Delay	537.50	Threshold Delay	153.00	Auto Speed	###
Auto LOS	###								

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	Yes	30.00	Yes	Wide	No	8	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Wide			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.70	D	2.01	B				4.91	E	11.19	A

Bicycle LOS	2.01	B	Pedestrian LOS	4.91	E	Bus LOS	11.19	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from FL Turnpike to I-95	Study Period	Standard K
Date Prepared	12/18/2020 16:15:13	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 6.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	2.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	15000	72500	3582	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3152	3699	1.894	555.82	F	#	13.16	F

Arterial Length	2.8523	Weighted g/C	0.45	FFS Delay	575.63	Threshold Delay	209.73	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Adjacent	No	8	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.08	C	N/A	N/A				4.88	E	11.19	A

Bicycle LOS			Pedestrian LOS			Bus LOS		
Bicycle LOS	3.08	C	Pedestrian LOS	4.88	E	Bus LOS	11.19	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from I-95 to Australian	Study Period	Standard K
Date Prepared	12/18/2020 16:20:44	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 7A.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	4.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	3000	84200	4160	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3661	3609	2.254	-1004.21	A	#	-2.18	F

Arterial Length	0.5795	Weighted g/C	0.45	FFS Delay	-998.23	Threshold Delay	0.00	Auto Speed	###

Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	Yes	8.00	Yes	Typical	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.64	D	2.93	C				5.15	F	5.43	B

Bicycle LOS	2.93	C	Pedestrian LOS	5.15	F	Bus LOS	5.43	B

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from I-95 to Australian	Study Period	Standard K
Date Prepared	12/18/2020 16:20:44	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Westbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 7B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	4.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	150	0.45	3	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	3000	84200	4160	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3661	3609	2.254	-1004.21	A	#	-2.18	F

Arterial Length	0.5795	Weighted g/C	0.45	FFS Delay	-998.23	Threshold Delay	0.00	Auto Speed	###
Auto LOS	###								

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Typical	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.64	D	N/A	N/A				5.15	F	5.43	B

Bicycle LOS	3.64	D	Pedestrian LOS	5.15	F	Bus LOS	5.43	B

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Australian to Tamar	Study Period	Standard K
Date Prepared	12/18/2020 16:27:27	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 8A.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	0.549	% Heavy Vehicles	3.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1400	78100	3859	3	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3396	3434	2.117	477.02	F	#	1.97	F

Arterial Length	0.2765	Weighted g/C	0.44	FFS Delay	482.18	Threshold Delay	429.47	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Typical	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.10	C	N/A	N/A				4.61	E	8.39	A

Bicycle LOS	3.10	C	Pedestrian LOS	4.61	E	Bus LOS	8.39	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Australian to Tamar	Study Period	Standard K
Date Prepared	12/18/2020 16:27:27	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Westbound	Version Date	12/12/2012
Arterial Class	1				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 8B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	FullyActuated
D	0.549	% Heavy Vehicles	3.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1400	78100	3859	3	45	50	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	3396	3653	1.990	405.58	F	#	2.32	F

Arterial Length	0.2765	Weighted g/C	0.44	FFS Delay	409.48	Threshold Delay	373.27	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	Yes	No	N/A	Yes	Typical	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Typical			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.32	C	N/A	N/A				4.88	E	6.72	A

Bicycle LOS	3.32	C	Pedestrian LOS	4.88	E	Bus LOS	6.72	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Tamarind to Rosemar	Study Period	Standard K
Date Prepared	12/18/2020 16:34:52	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 9.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	0.549	% Heavy Vehicles	3.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	1400	53100	2624	3	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2309	3434	1.481	281.51	F	#	3.22	F

Arterial Length	0.2765	Weighted g/C	0.44	FFS Delay	285.42	Threshold Delay	232.71	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	Yes	2.00	Yes	Adjacent	No	6	0.8	Excellent	Typical

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	4.65	E	3.80	D				4.05	D	7.90	A

Bicycle LOS			Pedestrian LOS			Bus LOS		
	3.80	D		4.05	D		7.90	A

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Rosemary Ave to US1	Study Period	Standard K
Date Prepared	12/18/2020 16:45:20	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Eastbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 10A.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	1	% Heavy Vehicles	2.4	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	600	23900	2151	4	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	1893	3499	1.214	130.06	F	#	3.12	F

Arterial Length	0.1250	Weighted g/C	0.44	FFS Delay	133.85	Threshold Delay	109.46	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.99	D	N/A	N/A				3.18	C	0.00	F

Bicycle LOS	3.99	D	Pedestrian LOS	3.18	C	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

ARTPLAN 2012 Conceptual Planning Analysis

Project Information

Analyst		Arterial Name	Okeechobee Blvd from Rosemary Ave to US1	Study Period	Standard K
Date Prepared	12/18/2020 16:45:20	From		Modal Analysis	Multimodal
Agency		To		Program	ARTPLAN 2012
Area Type	Large Urbanized	Peak Direction	Westbound	Version Date	12/12/2012
Arterial Class	2				

File Name	K:\FTL_TPTO\040416019 PB TPA WO #18 Okeechobee Blvd MCS\Task 3 Recommended Alternative\3.4 Benefits of Alternative\ARTPLAN\OBMCS_DesignOption 10B.xap
User Notes	

Arterial Data

K	0.09	PHF	1	Control Type	CoordinatedActuated
D	1	% Heavy Vehicles	1.9	Base Sat. Flow Rate	1950

Automobile Intersection Data

Cross Street	Cycle Length	Thru g/C	Arr. Type	INT # Dir.Lanes	% Left Turns	% Right Turns	Left Turn Lanes	Left Turn Phasing	# Left Turn Lanes	LT Storage Length	Left g/C	Right Turn Lanes
	120	0.44	4	2	12	12	Yes	Protected	1	235	0.15	No

Automobile Segment Data

Segment #	Length	AADT	Hourly Vol.	SEG # Dir.Lanes	Posted Speed	Free Flow Speed	Median Type	On-Street Parking	Parking Activity
1 (to)	600	26100	2349	4	35	40	Restrictive	No	N/A

Automobile LOS

Segment #	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Int. Approach LOS	Queue Ratio	Speed (mph)	Segment LOS
1 (to)	2067	3521	1.306	177.35	F	#	2.35	F

Arterial Length	0.1250	Weighted g/C	0.44	FFS Delay	181.18	Threshold Delay	156.79	Auto Speed	###	Auto LOS	###

Automobile Service Volumes

Note: The maximum normally acceptable directional service volume for LOS E in Florida for this facility type and area type is 1000 veh/h/ln.

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1					
2					
3					
4					
*					
Lanes	Hourly Volume In Both Directions				
2					
4					
6					
8					
*					
Lanes	Annual Average Daily Traffic				
2					
4					
6					
8					
*					

Multimodal Segment Data

Segment #	Outside Lane Width	Pave Cond	Pave Shldr /Bike Lane	Side Path	Side Path Separation	Side walk	Sidewalk Roadway Separation	Sidewalk Roadway Protective Barrier	Bus Freq	Passenger Load Factor	Amenities	Bus Stop Type
1 (to)	Typical	Desirable	No	No	N/A	Yes	Adjacent	No	0	0	Excellent	None

Pedestrian SubSegment Data

	% of Segment			Sidewalk			Separation			Barrier		
Segment #	1	2	3	1	2	3	1	2	3	1	2	3
1 (to)	100			Yes			Adjacent			No		

Multimodal LOS

	Bicycle Street		Bicycle Sidepath		Pedestrian					Bus	
Link #	Score	LOS	Score	LOS	1	2	3	Score	LOS	Adj. Buses	LOS
1 (to)	3.92	D	N/A	N/A				3.29	C	0.00	F

Bicycle LOS	3.92	D	Pedestrian LOS	3.29	C	Bus LOS	0.00	F

MultiModal Service Volume Tables

Bicycle

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Pedestrian

	A	B	C	D	E
Lanes	Hourly Volume In Peak Direction				
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
*	0	0	0	0	0
Lanes	Hourly Volume In Both Directions				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0
Lanes	Annual Average Daily Traffic				
2	0	0	0	0	0
4	0	0	0	0	0
6	0	0	0	0	0
8	0	0	0	0	0
*	0	0	0	0	0

Bus

A	B	C	D	E
Buses Per Hour In Peak Direction				
Buses in Study Hour in Peak Direction (Daily)				

* Service Volumes for the specific facility being analyzed, based on # of lanes from the intersection and segment data screens.
** Cannot be achieved based on input data provided.
*** Not applicable for that level of service letter grade. See generalized tables notes for more details.
# Under the given conditions, left turn lane storage is highly likely to overflow. The number of directional thru lanes should be reduced accordingly.
Facility weighted g/C exceeds normally acceptable upper range (0.5); verify that g/C inputs are correct.
Intersection capacity (ies) are exceeded for the full hour; an operational level analysis tool is more appropriate for this situation.

Appendix J

Summary of Design Option Traffic Impacts

Street Name	From	To	SERPM 2015	SERPM 2045	Posted Speed (MPH)	Number of Lanes (bi-directional) No Build	Number of Lanes (bi-directional) Build Alternative	SERPM Annual Growth Rate	FDOT Count Station Number	FDOT Count Station Location	AADT Year	2019 AADT	Peak Hour Direction	Peak Hour Peak Direction 2019	Calculated AADT 2045	Peak Hour Peak Direction 2045	Class	AADT LOS					Peak Hour Peak Direction LOS				
																		2019 (Base Year)	2045 (LRTP Horizon Year) No Build	Percent Failure (No Build)	2045 (LRTP Horizon Year) Design Option	Percent Failure (Design Option)	2019 (Base Year)	2045 (LRTP Horizon Year) No Build	Percent Failure (No Build)	2045 (LRTP Horizon Year) Design Option	Percent Failure (Design Option)
SR-7/US 441	Stribling Way	Forest Hill Blvd	61,497	79,926	45	8	8	0.88%	930721	S of Forest Hill Blvd	2019	61,000	N	2,546	76,600	3,200	Class I	C	C	96%	C	96%	C	C	79%	C	79%
SR-7/US 441[A]	Forest Hill Blvd	Southern Blvd	56,786	78,982	45	8	6	0.88%	930037	S of SR 80/Southern Blvd C-13	2019	65,500	S	2,798	82,300	3,510	Class I	C	C	98%	F	131%	C	C	83%	F	111%
SR-7/US 441[A]	Southern Blvd	Belvedere Rd	48,365	70,008	45	8	6	0.88%	930514	N of SR 80/Southern Blvd	2019	56,000	S	2,576	70,300	3,240	Class I	C	C	84%	F	112%	C	C	76%	F	102%
SR-7/US 441[A]	Belvedere Rd	Okeechobee Blvd	28,010	48,645	45	6	4	0.88%	930034	S of Okeechobee Blvd/SR 704	2019	42,000	N	1,996	52,700	2,510	Class I	C	C	84%	F	126%	C	C	79%	F	120%
Okeechobee Blvd[B]	Wildcat Way	SR-7/US 441	45,520	53,109	50	8	6	0.52%	937064	On Okeechobee Blvd from Wildcat Way	2019	44,500	E	2,203	50,900	2,520	Class I	C	C	61%	C	81%	C	C	59%	C	79%
Okeechobee Blvd	SR-7/US 441	Sansburys Way	49,348	68,546	50	8	6	1.10%	930754	E of SR 7/441 E	2019	52,500	E	3,342	69,800	4,440	Class I	C	C	83%	F	111%	C	F	105%	F	140%
Okeechobee Blvd	Sansburys Way	N Jog Rd	72,753	88,495	50	8	6	0.66%	937261	Benoist Farms Rd to Skees Rd	2019	62,000	E	4,028	73,600	4,780	Class I	C	C	88%	F	117%	C	F	113%	F	151%
Okeechobee Blvd	N Jog Rd	Okeechobee Toll Plaza	66,400	70,213	45	8	6	0.19%	930696	W of Florida's Turnpike Entrance	2019	68,000	E	4,144	71,400	4,350	Class I	C	C	85%	F	114%	C	F	103%	F	137%
Okeechobee Blvd	Okeechobee Toll Plaza	Military Trl	80,148	90,295	45	8	6	0.40%	930745	E of Florida's Turnpike Entrance	2019	66,500	E	3,860	73,800	4,280	Class I	C	C	88%	F	117%	C	F	101%	F	135%
Okeechobee Blvd	Military Trl	Palm Beach Lakes Blvd/Wabasso Dr	74,389	83,691	45	8	6	0.39%	930456	E of SR 809/Military Trl	2019	65,500	W	3,329	72,500	3,680	Class I	C	C	86%	F	115%	C	C	87%	F	116%
Okeechobee Blvd	Palm Beach Lakes Blvd/Wabasso Dr	Congress Ave	42,053	48,468	45	8	6	0.47%	935277	E of Tallahassee Dr	2019	53,000	E	2,777	59,900	3,140	Class I	C	C	71%	C	95%	C	C	74%	D	99%
Okeechobee Blvd	Congress Ave	I-95	60,346	68,387	45	8	6	0.42%	935410	W of I-95	2019	57,000	W	2,626	63,600	2,930	Class I	C	C	76%	F	101%	C	C	69%	C	92%
Okeechobee Blvd	I-95	S Australian Ave	70,028	77,087	45	8	6	0.32%	935412	E of I-95	2019	77,500	W	3,957	84,200	4,300	Class I	C	F	100%	F	134%	C	F	101%	F	136%
Okeechobee Blvd	S Australian Ave	Tamarind Ave	72,118	81,755	45	8	6	0.42%	935117	E of Australian Ave	2019	70,000	W	3,206	78,100	3,580	Class I	C	C	93%	F	124%	C	C	84%	F	113%
Okeechobee Blvd[C]	Tamarind Ave	S Rosemary Ave	74,439	81,072	45	8	6	0.28%	935120		2015	48,783	W	2,415	53,100	2,630	Class I	C	C	63%	C	84%	C	C	62%	C	83%
Okeechobee Blvd (WB)	S Dixie Hwy	S Rosemary Ave	28,462	32,052	40	4	4	0.40%	935322	.150 mile W of S Dixie Hwy	2019	23,500	W	2,238	26,100	2,480	Class I	C	F	104%	F	104%	F	F	197%	C	97%
Okeechobee Blvd (EB)	S Rosemary Ave	S Dixie Hwy	28,425	31,243	40	4	4	0.32%	935122	.150 mile W of S Dixie Hwy	2019	22,000	E	2,144	23,900	2,330	Class I	C	D	95%	D	95%	F	F	185%	C	92%
Tamarind Ave	Okeechobee Blvd	Banyan Blvd	21,283	24,741	30	4	4	0.50%	933503	N of Okeechobee Blvd	2019	19,200	N	1,389	21,900	1,580	Class II	D	D	64%	D	64%	D	D	92%	D	92%

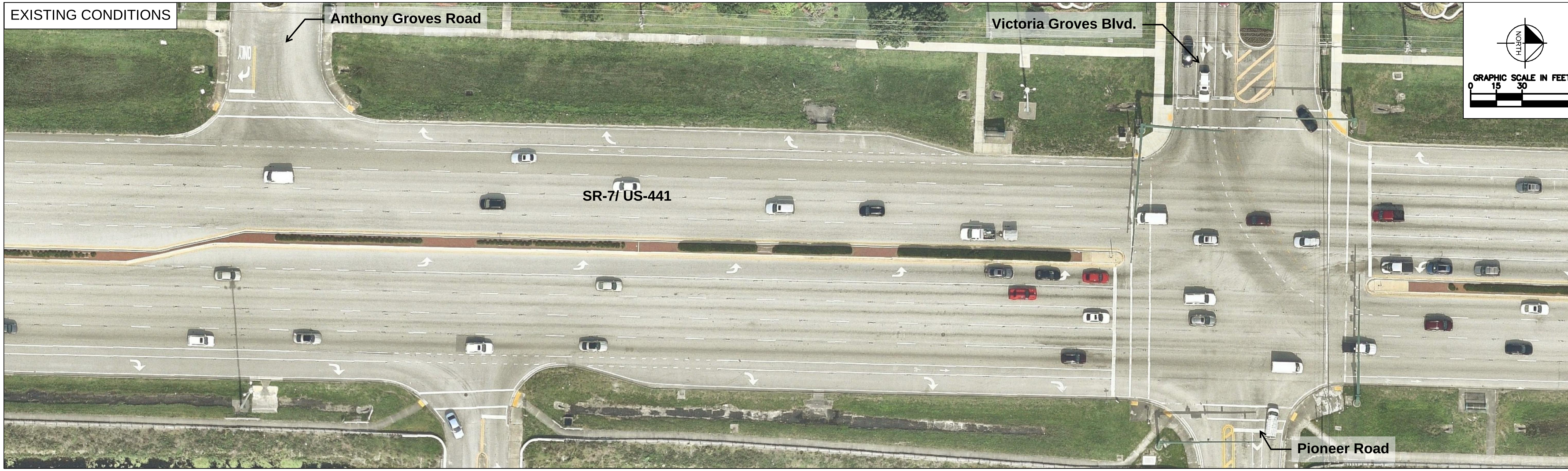
[A] A standard growth rate of 0.88% was used for the SERPM Annual Growth Rate of SR-7 between Forest Hill Blvd and Okeechobee Blvd due to the large difference between the SERPM 2015 base model volume and 2019 AADT volumes.

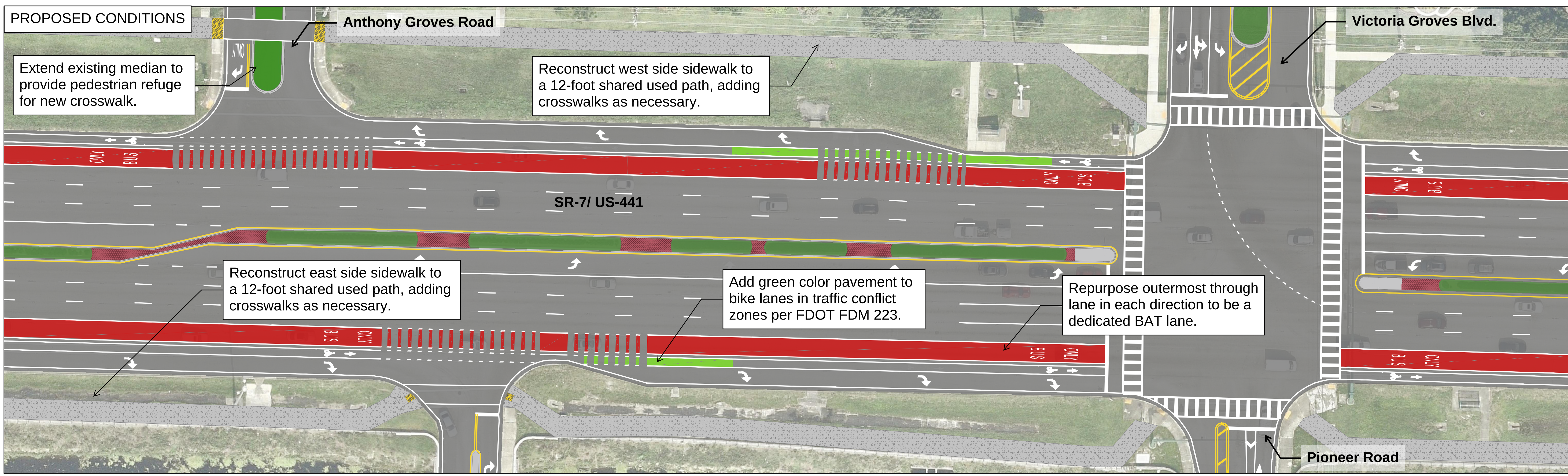
[B] Peak hour is estimated using K-Factor (K) of 0.09 and D-Factor (D) of 0.55 due to lack of directional traffic count.

[C] Palm Beach TPA Adjusted 2045 Two-Way Daily Traffic Volumes and utilized 2015 counts, which are the latest available traffic count numbers. Peak hour is estimated using K-Factor (K) of 0.09 and D-Factor (D) of 0.55 due to lack of directional traffic count.

Appendix K

Design Option Conceptual Plan Views





No.	REVISIONS	DATE	BY

Kimley»Horn

8201 PETERS ROAD, SUITE 2200, PLANTATION, FL 33324
PHONE: 954-535-5100 FAX: 954-739-2247
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	040416018
DATE	12/2020
SCALE	AS SHOWN
DESIGNED BY	--
DRAWN BY	EP
CHECKED BY	SR

EXAMPLE CONCEPTUAL DESIGN FOR THE SR-7 PROPOSED MODIFICATIONS

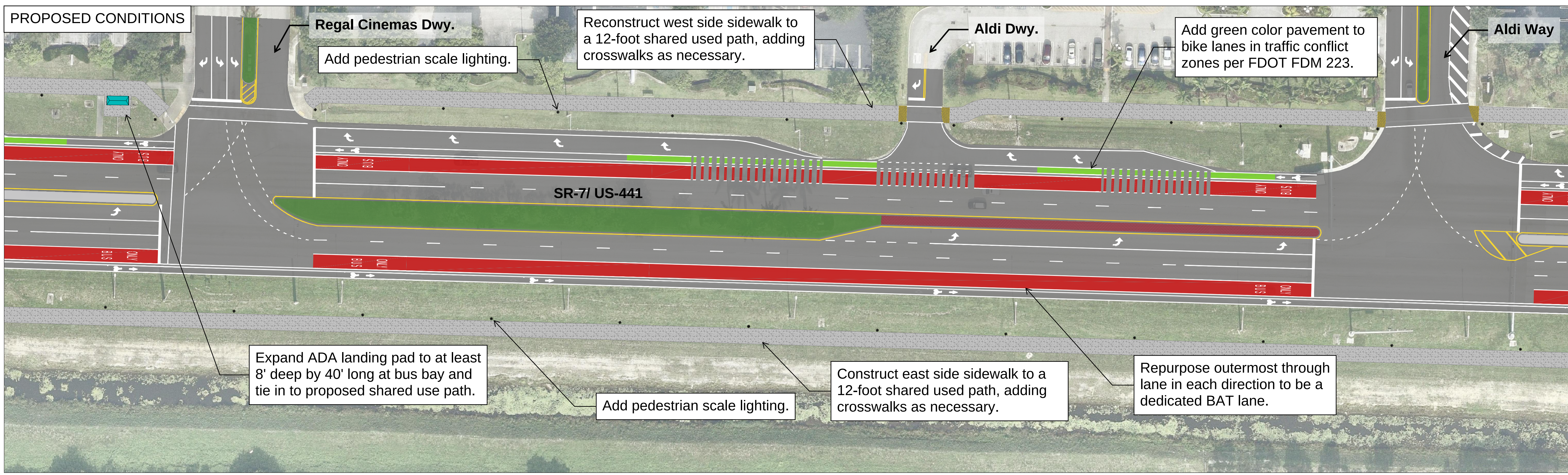
PREPARED FOR
PALM BEACH TPA

LICENSED PROFESSIONAL

DATE: ----

SR-7/ US-441
FROM ANTHONY GROVES ROAD TO PIONEER ROAD

SHEET NUMBER
1



No.	REVISIONS	DATE	BY

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WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 040416018
DATE 12/2020
SCALE AS SHOWN
DESIGNED BY --
DRAWN BY EP
CHECKED BY SR

EXAMPLE CONCEPTUAL DESIGN FOR THE SR-7 PROPOSED MODIFICATIONS

PREPARED FOR
PALM BEACH TPA

LICENSED PROFESSIONAL

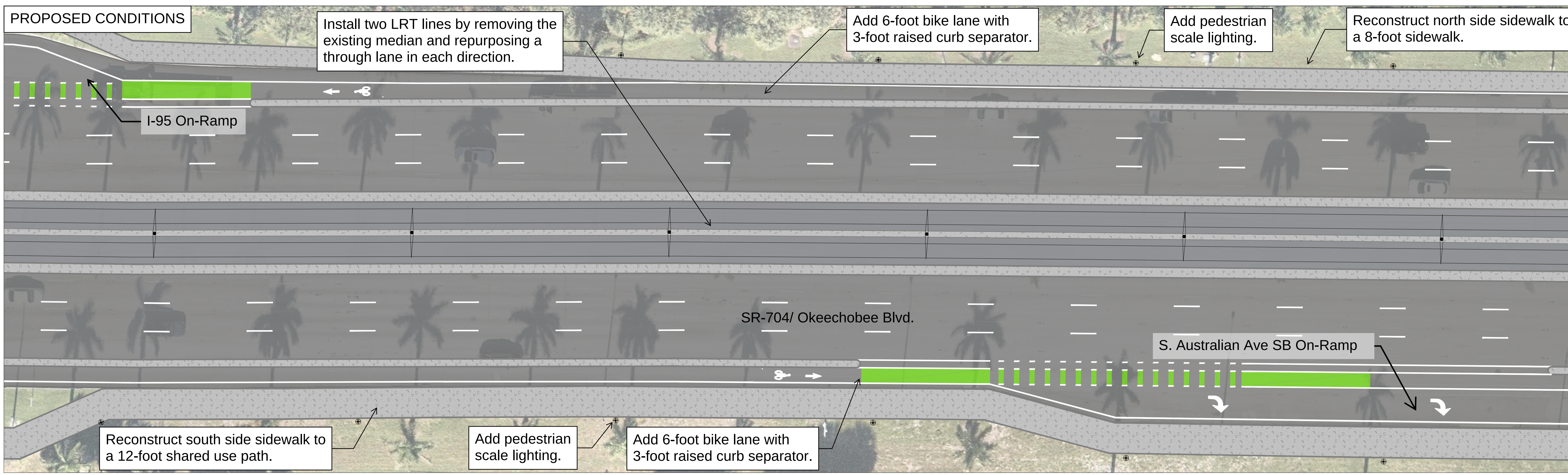
DATE: ----

SR-7/ US-441
FROM BELVEDERE ROAD TO OKEECHOBEE BLVD

SHEET NUMBER
1

EXISTING CONDITIONS

PROPOSED CONDITIONS



No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT	040416019
DATE	12/2020
SCALE	AS SHOWN
DESIGNED BY	––
DRAWN BY	EP
CHECKED BY	SR

EXAMPLE CONCEPTUAL DESIGN FOR THE SR-704 PROPOSED MODIFICATIONS

PREPARED FOR

PALM BEACH TPA

LICENSED PROFESSIONAL

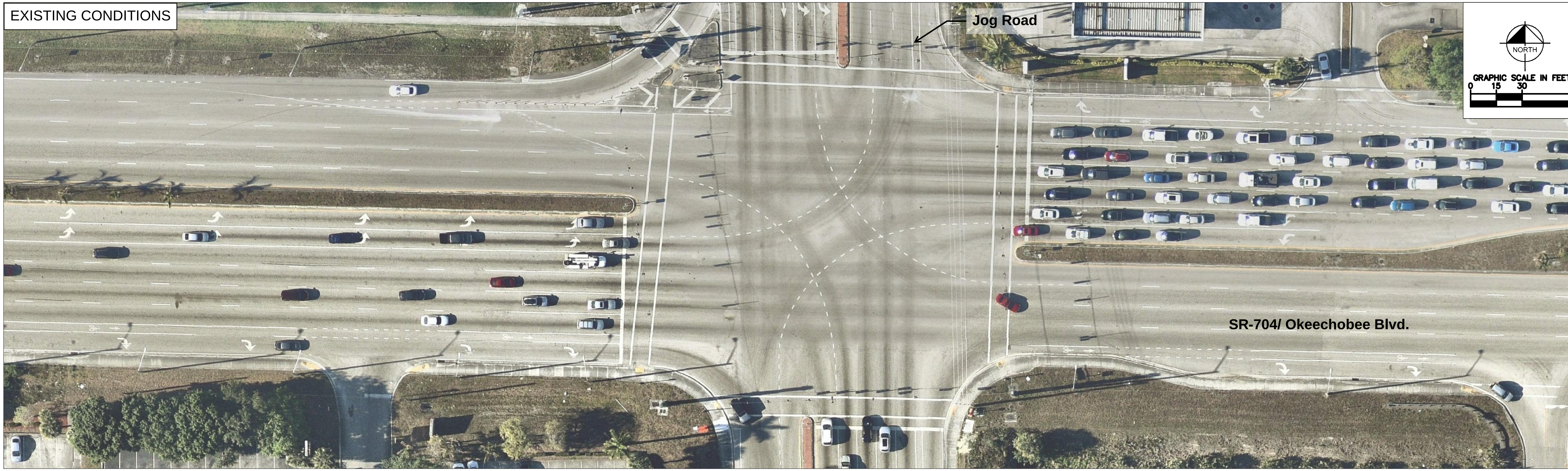
DATE: ----

SR-704/ OKEECHOBEE BLVD EAST OF I-95

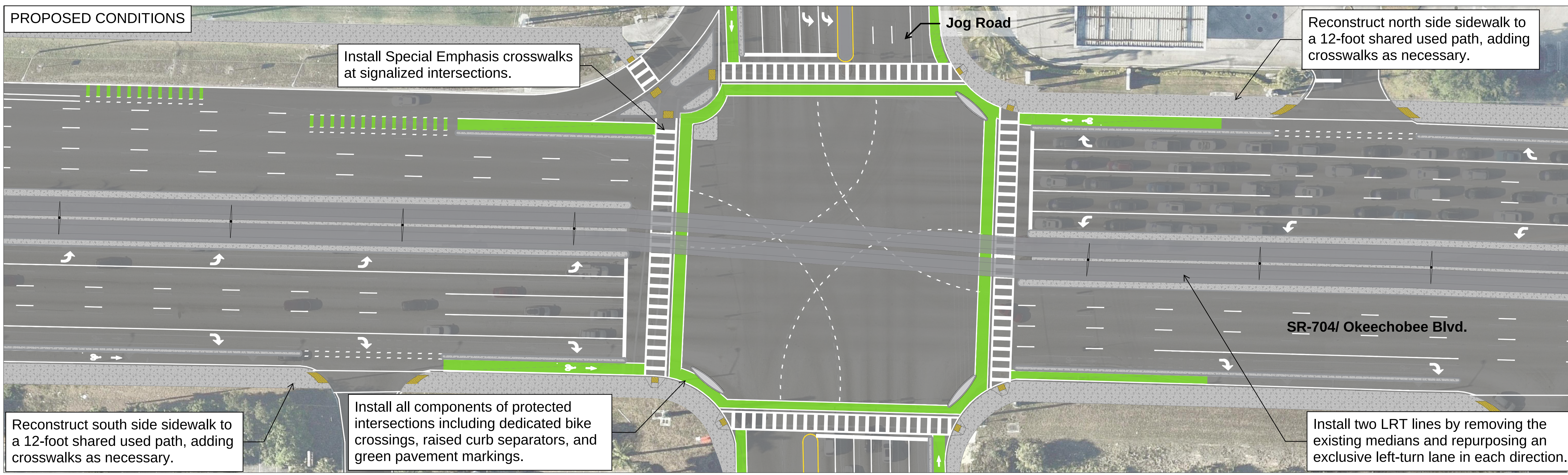
SHEET NUMBER

1

EXISTING CONDITIONS



PROPOSED CONDITIONS



No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT	040416019
DATE	12/2020
SCALE	AS SHOWN
DESIGNED BY	--
DRAWN BY	EP
CHECKED BY	SR

EXAMPLE CONCEPTUAL DESIGN FOR THE SR-704 PROPOSED MODIFICATIONS

PREPARED FOR

PALM BEACH TPA

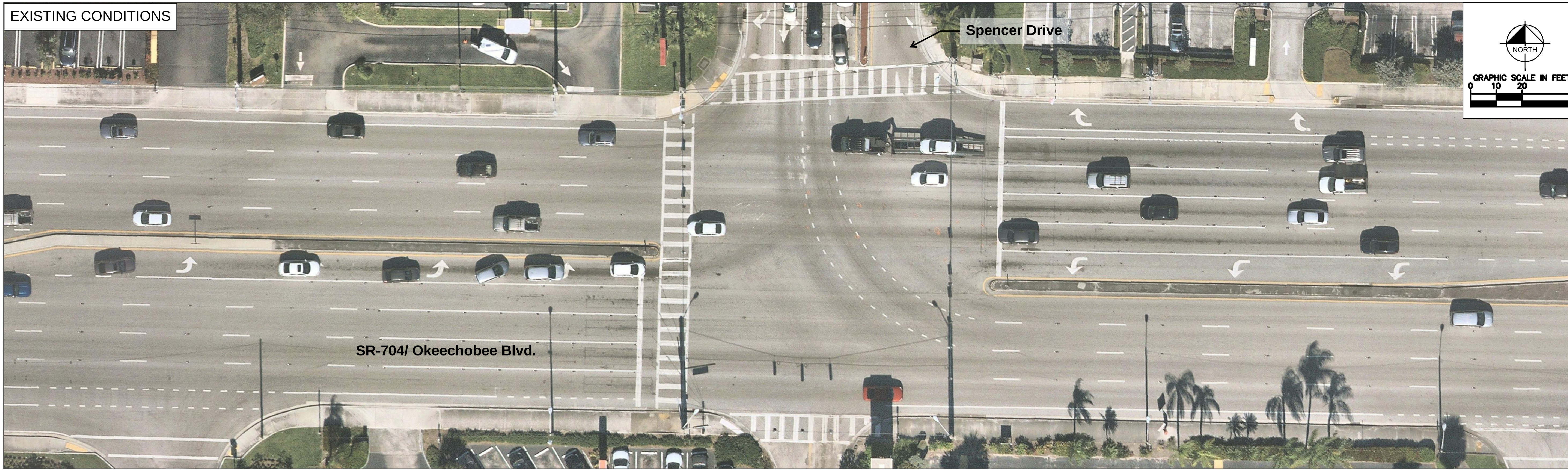
LICENSED PROFESSIONAL

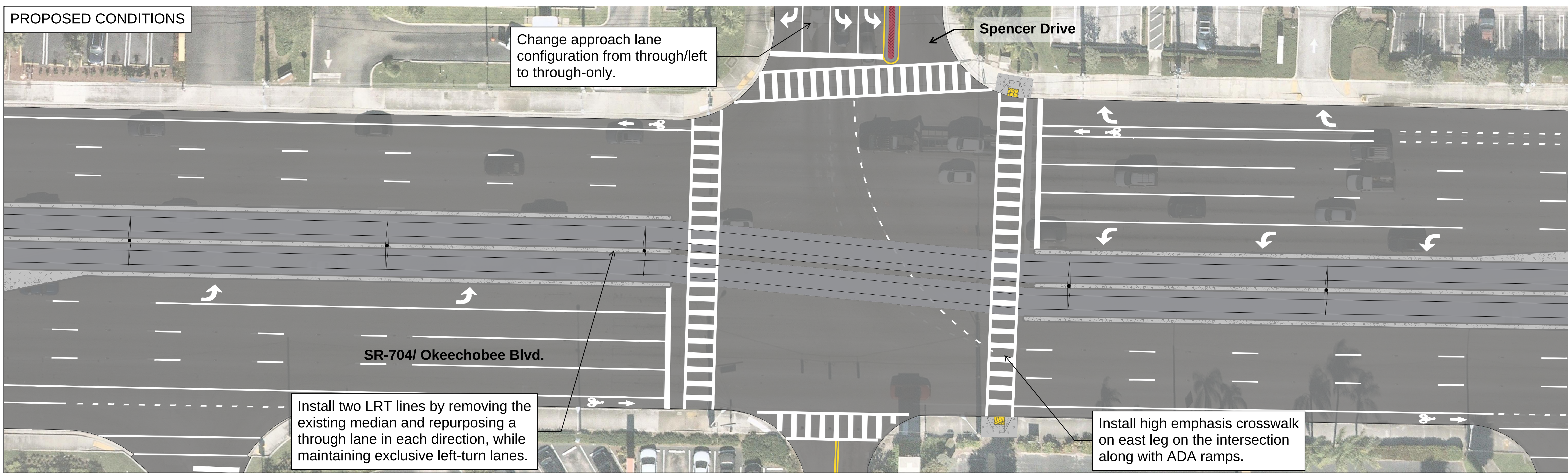
DATE: ----

SR-704/ OKEECHOBEE BLVD AT JOG ROAD

SHEET NUMBER

1





No.	REVISIONS	DATE	BY

Kimley»Horn

8201 PETERS ROAD, SUITE 2200, PLANTATION, FL 33324
PHONE: 954-535-5100 FAX: 954-739-2247
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	040416019
DATE	12/2020
SCALE	AS SHOWN
DESIGNED BY	--
DRAWN BY	EP
CHECKED BY	SR

EXAMPLE CONCEPTUAL DESIGN FOR THE SR-704 PROPOSED MODIFICATIONS

PREPARED FOR

PALM BEACH TPA

LICENSED PROFESSIONAL

DATE: ----

SR-704/ OKEECHOBEE BLVD AT SPENCER DRIVE

SHEET NUMBER

1

B: Public Engagement Summary

Contents

Study Purpose

The Okeechobee Blvd. and SR 7 corridor is rapidly redeveloping in both residential and non-residential uses. The corridor is one of the most traversed corridors in the County but holds the potential to be home to more residences and jobs immediately adjacent to the roadway, while also offering people the opportunity to walk, bike or use transit. Okeechobee Blvd. plays a vital part in our regional goals because it is a main corridor linking western and eastern communities, provides access to a variety of destinations that need transportation options, and services transit-dependent riders, such as low income and senior population. This roadway provides connections to Tri-Rail and Brightline, two critical regional transit systems, and this corridor has the potential to support incremental, higher-density and mixed-use redevelopment necessary for premium transit.

Unfortunately, many people who use the corridor feel the current system is failing them and are worried about the future of mobility. On top of this issue, the corridor cannot expand outwards to support new growth and is bounded by the Atlantic Ocean to the east and the Everglades to the west.

A new vision for mobility must be created to meet the needs of a growing and prosperous community long into the future. This study envisions an Okeechobee Blvd. and SR 7 as a "transit-first" roadway, meaning a more efficient growth pattern, supported by mobility choices for all users.

The study corridor is 13.5 miles long and passes through Palm Beach County, the Village of Wellington, the Village of Royal Palm Beach and the City of West Palm Beach. Palm Beach County has several north/south transit lines, but there is still a need for a rapid and reliable east/west line.

Ultimately this study aims to rethink the current menu of transportation choices people have in Palm Beach County to get around as the area welcomes new residents and visitors. Its vision aims to open a conversation about what transit will best support a safe, connected and multimodal transportation system. This memorandum summarizes the study's public and stakeholder engagement component.

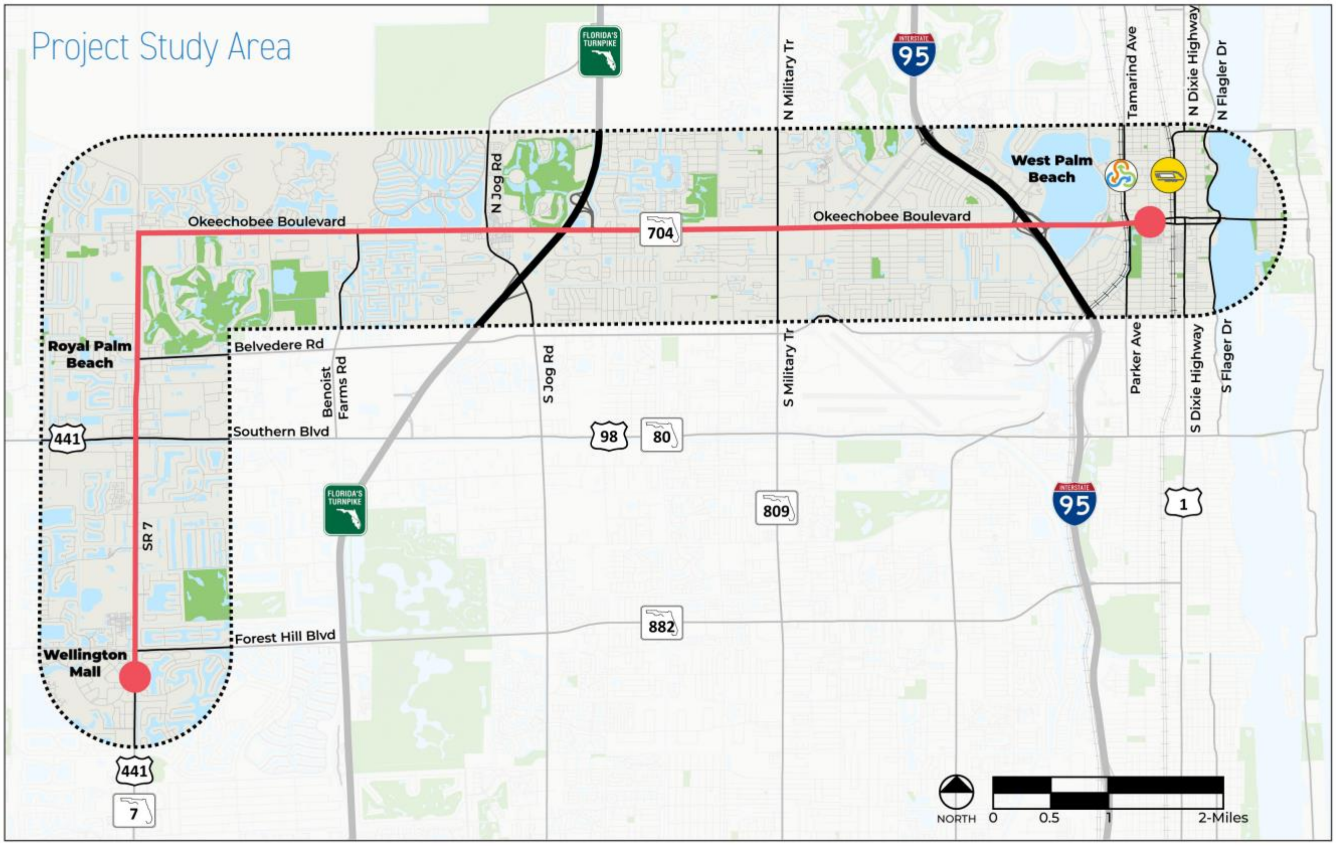
STUDY COMPONENTS

The Okeechobee Blvd & SR 7 Multimodal Corridor Study has five key components. Each component independently analyzes the impacts of transportation improvements along the corridor. When coordinated together, they identify safe and efficient multimodal transportation alternatives connecting people to places they live, work or play.

- Land Use & Economic Development Analysis
- Health Impact Assessment
- Public & Stakeholder Engagement
- Transit Analysis
- Roadway Analysis

Corridor Characteristics

The study corridor runs along SR 7 from The Wellington Mall to Okeechobee Blvd. and then east to downtown West Palm Beach.



CORRIDOR CHARACTERISTICS

SAFETY
4,794 Crashes
95 were bike/pedestrian
16 fatalities
(2019-2021)

POPULATION
42,000 Residents
56% Minority
20% Seniors
12% Disability

HOUSEHOLDS
14,000 Residents
30% are low income
45% have only 1 car
9% have no access to a car

JOBS
46,000 Jobs
59% are essential

37% Single Family Homes

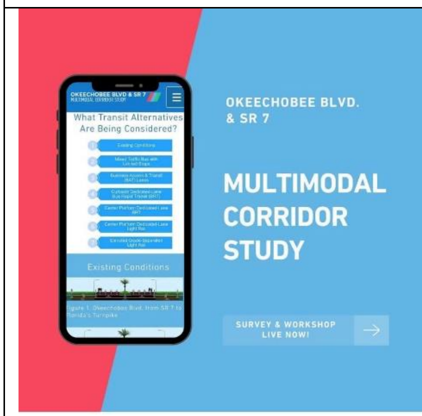
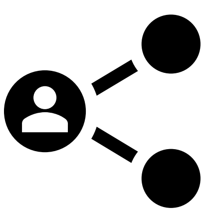
38% Multifamily Homes

4% Mobile Homes

70% of corridor residents do not have a bachelor's degree

Increasing Awareness & Spreading the Word

The Palm Beach TPA and consultant team used various methods to help spread the word about the study and opportunities to engage. These methods are summarized below.

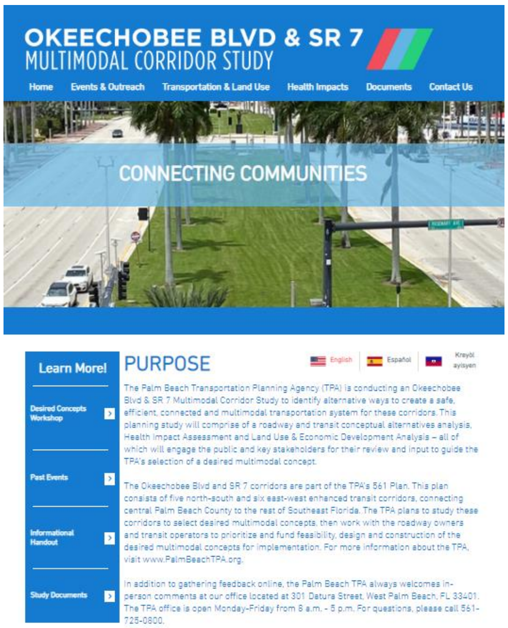
Social Media	
	The TPA posted about the study and opportunities to engage via their social media accounts on Facebook, Twitter, Instagram, LinkedIn, and YouTube.
Newsletters	
	The TPA included information in their newsletters about the study including links to a study survey and workshops.
Direct Engagement with Local Agencies & Stakeholders	
	The TPA engaged agencies and municipalities along the study corridor including Palm Beach County, the Village of Wellington, the Village of Royal Palm Beach, the City of West Palm Beach, and Westgate CRA, Palm Beach County Community Services, Palm Tran, Tri-Rail, Central Palm Beach County Chamber of Commerce, Treasure Coast Regional Planning Council asking them to share the workshop and survey with their residents, riders, members and overall networks.

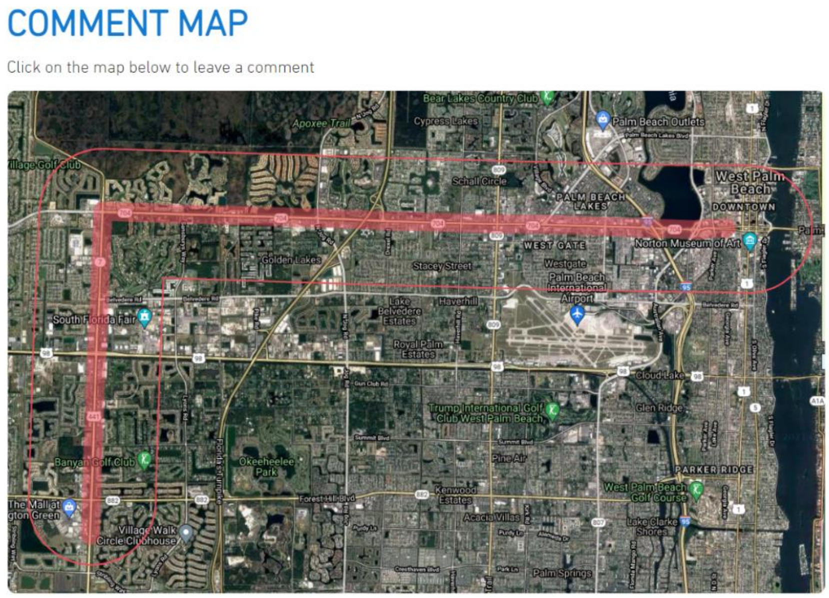
Direct In-person Engagement with the Community	
	The TPA conducted one-on-one interviews of those traveling the corridor. TPA staff also went to the Royal Palm Beach Green Market. Staff shared study information, including survey opportunities to share their opinions.
Presentations to TPA Board and TAC, CAC, & VZAC Committees	
	The consultant team, working closely with the TPA, presented about the study and opportunities to engage three individual times throughout the study process.

What tools did we use to engage?

WEBSITE WITH INTERACTIVE MAP

A project website with an interactive map was launched and maintained throughout the study process. The website contained the study purpose, background, timeline, engagement opportunities, study documents, and an interactive map where website goers could leave comments either for specific locations or in general.





Some stats about the website are below:

- Launched August 19th, 2021
- Visits to the Website as of October 2022
  - 5,155
  - 2,255 unique visitors

- Interactive map comments: 106

  A majority of the comments on the interactive map discussed issues involving pedestrian and bicycle safety, level of comfort walking and/or biking along the corridor and/or at intersections, lack of pedestrian crossings, speeding and lastly connectivity to places of interest.

  - The map had the following categories for the public to choose from when making comments:
    - General comment
    - Bicycle
    - Development
    - Pedestrian
    - Public transportation
    - Vehicular

  - General related comments included:
    - Lack of shade and walking facilities was a major theme.

- Many felt the design of the corridor created unsafe conditions while traveling.
- Many felt the corridor did not adequately provide alternative options other than drivel.
- Many felt the corridor created a highway-like division through their communities.

- Bicycle related comments:
  - Respondents commented about the level of comfort when biking along this corridor. Examples included (these are verbatim comments and have not been edited):
    - Okee from SR 7 to Turnpike ramps moves quick from a traffic perspective. Traffic signal coordination works well. Consider adding shared-use path on both sides of road since vehicles travel at a high rate of speed.
    - need safe bicycle trail to commute to downtown with kids
    - Deadly bike lane design
    - SO much room here to build nice well shaded multi-use trail. 14ft wide, a tree every 15 feet.
    - Everything is so far apart it isn't mass transportation, but it should be a cheap way to add a safe option
    - If there was a shared use path, this east/west canal could provide really useful access to the shopping centers on SR-7 from Lyons Road without having to suffer/brave the trek around the block.
    - The Southern Blvd bike lanes are terrifying. The sidewalk is protected by barricades, but cyclists are mere feet from 50+ MPH vehicles.

- Development related comments:
  - The following are a sampling of verbatim comments related to development:
    - Redevelop north side near West Gate to be more "urban" fronting street, reducing turning traffic
    - UPZONE all of Okeechobee Blvd east of Military Trail. Should have at least 4 or 5 story buildings with shops on the first floor and apartments on top. We have a housing affordability crisis, and we desperately need more housing. Turn this into a dense mixed used walkable corridor.
    - The land use west of the Turnpike is not conducive to high transit use. These planned unit developments cause so much car traffic, adding to congestion and pollution.
    - This intersection of Southern and 441, should be made into a cloverleaf to keep traffic moving on 441
    - Turn this "alley" along the canal into a multiuse trail, add some stage, bridge over 95 to a path around the lake. It could be a development driver similar to the BeltLine in Atlanta

- Pedestrian related comments included:
  - Respondents commented about the level of comfort when walking along and across this corridor. A sampling of verbatim comments is below:
    - While there are sidewalks along Okeechobee Blvd, with 8 lanes of traffic, the road noise of the sheer speed (70mph plus... it is a speedway between Jog Road and 441), we need green buffers and medians.
    - Too many lanes to cross. Why is Congress so many lanes?
    - Need shade here
    - Scary too cross here. Walk symbol too short, cars go too fast, run the red light
    - Wide radius of the corner and location of the crosswalk make pedestrians hard to see by vehicles turning right on red

- Public transportation related comments included:
  - Comments on Public Transportation included issues with connection to the downtown area, transfer locations, and last mile connections to origins and destinations. Having to make multiple transfers to get around was not a pleasant experience for some residents. A sampling of verbatim comments is shown below:
    - Include Okeechobee downtown and on Palm Beach, and *this* bus should go to the beach!!!
    - Convert middle lanes into a Bus Rapid Transit or Light Rail. Okeechobee is so dangerous with speeding up, slowing down, speeding up, slowing down, and just terrible design. Redevelop north side near West Gate to be more "urban" fronting street, reducing turning traffic.

WORKSHOPS

The TPA planned several public outreach opportunities through multimedia platforms as well as emails, handouts, and social media. Specifically, one in-person and virtual (i.e., hybrid) workshop, one virtual only workshop due to COVID-19, and one in-person only workshop. Feedback gathering tools used during the workshops and throughout the study included an online survey, an interactive map, and direct one-on-one discussions.

2 In-Person Workshops	2 Virtual Workshops	Online survey
		

Public Workshop 1:

Topic: Focused on identifying the issues and opportunities within the corridor.

Dates: In-person August 19, 2021, along with the virtual platform available to participants from August 19, 2021, through November 12, 2021

Public Workshop 2:

Topic: Focused on providing an overview of evaluated multimodal alternatives.

Dates: Held virtually from December 3, 2021, through January 17, 2022

Public Workshop 3: Focused on the desired multimodal concepts & next steps

Topic: Focused on identifying the issues and opportunities within the corridor.

Dates: In-person May 10, 2022

The project website has a summary of the workshop dates and in-person materials for Workshop 3: Events & Outreach | Okeechobee Blvd (palmbeachtpaokeestudy.org).

Workshop 1 - Issues and Opportunities

Topic: Focused on identifying the issues and opportunities within the corridor.

Dates: In-person August 19, 2021, along with the virtual platform available to participants from August 19, 2021, through November 12, 2021

Number of participants: 40 participants attended the workshop

Workshop Engagement Statistics:

- 1,326 Website views
- 508 unique views
- 809 survey visits & 236 completed surveys

Survey Feedback Statistics:

- 46% participants said they would use transit if it were introduced in the study area
- 26% participants voted for Congestion relief as #1 priority
- 20% participants voted for Health & Safety as #1 priority
- 15% participants voted to see alternative mobility choices on this corridor as a #1 priority

Survey Feedback by Focus Area:

To evaluate the opportunities, participants were asked about particular focus areas that included Multimodal Transportation, Land Use & Economic Development and Health and Equity.

Multimodal Transportation Ranking

They were specifically asked to rank what improvements they would like to see in terms of transportation along the corridor.

1. Automobile travel times	Building addition travel lanes and/or overpasses to reduce congestion and commute times.
2. New roadway technologies	Improving road capacity and efficiency through enhanced signalization and technology
3. Enhanced transit service	Implementing light rail or bus rapid transit with high frequency, long service hours and rapid boarding through level platforms and advance ticket purchasing.
4. Pedestrian & Bicycle Facilities	Increasing the quality of the pedestrian and bicycle environment with safe, connected facilities and supporting amenities

Land Use & Economic Development Ranking

Participants were asked what they would like to see in the areas surrounding the transportation network.

1. Placemaking and Beautification	Enhancing community appearance through increased landscaping. Lighting, signage and/or architectural standards.
2. Supporting Redevelopment	Encouraging redevelopment and repurposing of existing commercial centers and infill of vacant or underutilized properties
3. Increasing Mixed-Use Development	Focusing on opportunities to integrate office, retail and housing.
4. Increasing Density	Increasing density and intensity of new development by concentrating development building up rather than out and reducing surface parking.

Health & Equity Ranking

With a focus on improving the quality of life and equitable access to services and amenities, participants were asked to rank the following topics.

1. Safety
2. Housing
3. Access
4. Health
5. Active Living

Virtual Public Workshop 2 Multimodal Alternatives

The second public workshop was open to participants from December 3rd, 2021, and was closed on January 17th, 2022. This workshop enabled participants to provide feedback on a set of alternatives as well as participate in an online survey to rank the different alternatives such as Elevated Light Rail Transit, Light Rail Transit, Center Bus Rapid Transit, Curb Bus Rapid Transit, BAT, Mixed and Existing.

Workshop Engagement Statistics:

- 1,112 Website views
- 446 unique views
- 726 survey visits & 188 completed surveys

Survey Feedback Statistics on Preferred Alternative:

- Transit alternative preferences of survey takers was:
    - 27% Elevated Light Rail Transit (LRT)
    - 14% Center-running LRT
    - 26% Center-running Bus Rapid Transit (BRT)
    - 15% Curbside Dedicated BRT
    - 2% Business Access and Transit (BAT) Lanes
    - 2% Mixed Traffic Bus
    - 15% Existing conditions

Comment Themes

Eighty-eight comments were shared with the TPA, most being very specific to current conditions and locations.

Workshop 3 – Transit Alternatives

Topic: Focused on identifying the issues and opportunities within the corridor.

Dates: The third public workshop held in-person on 10th May 2022.

Number of participants: 40 participants attended the workshop

Comment Cards Feedback:

- Thoughts about the study and findings

  Reponses:

  - 'Light rail with express bus service to commercial district'
  - 'Driving to downtown is stressful and time consuming'
  - 'I am happy to see health and travel time as a metric. It was also interesting to see how the improvements can have an impact on affordable housing'
  - 'The investment would benefit the county in both growth and equality'

- Thoughts on Center-Platform Dedicated Lane Light Rail Transit? Would you use it?

  Reponses:

  - I would absolutely use LRT. This corridor is very important in my daily life. I would like to see more on intersection design
  - Alternative 6 and Alternative 5 – "high quality, you could combat feelings of typical bus ride

- Key Destinations users would like to connect to:
  - Downtown West Palm Beach
  - Waterfront
  - Brightline

DIRECT ENGAGEMENT WITH THE COMMUNITY

STORIES OF THE CORRIDOR

To evaluate the transit needs within the corridor, the team asked individuals about their experience with existing transit facilities. We learned about some of the unique struggles that they face while traveling along the corridor and how the incomplete multimodal facilities affected their everyday lives. Herein is a sampling of who we spoke to and their stories.

James—Royal Palm Beach

James is originally from New York and said he would consider a train as an option if it was convenient and reliable but feels like he will likely always need to drive in this area of the county. He commutes daily to his management job at the GNC from Royal Palm Beach along Okeechobee Blvd. He often uses alternative routes in the evening to return home to save time.

"A train could save me from having to own two vehicles, but the westbound evening traffic would have to be very bad."

Ed & Linda - Haverhill

Originally from Buffalo, Ed and Linda have lived in the area for 50 years and drive everywhere. They would not feel safe riding a bike anywhere on Okeechobee Blvd. and indicated that the general auto-oriented environment and the business need for abundant parking makes transit a challenge.

"People just need to get off of their phones and police need to do more enforcement."

Bill—Wellington
Bill has been riding his bike in the area for years and connects with transit, when convenient. He used to bike all the way from West Palm Beach to Royal Palm on Okeechobee Boulevard daily.

"...It's very scary. Especially at Congress (Ave)"

Josette—Royal Palm
Josette is retired and has lived in Palm Beach for over 30 years. He generally rides the 52 twice per week to run errands and save money. He would like enhanced transit as a viable option for east west commuting.

"My bus is 30 minutes late and it isn't showing me when it will come. I just called an Uber."

Crystal—Palm Beach

Crystal uses the bus every day to pick her children up from daycare and run errands. She says the bus is convenient especially for her relatively short commutes, but she would like to see a safe midblock crossing near her regular stop at Military Trail. and Okeechobee Blvd.

"I have a special needs son... if they call, I have to get there and that means I will just cross whenever it looks clear."

DIRECT ENGAGEMENT WITH LOCAL AGENCIES & STAKEHOLDERS

Dozens of stakeholders were engaged throughout the study process covering various agencies and topics of interest. Herein is a list of the general list of stakeholders. This group of people were engaged in one-on-one discussions either at the onset of the study or towards the conclusion of the study to get feedback on a vision and the desired concept.

Name	Title	Jurisdiction/Business
Alberto Micha-Buzali	Manager	Atlas Royal Palm LLC
Ali Soule	Chief of Staff	Brightline
Mary Lou Bedford	Executive Director	Central Palm Beach Chamber
Donald Burgess	President/CEO	Chamber of Commerce of the Palm Beaches
Christina Lambert	City Commissioner	City of West Palm Beach
Christy Fox	City Commissioner	City of West Palm Beach
Joe Peduzzi	City Commissioner	City of West Palm Beach
Keith James	Mayor of West Palm Beach	City of West Palm Beach
Kelly Shoaf	City Commissioner	City of West Palm Beach
Rick Greene	Development Services Director	City of West Palm Beach
Nathan Zieg	Manager	Cross County Owner LLC
Michele Jacobs	President/CEO	Economic Council
Andrew Waldman	MGRM	Fairways LLC

Name	Title	Jurisdiction/Business
Birgit Olkuch	Modal Development	Florida Department of Transportation
Steve Braun	Director of Development	Florida Department of Transportation
Mario Lamar	Partner	Four On Partners, Inc
Adam Freedman	Manager	Lotis Wellington
Ann-Marie Taylor	VP	Palm Beach Atlantic University
Greg Weiss	County Commissioner	Palm Beach County
Melissa McKinlay	County Commissioner	Palm Beach County
Patrick Rutter	Assistant County Administrator	Palm Beach County
David Ricks	County Engineer	Palm Beach County
Mack Bernard	County Commissioner	Palm Beach County
Ramsay Bulkeley	PZB Director	Palm Beach County
Todd Bonlarron	Assistant County Administrator	Palm Beach County
Verdenia Baker	County Administrator	Palm Beach County
Shawn J. Hall	cc for Clinton Forbes, Exec. Dir.	Palm Beach County
Denise Pennell	Senior Planner/Project Manager	Westgate/Belvedere Homes Community Redevelopment Agency
Elizee Michel	Executive Director	Westgate/Belvedere Homes Community Redevelopment Agency
Clinton Forbes	Executive Director	Palm Tran
Joe Carosella	Registered Agent	Pine Trail Square LLC
Craig Menin	Manager	Rosebud Wellington Regal One LLC
Loraine Cargill	Tri-Rail SFRTA Executive Director	SFRTA
		TM Wellington Green Mall
Merja Tuttle	Manager	Tuttle Land Holdings, LLC
Jeff Hmara	Councilman and TPA Board Alternate	Village of Royal Palm Beach
Fred Pinto	Mayor and TPA Chair	Village of Royal Palm Beach
Ray Liggins	Village Manager	Village of Royal Palm Beach
Jim Barnes	Village Manager	Village of Wellington
Anne Gerwig	Mayor of Wellington	Village of Wellington
John T. McGovern	Councilman and TPA Board Alternate	Village of Wellington
Michael Napoleone	Councilman and TPA Board Member	Village of Wellington
Raphael Clemente	Executive Director	WPB DDA

The following land use and economic development stakeholders were engaged throughout the study process. Two series of one-on-one sessions occurred with the land use stakeholders as well as an overall workshop. Current development and development potential was discussed with this group.

Name	Title	Jurisdiction/Business
Alex Hansen	Development Services Staff Member	City of West Palm Bach
Allison Justice	Deputy Director	West Palm Beach CRA
Bryan Davis		Palm Beach County Planning & Zoning
Chris Marsh	Village Engineer	Royal Palm Beach
Chris Roog	Executive Director	West Palm Beach CRA
Dana Little	Urban Design Director	Treasure Coast Regional Planning Council
Denise Pennell	Senior Planner/Project Manager	Westgate/Belvedere Homes Community Redevelopment Agency
Donald Burgess	President/CEO	Chamber of Commerce of the Palm Beaches
Elizee Michel	Executive Director	Westgate/Belvedere Homes Community Redevelopment Agency
Kevin Fischer	Deputy Planning Director	Palm Beach County Planning
Mary-Lou Bedford	CEO	Central Chamber of Commerce
Michael O'Dell	Assistant Planning Director	Wellington
Patricia Behn	GISP - Planning Director	Palm Beach County Planning
Ramsay Bulkeyley	Executive Director of Planning & Zoning	Palm Beach County Planning
Ray Liggins	Village Manager	Royal Palm Beach
Rick Greene	Director of Development Services	West Palm Beach
Tim Stillings	Director of Planning	Wellington

The following health related stakeholders were engaged throughout the study process. This group met four time throughout the process to give feedback on existing issues, potential strategies and needs and the overall health assessment process and integration into the overall study.

Name	Title	Business
Ken Reinhardt	Community Leader	AARP
Jennifer Bustamente	Representative	American Cancer Society
Tonya Ehrhardt	Regional V.P. of Community Health & CPR	American Heart Association
Sheree Wolliston	Facilitator	American Heart Association Health Equity Committee
Jayson Babel	Project Manager	Ann Storck Center, Inc.
Dennis Martin	Representative	Area Agency on Aging Palm Beach/Treasure Coast
Monique Wellons	Representative	Changes Center
Eric Dumbaugh	Professor	FAU School of Urban & Regional Planning
David Summers	Trauma Nurse Outreach Coordinator	HCD PBC
Andrea Stephenson	Executive Director	Health Council of SE Florida
Celine Ginsburg	Director of Planning	Health Council of SE Florida
Joseph Rombough	Health Planner & Special Program Manager	Health Council of SE Florida

Name	Title	Business
Brittani Coore	Health Planner and Program Manager	Health Council of SE Florida
Jeanette Marshall	Representative	Healthier Together PBC
Phyllis King	Dean, School of Nursing	Palm Beach Atlantic University
Lou Ferri	Representative	Palm Beach County
James Greene	Director	Palm Beach County Community Services
Shirley Lanier	Health Planner II	Palm Beach County Community Services
David Martin Rafaidus	Senior Planner	Palm Beach County Department of Community Services
Abby Goodwin	V.P. Grant & Community Investments	Palm Healthcare Foundation
Eric Stern	Physical, Health, & Driver Edu Administrator	PBC Schools
Melissa Jordan	Interim Director	Public Health Research
Nate Cousineau	Program Officer	Quantum Foundation
Randy Scheid	V.P. Programs	Quantum Foundation
Don Chester	Assistant Administrator	St. Mary's Medical Center
Seth Bernstein	Exec V.P. of Community Investments	United Way PBC
JohnMark Atchley	Chief Operating Officer	Wellington Regional Medical Center
Colleen Thielk	Chief Nursing Officer	Wellington Regional Medical Center
Andy McCausland	Representative	Palm Healthcare Foundation
Sally Chester	RN & Education Manager	Palm Healthcare Foundation

C: Roadway and Transit Analysis

ROADWAY AND TRANSIT ANALYSIS

This appendix contains documentation of the roadway and transit preliminary analysis conducted for the Okeechobee Boulevard & SR 7 Multimodal Corridor Study corridor and alternatives. The preliminary analysis of the corridor supports the development of the desired concept to be advanced for further study. The following sections are included in this appendix.

POTENTIAL ENVIRONMENTAL EFFECTS

The Okeechobee Blvd. & SR-7 Multimodal Corridor Study includes an assessment of potential environmental effects of multimodal transportation improvements in the project corridor. This assessment presents a description and documentation of existing conditions including soils and land use, wetlands and surface waters, mitigation, wildlife and habitat, special designations, floodplains, archaeological and historic sites, recreational facilities, and contamination within the project study area.

METHODOLOGY

The methodology for identifying potential environmental constraints within the project study area included a review of the following resources:

- Aerial photographs (scale, 1 inch = 400 feet), ESRI 2019;
- Various Geographic Information System (GIS) data layers from the U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC);
- South Florida Water Management District (SFWMD) FLUCFCS GIS Database (SFWMD 2017-2019);
- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), Soil Survey of Palm Beach County Area, Florida (NRCS 1978);
- Hydric Soils of Florida Handbook, 4th Edition (Florida Association of Environmental Soil Scientists, 2007);
- Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST), https://etdmpub.fla-etat.org/est/;
- Florida Geographic Data Library, https://www.fgdl.org/metadataexplorer/explorer.jsp;
- USFWS National Wetlands Inventory (NWI) Maps (Web-based maps available from http://www.fws.gov/wetlands/Data/mapper.html);
- United States Geological Service (USGS) Quadrangle Maps;
- U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12, June 2007;
- FWC, Florida's Endangered Species and Threatened Species, January 2017;
- FWC, Eagle Nest Locator website (https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx), September 2019;
- FWC, Wading Bird Rookeries website (http://ocean.floridamarine.org/TRGIS/Description_Layers_Terrestrial.htm), 1999;
- USFWS IPaC Trust Resources Report (https://ecos.fws.gov/ipac/);
- FNAI Biodiversity Matrix Map Server (http://www.fnai.org/biointro.cfm);

- U.S. Fish and Wildlife Service, 2010-2019 Wood Stork Nesting Colonies Maps (http://www.fws.gov/northflorida/woodstorks/wood-storks.htm), January 2020;
- USFWS, Critical Habitat Portal website (http://criticalhabitat.fws.gov/crithab/);
- Florida Department of Environmental Protection (FDEP) Map Direct Database (https://ca.dep.state.fl.us/mapdirect/);
- FDEP OCULUS Database (https://depedms.dep.state.fl.us/Oculus/servlet/login); and
- ERIS Database Report, dated May 18, 2021.

The following sections of this report are based upon review of these resources.

RESULTS

Soils and Land Use

The NRCS *Soil Survey of Palm Beach County Area, Florida* (1978) mapped 26 soil types that are located within the project study area (Table 1 – Soil Types and Coverage within the Project Study Area). According to the *Hydric Soils of Florida Handbook, 4th Edition* (Florida Association of Environmental Soil Scientists, 2007), 14 of these soils are considered hydric.

Table 1. Soil Types and Coverage within the Project Study Area

Map Unit Symbol	Soil Description	Acres within Project Study Area	Percent of Project Study Area	Hydric (Y/N)
2	Anclote fine sand	2.84	0.23%	Y
4	Arents-Urban land complex, 0 to 5 percent slopes	129.44	10.41%	N
5	Arents-Urban land complex, organic substratum	7.16	0.58%	N
6	Basinger fine sand, 0 to 2 percent slopes	4.64	0.37%	Y
7	Basinger-Urban land complex	19.09	1.54%	Y
8	Basinger and Myakka sands, depressional	13.50	1.09%	Y
10	Boca fine sand	151.34	12.17%	Y

12	Chobee fine sandy loam	62.57	5.03%	Y
16	Hallandale fine sand	7.83	0.63%	N
17	Holopaw fine sand, 0 to 2 percent slopes	15.74	1.27%	Y
19	Jupiter fine sand	5.92	0.48%	Y
21	Myakka fine sand, 0 to 2 percent slopes	70.00	5.63%	Y
22	Myakka-Urban land complex	15.73	1.27%	N
24	Okeelanta muck, drained, 0 to 1 percent slopes	2.67	0.21%	Y
29	Pineda fine sand, 0 to 2 percent slopes	19.57	1.57%	N
30	Pinellas fine sand	3.63	0.29%	N
31	Pits, 0 to 5 percent slopes	7.46	0.60%	N
34	Pompano fine sand	19.85	1.60%	Y
35	Quartzipsamments, shaped, 0 to 5 percent slopes	24.81	2.00%	N
36	Riviera fine sand, 0 to 2 percent slopes	296.25	23.83%	Y
37	Riviera fine sand, depressional	183.28	14.74%	Y
38	Riviera-Urban land complex	11.01	0.89%	Y
41	St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes	2.47	0.20%	N

47	Udorthents, 2 to 35 percent slopes	2.23	0.18%	N
48	Urban land	122.52	9.85%	Unranked
99	Water	41.67	3.35%	Unranked
	Total	**1243.22**	**100%**	

Vegetative communities were classified according to the *Florida Land Use, Cover, and Forms Classification System* (FLUCFCS, Florida Department of Transportation, 1999). A FLUCFCS map of the project study area is attached as Appendix A.

A description of the upland land cover included below, characterizes dominant vegetation characteristic of the land use type. The acreage provided for each land cover is approximate, based on aerial interpretation.

FLUCFCS 1110 – Fixed Single-Family Units (Less Than Two Dwelling Units Per Acre) (± 21.06 Ac.)

This land use is residential for single family units with less than two dwelling units per acre of land. Within the project study area, this land use is primarily located southeast of the US 98/SR 80 (Southern Boulevard) and SR 7 intersection.

FLUCFCS 1210 – Fixed Single-Family Units (Two-Five Dwelling Units Per Acre) (± 111.22 Ac.)

This land use is residential for single family units with two to five dwelling units per acre of land. Within the project study area, this land use is located in communities along the east and west side of SR 7 and in several sections on the north and south side of Okeechobee Blvd.

FLUCFCS 1320 – Mobile Home Units (± 6.77 Ac.)

This land cover is residential and includes mobile home units. This land use is primarily located in the east section of the project study area. Plantation Mobile Home Park is located south of Okeechobee Blvd. and east of Drexel Road and Lakeside Mobile Home Park is south of Okeechobee Blvd. and east of S. Congress Avenue.

FLUCFCS 1330 – Multiple Dwelling Units, Low Rise (± 23.12 Ac.)

This category contains multiple dwelling units of two stories or less including duplex units, triplex units, quadruplex units, apartment units, townhouse units, and patio houses. This land use is primarily located in various locations on the north side of Okeechobee Blvd.

FLUCFCS 1340 – Multiple Dwelling Units, High Rise (± 13.00 Ac.)

This land use contains multiple dwelling units of three stories or more including apartment units, townhouse units, condominium units, and mixed edits. Within the project limits, this land use is primarily located on the north side of Okeechobee Blvd.

FLUCFCS 1400 – Commercial and Services (± 309.61 Ac.)

This land cover is associated with the distribution of products and services. This includes all secondary structures associated with an enterprise in addition to the main building and integral areas assigned to support the base unit, including sheds, warehouses, office buildings, parking lots, and landscaped areas. This cover type also encompasses roadside ditches (FLUCFCS 5120) and stormwater ponds (FLUCFCS 5300) that collect stormwater runoff from these developments. Within the project study area, this land use is located throughout the project study area on both sides of the project corridor.

FLUCFCS 1411 – Retail Sales and Services (± 148.77 Ac.)

This land use is comprised of elements of central business districts, shopping centers and office building including associated structures, driveways, and parking lots. Within the project study area, this land cover is located primarily on the southwest corner on the SR 882 and SR 7 intersection. The Mall at Wellington Green is at this location and contains a variety of retail stores and services.

FLUCFCS 1490 – Commercial and Services Under Construction (± 13.87 Ac.)

This category consists of commercial and services buildings, parking lots, and other facility-related areas under construction.

FLUCFCS 1550 – Light Industry (± 31.90 Ac.)

This class is primarily for fabrication industries that use products from other processing and manufacturing industries to make parts and finished products. Light industries tend to be enclosed operations with buildings used for equipment, materials, and manufacturing. The light industry land use is in several parcels throughout the project corridor.

FLUCFCS 1620 – Sand and Gravel Pits (± 4.05 Ac.)

This land use is primarily used to support construction activities.

FLUCFCS 1700 – Institutional (± 9.94 Ac.)

This land use can include educational, religious, health, and military facilities and buildings, grounds, and parking lots associated with the facilities. Within the project study area, this land cover is located on various pieces of land throughout the project study area. The Wellington Regional Medical Center is located at the northwest corner of the SR 882 and SR 7 intersection, containing a variety of health services. There are several religious facilities along the project corridor.

FLUCFCS 1710 – Educational Facilities (± 16.89 Ac.)

This land cover consists of educational facilities including parking lots, stadiums, and all buildings and other featured related to the facility. There are several educational facilities within the project study area. Royal Palm Beach is located southwest of the

Okeechobee Blvd. and SR 7 intersection. Berean Christian School, Benoist Farms Elementary School, and Indian Ridge School are all located on the south side of Okeechobee Blvd. between Sansburys Way and Golden Lakes Boulevard. West Gate Elementary is also located south of Okeechobee Blvd. between SR 809 and N. Congress Avenue. The Mattisyn School and Renaissance Charter School at Cypress are north of Okeechobee Blvd. east of Andros Isle.

FLUCFCS 1820 – Golf Courses (± 33.02 Ac.)

This land use consists of golf courses for recreational use. Within the project study area, this land cover is primarily located southeast of the SR 7 and Okeechobee Blvd. intersection. The two golf courses within the project limits are the Breakers West Country Club and the Mayacoo Lakes Country Club.

FLUCFCS 1850 – Parks and Zoos (± 3.96 Ac.)

The parks and zoos land use consists of public recreational areas. Within the project study area, this land use is found in the far eastern section of the Okeechobee Blvd. corridor. Gateway Park is located in the northeast quadrant of the intersection of Okeechobee Blvd. and S. Australian Avenue and has a sidewalk, trees, and various landscaping. Gateway Park includes the Okeechobee Sacrifice Memorial to honor those who have lost their life on Okeechobee Blvd.

FLUCFCS 1900 – Open Land (± 10.34 Ac.)

This classification includes undeveloped land within urban areas and inactive land with street patterns but without structures. Within the project study area, there are two primary areas of this land use. There is a vacant parcel on the north side of Okeechobee Blvd. located east of the east entrance and exit ramp for Florida's Turnpike and an additional lot on the south side of Okeechobee Blvd. between N. Jog Road and Florida's Turnpike.

FLUCFCS 2510 – Horse Farms (± 2.11 Ac.)

This land use consists of farms that breed and train horses for sport using in racing, riding, and harness racing. Within the project study area, there is one horse farm located on the southwest corner of the intersection of Okeechobee Blvd. and Augustine Road.

FLUCFCS 3100– Herbaceous (Dry Prairie) (± 4.18 Ac.)

This land use includes upland prairie grasses which occur on non-hydric soils but may be occasionally inundated by water. These grasslands are generally treeless with a variety of vegetation types dominated by grasses, sedges, rushes, and other herbs including wire grasses with some saw palmetto present. Within the project study area, this land cover type is located on the south side of Okeechobee Blvd. near the intersection with Breezy Lane.

FLUCFCS 4110 – Pine Flatwoods (± 19.95 Ac.)

This class is dominated by either slash pine, longleaf pine or both and less frequently pond pine. The common flatwoods understory species include saw palmetto, wax myrtle, gallberry and a wide variety of herbs and brush. Within the project study area, this land cover type is located near the southeast corner of the intersection of Okeechobee Blvd. and SR 7.

FLUCFCS 4340 – Hardwood – Coniferous Mixed (± 0.74 Ac.)

The hardwood-coniferous mixed land use includes forested uplands in which neither upland conifers nor hardwoods achieve 66-percent crown canopy dominance. Dominant vegetation within these communities could consist of slash pine, live oak, and cabbage palm. Within the project study area, this land cover type is located at the northwest corner of the Okeechobee Blvd. overpass over Florida's Turnpike.

FLUCFCS 8140 – Roads and Highways (± 368.46 Ac.)

This class includes those highways exceeding 100 ft. in width, with 4 or more lanes and median strips. The intent of this data layer is to include only the major transportation corridors. This cover type also encompasses roadside ditches (FLUCFCS 5120) that collect stormwater runoff from these roadways. The major roadways within the project study area included in this land cover include SR 7 and Okeechobee Blvd.

FLUCFCS 8320– Electrical Power Transmission Lines (± 1.70 Ac.)

Electrical power transmission lines travel along the west side of SR 7 along the entire corridor and along the north and south sides of Okeechobee Blvd. along the entire corridor.

Wetlands and Surface Waters

The presence of wetlands was evaluated based on the Florida unified wetland delineation methodologies, in accordance with *Chapter 62-340, Florida Administrative Code (FAC)* and the *U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual*. These methods consider the prevalence of wetland vegetation, hydric soil indicators, and wetland hydrology. Surface waters include both natural and manmade bodies of water, such as streams, lakes, ponds, canals, and ditches, and were determined through a review of aerial photography and database review. Each wetland and/or surface water habitat within the project study area was classified using FLUCFCS (FDOT 1999) and the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 2013). Formal wetland boundary delineations and surveys were not conducted as a part of this study but should be completed as part of the state and federal permit process. Based on the database review, the project study area contains wetlands and surface waters (Appendix B – Wetlands and Surface Waters Map).

In accordance with EO 11990, all actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands have been undertaken. If the proposed project limits or needs change and unavoidable impacts to wetlands are anticipated, they will be mitigated to achieve no net loss of wetland function.

FLUCFCS 5120 – Channelized Waterway – Canals (± 17.16 Ac.)

This land cover consists of several channelized canals that are directly adjacent to both major roadways within the project limits. One is directly adjacent to the east side of SR 7 starting south of the project limits and continuing north until it meets a perpendicular canal south of State Road 80. Two additional canals are adjacent to the east side of SR 7 beginning just north of State Road 80 and continuing north until they turn east to continue along the south side of Okeechobee Boulevard. One of these canals turns south just before Augustine Road and the other continues until reaching Florida's Turnpike. Impacts from this project to this surface water/channelized waterway system are not anticipated.

FLUCFCS 5200 – Lakes (± 22.93 Ac.)

Within the project study area, this land use is located on the north and south portions of Okeechobee Boulevard. Clear Lake is a large lake located north of Okeechobee Boulevard between I-95 and S Australian Avenue. There is a smaller lake located south of Okeechobee Boulevard between the same major roadways.

FLUCFCS 5300 – Reservoirs (± 31.90 Ac.)

Reservoirs are artificial impoundments of water used for irrigation, flood control, municipal and rural water supplies, recreation, and hydro-electric power generation.

FLUCFCS 6170 – Mixed Wetland Hardwoods (± 6.81 Ac.)

This category is for wetland hardwood communities composed of a large variety of hardwood species tolerant of hydric conditions yet exhibit a mixture of species.

FLUCFCS 6190 – Exotic Wetland Hardwoods (± 3.98 Ac.)

This land use is a wetland with a dominant exotic species such as Brazilian pepper, melaleuca, or other exotic species.

FLUCFCS 6410 – Freshwater Marshes (± 5.71 Ac.)

This land use is characterized by having one or more of the following species predominate: sawgrass, cattail, arrowhead, maidencane, buttonbush, cordgrass, giant cutgrass, switchgrass, bulrush, needlerush, common reed, or arrowroot.

Mitigation

In 2008 the USACE and the EPA issued regulations governing compensatory mitigation for activities authorized by the Department of the Army (Federal Register, 2008). These regulations, as promulgated in 33 Code of Federal Regulations (CFR) Part 332, establish a hierarchy for determining the type and location of compensatory mitigation. To briefly summarize, the rule establishes a preference for the use of mitigation bank credits if a mitigation bank has the appropriate number and resource type of credits available. If the permitted impacts are not in the service area of an approved mitigation bank, or if the appropriate number and resource type of credits are otherwise unavailable, then the rule establishes a preference for in lieu fee program credits. If an approved mitigation bank or in-lieu fee program cannot be used to provide the required compensatory mitigation, the rule establishes a preference for permittee responsible mitigation conducted under a watershed approach. Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 22 U.S.C. §1344. Compensatory mitigation for this project is not anticipated at this time. If the proposed project limits and/or needs change and mitigation is required, it will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. Presently, the project study area is located within the service area of Loxahatchee Mitigation Bank.

Permitting

The USACE, SWFWMD and FDEP have the potential to regulate impacts to wetlands and surface waters within the project study area. Other agencies, including the USFWS, NMFS, U.S. Environmental Protection Agency (EPA), and the FWC, review and comment on wetland permit applications. The FWC also issues permit for gopher tortoise relocation activities and nest takes for state protected avian species and the USFWS is the lead agency for eagle nest take permitting or coordination. In addition, the FDEP regulates stormwater discharges from construction sites. The complexity of the permitting process will depend on the degree of the impact to jurisdictional areas. It is anticipated that the following permits will be required for this project:

Permit	***Issuing Agency***
Section 404 Dredge and Fill Permit	USACE
Environmental Resource Permit (ERP)	SFWMD
Section 404 State Assumption	FDEP
National Pollutant Discharge Elimination System (NPDES)	FDEP

Federal Permits

The USACE regulates federally retained waters along with a 300-ft guideline and Indian Country as defined by the Memorandum of Agreement (MOA) between FDEP and the USACE. A portion of the project study area that includes Clear Lake is identified as federally retained waters and is jurisdictional to USACE. If impacts to this area are proposed, then the entire project would be reviewed under the USACE permitting guidelines and would require a Section 404 Dredge and Fill permit. If impacts are not proposed at Clear Lake but do involve impacts to other wetlands and surface waters than a FDEP State 404 program permit would be needed.

State Permits

SFWMD requires an ERP when construction of any project results in the creation of a new or modification of an existing surface water management system or results in impacts to waters of the state. The complexity associated with the ERP permitting process will depend on the size of the project and/or the extent of wetland impacts.

FDEP State 404 Program

In 2018, FDEP was given the authority to begin the rulemaking process to assume the federal dredge and fill permitting program under section 404 of the Clean Water Act within state-assumed waters. This process was completed in July 2020 and created the State 404 Program within Chapter 62-330 and 62-331, F.A.C. to facilitate this assumption. This State 404 Program is responsible for overseeing permitting for any project proposing dredge or fill activities within state-assumed waters. The State 404 Program is a separate program from the existing ERP program, and projects within the state-assumed waters require both an ERP and a State 404 Program authorization. The wetlands and surface waters outside of the Clear Lake system would fall under the state-assumed waters definition. If impacts to the Clear Lake system are avoided, then a State 404 program permit would be needed for impacts to the wetlands and surface waters.

NPDES

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without a NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, F.A.C., or an individual permit issued pursuant to Chapter 62-620, F.A.C. A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices (i.e., best management practices) that will be used to reduce the pollutants.

Depending on the types of permits required from the regulatory agencies, the permitting process typically ranges from 90 to 180 days.

Local Ordinances

The project study area falls within four (4) local jurisdictions: City of West Palm Beach, Village of Royal Palm Beach, Village of Wellington, and unincorporated Palm Beach County. The proposed project will comply with all applicable regulations regarding tree preservation and removal within their respective jurisdictions.

Wildlife and Habitat

Listed species are afforded special protective status by federal and state agencies. This special protection is federally administered by the United States Department of the Interior – U.S. Fish and Wildlife Service (USFWS), and National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-NMFS) pursuant to the Endangered Species Act of 1973 (as amended). The USFWS administers the federal list of animal species (50 CFR 17) and plant species (50 CFR 23). Federal protection of marine species is the responsibility of the NOAA-NMFS.

Administered by the Florida Fish and Wildlife Conservation Commission (FWC), the State of Florida affords special protection to animal species designated as State-designated Threatened or State Species of Special Concern, pursuant to Chapter 68A-27, F.A.C. The State of Florida also protects and regulates plant species designated as endangered, threatened or commercially exploited as identified on the Regulated Plant Index (5B-40.0055, F.A.C.), which is administered by the Florida Department of Agriculture and Consumer Services (FDACS), Division of Plant Industry, pursuant to Chapter 5B-40, F.A.C.

To determine federal- and state-listed protected plant and animal species that have potential to occur within the project study area and identify potential habitat for these species, available site-specific data was reviewed and evaluated.

Environmental scientists familiar with Florida natural communities conducted database reviews within and adjacent to the project study area. The database review included in-office literature reviews, FLUCFCS data review, and aerial photo interpretation. The Florida Natural Areas Inventory (FNAI) Biodiversity Matrix and USFWS Information for Planning and Consultation (IPaC) were reviewed for documented occurrences of listed species within one mile of the project study area (see Appendix C. - FNAI and IPaC Data Report). The project study area is partially or wholly within the USFWS Consultation Area (CA) for the Everglade snail kite (*Rostrhamus sociabilis*), red-cockaded woodpecker (*Picoides borealis*), and Florida bonneted bat (*Eumops floridanus*).

Based on these data reviews and evaluation of available information as described above, a listing of the state and federally listed species potentially occurring within the project study area has been compiled.

Table 2 lists species that may occur on-site or within the immediate vicinity of the project study area and their likelihood of occurrence. Likelihood of occurrence within the project study area is based on documented observation of the species, signs of the species (burrows, tracks, scat, etc.), and/or observation of potential suitable habitat.

For a species to be listed as potentially occurring within the project study area, the project study area must be within the species' distribution range. Several species were included in the USFWS IPaC Trust Resources Report because USFWS includes historic data; however, when comparing current conditions within the project study area, it was determined that many of these species would not occur within the site. Only species with potential habitat within the project study area are discussed further.

Table 2. Potential Listed Species within the Project Study Area

Common Name	Scientific Name	Federal Status	State Status	Comments	Likelihood of Occurrence
Red-cockaded Woodpecker	*Picoides borealis*	E	FE	The project study area is within the consultation area for this species. No documented occurrences were identified; however, limited potential habitat does occur onsite. Verification recommended to rule out suitability.	Low
Everglade Snail Kite	*Rostrhamus sociabilis*	E	FE	The project study area is within the consultation area for this species. No	Low

				documented occurrences were identified; however, potential habitat does occur onsite.	
Wood Stork	*Mycteria Americana*	T	FT	Minimal foraging habitat occurs on site; however, no documented occurrences were identified.	Low
Eastern Indigo Snake	*Drymarchon couperi*	T	FT	No documented occurrences were identified; however, potential habitat does occur onsite.	Low
Florida Bonneted Bat	*Eumops floridanus*	E	FE	The project study area is within the consultation area for this species. No documented occurrences were identified; however, potential habitat does occur onsite.	Medium
Florida Burrowing Owl	*Athene cunicularia*	N	ST	No documented occurrences were identified; however, potential habitat does occur onsite.	Low
Gopher Tortoise	*Gopherus polyphemus*	C	ST	No documented occurrences were identified; however, potential habitat does occur onsite.	Low

Federal Status: E = Endangered; T=Threatened; C = Candidate Species; N=Not Listed
State Status: FE – Federally Endangered; FT – Federally Threatened; ST – State Threatened

Federal Protected Species

Red-cockaded Woodpecker

The red-cockaded woodpecker is small woodpecker that is listed as endangered by both the USFWS and FWC. Red-cockaded woodpeckers inhabit open, mature pine woodlands that have a diversity of grass and shrub species. Preferred habitat includes old growth longleaf pine flatwoods in north and central Florida and mixed longleaf pine and slash pine in south-central Florida. The red-cockaded woodpecker creates cavities in within the longleaf pine tree and rely on the trees production of resin to protect them from predators. Development of longleaf pine habitat as well as fire exclusion in this fire-dependent ecosystem has led to a large decrease in populations of red-cockaded woodpeckers. The project study area is partially located within the USFWS consultation area for the red-cockaded woodpecker; however, only a very limited amount of potential habitat for the red-cockaded woodpecker occurs within the project study area and no records of individuals were identified in the database review. Based on the urban nature of the project corridor, no impacts are anticipated to this species, but potential habitat will be assessed through an onsite field review.

Everglade Snail Kite

The snail kite is listed as endangered by the USFWS and FWC due to degradation of its restricted range of foraging habitat and its highly specific diet, which is made up almost exclusively of apple snails (*Pomacea paludosa*). Snail kites typically prefer large, open, freshwater marshes and shallow lakes (< 4 ft. deep) with a low density of emergent vegetation and typically nest in low trees or shrubs over water (commonly willow, wax myrtle, pond apple, or buttonbush, but also in non-woody vegetation like cattail or sawgrass). They are protected under the Endangered Species Conservation Act, U.S. Migratory Bird Treaty Act and state wildlife laws. The project study area is located within the USFWS consultation area for the snail kite; however, no records of individuals were identified in the database review and only limited potential habitat occurs onsite. Based on the urban nature of the project corridor, no impacts are anticipated to this species, but potential habitat will be assessed through an onsite field review.

Wood Stork

The wood stork is listed as threatened by the USFWS and threatened by the FWC. Wood storks are typically found in marshes, cypress swamps, and mangrove swamps, but their presence in artificial ponds, seasonally flooded roadside or agricultural ditches, and managed impoundments has become common. Calm, shallow water areas (between 10 and 25 centimeters) that are not overgrown with dense, aquatic vegetation usually supply good feeding conditions. A determination of potential suitable foraging habitat will need to be completed through an onsite field review to assess the steepness of the slopes approaching the various canals within the project area and the depth of the water in these canals. If these canals provide foraging habitat for this species, a wood stork site-specific foraging analysis may be required.

Eastern Indigo Snake

The eastern indigo snake is listed as threatened by both the USFWS and the FWC due to a decline in population. The eastern indigo snake occurs in a range of habitats, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. The snake requires large tracts of land to survive and often winters in burrows of gopher tortoises, armadillos, cotton rats, and land crabs (in coastal areas) and forages in hydric habitats. No records of individuals were identified in the database review; however, potential habitat for this species is present within the project study area. Based on the urban nature of the project corridor, no impacts are anticipated to this species, but potential habitat will be assessed through an onsite field review.

Florida Bonneted Bat

The Florida bonneted bat is the largest bat species endemic to Florida and is listed as endangered by both USFWS and FWC. This species has a wide ranging USFWS consultation area but has only been recorded to occur in south Florida (Miami-Dade, Broward, Collier, Hendry, Lee, Charlotte, Glades, Highlands, Desoto, and Polk counties). This species is known to roost in natural tree cavities and tree cavities created by woodpeckers and other species as well as in man-made structures. The project study area is partially within the USFWS consultation area for the Florida bonneted bat. Further coordination with USFWS is needed to determine the level of survey needed for this project based on potential impacts within the project limits.

State Protected Species

Florida Burrowing Owl

The Florida burrowing owl is listed as a species of special concern by the FWC. This small, ground- dwelling owl is boldly spotted and barred with brown and white. Habitat includes open, native prairies and cleared areas that provide short ground cover such as pastures, agricultural fields, golf courses, airports, and vacant lots in residential areas. No records of individuals were identified in the database review; however, limited potential habitat for this species is present within the project study area. Based on the urban nature of the project corridor, no impacts are anticipated to this species, but potential habitat will be assessed through an onsite field review.

Gopher Tortoise

The gopher tortoise is listed by FWC as threatened and a candidate species for USFWS. Gopher tortoises prefer dry upland habitats such as pine flatwoods, xeric oak hammocks, open sandy pastures, and disturbed areas. No records of individuals were identified in the database review; however, natural upland FLUCFCS classifications are present within the project study area. If gopher tortoises or burrows are found within the project study area, coordination with FWC to secure any necessary permits will be needed to relocate the tortoises and associated commensal species prior to construction. At this time, no further action is anticipated for this species.

Listed Plant Species

The Florida Department of Agriculture and Consumer Service's *Notes on Florida's Threatened and Endangered Plants*, and Richard Wunderlin's *Guide to Vascular Plants of Florida*, were consulted to assess habitat requirements for listed plant species. Although listed plants were noted by FNAI and USFWS as possibly occurring in this area, no potential habitat is likely to occur due to the urban nature of the project study area. No further action is anticipated for listed plant species.

Special Designations

The project study area was evaluated for the occurrence of Critical Habitat as defined by the Endangered Species Act of 1973 as amended and 50 CFR part 424. The USFWS is the authority, as a federal agency, to protect critical habitat from destruction or adverse modification of the biological or physical constituent elements essential to the conservation of listed species. Critical Habitat is defined as the specific areas within the geographical area occupied by a species on which are found those physical or biological features essential to the conservation of the species and which defined may require special management considerations or protection. No designated Critical Habitat occurs within the project study area.

The project study area was also evaluated for the occurrence of Aquatic Designations such as Aquatic Preserve or Outstanding Florida Waterbody. In 1975 Florida enacted the Aquatic Preserve Act managed through Florida Department of Environmental Protection (FDEP) to ensure the preservation of the natural conditions within the waters. Section 403.031(27), Florida Statutes, gives FDEP the power to establish rules that provide for a special category of waterbodies within the state, Outstanding Florida Waters (62-302.700 F.A.C.) which is a water designated worthy of special protection because of its natural attributes and is intended to protect existing good water quality. No Aquatic Designations occur within the project study area.

Floodplains

FEMA FIRM panels 12099C0583F, 12099C0579F , 12099C0578F, 12099C0559F, 12099C0558F, 12099C0554F, 12099C0562F, and 12099C0562F (all effective 10/05/2017), indicates that portions of the project study area are within Zone A or AE (areas determined to be within 1% chance of Annual Chance Floodplain) and Zone X (areas determined to be outside of the 0.2% annual chance floodplain). Impacts to floodplains will be assessed during the PD&E phase of the project. A FEMA Flood Zone Map is attached as Appendix D.

Historic and Archaeological Resources

Kimley-Horn requested an inquiry from the Department of State, State Historic Preservation Officer (SHPO) Division of Historical Resources Florida Master Site File (FMSF) regarding the presence of known historical or archaeological findings within the site. Data was also reviewed from the SHPO FMSF available from FGDL. The FMSF indicates that there are no archeological sites, no historical structures, and one linear resource within the project study area. The Miami River Canal (C-6) is listed as eligible for listing in the National Register of Historical Places but impacts to this resource are not anticipated for this project. Coordination with SHPO for concurrence on this resource is recommended before construction activities commence.

Recreational Facilities

Based on the review of available resources, eight (8) recreational facilities were documented within the project study area. A list of these resources can be found below. If federal funds are used for this project or the project requires the approval of FDOT, and impacts to the park occur, then a Section 4(f) determination of applicability and use will be required.

Contamination

A preliminary screening evaluation was conducted to identify known contamination sites within the project study area. The project study area includes the approximately 13.5-mile project corridor and 250 feet on either site of the public right-of-way (ROW). This evaluation consisted of a desktop review and did not include field reconnaissance of the project study area. Readily available records from the Florida Department of

Environmental Protection (FDEP) Map Direct Database, and a Database Report (dated May 18, 2021) provided by Environmental Risk Information Services (ERIS) were reviewed. It should be noted that the project study area is located within a densely developed urban corridor of Palm Beach County, Florida. As such, there are numerous sites identified within the ERIS Database Report and the FDEP Map Direct databases. The ERIS Database Report contains records of facilities that were identified from a variety of federal, state, and local regulatory databases. In total, the Database Report identified 331 mapped sites associated with 709 database listings within the project study area. For the purposes of this evaluation, the databases were evaluated further to identify those sites that have known contamination existing at the site.

Other listed sites, such as registered storage tank sites with no reported discharges, previous contamination sites that have achieved regulatory closure for past discharges, hazardous waste generator facilities, stormwater permits, and other listings with no documentation of existing contamination, were not included in this evaluation. A review of contaminant plume composition and extents at known contaminated sites, and an assignment of site-specific risk ratings, was not included in this evaluation. Further evaluation of known and/or potentially contaminated sites within the project study area may be performed as part of a Level I Contamination Screening Evaluation, which is discussed further below. A total of 20 known contamination sites were identified within the project study area from the databases below. These sites are summarized in *Table 3* below and a map is provided Appendix E.

- FDEP Cleanup Sites – This database layer identifies State funded sites currently awaiting cleanup funding. Cleanup programs include: Brownfields, Petroleum, EPA Superfund (CERCLA), Drycleaning, Responsible Party Cleanup, State Funded Cleanup, State Owned Lands Cleanup and Hazardous Waste Cleanup.
- Drycleaning Solvent Program Cleanup Sites – This database lists drycleaning sites that are eligible for state funding through the Drycleaning Solvent Cleanup Program (DCSP) to cleanup properties that are contaminated as a result of drycleaning operations or wholesale supply.
- Petroleum Contamination Monitoring (PCTS) Discharges – This database includes all identified petroleum contaminated discharge sites where cleanup is ongoing or complete. Discharge cleanup sites may be eligible or ineligible for state funding assistance.
- Environmental Restoration Integrated Cleanup (ERIC) Sites – This database tracks contaminated site cleanup activities within the FDEP Division of Waste Management.
- Solid Waste Facilities – This database includes authorized and unauthorized solid waste facilities, including municipal solid waste, landfills, dumps, construction and demolition disposal, and recycling facilities.
- ERNS / SPILLS Sites – The ERNS (Emergency Response Notification System) database includes oil and hazardous substances spill reports made available by the US Coast Guard National Response Center. The SPILLS database is a statewide listing of oil and hazardous materials spills and incidents recorded by the FDEP.

Table 3. Contamination Sites Summary

Site No.	Site No. per ERIS Database Report	Facility Name	Location/ Address	Facility ID	Distance from ROW	Contamination Database Category					
						DEP Cleanup Sites	Drycleaning Solvent Program Cleanup Sites	Petroleum Contamination Monitoring (PCTS) Discharges	ERIC Cleanup Sites	Solid Waste Facilities	ERNS / SPILLS Sites
01	233	Shell – First Coast Energy #2719 Shell – Petroleum Services of Palm Beach	192 S State Road 7, West Palm Beach, FL	9100151	Eastern adjacent	X		X			
02	255, 267	Texaco #021 – 1323 Short Stop	10029 Southern Boulevard, West Palm Beach, FL	8514642	Within ROW	X		X			
03	232	Chevron #48190-A08	9931 Southern Boulevard, West Palm Beach, FL	8514775	Within ROW	X		X			
04	308	Next Era Landscaping, LLC	None listed	99154	Southern adjacent					X	
05	122, 123	Barney's Convenience Store	6950 Okeechobee Boulevard, West Palm Beach, FL	8513870	Southern adjacent	X		X			
06	26, 27	Family Fina #604	5028 Okeechobee Boulevard, West Palm Beach, FL	8513941	Southern adjacent	X		X			
07	67, 68	U-Haul Center West Palm Beach	4371 Okeechobee Boulevard, West Palm Beach, FL	8630507	Northern adjacent	X		X			
08	80, 81, 82, 83	Amlene Clean Duclac Inc. DBA T & W Cleaners	4275 Okeechobee Boulevard, West Palm Beach, FL	ERIC_5185	Northern adjacent	X	X		X		
09	86	Public Storage Inc. Public Storage Facility – 4200 Okeechobee	4200 Okeechobee Boulevard, West Palm Beach, FL	9805655	Southern adjacent	X		X			

10	90, 91	Critz Property	Okeechobee Boulevard & Donnell Road, West Palm Beach, FL	9700618 ERIC_6365 ERIC_10590	Southern adjacent	X		X	X	
11	99, 100	Marathon – European #461 BP – European #461	4111 Okeechobee Boulevard, West Palm Beach, FL	8514748	Northern adjacent	X		X		
12	142, 143	Luxury Laundry & Drycleaning	2827 Okeechobee Boulevard, West Palm Beach, FL	ERIC_5277	Northern adjacent	X	X		X	
13	N/A	Toyota of Palm Beach	2702 & 2707 Okeechobee Boulevard, West Palm Beach, FL	ERIC_8722 ERIC_10857	Northern adjacent				X	
14	171, 172	THCW Land Holdings Inc.	2405 Okeechobee Boulevard, West Palm Beach, FL	8514777	Northern adjacent	X		X		
15	N/A	Florida DOT Okeechobee Blvd (SR 704) Widening Project	Okeechobee Boulevard & S Congress Avenue, West Palm Beach, FL	ERIC_10795	Within ROW				X	
16	180	Sunshine #37	2274 Okeechobee Boulevard, West Palm Beach, FL	8514631	Southern adjacent	X		X		
17	185	Prime Autos	2008 Okeechobee Boulevard, West Palm Beach, FL	9100616	Southern adjacent	X		X		
18	303, 320	Amoco #447	746 Okeechobee Boulevard, West Palm Beach, FL	8513818	Southern adjacent	X		X		
19	140, 148	Braman Motor Cars	2815 & 2901 Okeechobee Boulevard, West Palm Beach, FL	52265 1104439	Northern adjacent					X
20	183	Dean Property	2158 Okeechobee Boulevard, West Palm Beach, FL	9601268	Southern adjacent			X		

SUMMARY

The project study area includes wetlands and surface waters and if unavoidable impacts to these systems are anticipated then state permits will be needed. Impacts to unavoidable wetlands and surface waters will be assessed to determine if mitigation for these impacts will be needed. An ERP from SFWMD and State 404 permit from FDEP is anticipated if impacts to wetlands or surface water will occur and mitigation may be required to offset any proposed wetland impacts. Mitigation can be provided on-site or may be comprised of off-site purchase of mitigation bank credits. A NPDES permit through FDEP to develop a Stormwater Pollution Prevention Plan. Additionally, a Tree Removal Permit will be required from if any trees are proposed for removal.

A formal Florida bonneted bat roost survey during the design phase is recommended and consultation with USFWS may be required on the survey results. Implementation of the *Standard Protection Measures for the Eastern Indigo Snake* during construction is recommended per the USFWS key. These measures consist of informational signage and construction crew educational materials to identify and avoid impacts to the species. No designated Critical Habitat or Aquatic Designations occurs within the project study area.

Portions of the project study area are within Zone A, AE and Zone X; however, impacts to the floodplain are not anticipated. No further action is anticipated. Impacts to floodplains will be assessed during the PD&E phase of the project.

Based on the Florida Master Site File, no archeological sites, no historical structures, and one linear resource within the project study area. Additional cultural resource evaluations may be required based on the Miami River Canal (C-6) eligibility. It is recommended that a compliance review be requested from SHPO to determine if additional studies will be required.

A total of 20 known contamination sites were identified within the project study area through the preliminary desktop review as previously described.

This desktop review is not meant to represent a Level I Contamination Screening Evaluation, which is described in Part 2, Chapter 20 of the Florida Department of Transportation (FDOT) Project Development and Environment (PD&E) Manual (dated July 1, 2020). A Level I evaluation may be necessary to further evaluate potential contaminant impacts to the project alternatives. The Level I evaluation is performed to screen known and/or potentially contaminated sites that may impact project alternatives. The Level I evaluation consists of a database review, review of historical resources (i.e aerial photographs, topographic maps, Sanborn maps, and city directories), review of existing land use and hydrologic features, field reconnaissance, and interviews.

Sites identified during the Level I as potential contamination sites are further evaluated for impact to the project alternatives and each site is assigned a "risk rating" of "No", "Low", Medium" or "High". It should be noted that Level I evaluations are intended to evaluate potential contamination sites within specified distances from the project study area. These distances include 500 feet from the ROW line for petroleum, drycleaners, and non-petroleum sites; 1,000 feet for non-landfill solid waste sites; and 0.5 miles for CERCLA, National Priority List (NPL) Superfund sites, or Landfill sites.

As discussed previously, the ERIS Database Report identified 331 sites across 709 database listings within 250 feet of the project ROW. Additional potential contamination sites are likely to be identified through a Level I evaluation upon entering the PD&E phase due to the expanded scope and search distances specified within a Level I evaluation.

Based on the findings of a Level I evaluation, a Level II contamination evaluation may also be warranted to further assess potential contaminant impacts to the project. The Level II evaluation, if warranted, is typically performed during the project design phase to assess the type and extent of potential contamination impacts to construction activities on the project or ROW acquisition.

SOCIOCULTURAL EVALUATION

Methodology

The study area for the social and economic analysis extends to areas within a ¼-mile of the project corridor. The *Sociocultural Effects Evaluation Handbook* recommends a ¼-mile buffer as a minimum distance for sociocultural effects evaluations to allow for the inclusion of community facilities and address connectivity.

Results

Community Facilities

Community and neighborhood feature data from the Florida Geographic Data Library was used to determine where features are located throughout the study area. Field reconnaissance and verification is recommended during the PD&E phase for the project. A summary of the community and neighborhood facilities are included in *Table 4*.

Table 4. Community Facilities within the Project Study Area

Site Name
EDUCATIONAL FACILITIES
ACADEMY FOR NURSING AND HEALTH OCCUPATIONS
ADULT EDUCATION CENTER OF PALM BEACH
ALEXANDER W DREYFOOS JUNIOR SCHOOL OF THE ARTS
BENOIST FARMS ELEMENTARY SCHOOL
BEREAN CHRISTIAN SCHOOL
CREATIVE MONTESSORI ACADEMY, LLC
FLORIDA CAREER COLLEGE - WEST PALM BEACH
INDIAN RIDGE SCHOOL
RENAISSANCE CHARTER SCHOOL AT CYPRESS
SOUTH UNIVERSITY-WEST PALM BEACH
TURNING POINTS ACADEMY
RECREATIONAL FACILITIES
CHILLINGWORTH PARK
GATEWAY PARK
HARRIET HIMMEL THEATRE
HOWARD PARK COMMUNITY CENTER
OKEECHOBEE BLVD BRANCH LIBRARY

PALM BEACH COUNTY CONVENTION CENTER
RAYMOND F KRAVIS CENTER FOR THE PERFORMING ARTS
SOUTH UNIVERSITY - SOUTH UNIVERSITY LIBRARY
RELIGIOUS FACILITIES
CHRIST FELLOWSHIP CHURCH INC
FAMILY WORSHIP CENTER
GRACE FELLOWSHIP OF WEST PALM
NEW HOPE CHRISTIAN CENTER
ROYAL POINCIANA CHAPEL
SEVENTH DAY CHURCH-THE LIVING
ST CASIMIRS ROMAN CATHOLIC CHURCH
UNITED PENTECOSTAL CHURCH
WESTGATE NEW TESTAMENT CHURCH
HEALTH CARE FACILITIES
WELLINGTON REGIONAL MEDICAL CENTER
SOCIAL SERVICE FACILITIES
CHILD AND FAMILY CONNECTIONS
GOVERNMENTAL FACILITIES
US POST OFFICE - ZIP CODE PLACE DDC ANNEX
PALM BEACH COUNTY FIRE RESCUE STATION 23 - HEADQUARTERS
PALM BEACH COUNTY FIRE RESCUE STATION 29
PALM BEACH COUNTY SHERIFF
WEST PALM BEACH FIRE RESCUE STATION 7

Access will remain for these community facilities throughout construction of the proposed project. The proposed project will provide greater mobility within the community allowing for enhanced access to these community facilities.

Community Cohesion

Community cohesion is the degree to which residents have a sense of belonging to their community. This may also include the degree in which neighbors interact and cooperate with one another, the level of attachment felt between residents and institutions in the community, and/or a sense of common belonging, cultural similarity or "togetherness" experienced by the population. Increased connections between communities and regions can be a positive effect on community cohesion particularly in areas that are heavily congested or divided by man-made or natural barriers such as wetland or stream systems.

The corridor involves the proposal of implementing enhanced transit facilities that may include capital investments of bus rapid transit (BRT) or light rail transit (LRT) on Okeechobee Blvd. and SR 7. In developing these alternatives, consideration will be given to minimizing effects to existing neighborhoods and businesses.

Overall, connectivity will be improved due to the enhanced transit facilities, improved access along the corridor, and improved access to local businesses and community facilities.

Under the No-Build Alternative, Okeechobee Boulevard and SR 7 would remain an 8-lane divided roadway and 6-lane divided roadway, respectively. Local traffic movements within the existing communities would remain unchanged. The roadways would likely experience increased traffic volumes and decreased safety for users.

DEMOGRAPHICS

The project study area was reviewed in accordance with the *Civil Rights Act of 1964*, as amended by the *Civil Rights Act of 1968*. Additionally, the alternatives will be developed in accordance with *Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994)*. This project will be developed without regard to race, color, national origin, age, sex, religion, disability or family status.

An analysis of existing minority, low-income populations, and other vulnerable populations was conducted through a review of 2019 5-year American Community Survey (ACS) census data. The study area for reviewing the demographics included census blocks groups that overlap the study area and ¼-mile buffer.

Based on 2019 5-year estimates, the residential population in the study area is approximately 90,485. Census tracts with more minority populations than the study area are generally located between I-95 and the Florida Turnpike adjacent to Okeechobee Boulevard, and west of SR 7. *Table 5* includes a summary of the residential population by race.

Table 5. Population by Race (2019 5-year ACS) within the Project Study Area

Geography	Census Block Group	2019 Population	Percent White	Percent Hispanic[1]	Percent Black	Percent Other[2]
Okeechobee Boulevard & SR 7 Study Area		90,485	39.4	26.9	27.1	6.6
Census Tract 19.09	Block Group 1	2,730	16.4	50.4	28.4	4.8
Census Tract 19.11	Block Group 1	596	72.8	13.8	5.7	7.7
Census Tract 19.11	Block Group 2	308	72.4	9.4	16.2	1.9
Census Tract 19.13	Block Group 1	672	71.6	5.4	19.9	3.1
Census Tract 19.13	Block Group 2	568	84.2	12.9	1.6	1.4
Census Tract 19.13	Block Group 3	571	89.5	10.5	0.0	0.0
Census Tract 19.17	Block Group 1	1,951	39.3	13.0	39.9	7.8
Census Tract 20.05	Block Group 1	3,130	13.1	9.5	75.4	2.0
Census Tract 20.06	Block Group 1	439	38.7	30.3	23.5	7.5
Census Tract 20.06	Block Group 2	2,230	14.8	18.4	57.8	9.0
Census Tract 26.00	Block Group 1	1,301	69.9	17.8	4.8	7.5
Census Tract 27.00	Block Group 1	1,622	65.4	26.1	5.8	2.7
Census Tract 27.00	Block Group 3	1,840	75.9	12.7	8.9	2.6

Census Tract 28.00	Block Group 1	1,167	23.7	54.1	18.8	3.5
Census Tract 28.00	Block Group 3	612	69.0	29.7	0.0	1.3
Census Tract 28.00	Block Group 4	461	41.0	36.0	18.0	5.0
Census Tract 29.00	Block Group 1	2,206	7.3	83.7	9.0	0.0
Census Tract 29.00	Block Group 2	4,721	3.6	40.5	52.5	3.3
Census Tract 31.01	Block Group 2	1,598	15.8	79.1	0.0	5.1
Census Tract 31.01	Block Group 3	1,861	21.8	66.0	9.8	2.4
Census Tract 31.02	Block Group 3	2,680	7.1	35.6	55.5	1.9
Census Tract 31.02	Block Group 4	1,423	20.9	42.4	33.5	3.2
Census Tract 77.52	Block Group 1	6,055	65.5	14.0	12.1	8.4
Census Tract 77.60	Block Group 1	4,295	52.9	19.1	15.2	12.9
Census Tract 77.62	Block Group 1	1,197	59.1	17.2	11.4	12.2
Census Tract 77.62	Block Group 2	878	98.5	0.0	1.5	0.0
Census Tract 77.63	Block Group 1	2,114	56.0	42.5	0.8	0.8
Census Tract 77.63	Block Group 2	6,141	32.4	21.7	40.2	5.8

Census Tract 77.65	Block Group 1	3,206	47.7	26.2	1.3	24.9
Census Tract 77.65	Block Group 3	3,543	27.7	37.8	21.9	12.6
Census Tract 78.13	Block Group 1	4,398	38.6	30.8	26.4	4.2
Census Tract 78.13	Block Group 2	2,518	52.6	14.4	20.4	12.6
Census Tract 78.18	Block Group 1	2,013	59.7	9.9	26.9	3.5
Census Tract 78.32	Block Group 1	1,252	21.4	35.1	37.5	6.1
Census Tract 78.32	Block Group 2	771	66.1	21.4	9.1	3.4
Census Tract 78.32	Block Group 3	895	38.5	34.0	21.2	6.3
Census Tract 78.33	Block Group 2	4,511	11.4	17.1	59.4	12.1
Census Tract 78.36	Block Group 1	3,073	64.8	25.3	3.2	6.6
Census Tract 78.36	Block Group 2	1,699	32.1	12.8	53.3	1.8
Census Tract 78.37	Block Group 1	2,475	31.9	7.4	55.8	4.8
Census Tract 78.37	Block Group 2	2,420	61.6	17.1	14.6	6.7
Census Tract 78.37	Block Group 3	2,344	63.3	19.5	13.3	3.9

Source: US Census Bureau, 2015-2019 American Community Survey Five-Year Estimates.

[1]Hispanic includes persons of any race with Hispanic or Latino family heritage.

[2]Other includes: American Indian/Alaskan Native, Asian, Native Hawaiian, other single race, and two or more races.

Table 6 summarizes the household income characteristics for the study area. The 2019 5-year estimates indicate that the median household income of the study area is approximately $64,820, with approximately 14.2% of families having incomes below the federal poverty level. Census tracts with more household incomes below the poverty level are generally located between I-95 and the Florida Turnpike adjacent to Okeechobee Boulevard.

Table 6. Household Income Characteristics (2019 5-year ACS) within the Project Study Area

Geography	Census Block Group	Median Household Income (Dollars)	Percentage of Households with Incomes Below Poverty Level
Okeechobee Boulevard & SR 7 Study Area		$64,820	14.2
Census Tract 19.09	Block Group 1	$34,904	26.7
Census Tract 19.11	Block Group 1	$24,943	16.0
Census Tract 19.11	Block Group 2	$18,220	25.3
Census Tract 19.13	Block Group 1	$26,944	13.1
Census Tract 19.13	Block Group 2	$24,821	18.5
Census Tract 19.13	Block Group 3	$27,882	16.1
Census Tract 19.17	Block Group 1	$36,071	36.8
Census Tract 20.05	Block Group 1	$49,192	8.1
Census Tract 20.06	Block Group 1	$100,817	3.3
Census Tract 20.06	Block Group 2	$37,341	22.9
Census Tract 26.00	Block Group 1	$78,155	14.1
Census Tract 27.00	Block Group 1	$85,033	10.4
Census Tract 27.00	Block Group 3	$52,344	2.4
Census Tract 28.00	Block Group 1	$47,889	10.2
Census Tract 28.00	Block Group 3	$131,369	14.4
Census Tract 28.00	Block Group 4	$67,930	3.7
Census Tract 29.00	Block Group 1	$30,865	41.3
Census Tract 29.00	Block Group 2	$28,699	35.6
Census Tract 31.01	Block Group 2	$36,453	35.5
Census Tract 31.01	Block Group 3	$29,083	37.9
Census Tract 31.02	Block Group 3	$30,636	33.7
Census Tract 31.02	Block Group 4	$39,099	20.8
Census Tract 77.52	Block Group 1	$100,104	2.7
Census Tract 77.60	Block Group 1	$126,000	4.5
Census Tract 77.62	Block Group 1	$154,375	2.0
Census Tract 77.62	Block Group 2	$84,219	5.6

Census Tract 77.63	Block Group 1	$54,615	14.2
Census Tract 77.63	Block Group 2	$87,746	0.0
Census Tract 77.65	Block Group 1	$152,895	0.0
Census Tract 77.65	Block Group 3	$144,750	7.1
Census Tract 78.13	Block Group 1	$80,833	0.8
Census Tract 78.13	Block Group 2	$78,254	4.6
Census Tract 78.18	Block Group 1	$119,167	5.2
Census Tract 78.32	Block Group 1	$50,780	5.3
Census Tract 78.32	Block Group 2	$24,279	16.9
Census Tract 78.32	Block Group 3	$26,750	18.4
Census Tract 78.33	Block Group 2	$41,146	22.7
Census Tract 78.36	Block Group 1	$67,337	13.8
Census Tract 78.36	Block Group 2	$59,695	17.4
Census Tract 78.37	Block Group 1	$93,153	0.0
Census Tract 78.37	Block Group 2	$71,131	2.7
Census Tract 78.37	Block Group 3	$66,538	4.1
Source: 2015-2019 American Community Survey Five-Year Estimates			

In addition to race and household income, the 2019 5-year estimates were reviewed to evaluate the percentage of households with one or more persons 65 years or older (*Table 7*) and the percentage of households with limited English proficiency (

Table 8). Limited English proficiency is defined as Census Tracts and Block Groups within the study area containing people that do not speak English “very well” or “well”.

Census tracts with more households than the study area with one or more persons greater than 65 are in proximity to the Riverwalk and Century Village neighborhoods, and the Breakers West Country Club. Census tracts with more households than the study area with limited English proficiency are generally located south of Okeechobee Boulevard between I-95 and Sansburys Way.

Table 7. Household Age (2019 5-year ACS) within the Project Study Area

Geography	Census Block Group	Percentage of Households with one or more person 65 years or older
Okeechobee Boulevard & SR 7 Study Area		33.9
Census Tract 19.09	Block Group 1	13.0
Census Tract 19.11	Block Group 1	87.0
Census Tract 19.11	Block Group 2	90.9
Census Tract 19.13	Block Group 1	81.8
Census Tract 19.13	Block Group 2	77.3
Census Tract 19.13	Block Group 3	98.0
Census Tract 19.17	Block Group 1	28.4
Census Tract 20.05	Block Group 1	32.1
Census Tract 20.06	Block Group 1	3.7
Census Tract 20.06	Block Group 2	21.8
Census Tract 26.00	Block Group 1	32.5
Census Tract 27.00	Block Group 1	34.2
Census Tract 27.00	Block Group 3	36.1
Census Tract 28.00	Block Group 1	21.6
Census Tract 28.00	Block Group 3	31.2
Census Tract 28.00	Block Group 4	4.3
Census Tract 29.00	Block Group 1	3.9
Census Tract 29.00	Block Group 2	18.8
Census Tract 31.01	Block Group 2	24.4
Census Tract 31.01	Block Group 3	42.0
Census Tract 31.02	Block Group 3	10.0
Census Tract 31.02	Block Group 4	12.8
Census Tract 77.52	Block Group 1	35.7
Census Tract 77.60	Block Group 1	22.8
Census Tract 77.62	Block Group 1	15.5

Census Tract 77.62	Block Group 2	89.9
Census Tract 77.63	Block Group 1	27.3
Census Tract 77.63	Block Group 2	16.0
Census Tract 77.65	Block Group 1	20.2
Census Tract 77.65	Block Group 3	42.0
Census Tract 78.13	Block Group 1	21.8
Census Tract 78.13	Block Group 2	20.2
Census Tract 78.18	Block Group 1	57.5
Census Tract 78.32	Block Group 1	31.8
Census Tract 78.32	Block Group 2	74.6
Census Tract 78.32	Block Group 3	50.8
Census Tract 78.33	Block Group 2	6.0
Census Tract 78.36	Block Group 1	69.8
Census Tract 78.36	Block Group 2	8.6
Census Tract 78.37	Block Group 1	21.8
Census Tract 78.37	Block Group 2	30.5
Census Tract 78.37	Block Group 3	70.1

Table 8. Language Characteristics (2019 5-year ACS) within the Project Study Area

Geography	Census Block Group	Percentage of Limited English-Speaking Households
Okeechobee Boulevard & SR 7 Study Area		9.7
Census Tract 19.09	Block Group 1	20.4
Census Tract 19.11	Block Group 1	14.9
Census Tract 19.11	Block Group 2	7.5
Census Tract 19.13	Block Group 1	3.7
Census Tract 19.13	Block Group 2	7.9
Census Tract 19.13	Block Group 3	6.8
Census Tract 19.17	Block Group 1	14.1
Census Tract 20.05	Block Group 1	3.0
Census Tract 20.06	Block Group 1	8.6
Census Tract 20.06	Block Group 2	16.3
Census Tract 26.00	Block Group 1	3.2
Census Tract 27.00	Block Group 1	10.3
Census Tract 27.00	Block Group 3	5.9
Census Tract 28.00	Block Group 1	19.5
Census Tract 28.00	Block Group 3	5.3
Census Tract 28.00	Block Group 4	0.0
Census Tract 29.00	Block Group 1	44.1
Census Tract 29.00	Block Group 2	39.6
Census Tract 31.01	Block Group 2	20.4
Census Tract 31.01	Block Group 3	23.5
Census Tract 31.02	Block Group 3	25.4
Census Tract 31.02	Block Group 4	6.6
Census Tract 77.52	Block Group 1	2.0
Census Tract 77.60	Block Group 1	4.2
Census Tract 77.62	Block Group 1	4.6
Census Tract 77.62	Block Group 2	0.0
Census Tract 77.63	Block Group 1	17.4
Census Tract 77.63	Block Group 2	0.0
Census Tract 77.65	Block Group 1	0.0
Census Tract 77.65	Block Group 3	14.2
Census Tract 78.13	Block Group 1	4.2

Census Tract 78.13	Block Group 2	1.1
Census Tract 78.18	Block Group 1	0.0
Census Tract 78.32	Block Group 1	25.0
Census Tract 78.32	Block Group 2	12.3
Census Tract 78.32	Block Group 3	17.0
Census Tract 78.33	Block Group 2	15.5
Census Tract 78.36	Block Group 1	1.2
Census Tract 78.36	Block Group 2	2.2
Census Tract 78.37	Block Group 1	0.0
Census Tract 78.37	Block Group 2	4.2
Census Tract 78.37	Block Group 3	1.1

Source: 2015-2019 American Community Survey Five-Year Estimates

Minority or low-income populations are present in the study area and will be taken into consideration during future planning and design of the preferred alternative. Temporary construction impacts would be the same for all populations within the study area. The proposed project will enhance mobility for all residents, including minority and low-income populations.

MOBILITY

Corridor alternatives are proposed to improve multimodal connectivity and access with transit facilities along Okeechobee Boulevard and SR 7. Enhanced transit service will improve connections on Okeechobee Boulevard and SR 7, providing efficient connections between project termini at Forest Hill Boulevard and Rosemary Avenue in the City of West Palm Beach. Improved transit service within the project corridor will result in improved access to homes, businesses, various recreational resources, educational facilities, and religious facilities as well.

RELOCATION AND DISPLACEMENT IMPACTS

Corridor alternatives are anticipated to positively impact the local economy or tax base with a potential increase in jobs and economic activity around the station areas due to the enhanced transit service. Potential right-of-way impacts will be evaluated for the recommended alternative. In order to minimize the unavoidable effects of right-of-way acquisition and displacement of people, FDOT would carry out a Right-of-Way and Relocation Assistance Program in accordance with Florida Statute 421.55, Relocation of displaced persons, if needed.

AESTHETIC EFFECTS

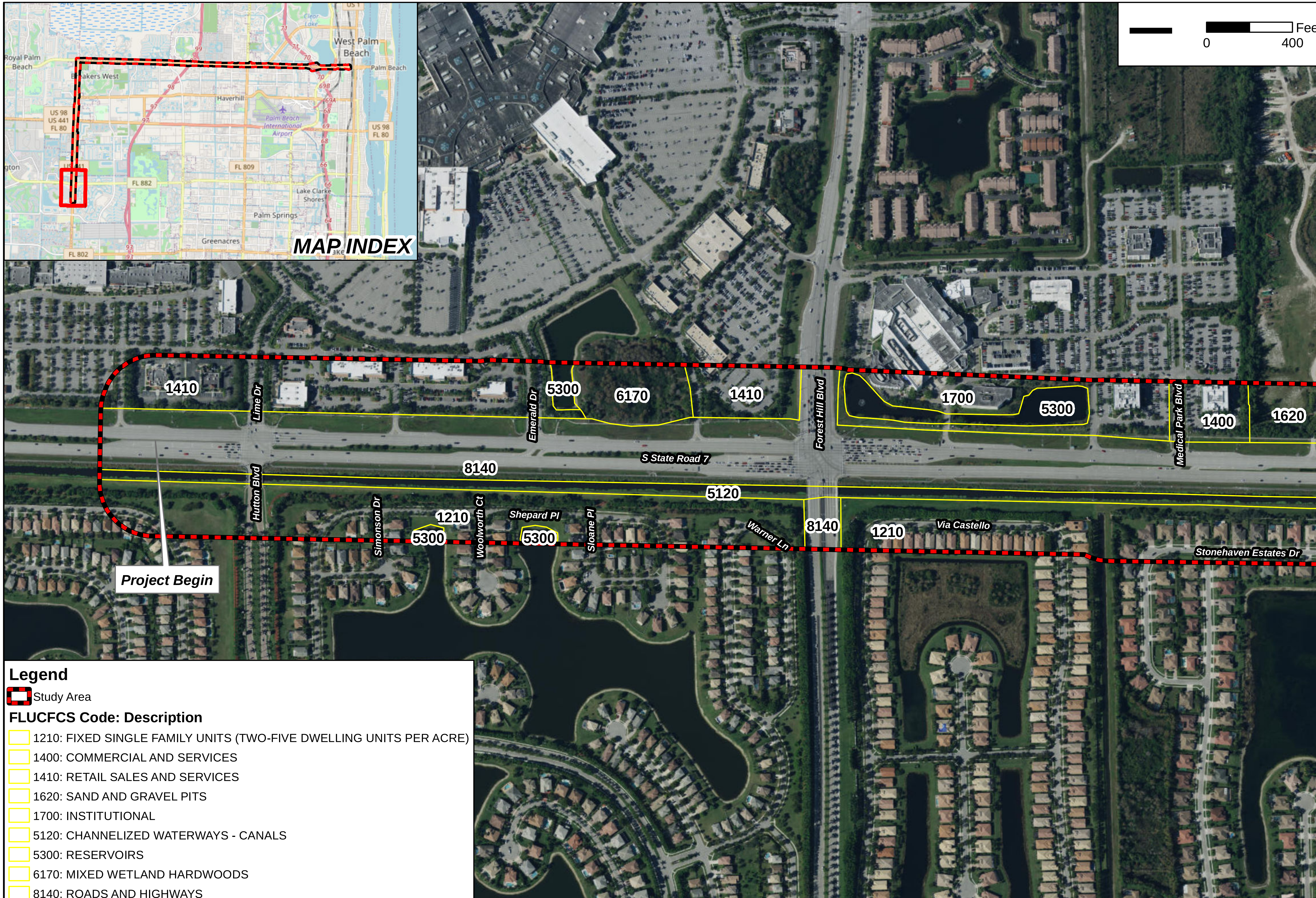
The topography of the project study area is flat consisting primarily of single- and multi-family residential use, along with single-story commercial buildings. Views within the area are restricted by the existing buildings and trees. Okeechobee Boulevard and SR 7 are already existing roadways and therefore the viewshed is not anticipated to change from the corridor alternatives' improvements. The Elevated grade-separated

LRT Alternative would present the highest risk of visual barrier to the surrounding neighborhoods and businesses, and aesthetic design choices would be considered in future phases of the project development. Future landscaping will be considered with the corridor alternatives' improvements.

LAND USE CHANGES

Future land use (FLU) was determined based on a review of Palm Beach County's FLU GIS data including categories for the City of West Palm Beach. The project study area is almost entirely developed with residential and commercial land uses. FLU shows the following land use categories: Commercial High, Commercial Low, Industrial, Institutional, Conservation, High Residential, Medium Residential, Low Residential, and Mixed Use. The study area is largely built-out but may encourage transit-oriented development and redevelopment that supports the existing businesses and residences in the area.

APPENDIX A: FLUCFCS MAP



Source: Aerials courtesy of NearMap

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Florida Land Use, Cover, and Forms Classification System Map

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Palm Beach County, FL

1 inch = 400 feet

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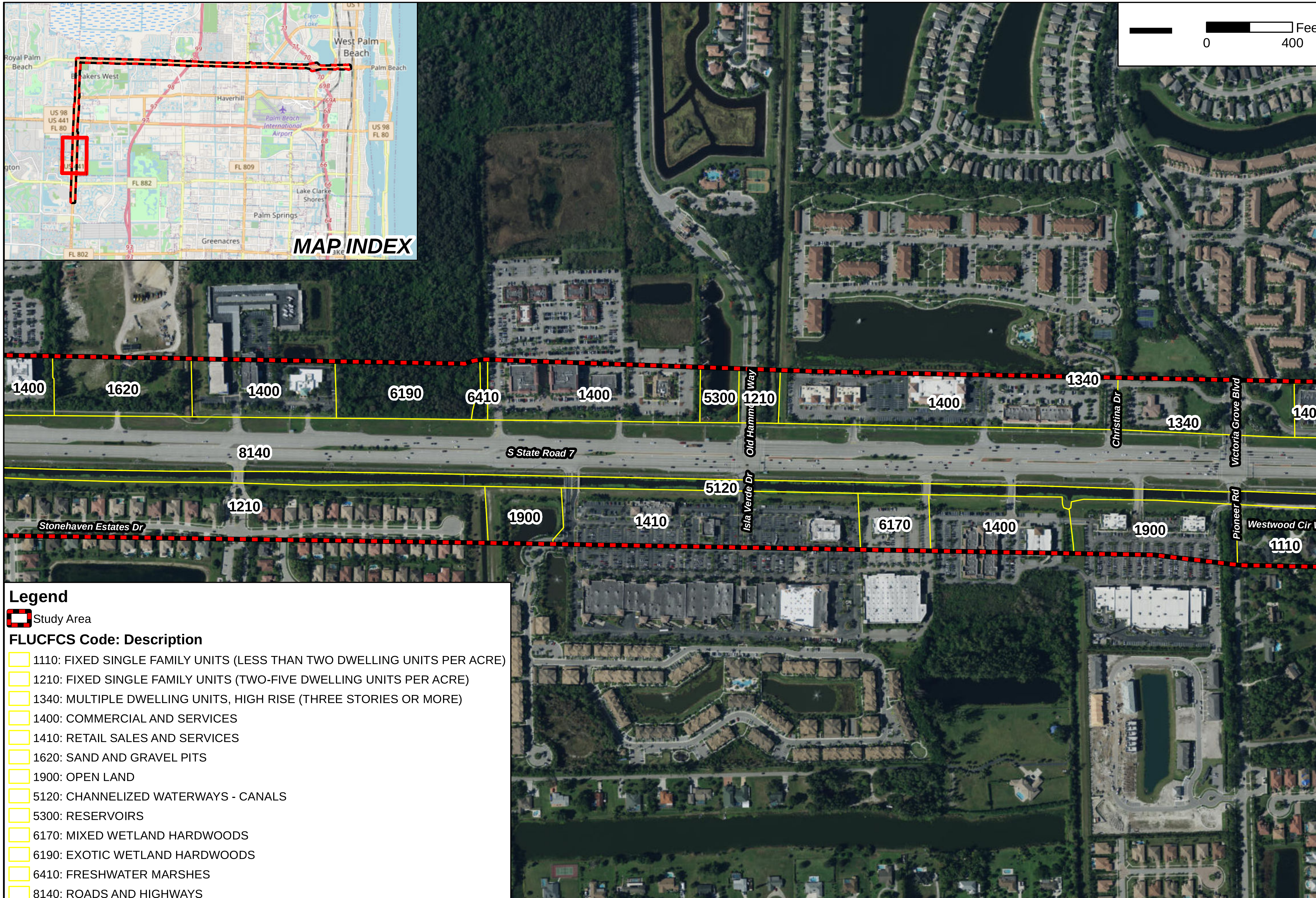

Source: Aerials courtesy of NearMap

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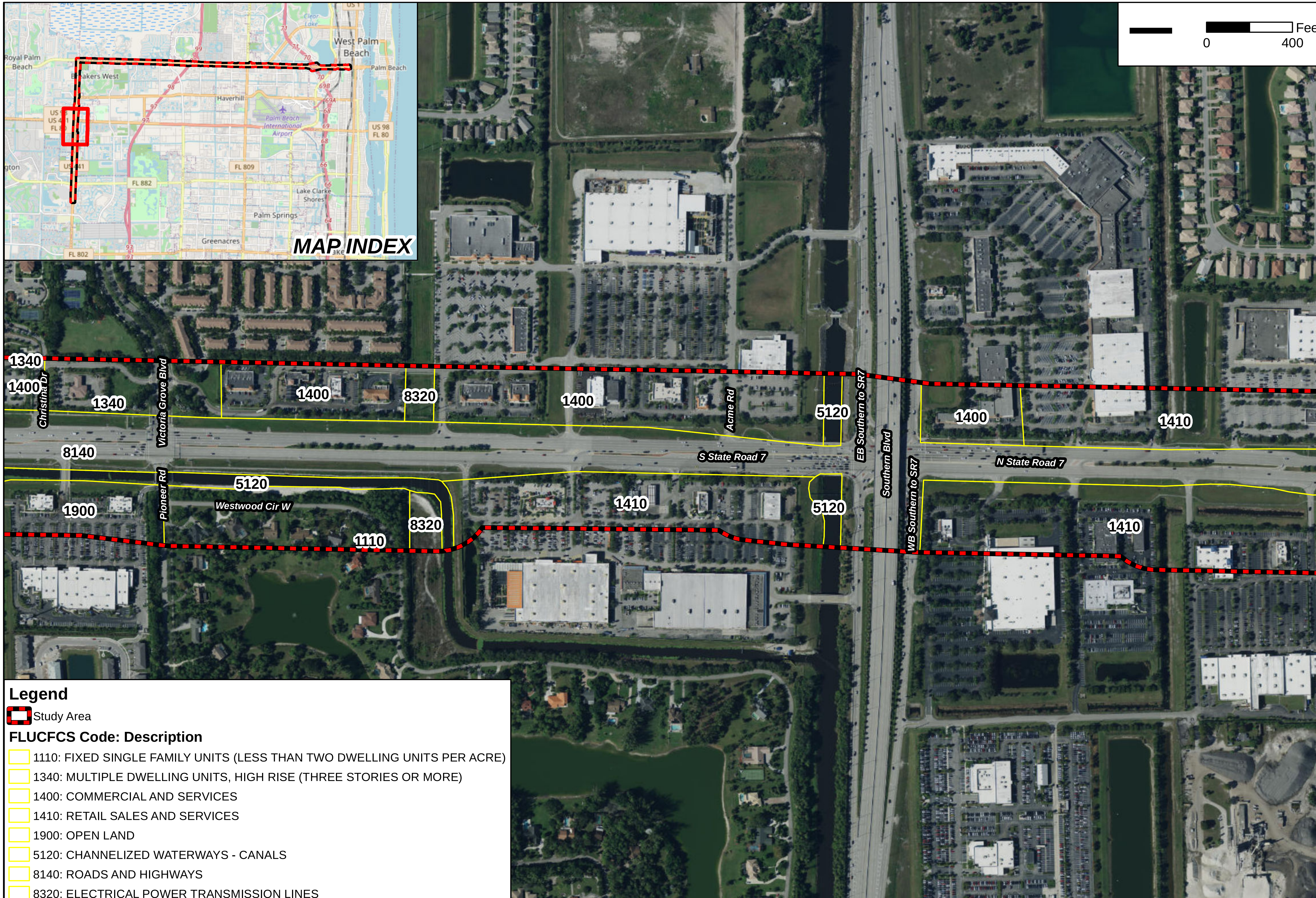
FIGURE 3 - PAGE 2 OF 15



Legend

Study Area

FLUCFCS Code: Description

- 1110: FIXED SINGLE FAMILY UNITS (LESS THAN TWO DWELLING UNITS PER ACRE)
- 1340: MULTIPLE DWELLING UNITS, HIGH RISE (THREE STORIES OR MORE)
- 1400: COMMERCIAL AND SERVICES
- 1410: RETAIL SALES AND SERVICES
- 1900: OPEN LAND
- 5120: CHANNELIZED WATERWAYS - CANALS
- 8140: ROADS AND HIGHWAYS
- 8320: ELECTRICAL POWER TRANSMISSION LINES

Source: Aerials courtesy of NearMap

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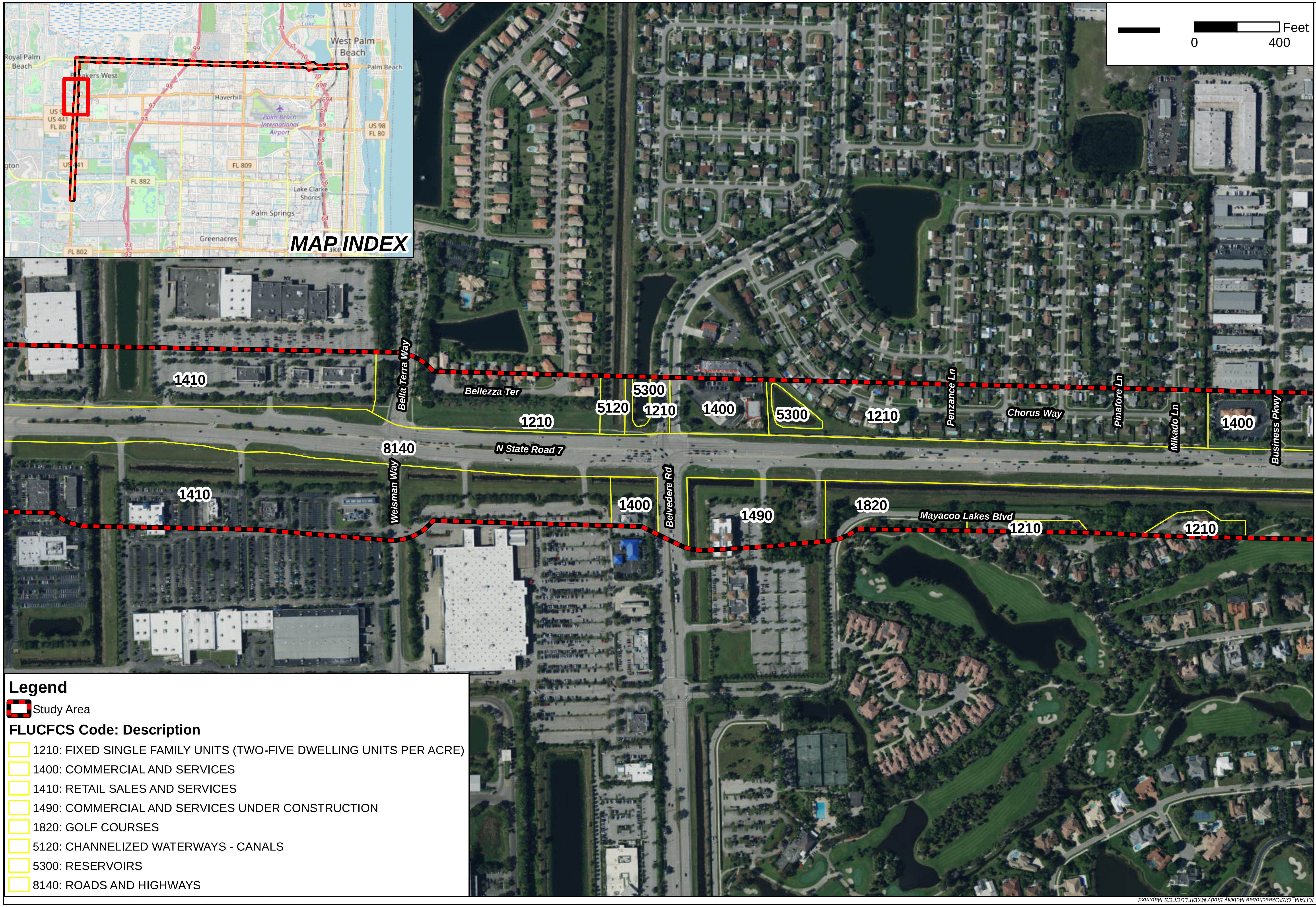

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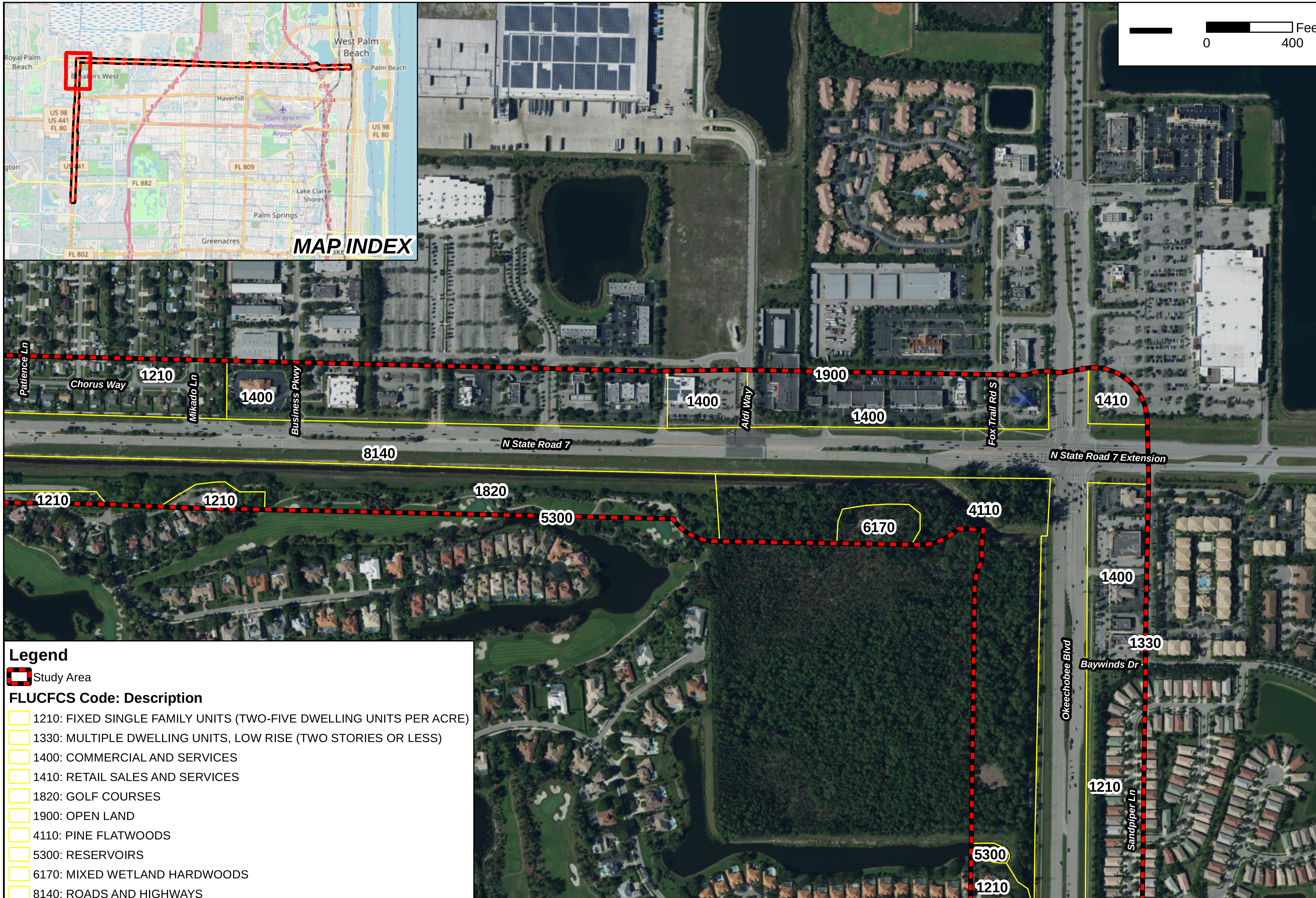
FIGURE 3 - PAGE 4 OF 15



Source: Aerials courtesy of NearMap

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FIGURE 3 - PAGE 5 OF 15

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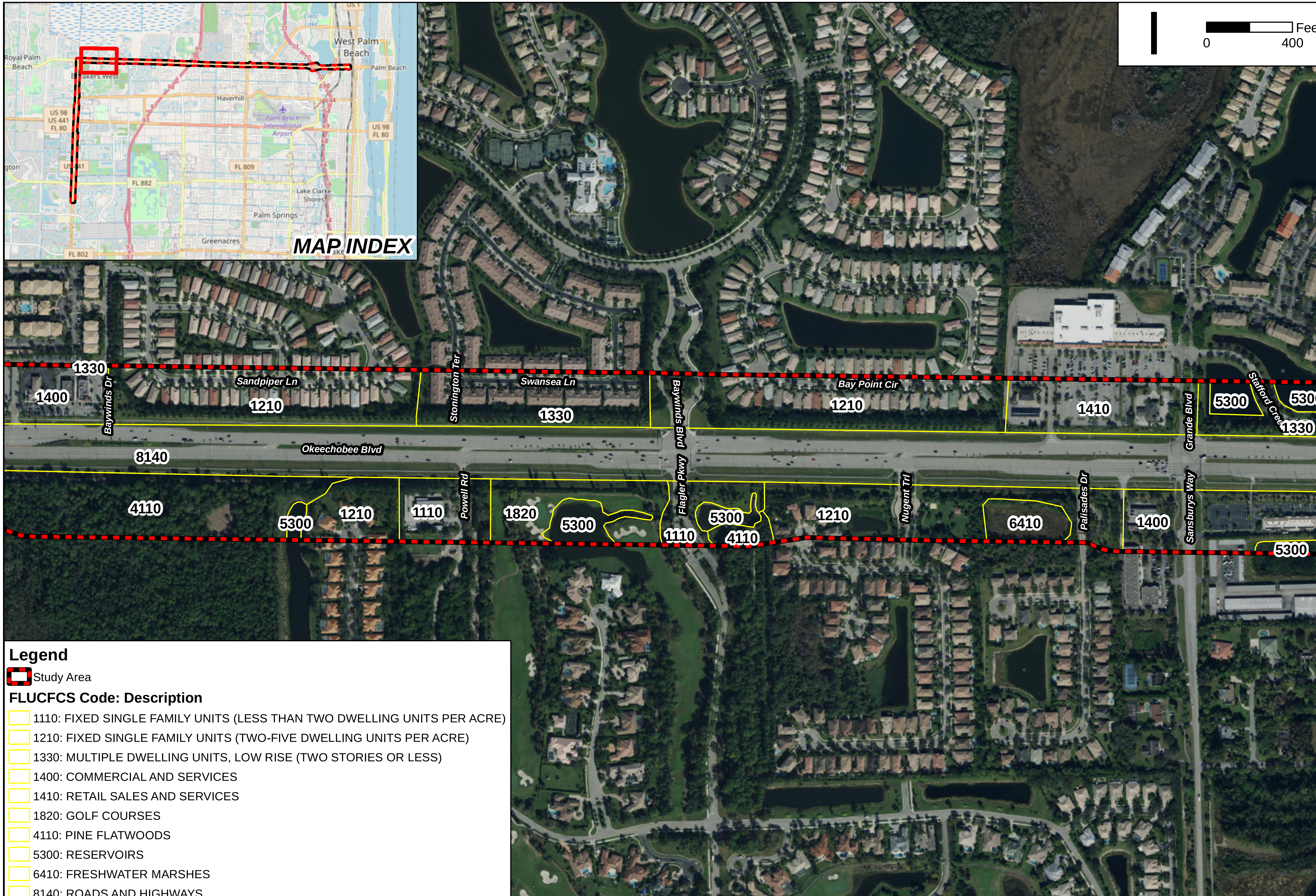

Source: Aerials courtesy of NearMap

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FIGURE 3 - PAGE 6 OF 15

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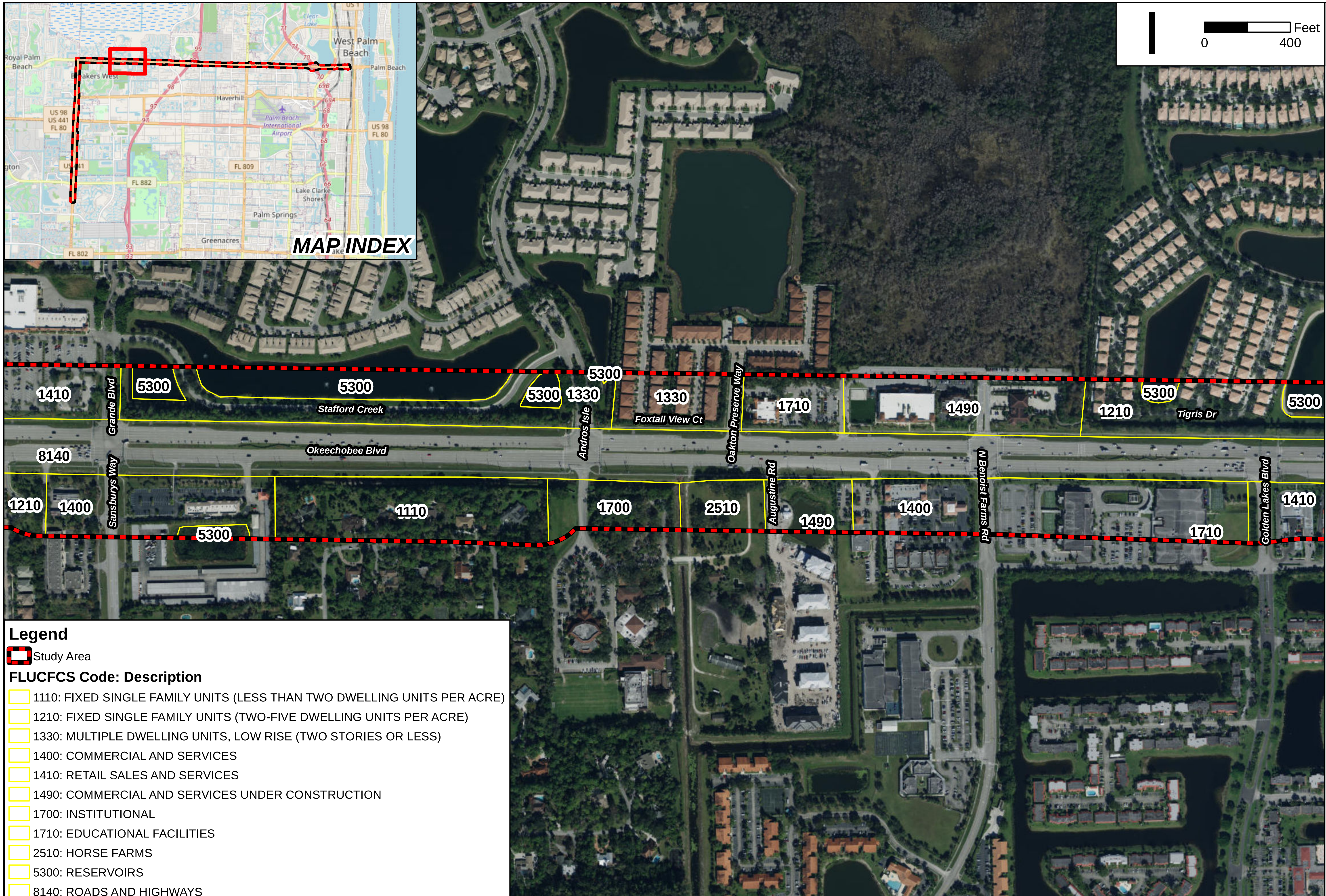

K:\TAM_GIS\Okeechobee Mobility Study\MXD\FLUCFCS Map.mxd

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FIGURE 3 - PAGE 7 OF 15

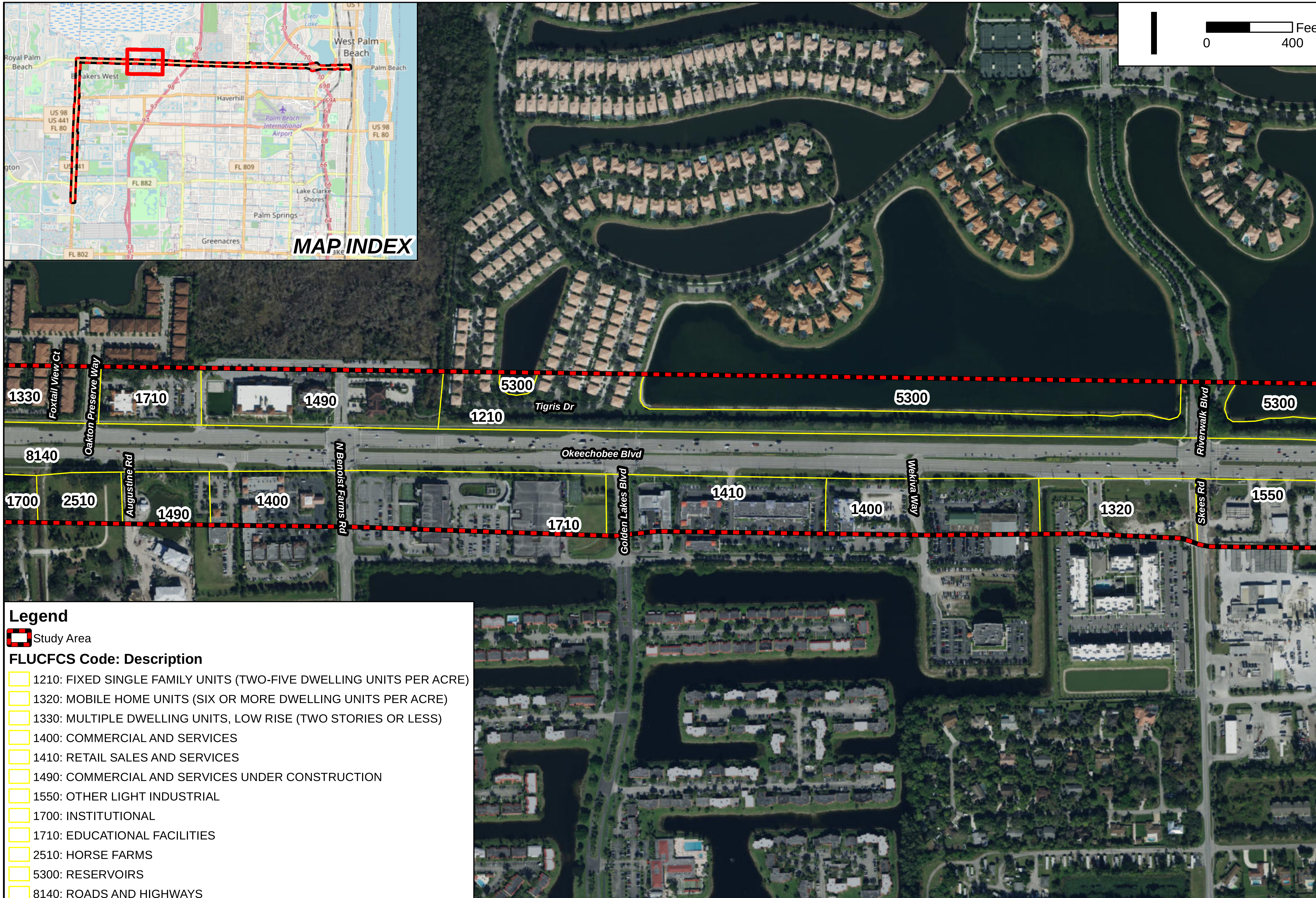

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FIGURE 3 - PAGE 8 OF 15

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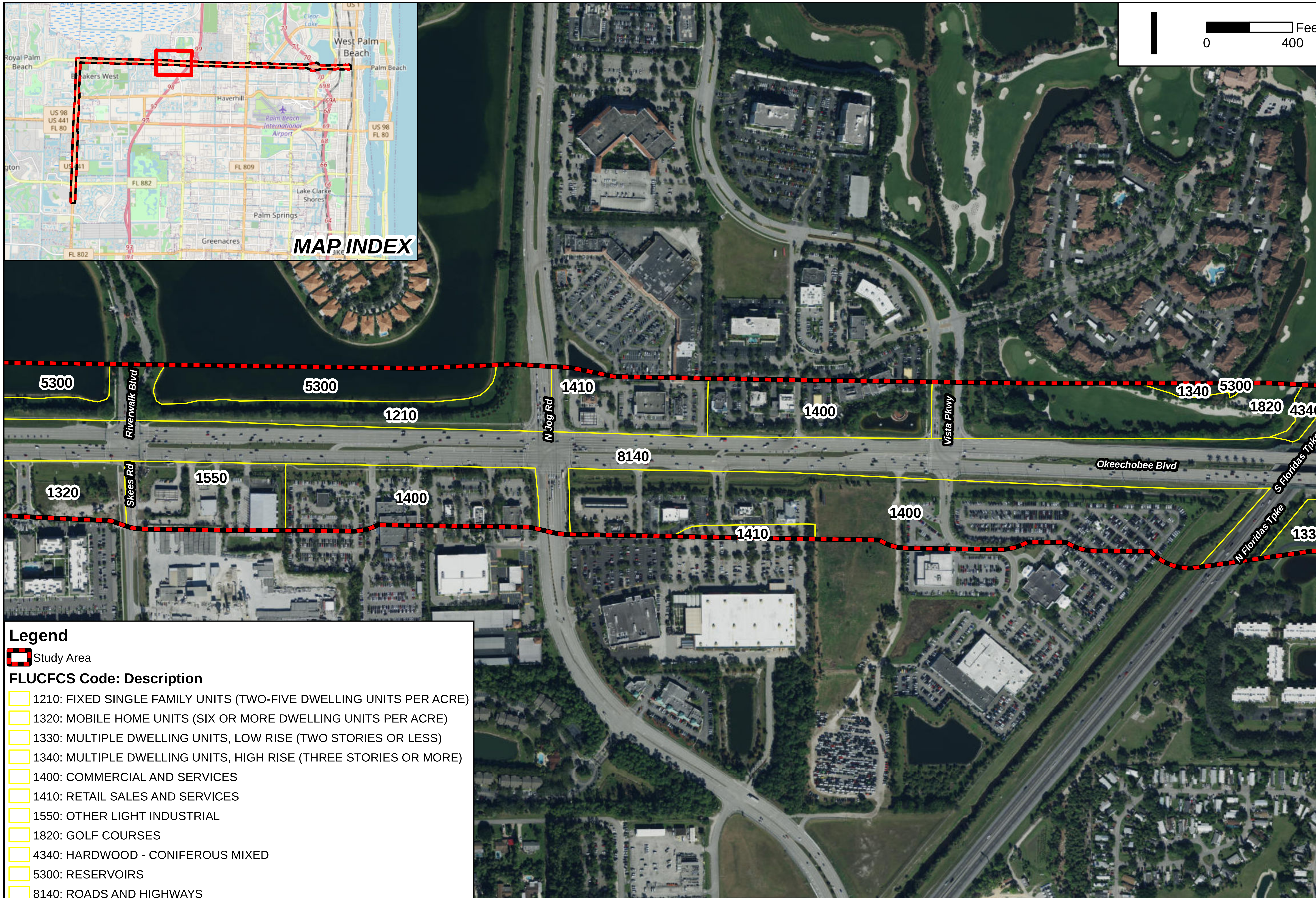

Legend

Study Area

FLUCFCS Code: Description

- 1210: FIXED SINGLE FAMILY UNITS (TWO-FIVE DWELLING UNITS PER ACRE)
- 1320: MOBILE HOME UNITS (SIX OR MORE DWELLING UNITS PER ACRE)
- 1330: MULTIPLE DWELLING UNITS, LOW RISE (TWO STORIES OR LESS)
- 1340: MULTIPLE DWELLING UNITS, HIGH RISE (THREE STORIES OR MORE)
- 1400: COMMERCIAL AND SERVICES
- 1410: RETAIL SALES AND SERVICES
- 1550: OTHER LIGHT INDUSTRIAL
- 1820: GOLF COURSES
- 4340: HARDWOOD - CONIFEROUS MIXED
- 5300: RESERVOIRS
- 8140: ROADS AND HIGHWAYS

Source: Aerials courtesy of NearMap

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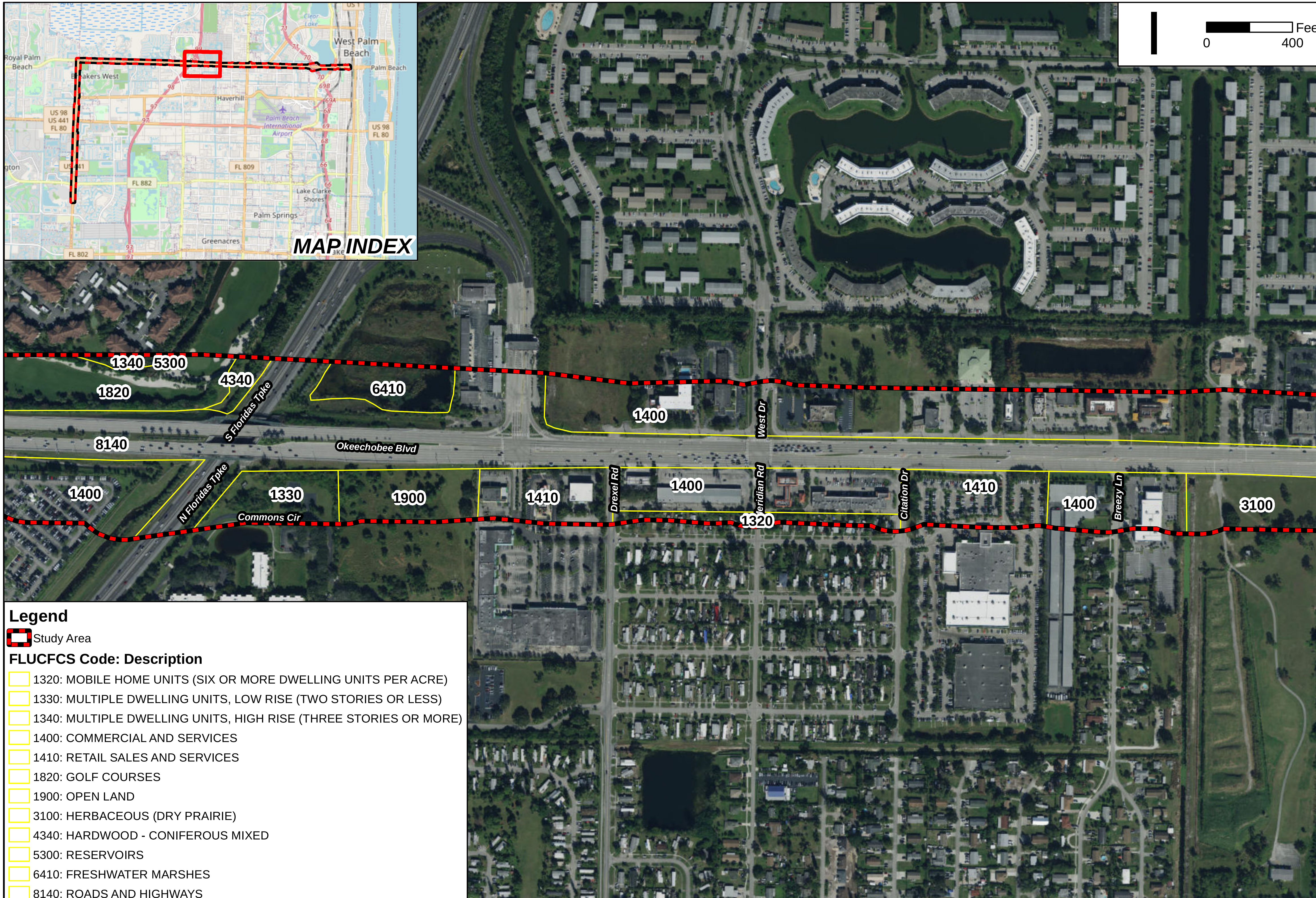
FIGURE 3 - PAGE 9 OF 15



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Study Area

FLUCFCS Code: Description

- 1320: MOBILE HOME UNITS (SIX OR MORE DWELLING UNITS PER ACRE)
- 1330: MULTIPLE DWELLING UNITS, LOW RISE (TWO STORIES OR LESS)
- 1340: MULTIPLE DWELLING UNITS, HIGH RISE (THREE STORIES OR MORE)
- 1400: COMMERCIAL AND SERVICES
- 1410: RETAIL SALES AND SERVICES
- 1820: GOLF COURSES
- 1900: OPEN LAND
- 3100: HERBACEOUS (DRY PRAIRIE)
- 4340: HARDWOOD - CONIFEROUS MIXED
- 5300: RESERVOIRS
- 6410: FRESHWATER MARSHES
- 8140: ROADS AND HIGHWAYS

Source: Aerials courtesy of NearMap

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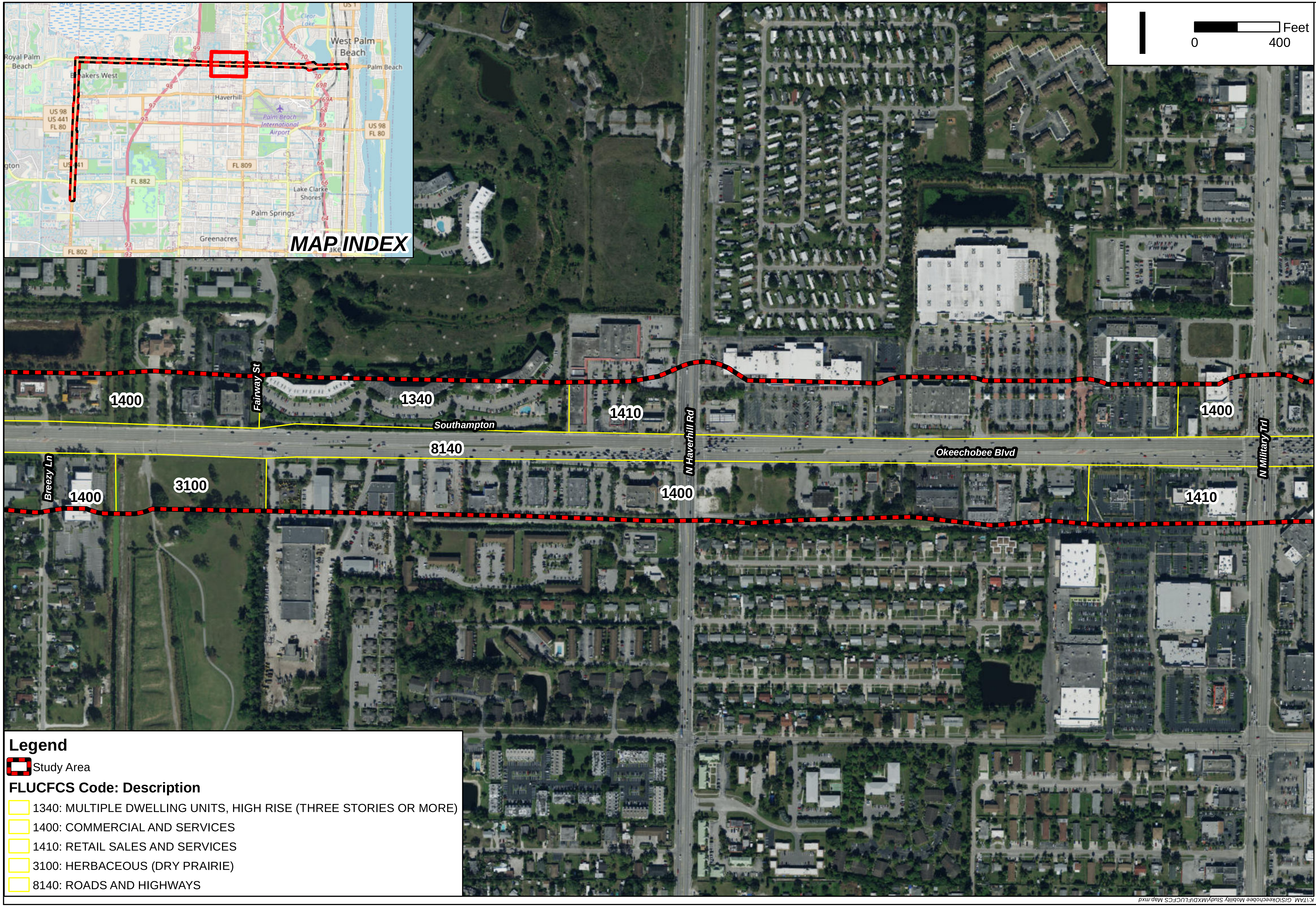
FIGURE 3 - PAGE 10 OF 15



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Study Area

FLUCFCS Code: Description

- 1340: MULTIPLE DWELLING UNITS, HIGH RISE (THREE STORIES OR MORE)
- 1400: COMMERCIAL AND SERVICES
- 1410: RETAIL SALES AND SERVICES
- 3100: HERBACEOUS (DRY PRAIRIE)
- 8140: ROADS AND HIGHWAYS

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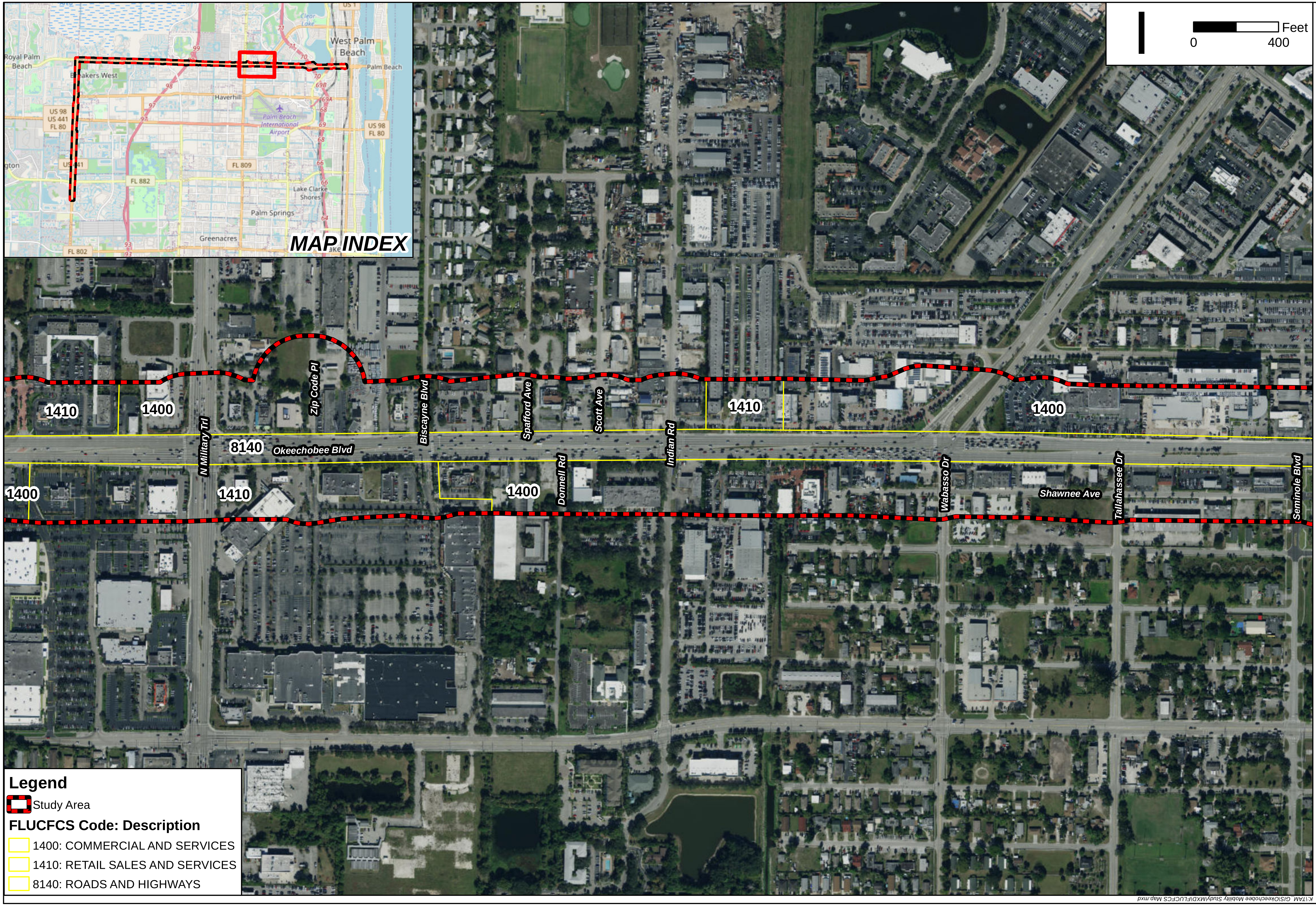
FIGURE 3 - PAGE 11 OF 15



Source: Aerials courtesy of NearMap

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FIGURE 3 - PAGE 12 OF 15

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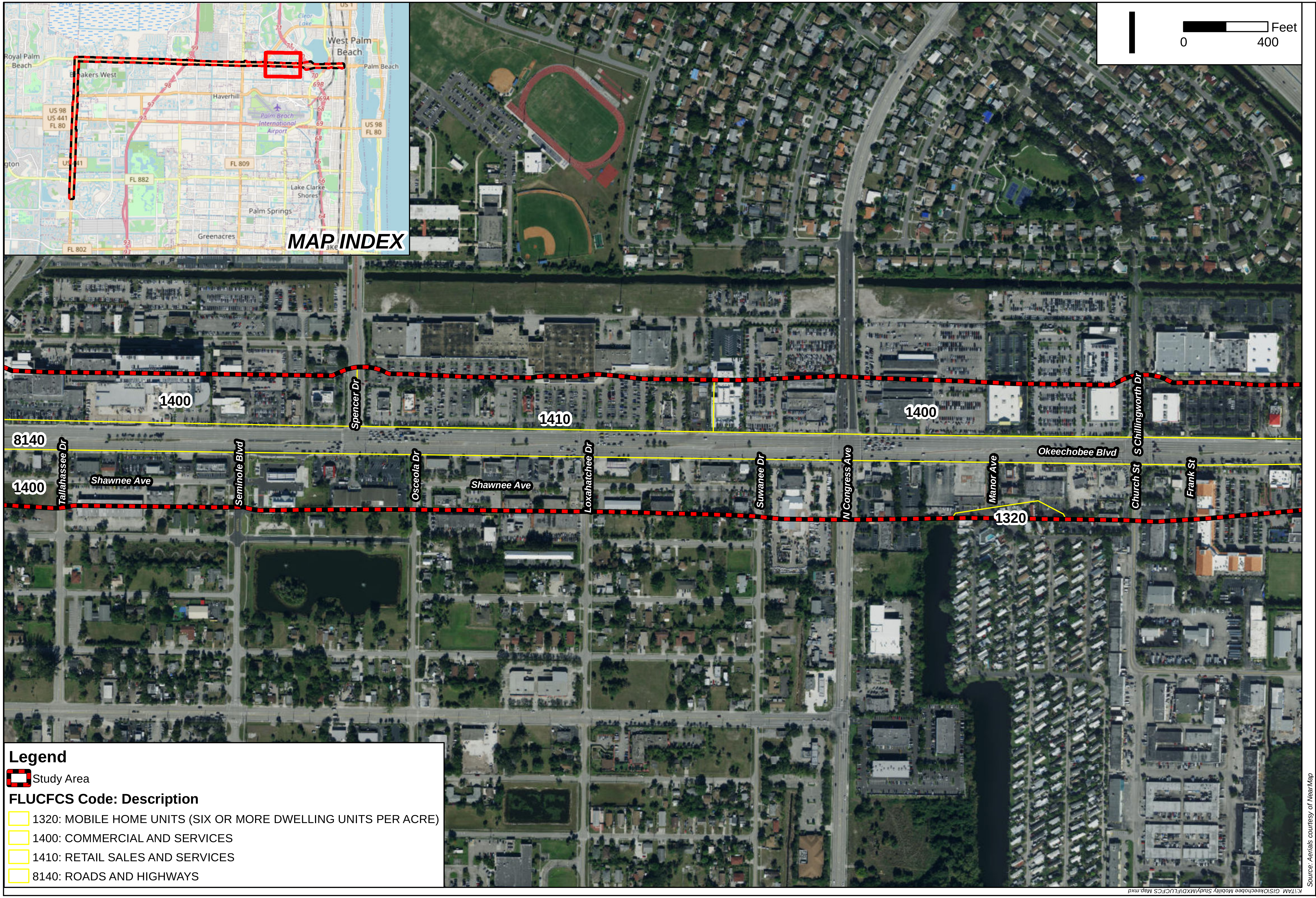

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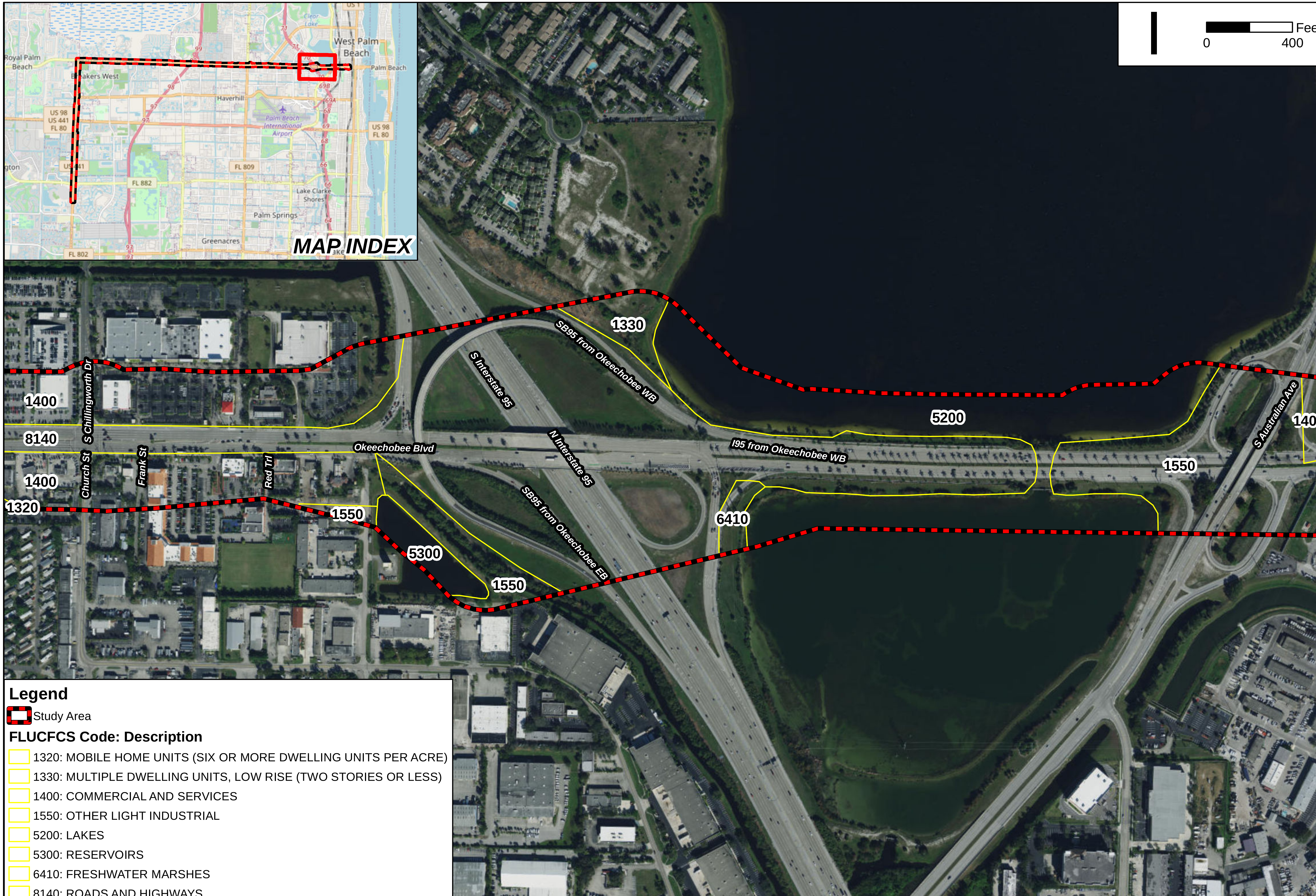

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Study Area

FLUCFCS Code: Description

- 1320: MOBILE HOME UNITS (SIX OR MORE DWELLING UNITS PER ACRE)
- 1330: MULTIPLE DWELLING UNITS, LOW RISE (TWO STORIES OR LESS)
- 1400: COMMERCIAL AND SERVICES
- 1550: OTHER LIGHT INDUSTRIAL
- 5200: LAKES
- 5300: RESERVOIRS
- 6410: FRESHWATER MARSHES
- 8140: ROADS AND HIGHWAYS

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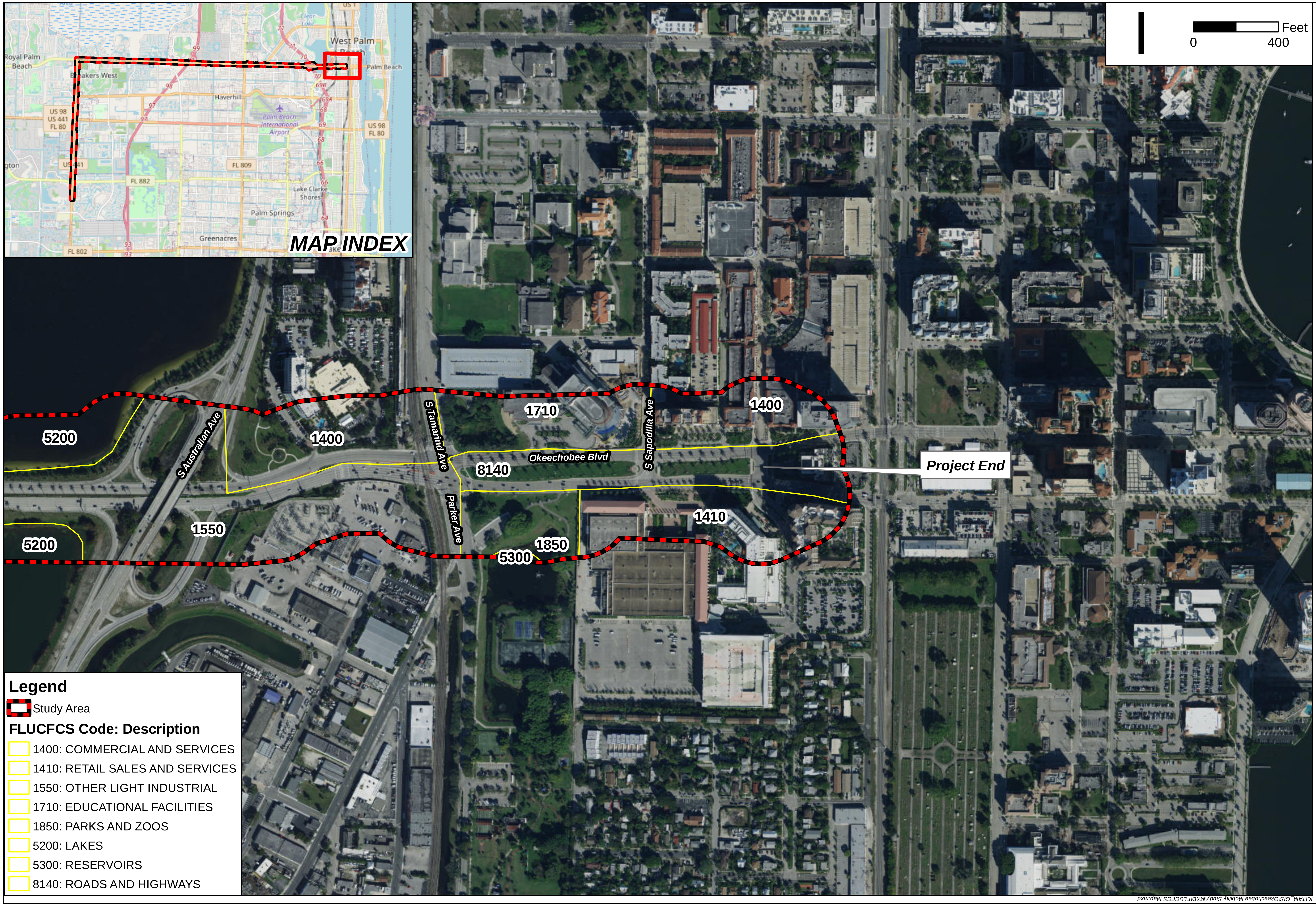

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APPENDIX B: WLSW MAP

Source: Aerials courtesy of NearMap

Wetlands and Surface Waters Map

Okeechobee Mobility Study
Palm Beach County, FL

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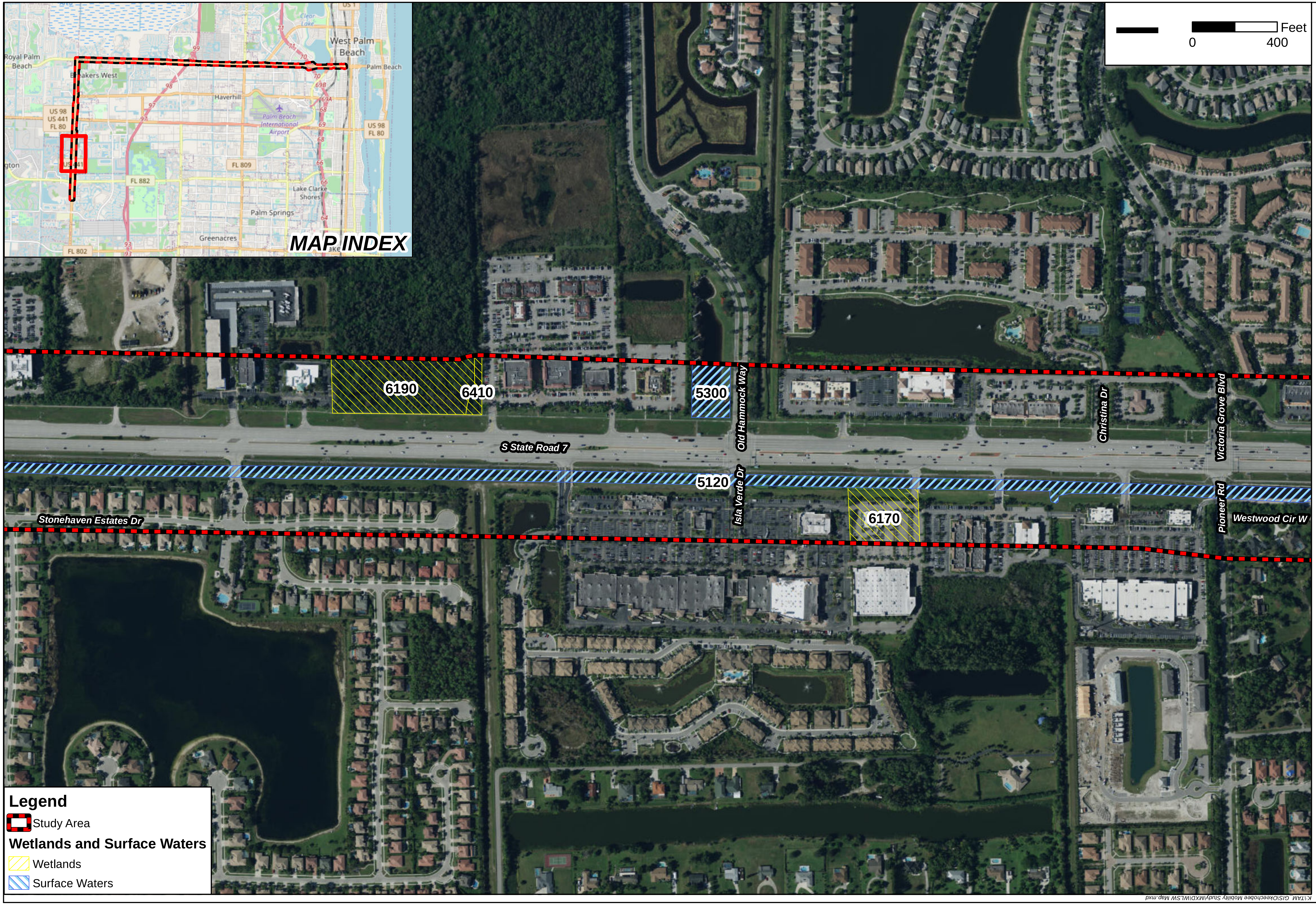

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Wetlands and Surface Waters Map

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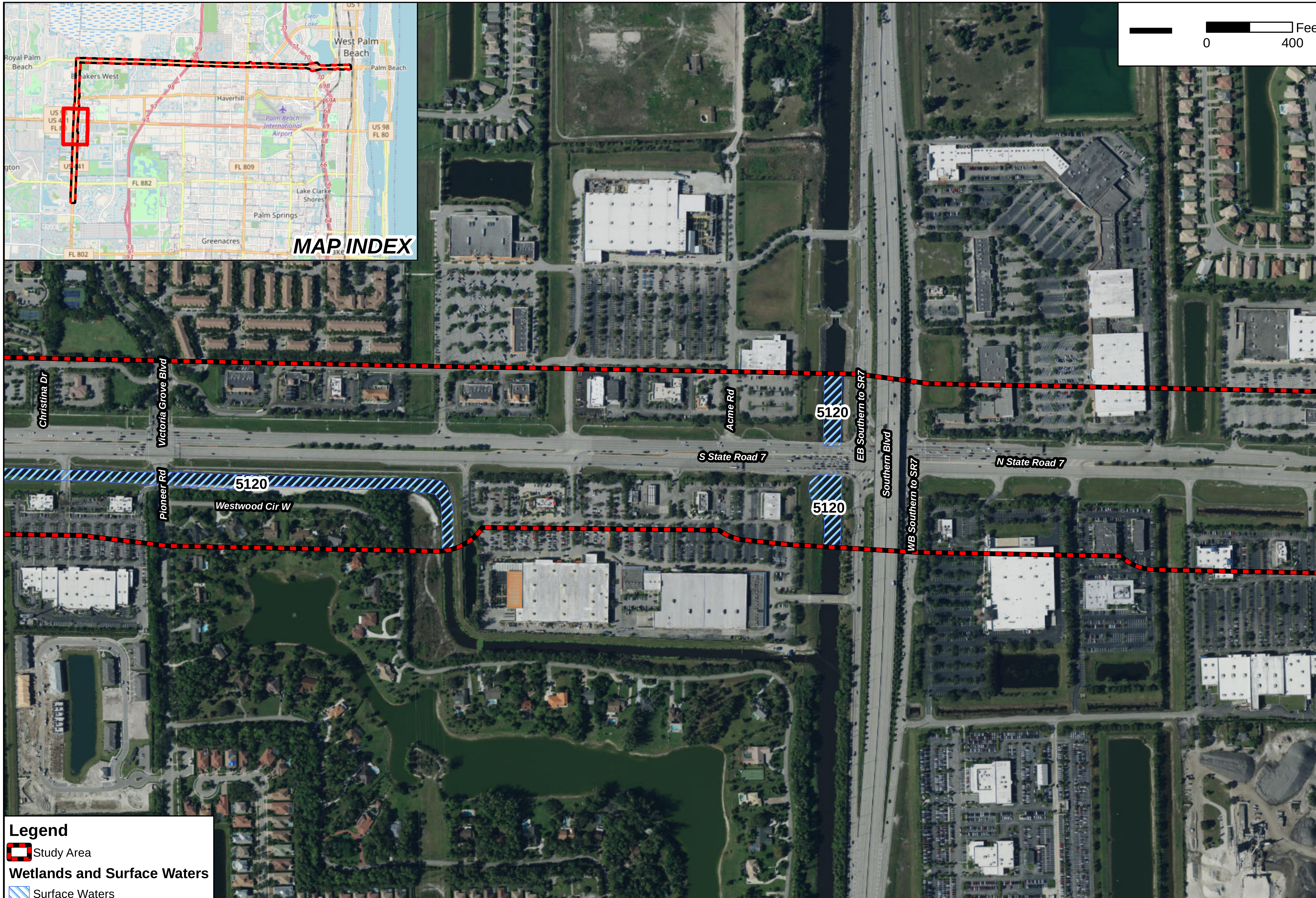

Feet
0 400

Legend
Study Area
Wetlands and Surface Waters
Surface Waters

Source: Aerials courtesy of NearMap

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Wetlands and Surface Waters Map

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Palm Beach County, FL

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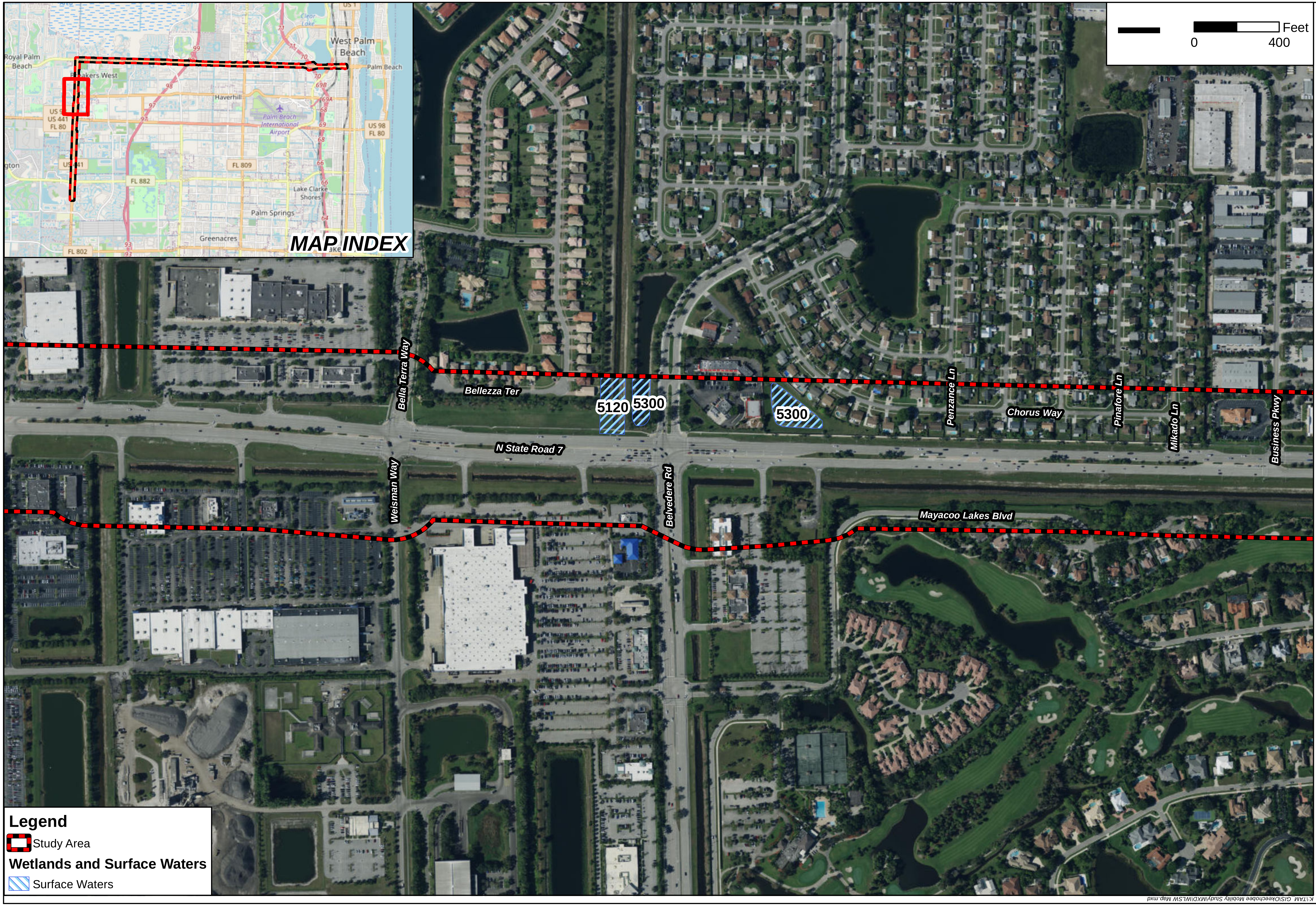
MAY 2021

PROJECT NUMBER: 040416206



Source: Aerials courtesy of NearMap

Wetlands and Surface Waters Map

Okeechobee Mobility Study
Palm Beach County, FL

Kimley-Horn
© 2021 Kimley-Horn and Associates, Inc.
655 N Franklin Street, Suite 150, Tampa, FL 33602
Phone (813)-620-1460
www.kimley-horn.com

1 inch = 400 feet

MAY 2021

PROJECT NUMBER: 040416206

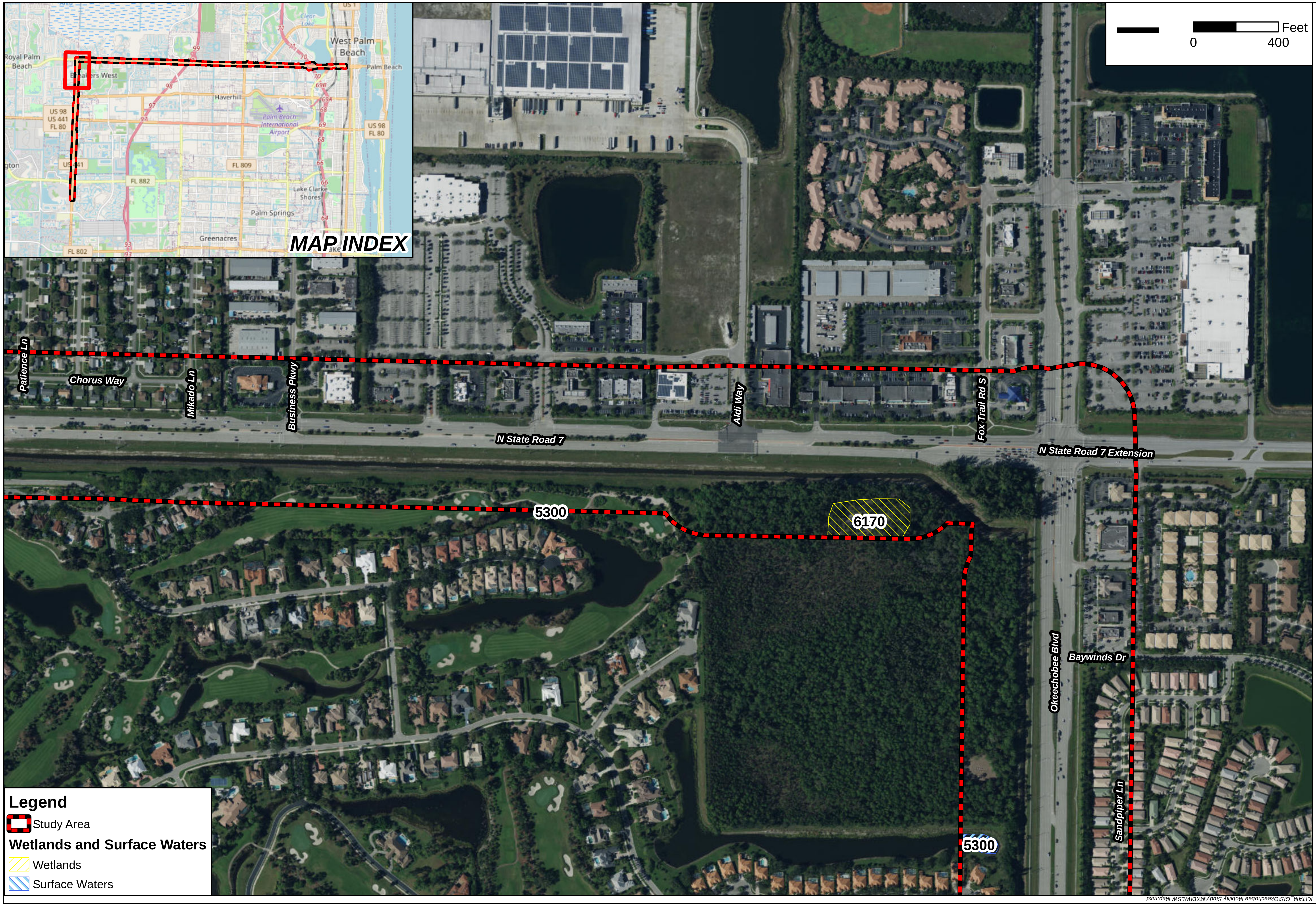


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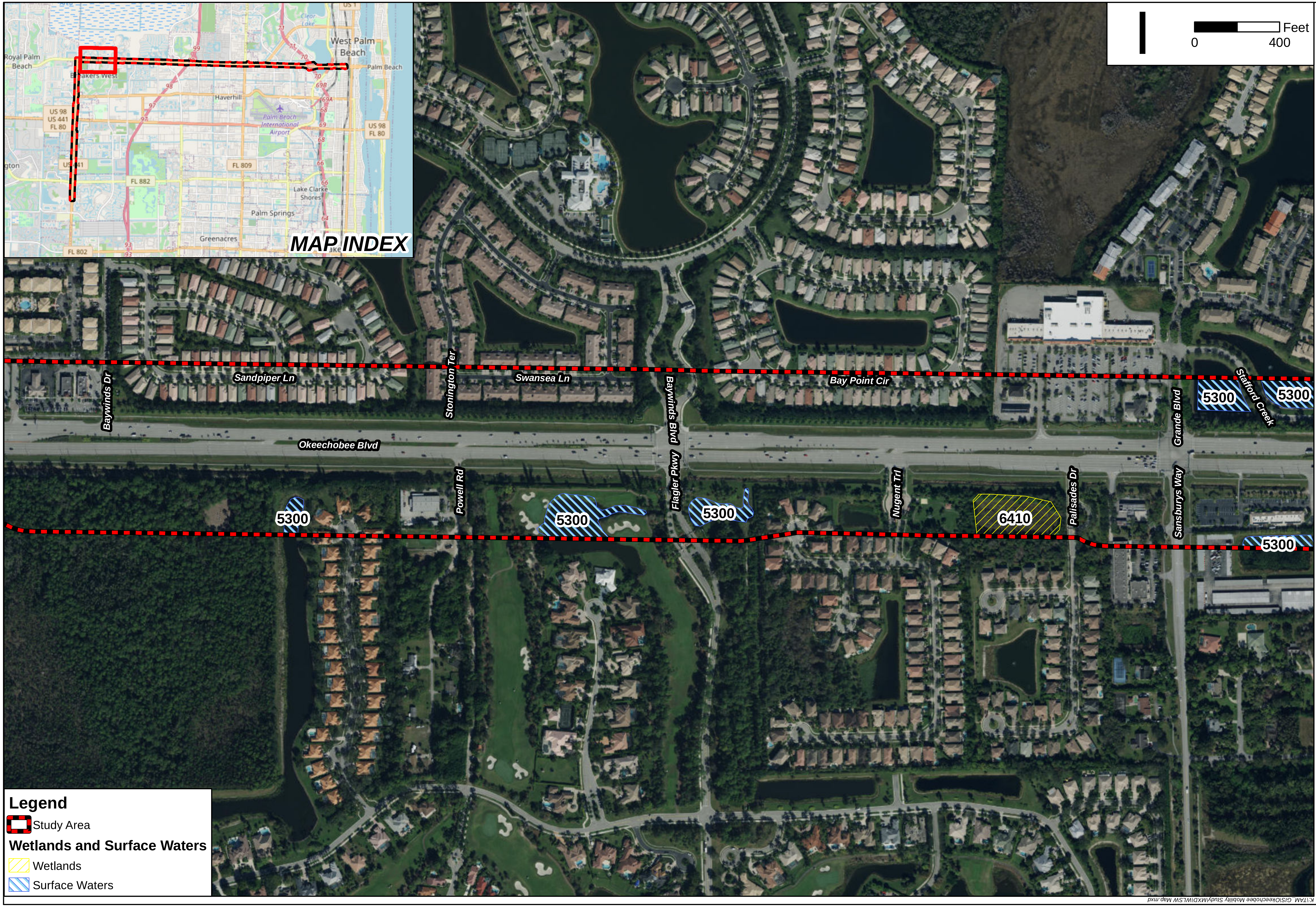
FIGURE 3 - PAGE 5 OF 15



Source: Aerials courtesy of NearMap

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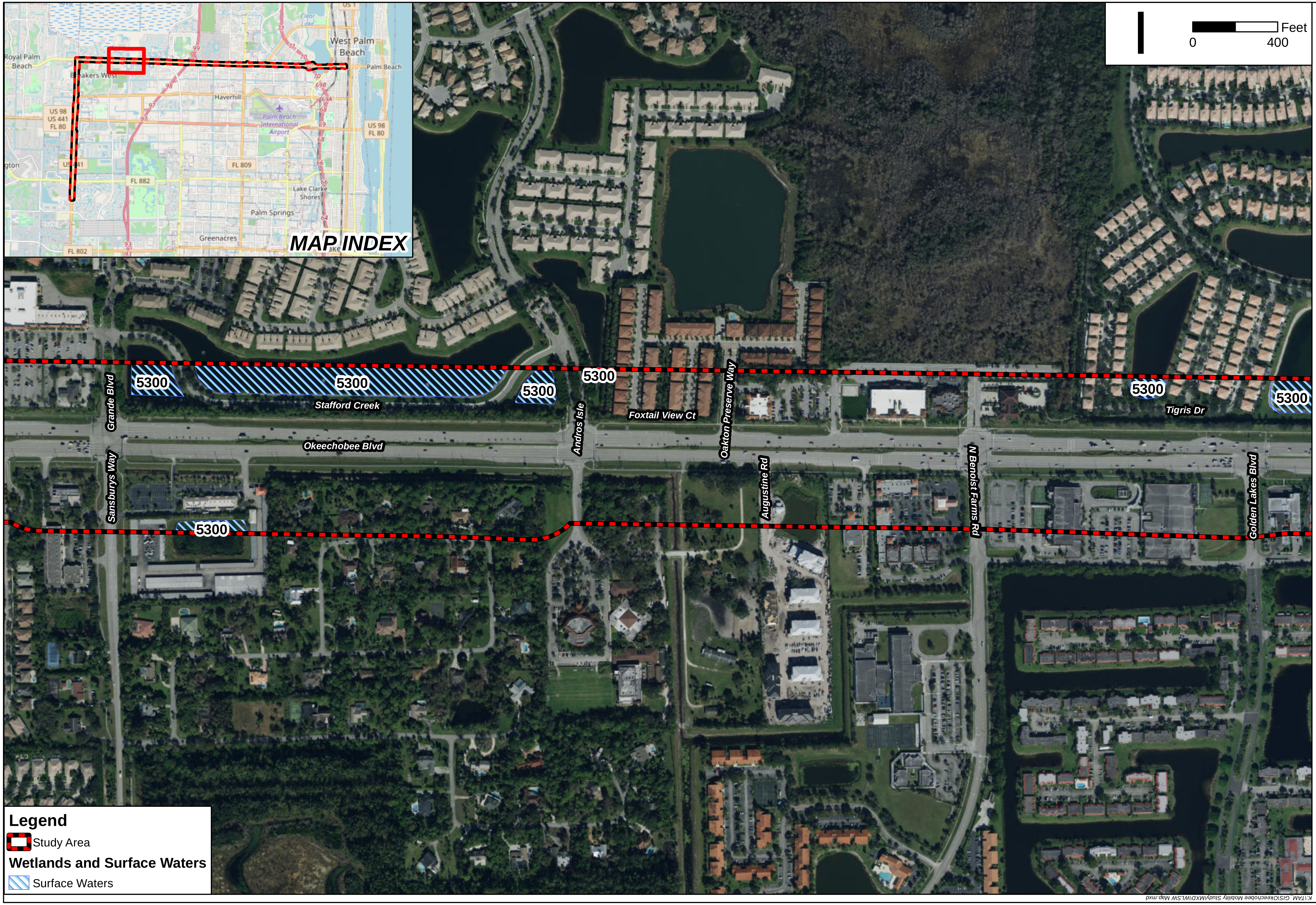

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Okeechobee Mobility Study
Palm Beach County, FL

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FIGURE 3 - PAGE 7 OF 15

K:\TAM_GIS\Okeechobee Mobility Study\MXD\WLSW Map.mxd

Wetlands and Surface Waters Map

Okeechobee Mobility Study
Palm Beach County, FL

1 inch = 400 feet

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FIGURE 3 - PAGE 8 OF 15

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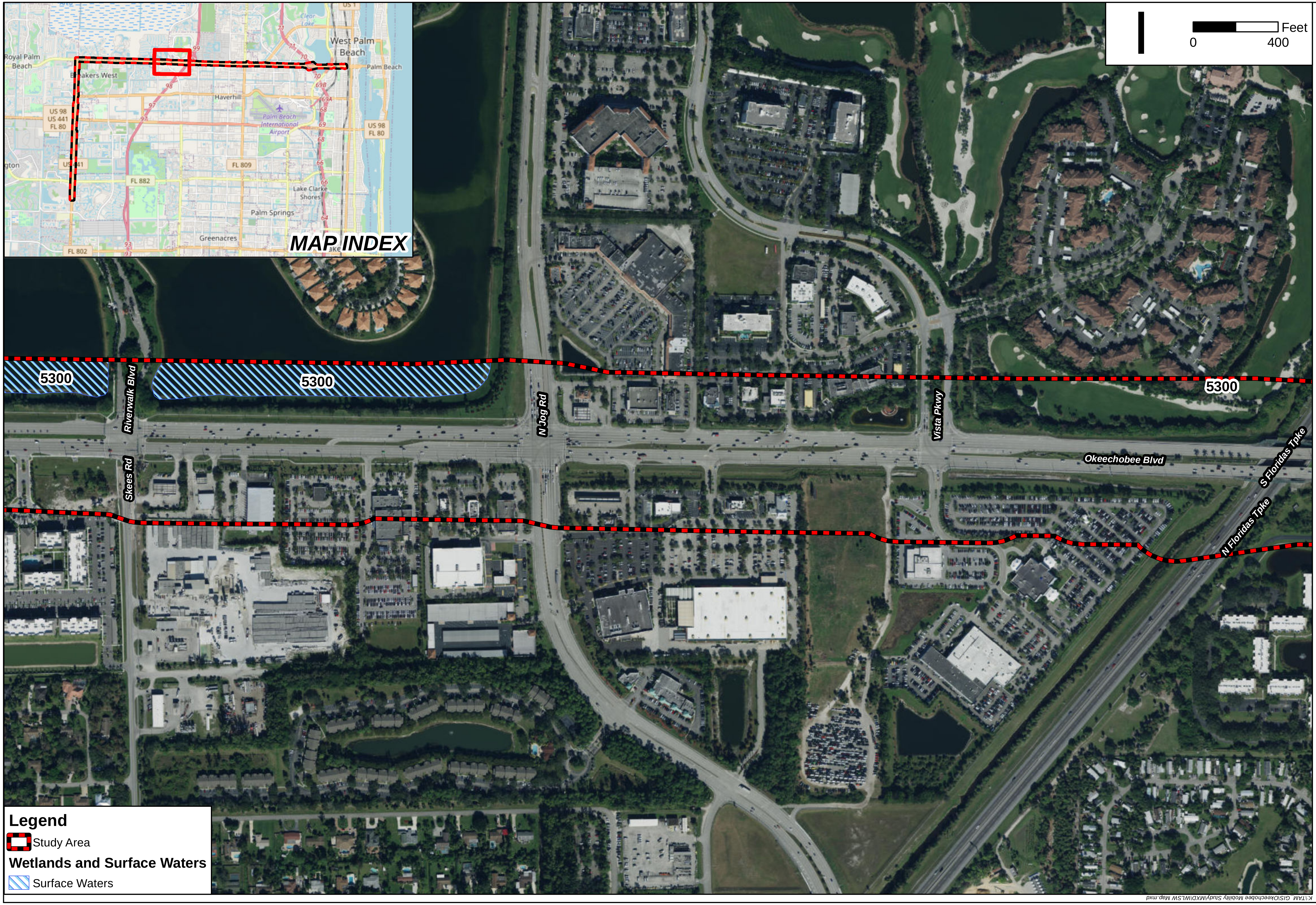

Source: Aerials courtesy of NearMap

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Wetlands and Surface Waters Map

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Palm Beach County, FL

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FIGURE 3 - PAGE 9 OF 15

Source: Aerials courtesy of NearMap

Wetlands and Surface Waters Map

Okeechobee Mobility Study
Palm Beach County, FL

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FIGURE 3 - PAGE 10 OF 15

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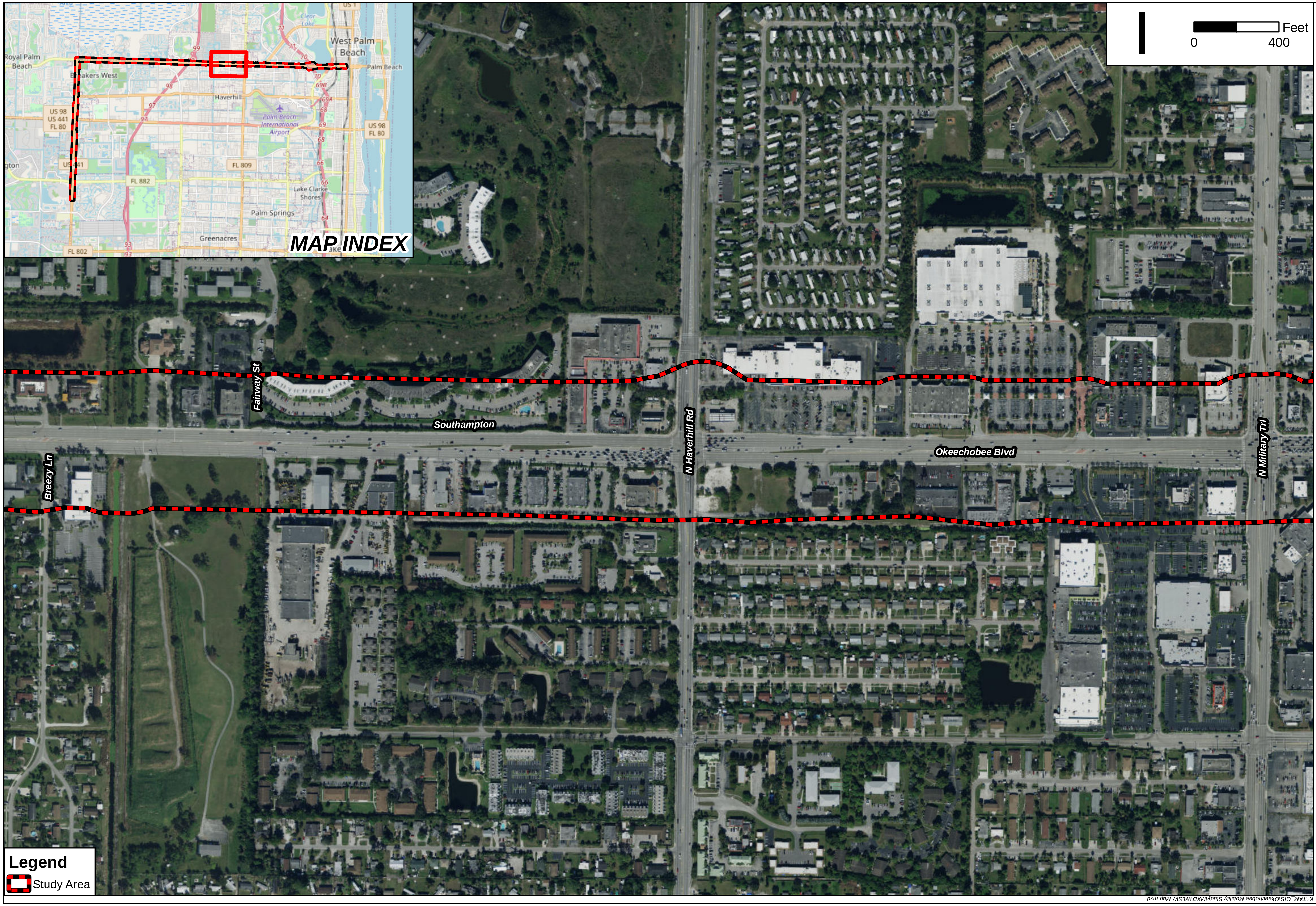

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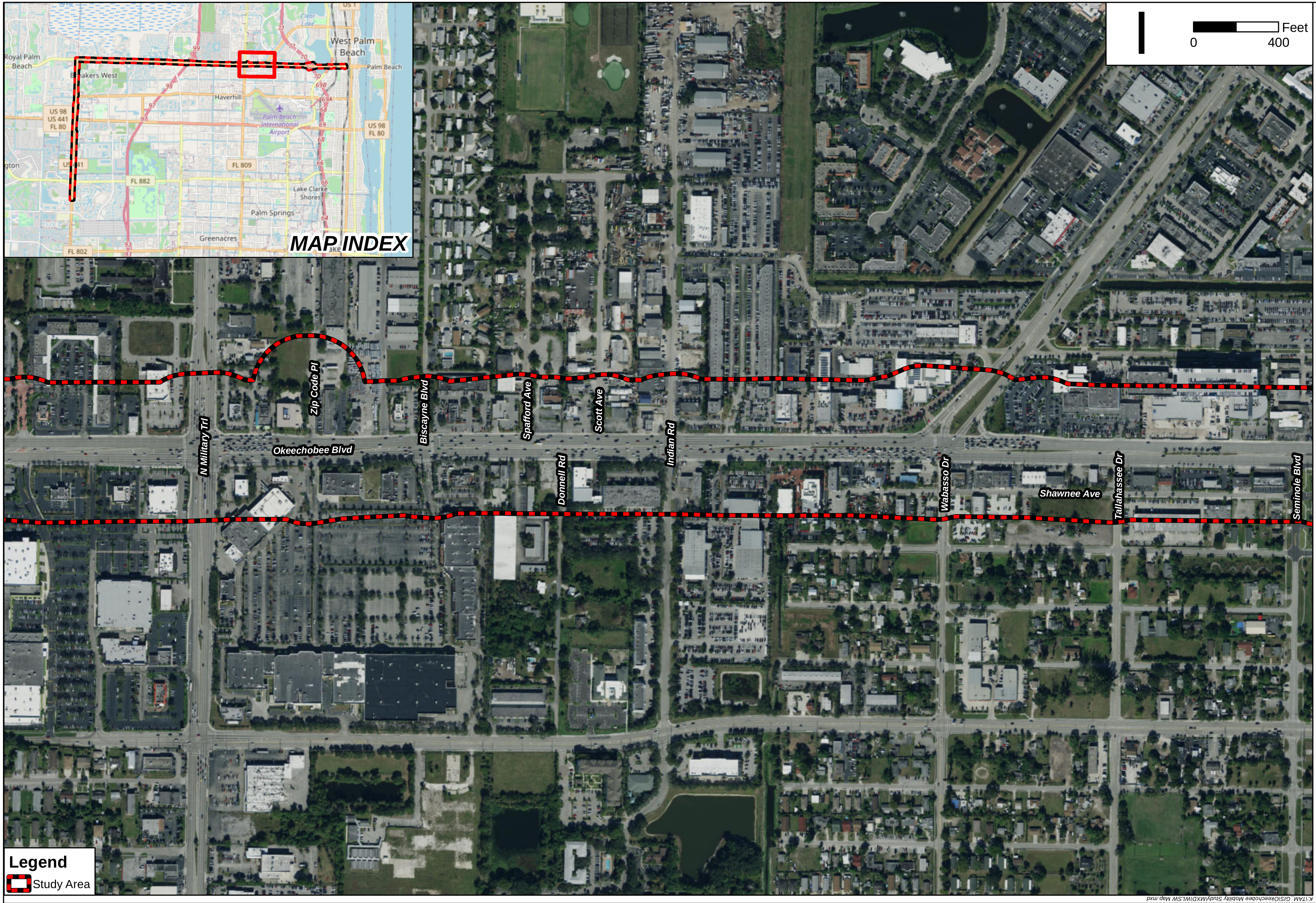

Source: Aerials courtesy of NearMap

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Palm Beach County, FL

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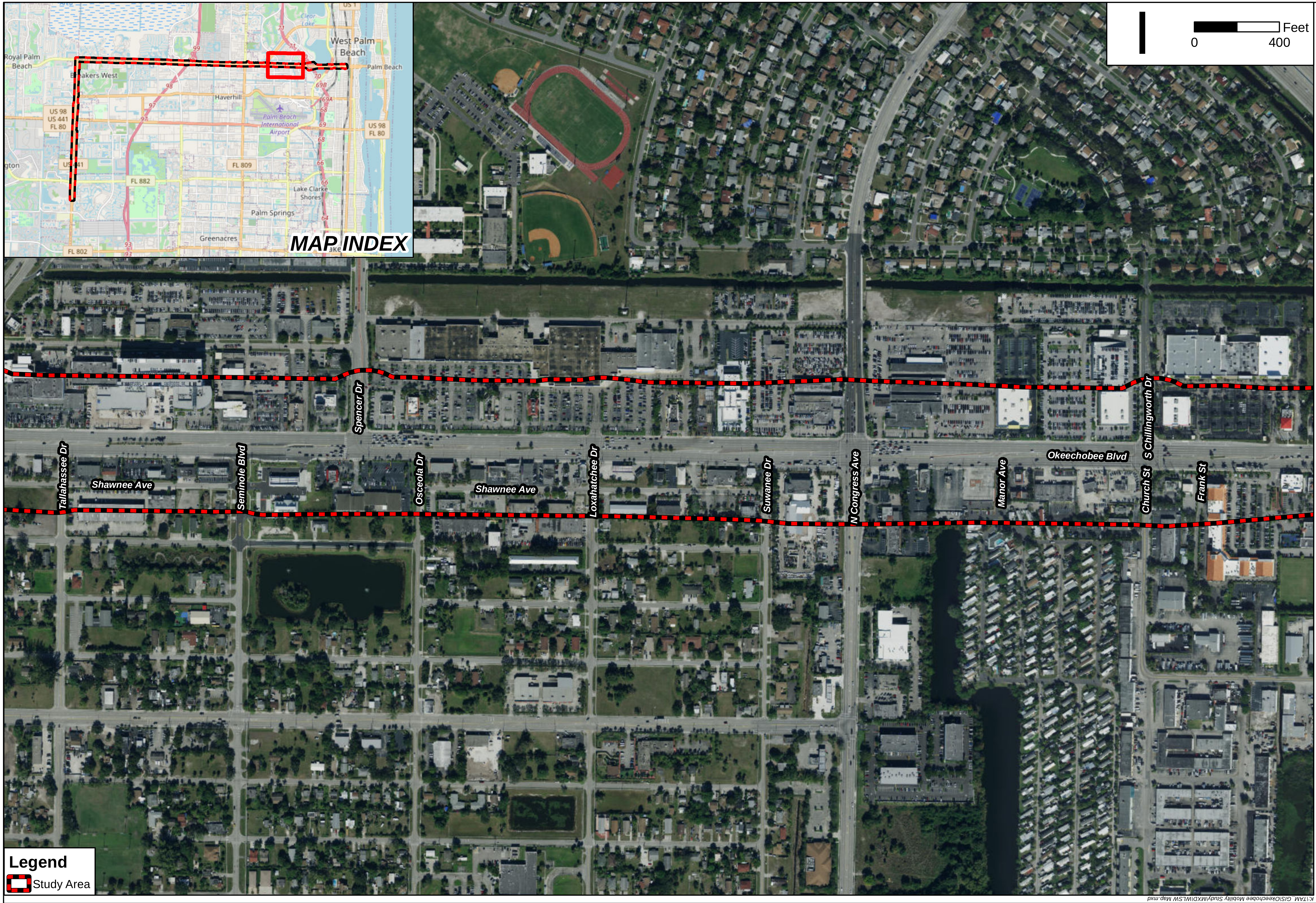
FIGURE 3 - PAGE 12 OF 15



Source: Aerials courtesy of NearMap

Wetlands and Surface Waters Map

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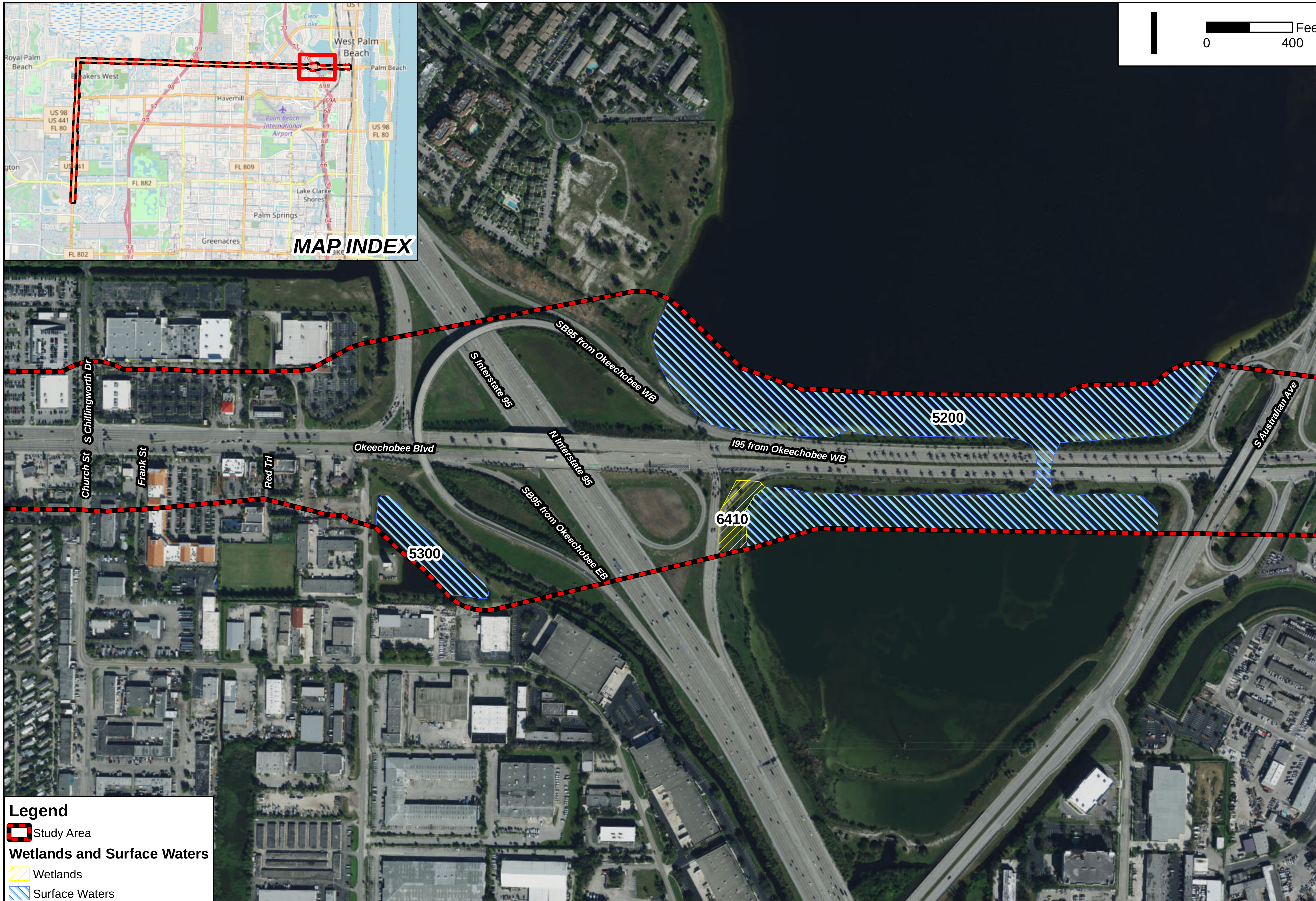
1 inch = 400 feet

MAY 2021

PROJECT NUMBER: 040416206

FIGURE 3 - PAGE 13 OF 15



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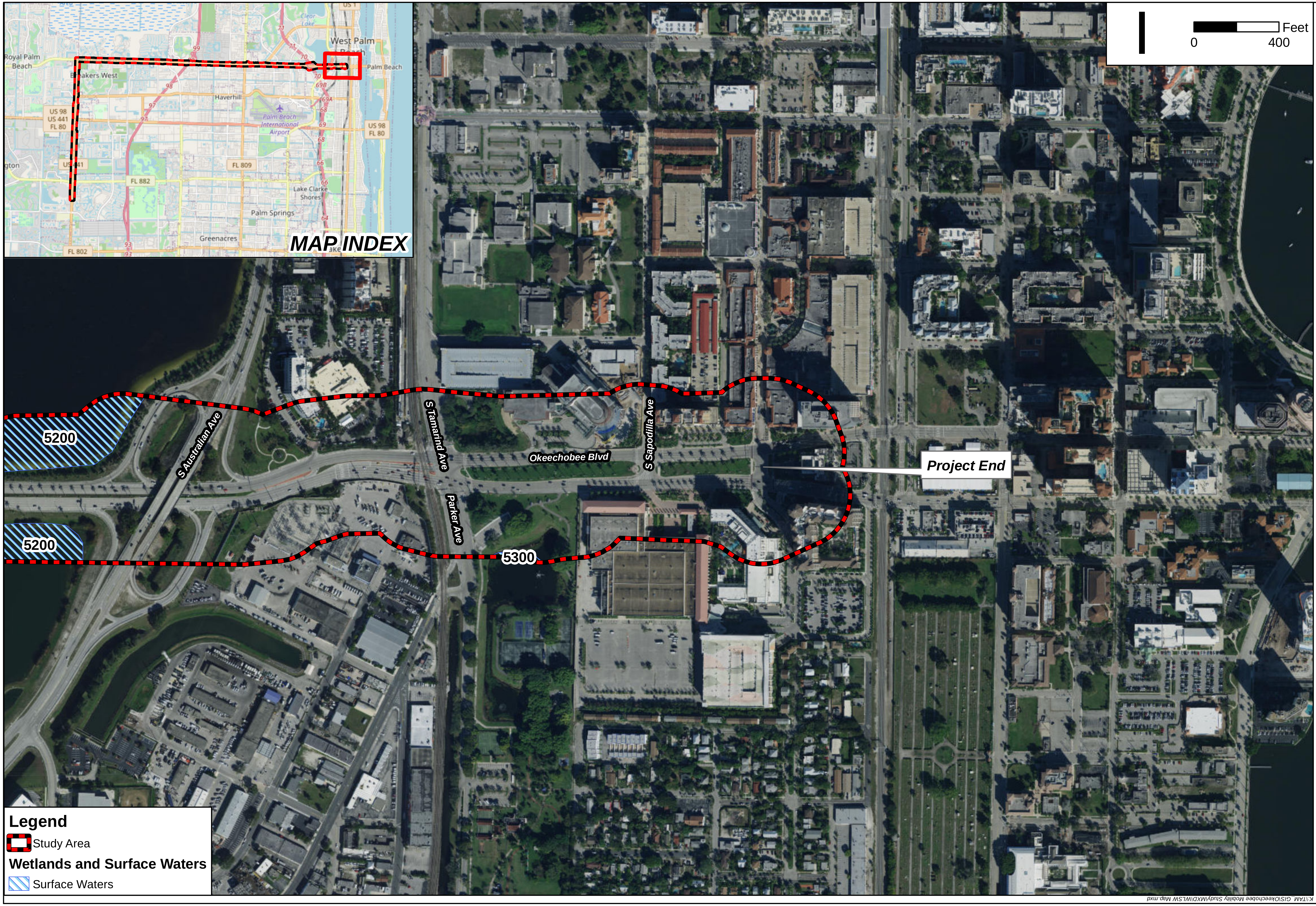

Source: Aerials courtesy of NearMap

K:\TAM_GIS\Okeechobee Mobility Study\MXD\WLSW Map.mxd

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FIGURE 3 - PAGE 15 OF 15

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APPENDIX C: FNAI AND IPAC REPORTS

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
850-681-9364 fax
www.fnai.org

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

UNOFFICIAL REPORT

Created 5/20/2021

(Contact the FNAI Data Services Coordinator at 850.224.8207 or kbrinegar@fnai.fsu.edu for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 9 Matrix Units: 68245 , 68397 , 68540 , 68681 , 68820 , 68956 , 69090 , 69218 , 69336

Study Area too Large to Display Map.

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 68245

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N

Matrix Unit ID: 68397

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

2 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing

Mycteria americana Wood Stork	G4	S2	LT	FT
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N

Matrix Unit ID: 68540

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N

Matrix Unit ID: 68681

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 68820

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

0 **Likely** Elements Found

Matrix Unit ID: 68956

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

0 **Likely** Elements Found

Matrix Unit ID: 69090

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

0 **Likely** Elements Found

Matrix Unit ID: 69218

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global	State	Federal	State

	Rank	Rank	Status	Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 69336
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Trichechus manatus West Indian Manatee	G2	S2	LE	FE

Matrix Unit IDs: 68245 , 68397 , 68540 , 68681 , 68820 , 68956 , 69090 , 69218 , 69336
27 **Potential** Elements Common to Any of the 9 Matrix Units

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Bolbocerosoma hamatum Bicolored Burrowing Scarab Beetle	G3G4	S3	N	N
Conradina grandiflora Large-flowered Rosemary	G3	S3	N	T
Ctenogobius stigmaturus Spottail Goby	G2	S2	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Elytraria caroliniensis var. angustifolia Narrow-leaved Carolina Scalystem	G4T2	S2	N	N
Encyclia cochleata var. triandra Clamshell Orchid	G4G5T2	S2	N	E
Eretmochelys imbricata Hawksbill Sea Turtle	G3	S1	LE	FE
Forestiera segregata var. pinetorum Florida Pinewood Privet	G4T2	S2	N	N
Glandularia maritima Coastal Vervain	G3	S3	N	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Halophila johnsonii Johnson's Seagrass	G2	S2	LT	E
Lechea cernua Nodding Pinweed	G3	S3	N	T
Linum carteri var. smallii Small's Flax	G2T2	S2	N	E
Lithobates capito Gopher Frog	G3	S3	N	SSC
Nemastylis floridana Celestial Lily	G2	S2	N	E
Panicum abscissum Cutthroat Grass	G3	S3	N	E
Phyllophaga elongata Elongate June Beetle	G3	S3	N	N
Picoides borealis Red-cockaded Woodpecker	G3	S2	LE	FE
Podomys floridanus Florida Mouse	G3	S3	N	SSC
Polygala smallii Tiny Polygala	G1	S1	LE	E

Rallus longirostris scottii Florida Clapper Rail	G5T3?	S3?	N	N
Rivulus marmoratus Mangrove Rivulus	G4G5	S3	SC	SSC
Roystonea elata Florida Royal Palm	G2G3	S2	N	E
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N
Setophaga discolor paludicola Florida Prairie Warbler	G5T3	S3	N	N
Trichomanes punctatum ssp. floridanum Florida Filmy Fern	G4G5T1	S1	E	E

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

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850-224-8207
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Florida Natural Areas Inventory

Biodiversity Matrix Query Results

UNOFFICIAL REPORT

Created 5/20/2021

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NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 7 Matrix Units: 68083 , 68084 , 68085 , 68086 , 68087 , 68088 , 68089

Study Area too Large to Display Map.

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 68083

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 68084

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 68085
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 68086
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 68087
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

0 **Likely** Elements Found

Matrix Unit ID: 68088
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N

Matrix Unit ID: 68089
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N

Matrix Unit IDs: 68083 , 68084 , 68085 , 68086 , 68087 , 68088 , 68089

15 **Potential** Elements Common to Any of the 7 Matrix Units

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Bolbocerosoma hamatum Bicolored Burrowing Scarab Beetle	G3G4	S3	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Elytraria caroliniensis var. angustifolia Narrow-leaved Carolina Scalystem	G4T2	S2	N	N
Encyclia cochleata var. triandra Clamshell Orchid	G4G5T2	S2	N	E
Forestiera segregata var. pinetorum Florida Pinewood Privet	G4T2	S2	N	N
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Linum carteri var. smallii Small's Flax	G2T2	S2	N	E
Lithobates capito Gopher Frog	G3	S3	N	SSC
Nemastylis floridana Celestial Lily	G2	S2	N	E
Phyllophaga elongata Elongate June Beetle	G3	S3	N	N
Picoides borealis Red-cockaded Woodpecker	G3	S2	LE	FE
Polygala smallii Tiny Polygala	G1	S1	LE	E
Roystonea elata Florida Royal Palm	G2G3	S2	N	E
Trichomanes punctatum ssp. floridanum Florida Filmy Fern	G4G5T1	S1	E	E

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Palm Beach County, Florida

Local office

South Florida Ecological Services Field Office

(772) 562-3909
(772) 562-4288

1339 20th Street
Vero Beach, FL 32960-3559

http://fws.gov/verobeach

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Florida Bonneted Bat Eumops floridanus | Endangered
Wherever found
There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/8630

Florida Panther Puma (=Felis) concolor coryi | Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1763

Puma (=mountain Lion) Puma (=Felis) concolor (all subsp. except coryi) | SAT
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/6049

Southeastern Beach Mouse Peromyscus polionotus niveiventris | Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3951

West Indian Manatee Trichechus manatus | Threatened, Marine mammal
Wherever found
There is **final** critical habitat for this species. Your location overlaps the critical habitat.
https://ecos.fws.gov/ecp/species/4469

Birds

NAME	STATUS
Everglade Snail Kite Rostrhamus sociabilis plumbeus Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/7713	Endangered
Whooping Crane Grus americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN
Wood Stork Mycteria americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8477	Threatened

Reptiles

NAME	STATUS

American Alligator Alligator mississippiensis — SAT
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/776

Eastern Indigo Snake Drymarchon corais couperi — Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/646

Hawksbill Sea Turtle Eretmochelys imbricata — Endangered
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/3656

Leatherback Sea Turtle Dermochelys coriacea — Endangered
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1493

Loggerhead Sea Turtle Caretta caretta — Threatened
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1110

Insects

NAME	STATUS
Bartram's Hairstreak Butterfly Strymon acis bartrami Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4837	Endangered
Florida Leafwing Butterfly Anaea troglodyta floridalis Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6652	Endangered
Miami Blue Butterfly Cyclargus (=Hemiargus) thomasi bethunebakeri Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3797	Endangered

Flowering Plants

NAME	STATUS
Beach Jacquemontia Jacquemontia reclinata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1277	Endangered
Florida Prairie-clover Dalea carthagenensis floridana Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2300	Endangered
Four-petal Pawpaw Asimina tetramera Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3461	Endangered
Tiny Polygala Polygala smallii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/996	Endangered

Lichens

NAME	STATUS
Florida Perforate Cladonia Cladonia perforata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7516	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
West Indian Manatee Trichechus manatus https://ecos.fws.gov/ecp/species/4469#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES

THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

American Kestrel Falco sparverius paulus — Breeds Apr 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9587

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Jul 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Common Ground-dove Columbina passerina exigua — Breeds Feb 1 to Dec 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Dunlin Calidris alpina arcticola — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

King Rail Rallus elegans — Breeds May 1 to Sep 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8936

Least Tern Sterna antillarum — Breeds Apr 20 to Sep 10

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Limpkin Aramus guarauna — Breeds Jan 15 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Magnificent Frigatebird Fregata magnificens — Breeds Oct 1 to Apr 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Short-tailed Hawk Buteo brachyurus — Breeds Mar 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8742

Swallow-tailed Kite Elanoides forficatus — Breeds Mar 10 to Jun 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8938

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

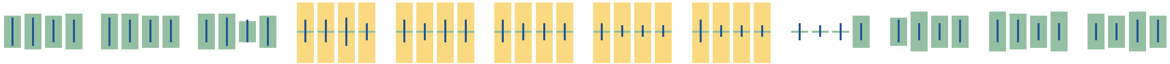
Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

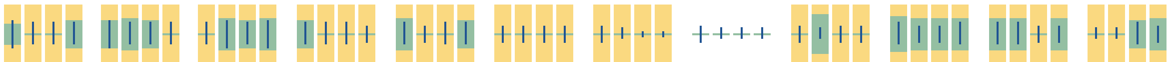
■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

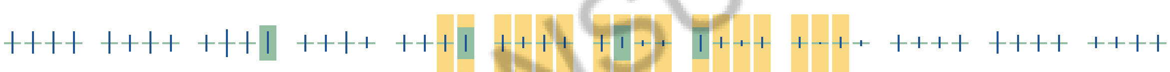
American Kestrel
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



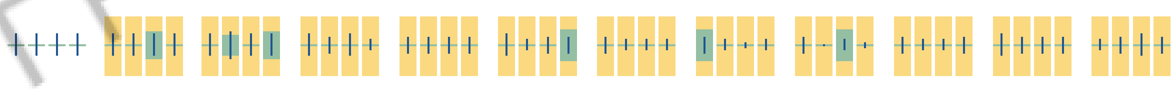
Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



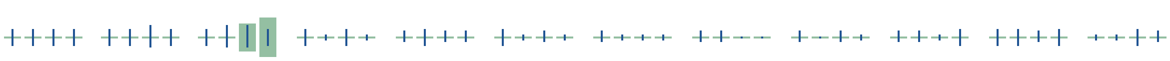
Black Skimmer
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



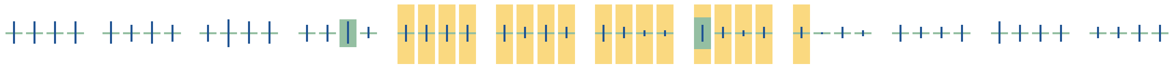
Common Ground-dove
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



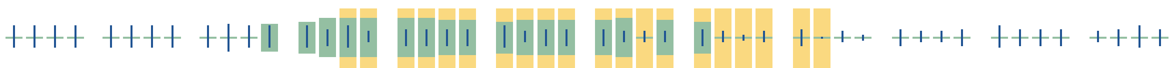
Dunlin
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



King Rail
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

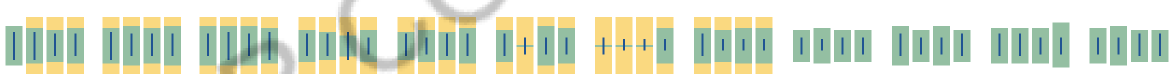


Least Tern
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

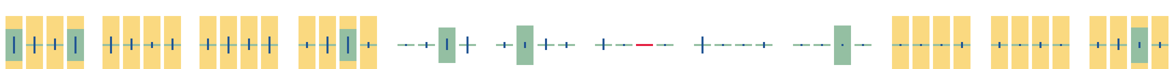


Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

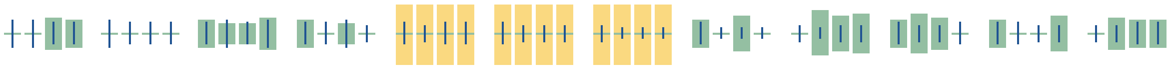
Limpkin
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



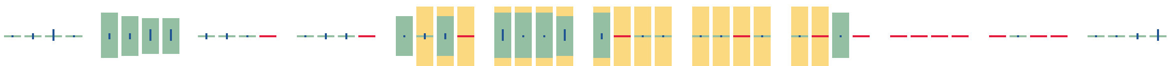
Magnificent Frigatebird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



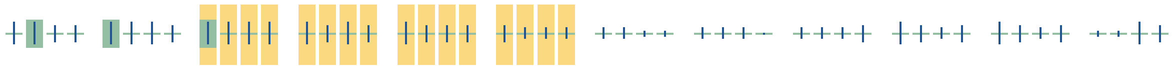
SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Ruddy Turnstone
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

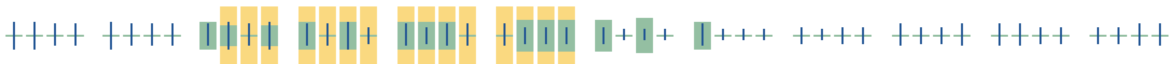
Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

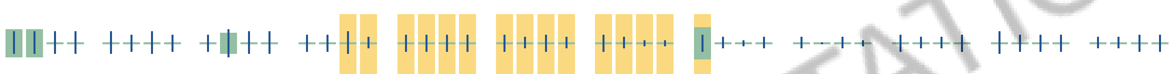
Short-tailed Hawk
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Swallow-tailed Kite
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee Trichechus manatus
https://ecos.fws.gov/ecp/species/4469

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1Fx
- PEM1Ax
- PEM1C

FRESHWATER FORESTED/SHRUB WETLAND
- PFO1/SS1B
- PSS1C
- PFO1C
- PFO1B

FRESHWATER POND
- PUBHx

LAKE
- L1UBHx

RIVERINE
- R2UBHx
- R5UBFx
- R5UBH
- R2AB4Hx

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX D: FEMA MAP

Source: Aerials courtesy of NearMap

K:\TAM_GIS\Okeechobee Mobility Study\MXD\FEMA Map.mxd

Kimley»Horn

655 N Franklin Street, Suite 150, Tampa, FL 33602
Phone (813)-620-1460
www.kimley-horn.com

FEMA FIRM Map

Okeechobee Mobility Study
Palm Beach County, FL

1 inch = 400 feet

MAY 2021

PROJECT NUMBER: 040416206

FIGURE 3 - PAGE 1 OF 15

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www.kimley-horn.com

FEMA FIRM Map

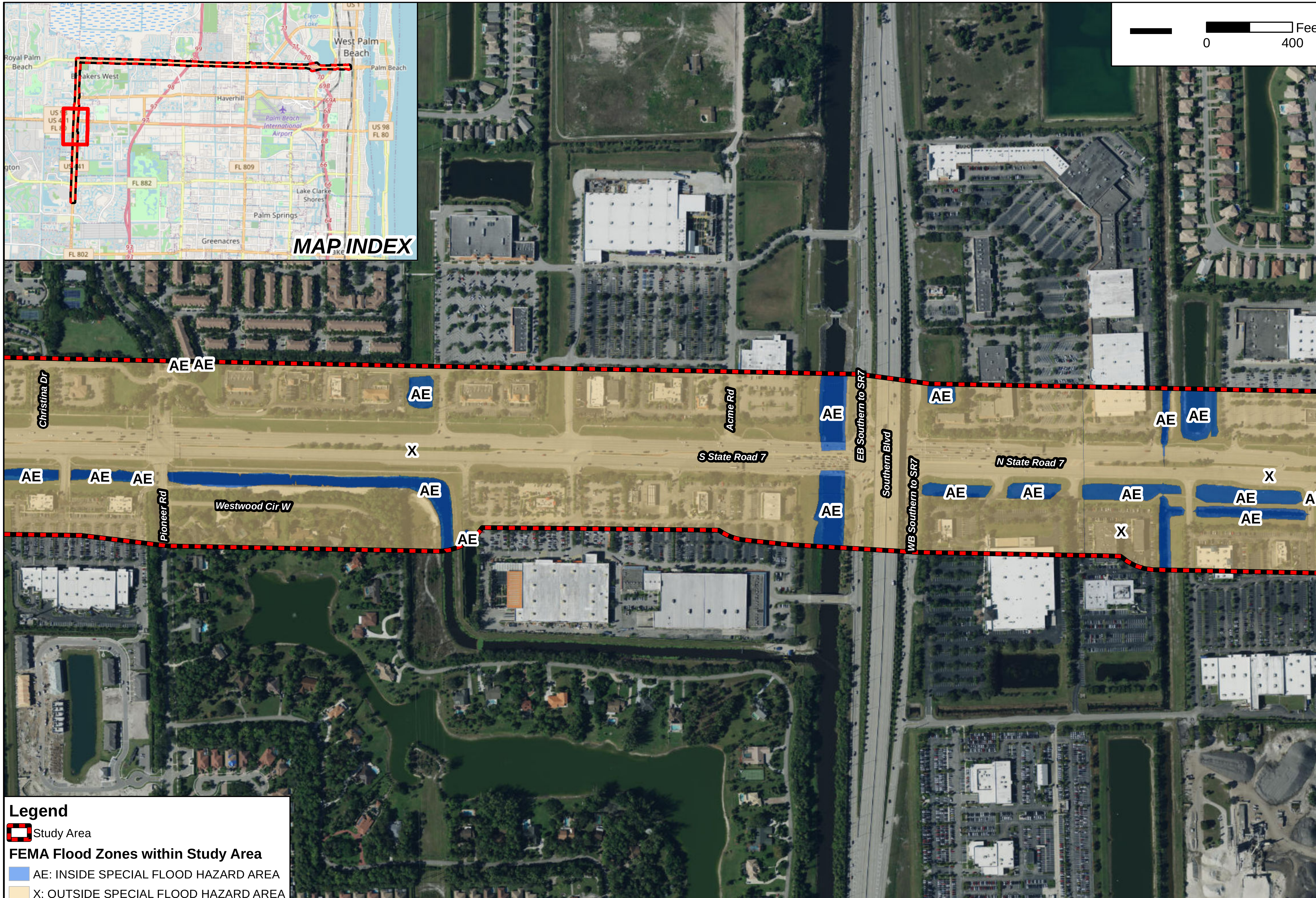
Okeechobee Mobility Study
Palm Beach County, FL

1 inch = 400 feet

MAY 2021

PROJECT NUMBER: 040416206

FIGURE 3 - PAGE 2 OF 15



Source: Aerials courtesy of NearMap

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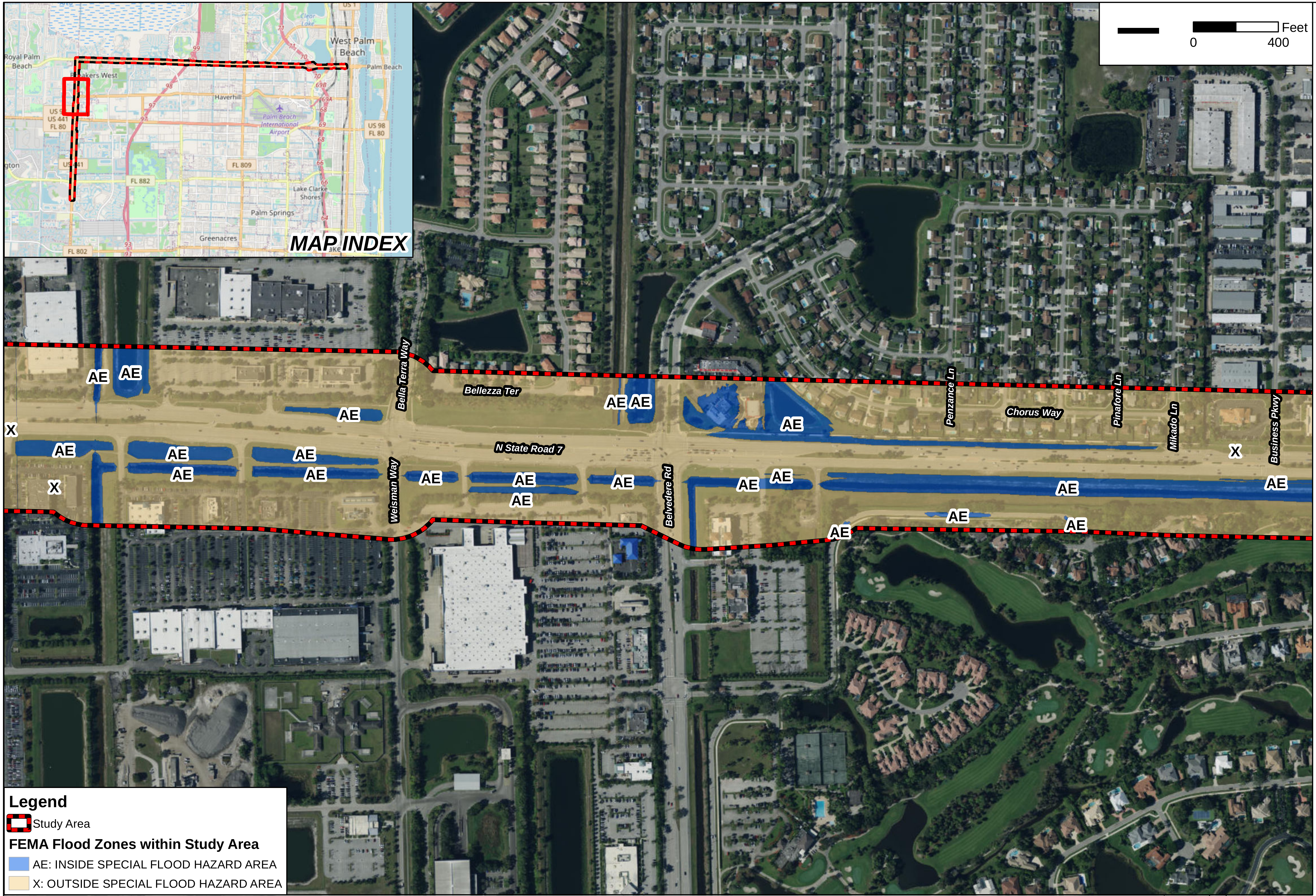
FEMA FIRM Map

Okeechobee Mobility Study
Palm Beach County, FL

1 inch = 400 feet

MAY 2021

PROJECT NUMBER: 040416206



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www.kimley-horn.com

1 inch = 400 feet

FEMA FIRM Map

Okeechobee Mobility Study
Palm Beach County, FL

MAY 2021

PROJECT NUMBER: 040416206

FIGURE 3 - PAGE 4 OF 15

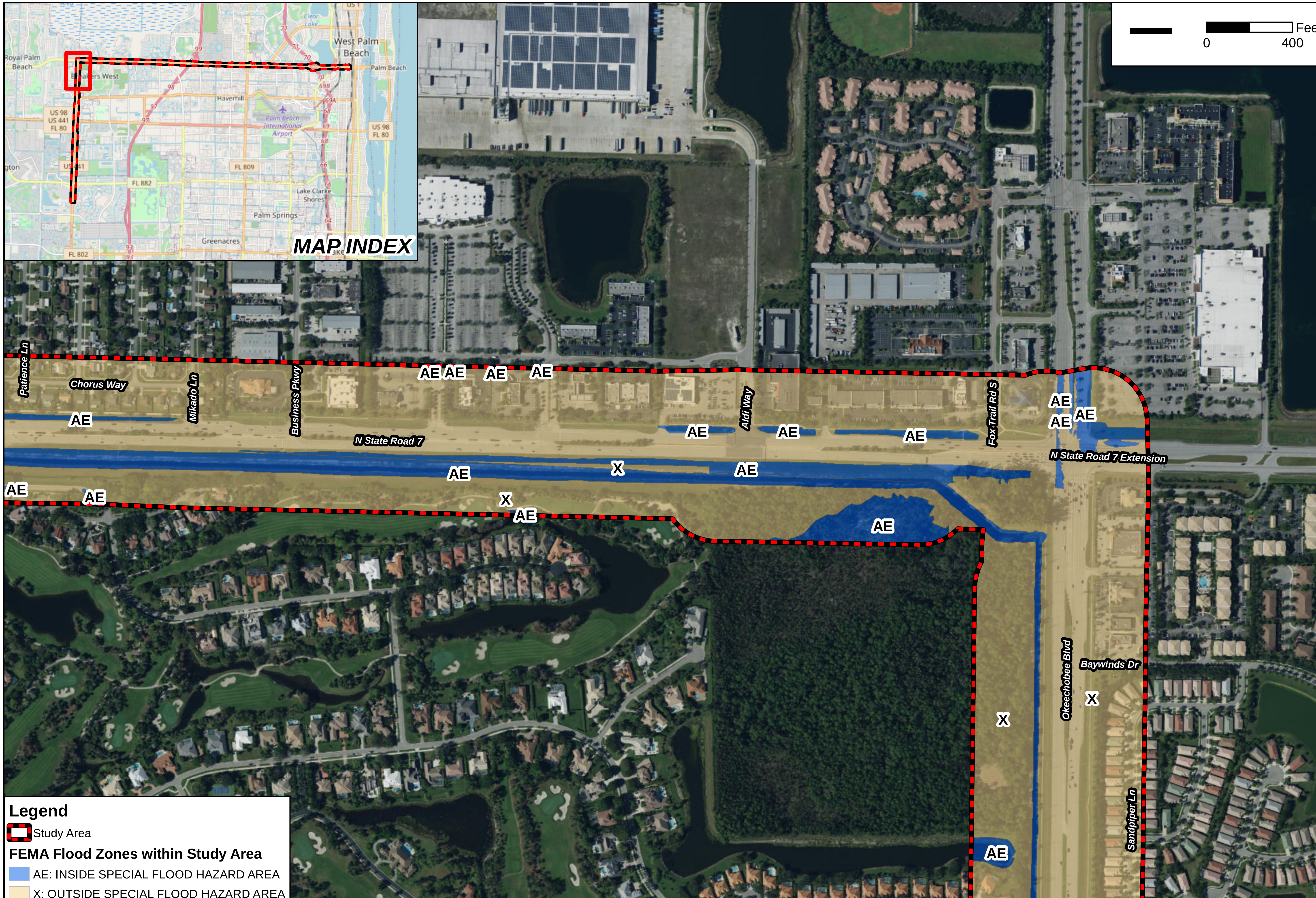

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FIGURE 3 - PAGE 6 OF 15

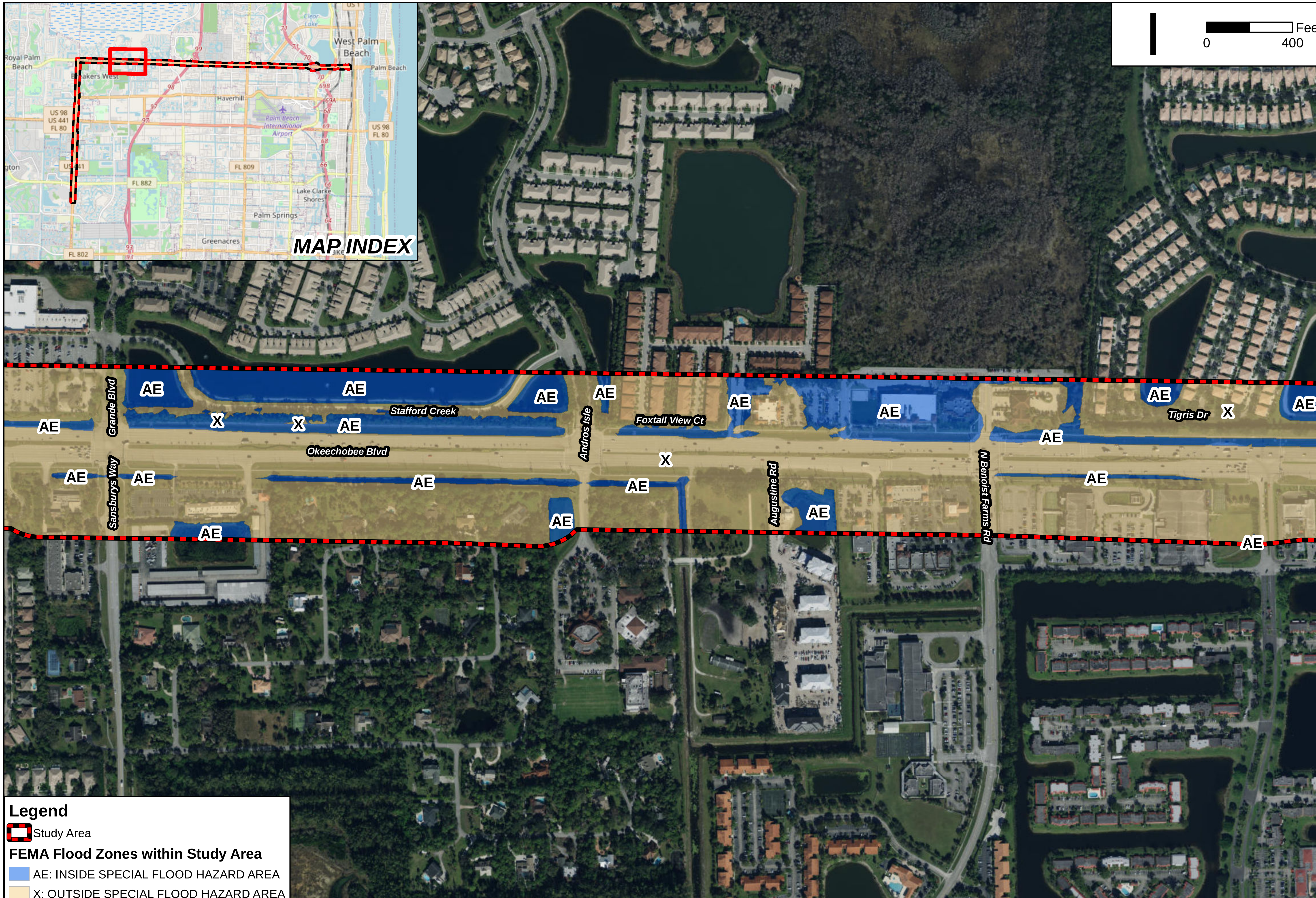

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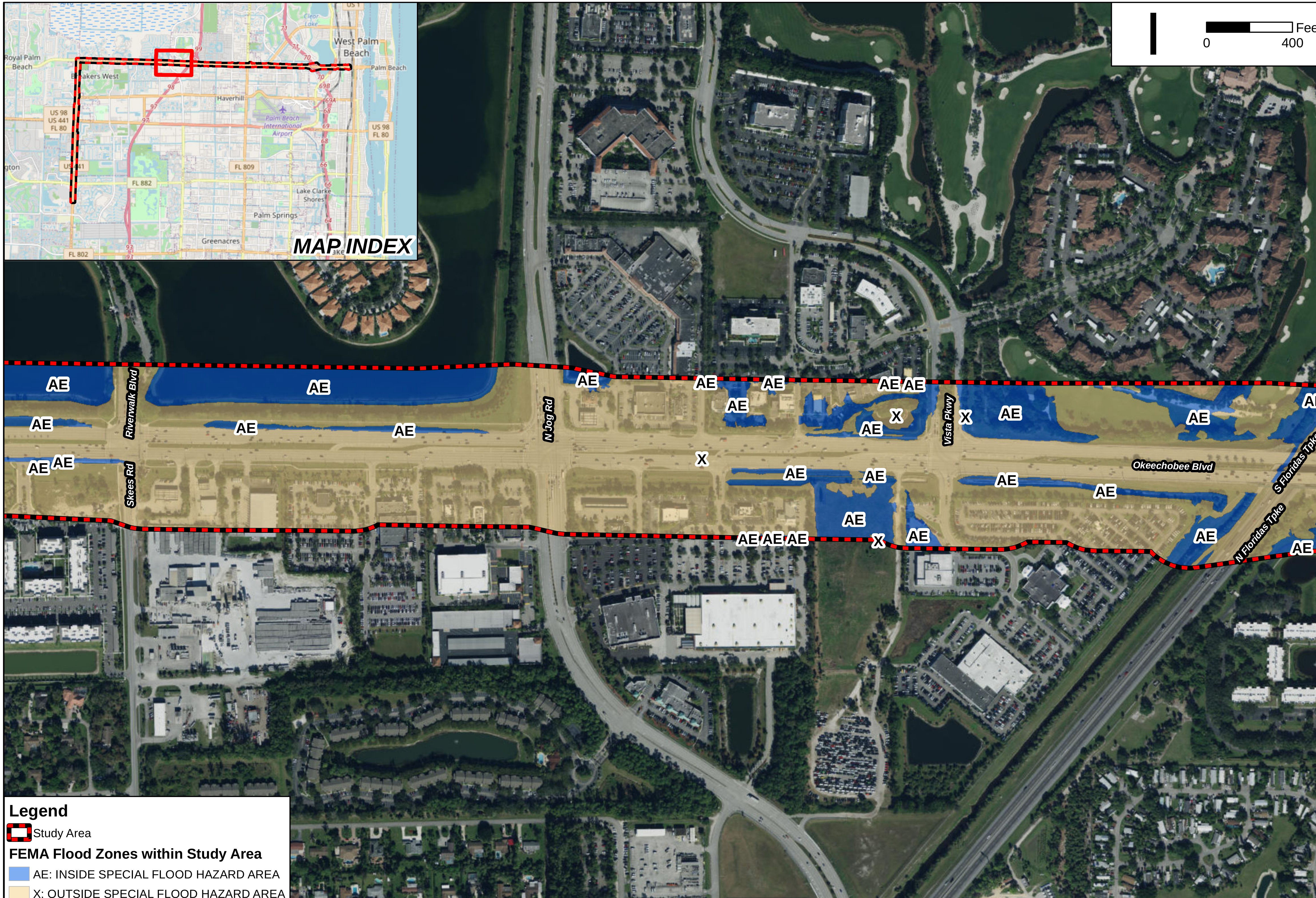
FIGURE 3 - PAGE 8 OF 15



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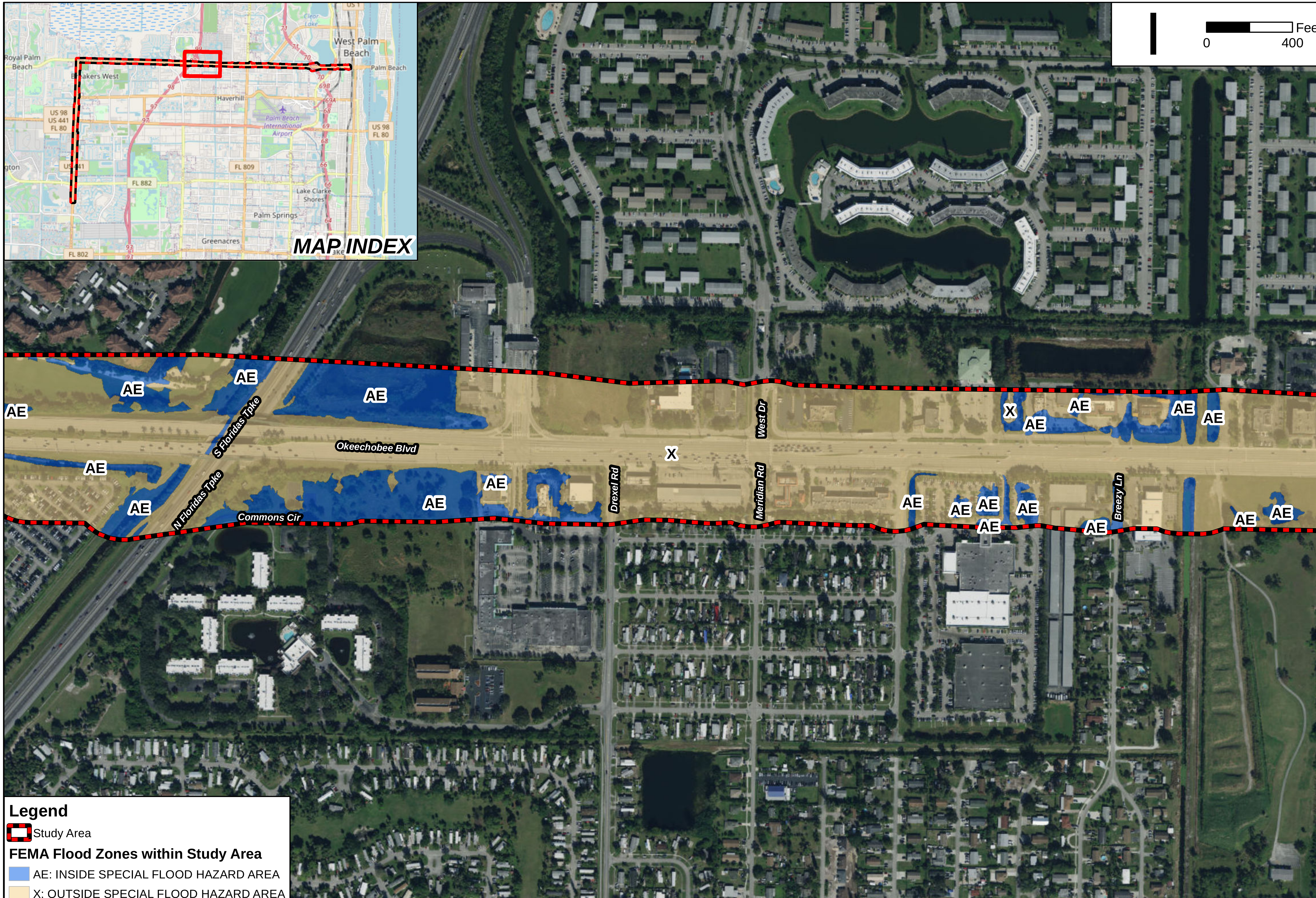

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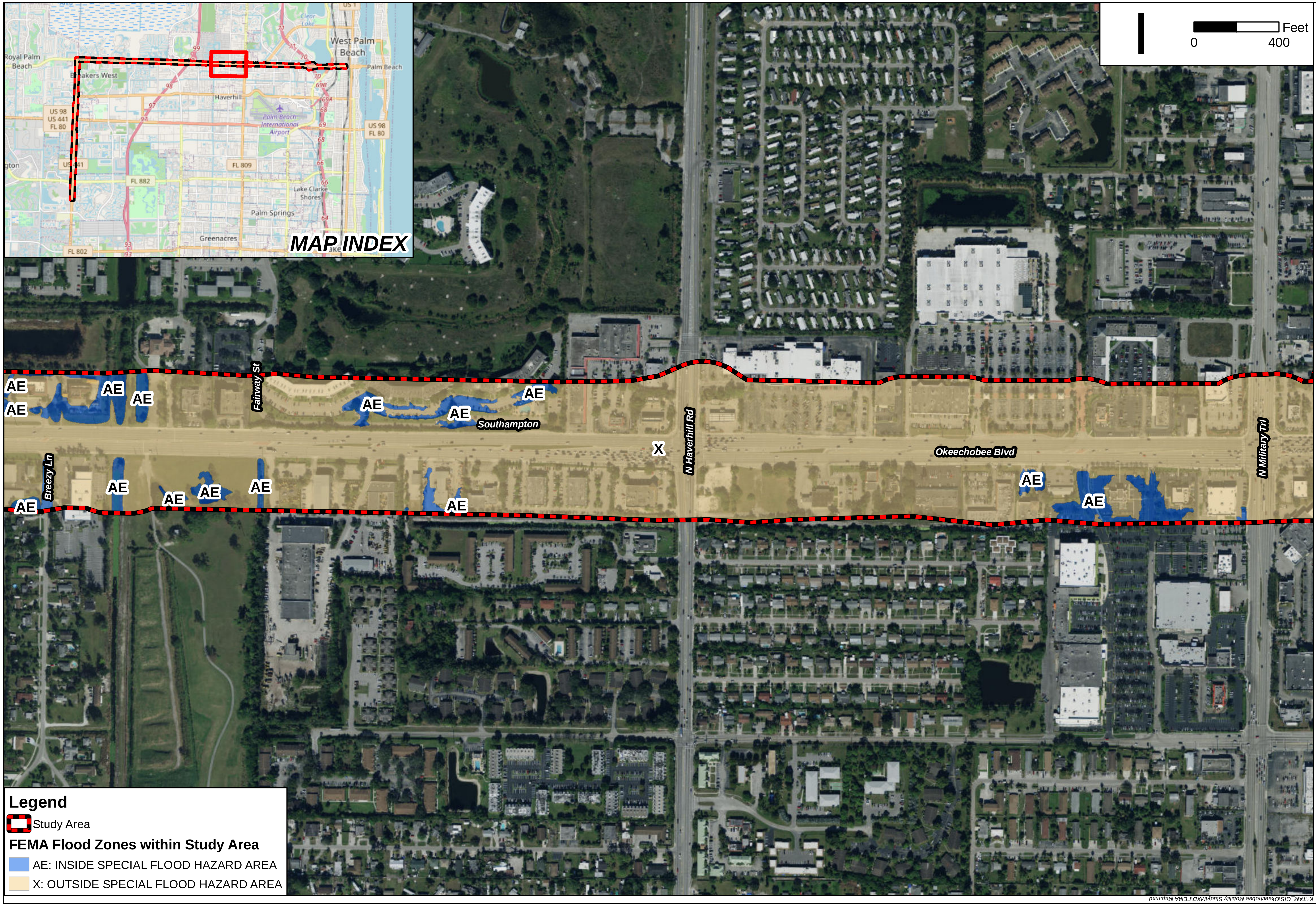

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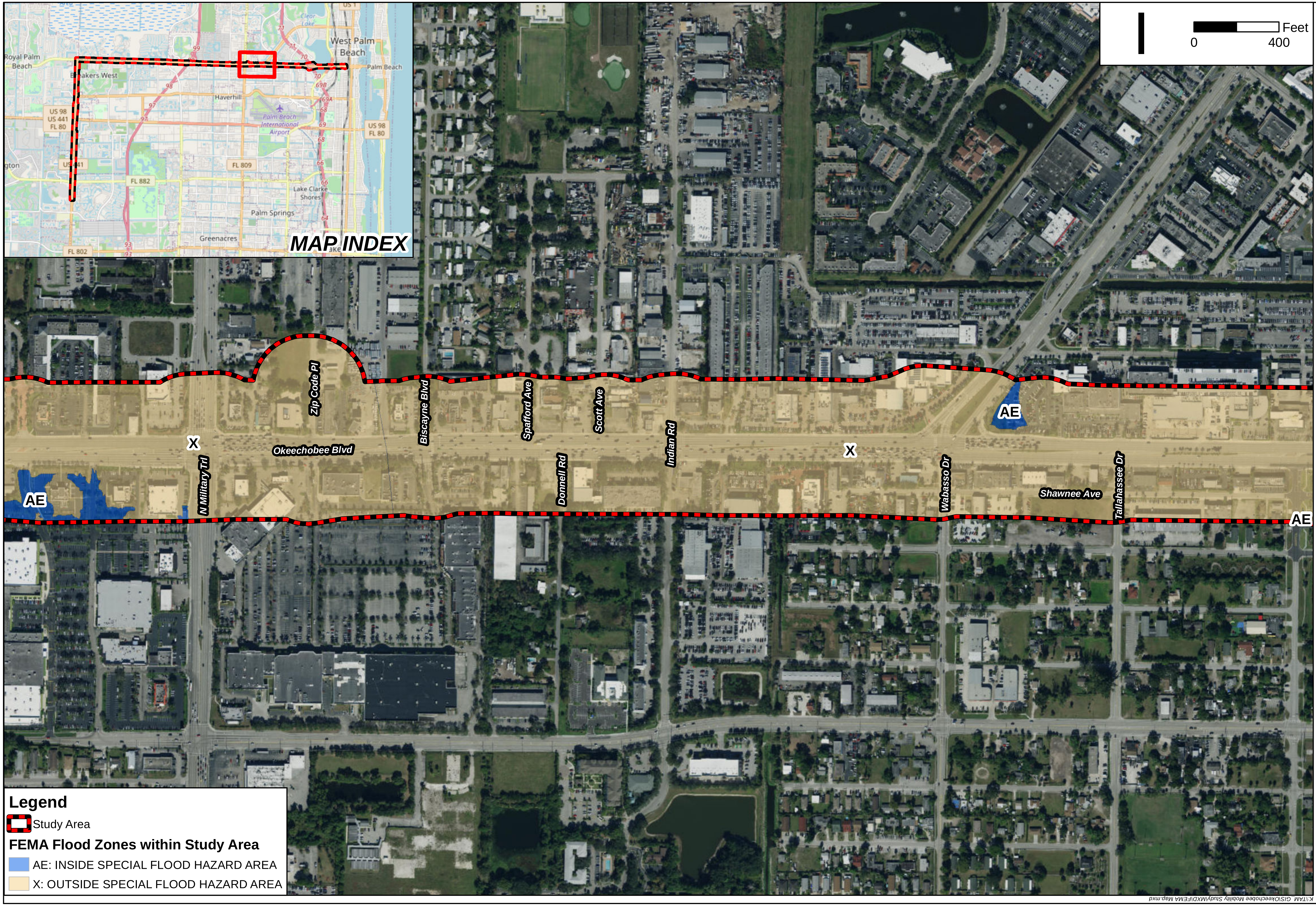

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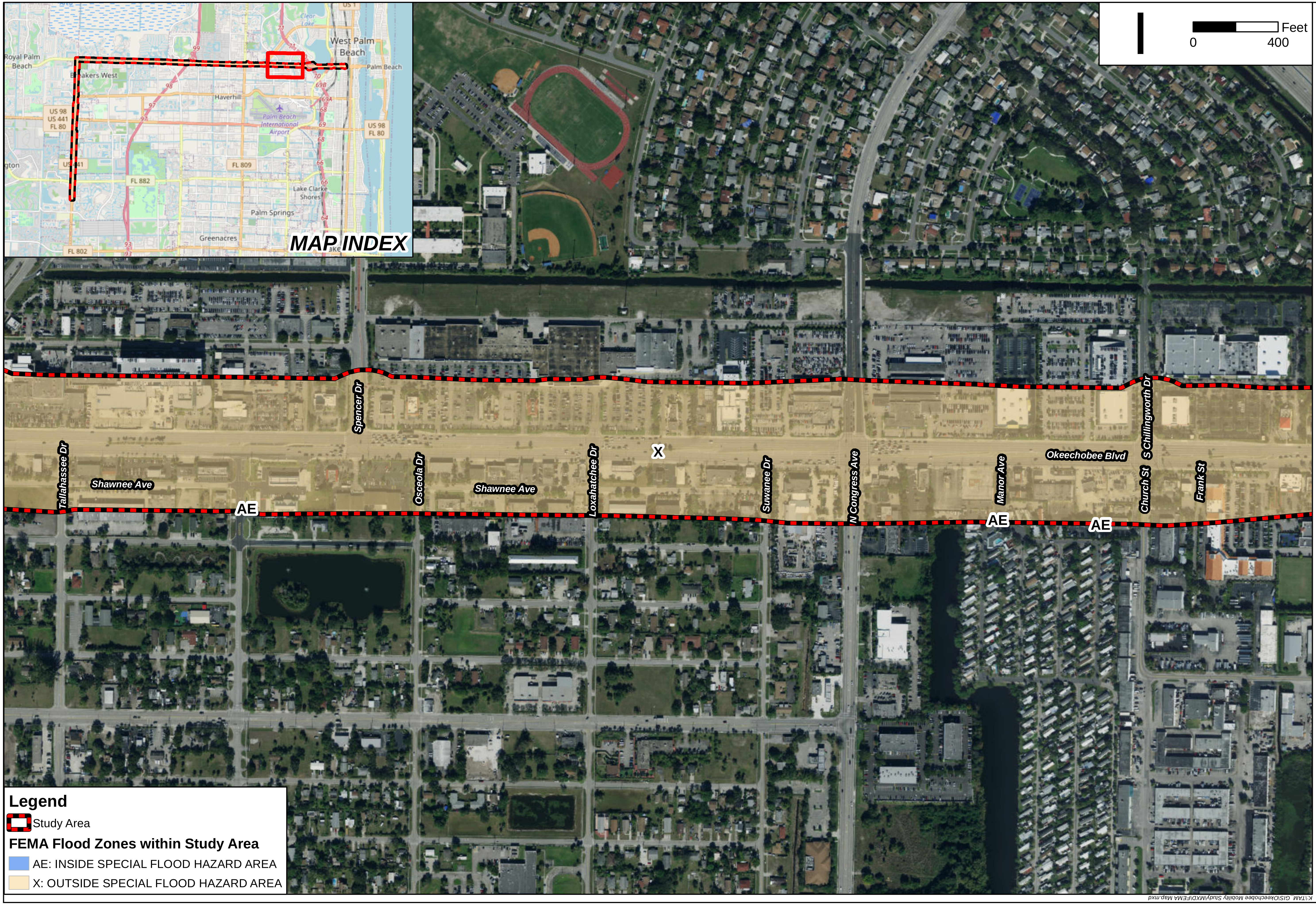

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FIGURE 3 - PAGE 13 OF 15

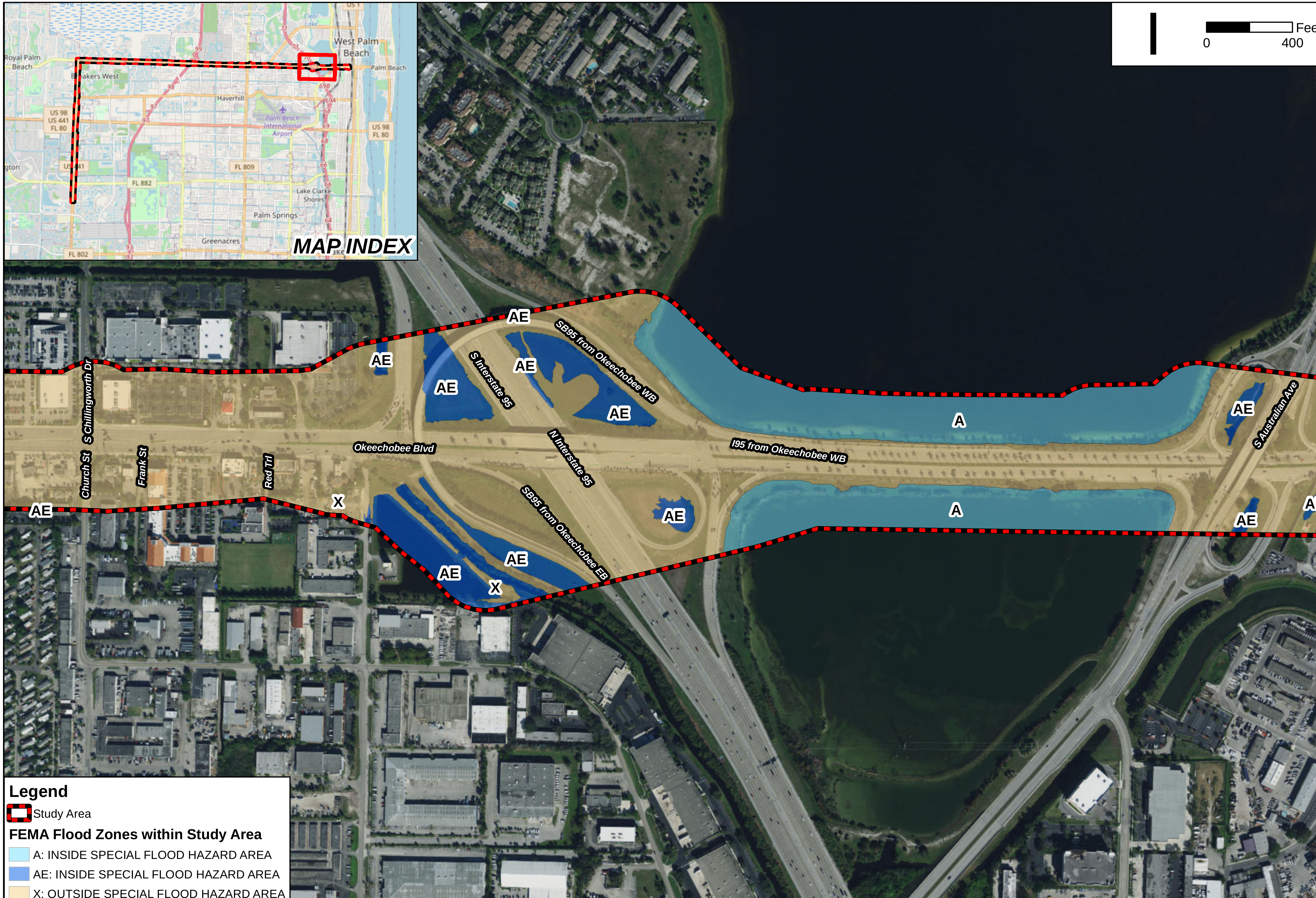

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FIGURE 3 - PAGE 15 OF 15

APPENDIX E: CONTAMINATION SITES MAP

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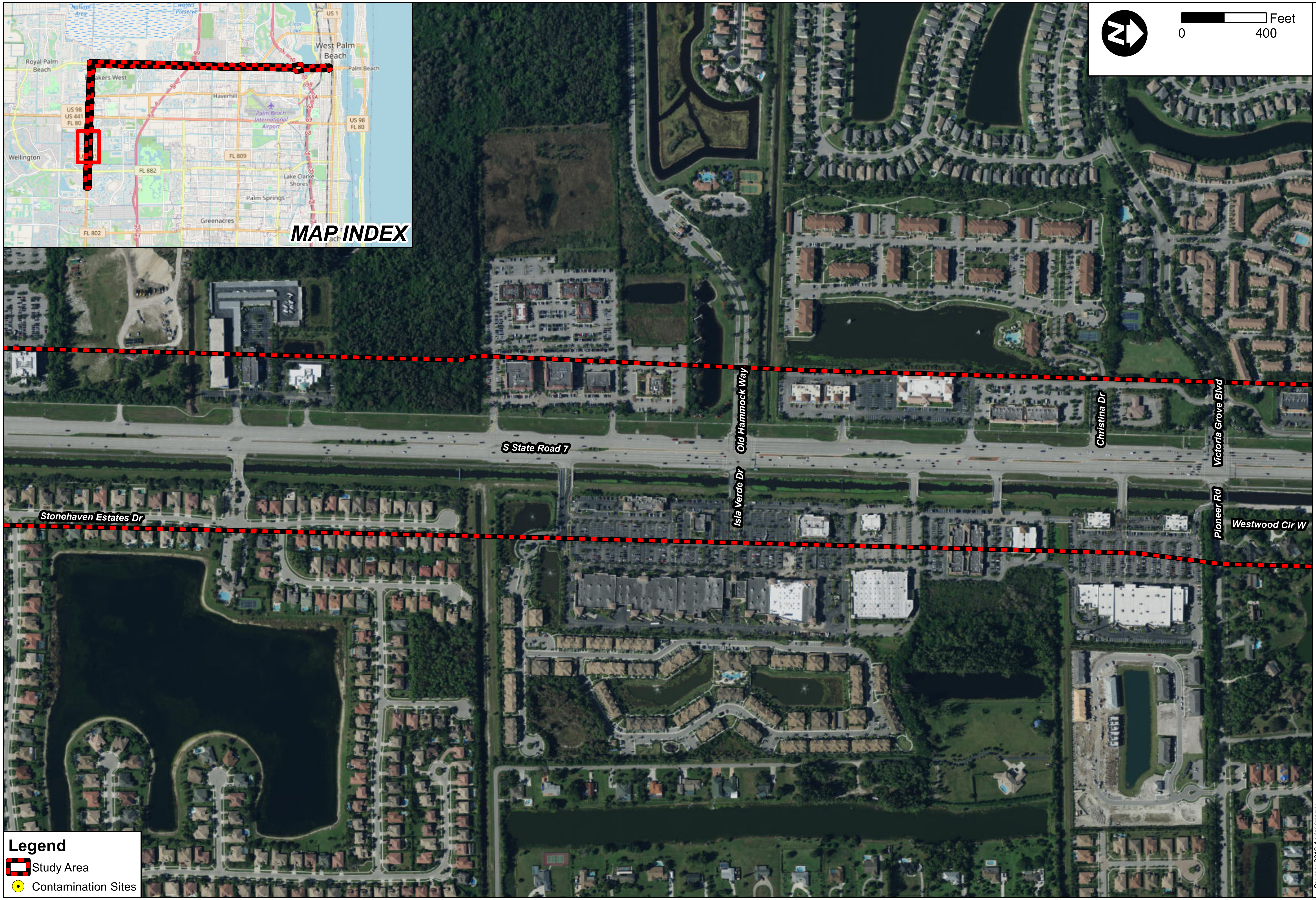
Source: 2019 Aerial Imagery



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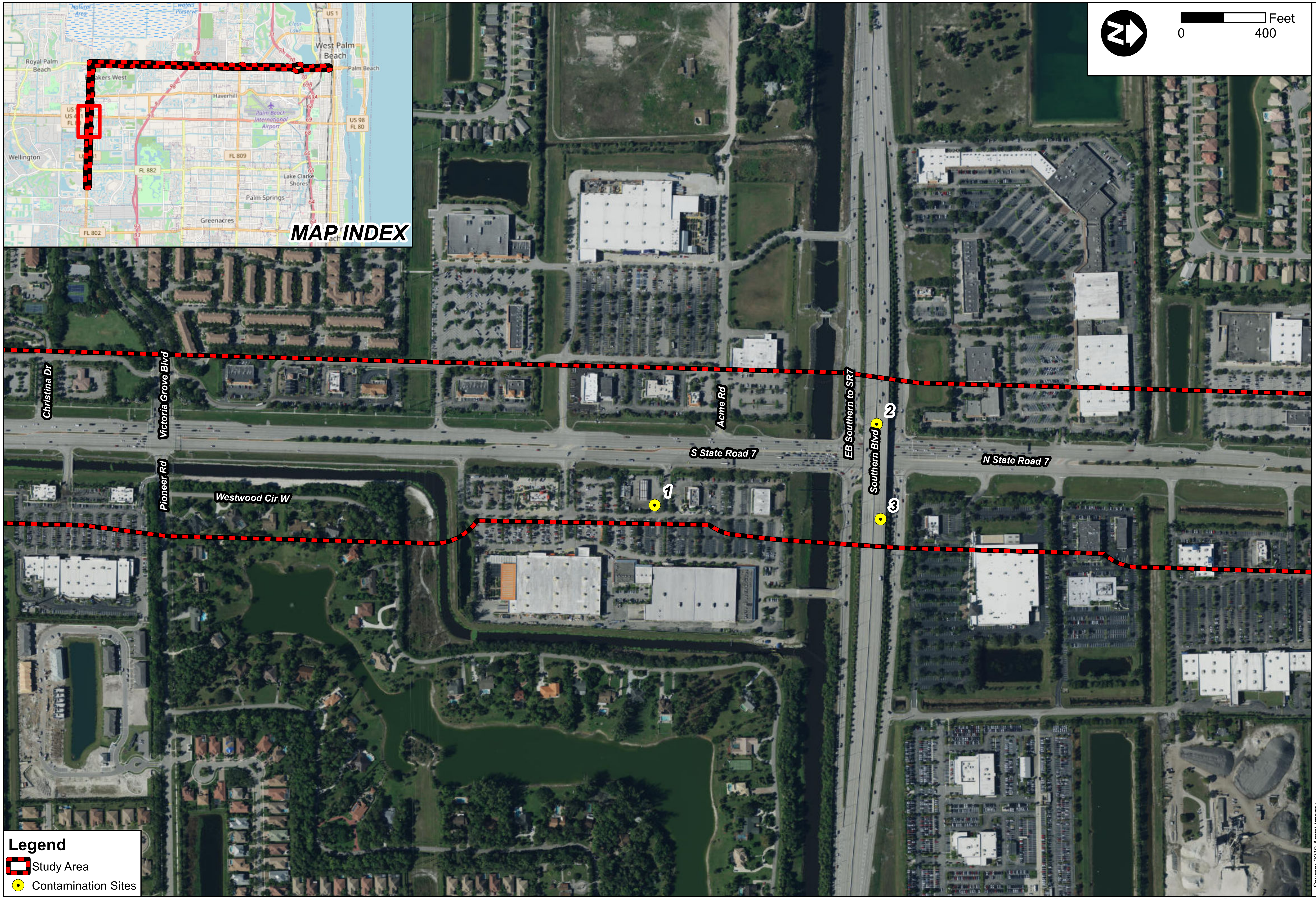

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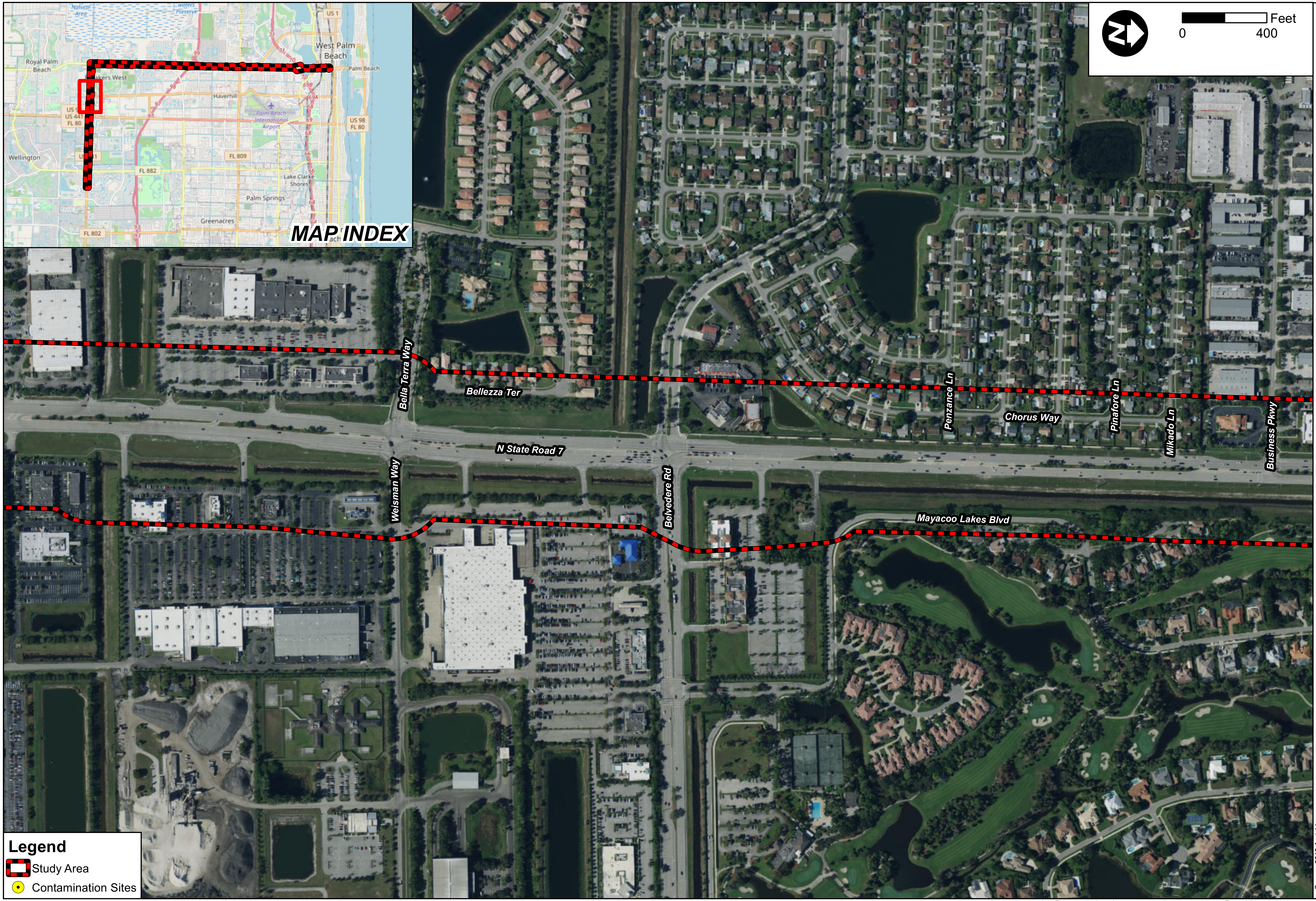

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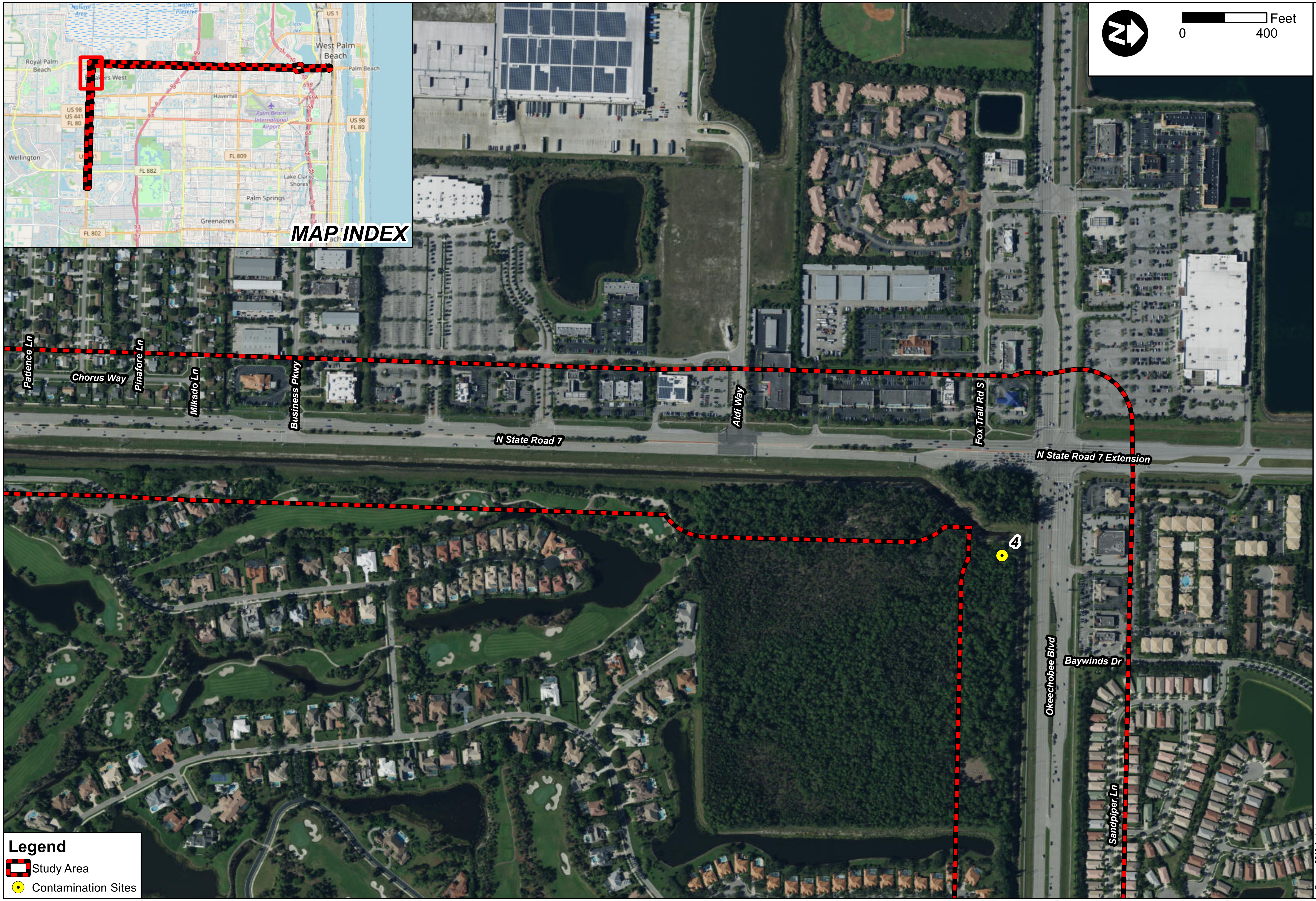

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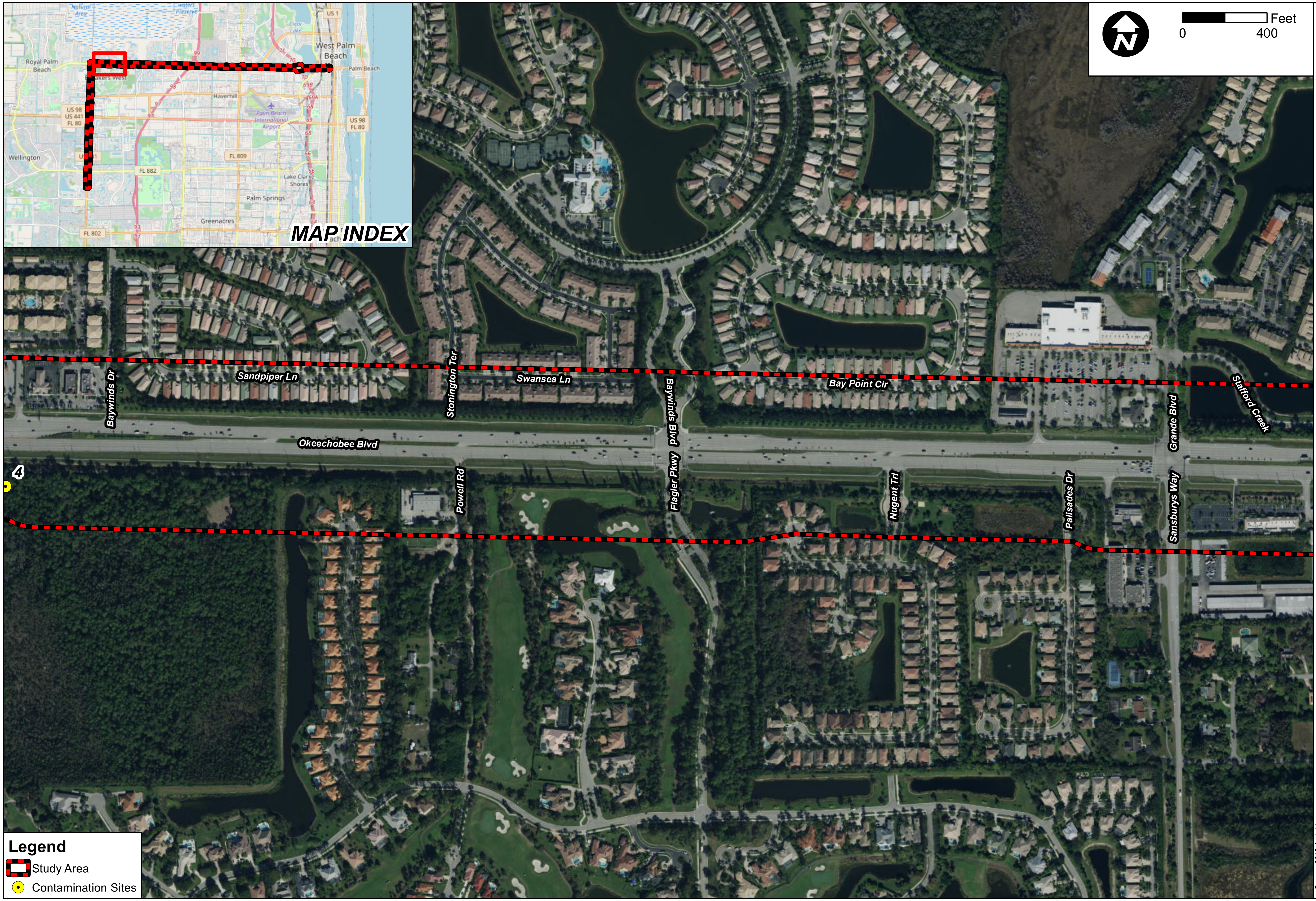

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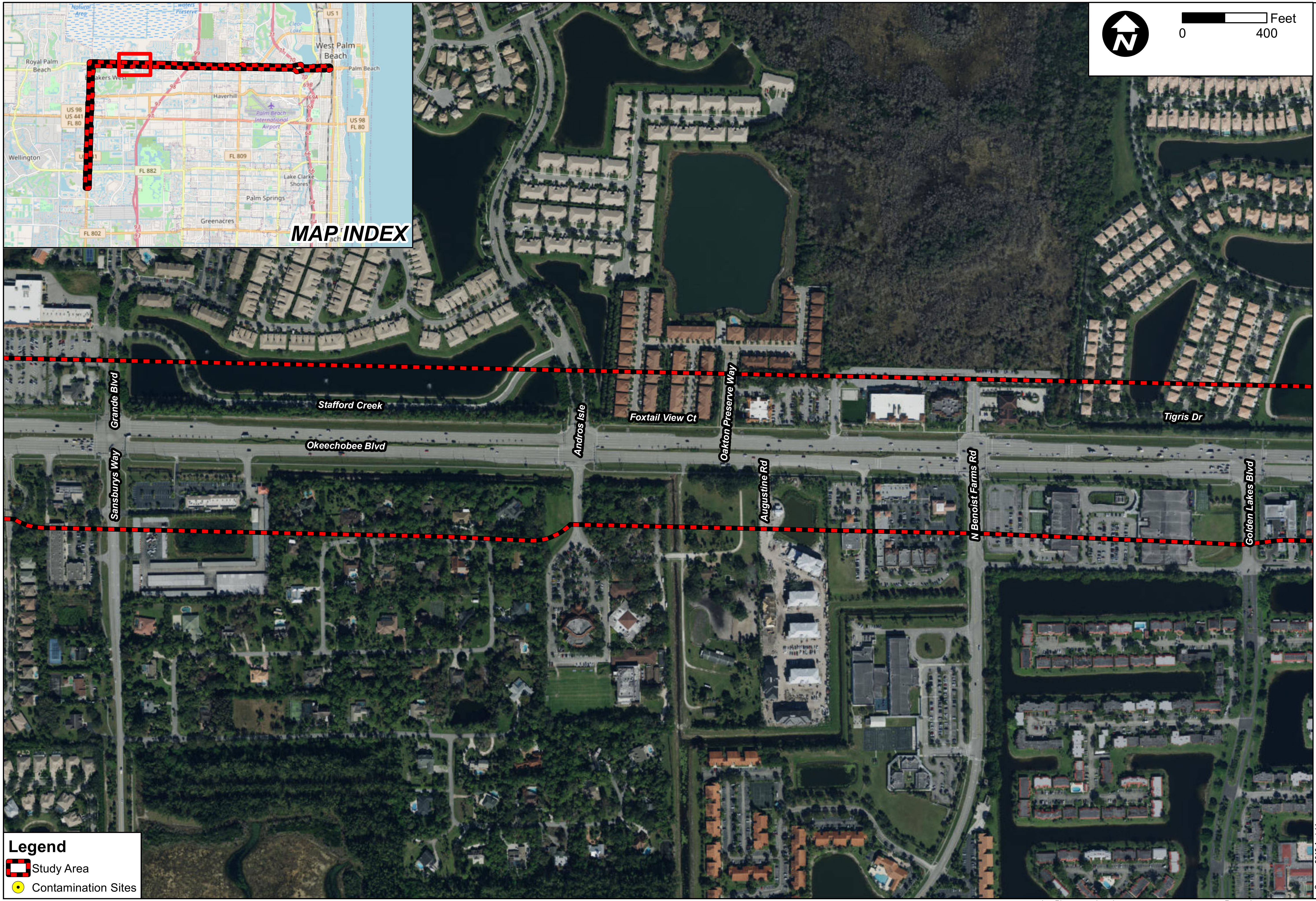

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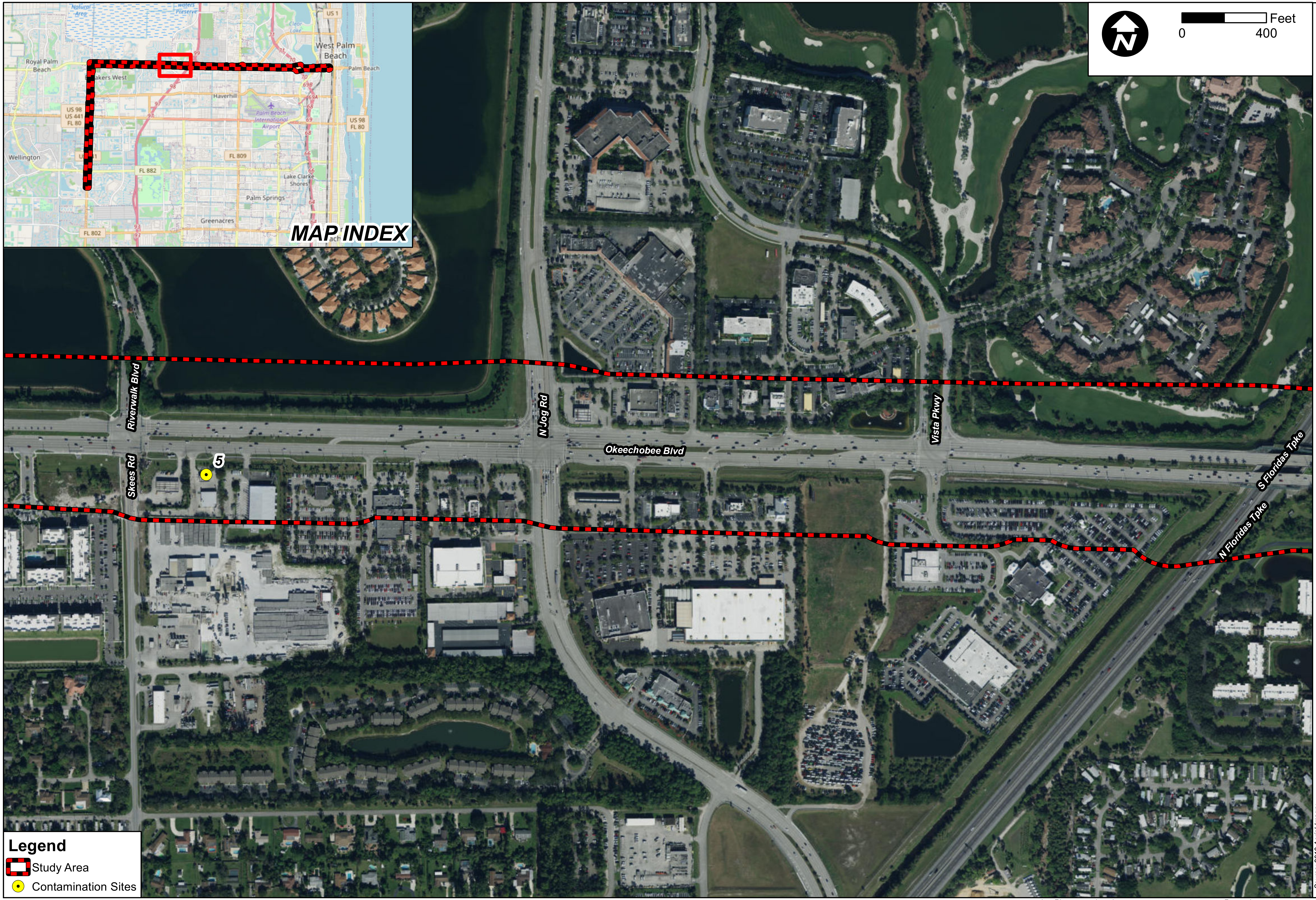

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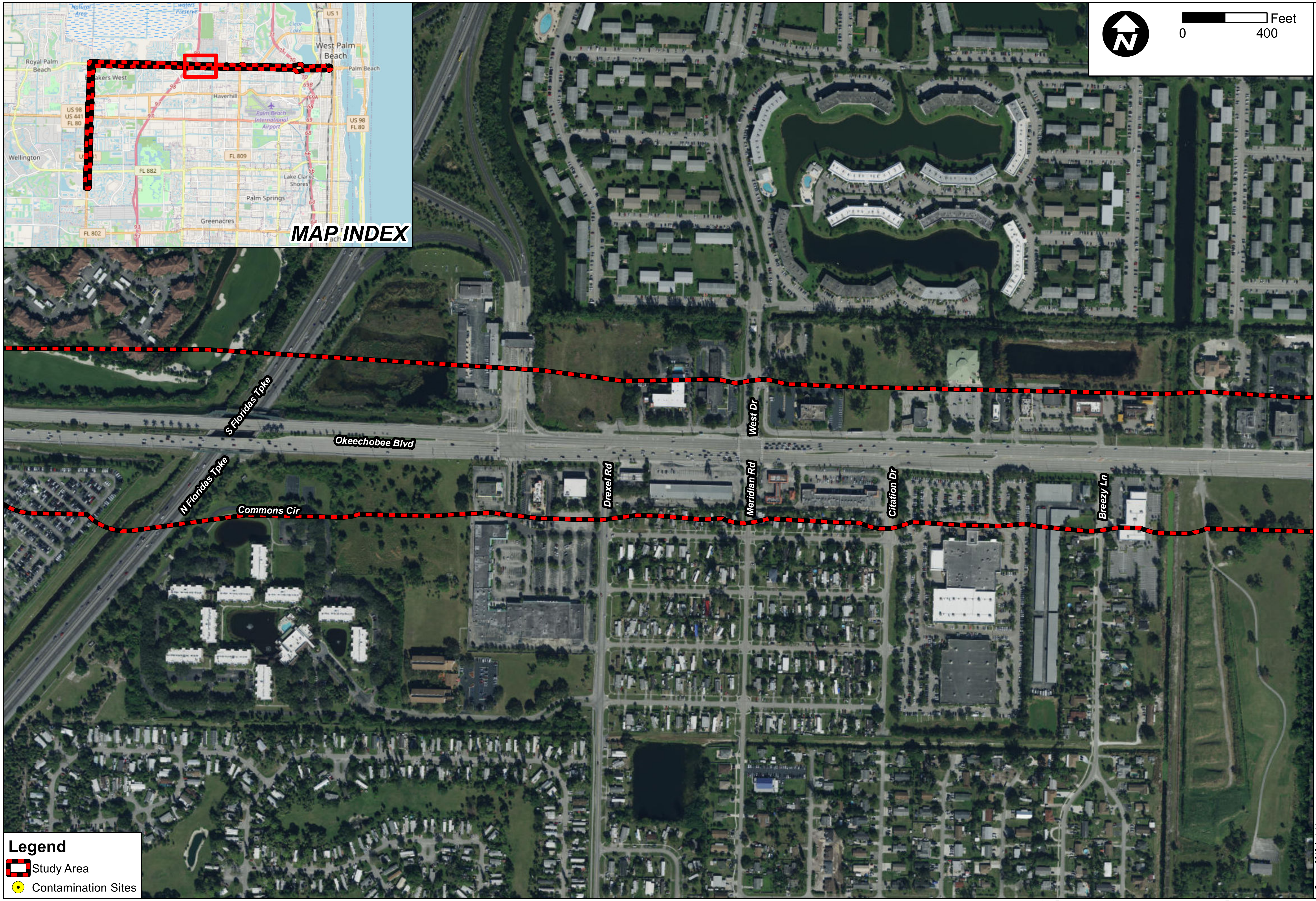

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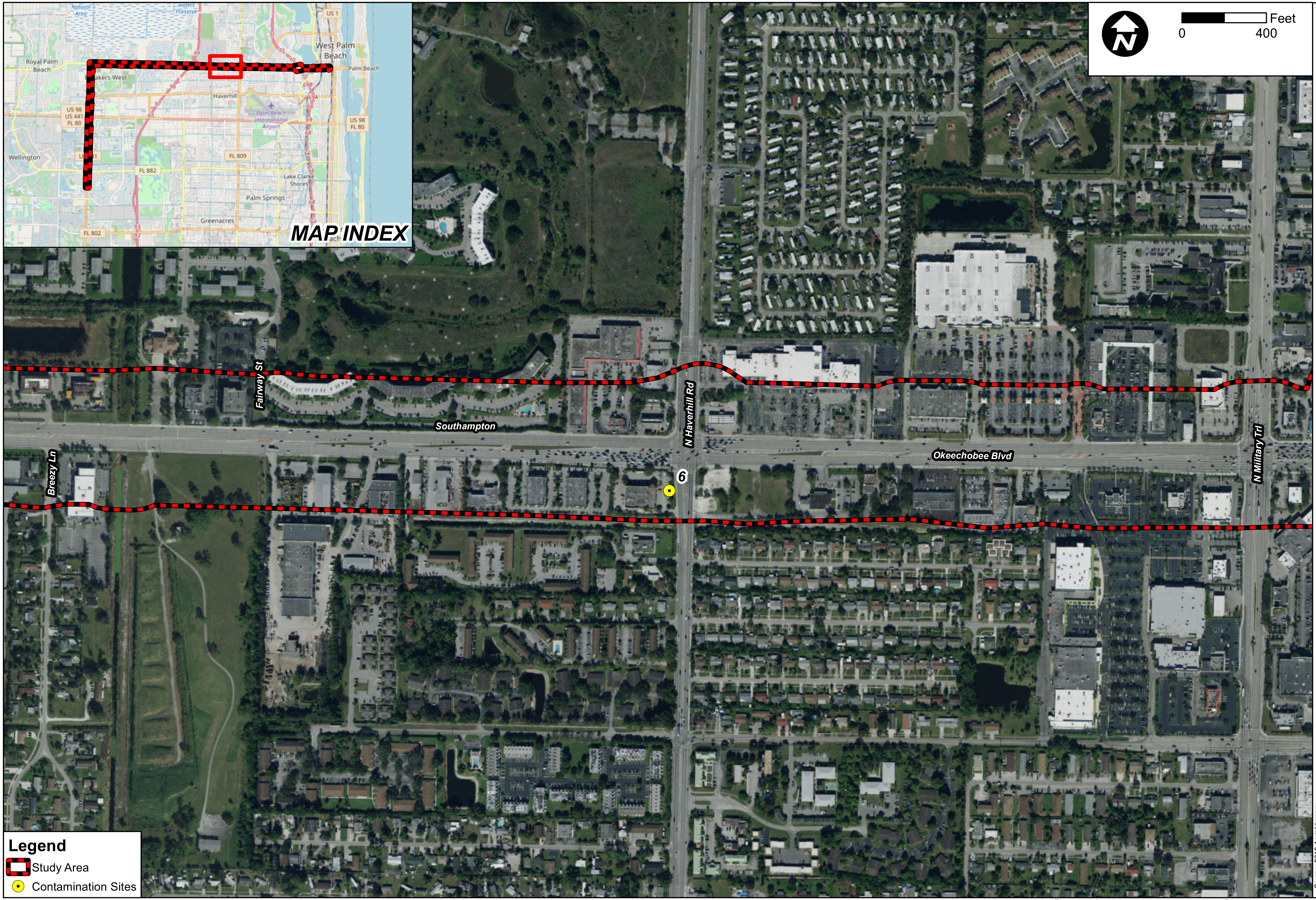

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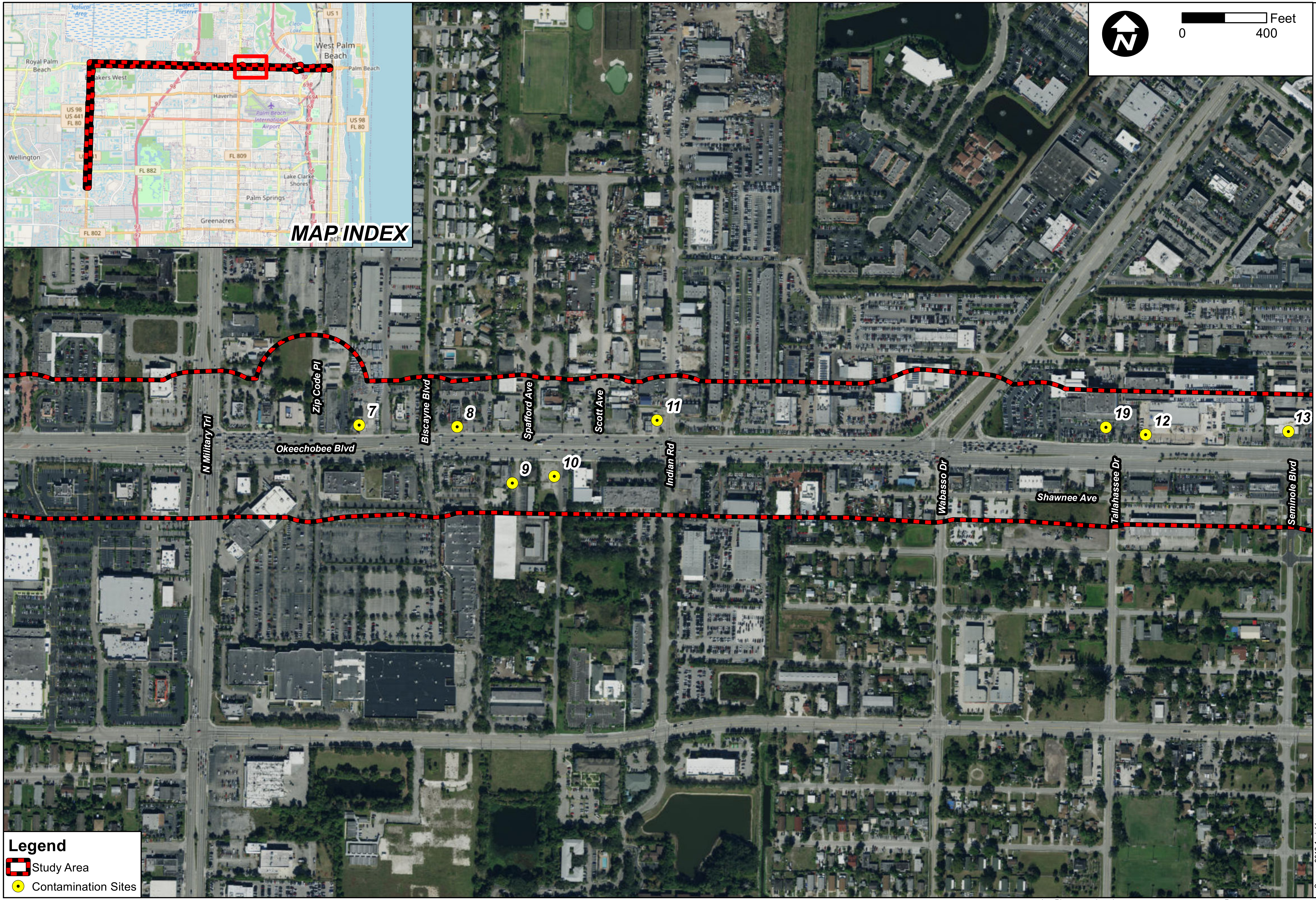

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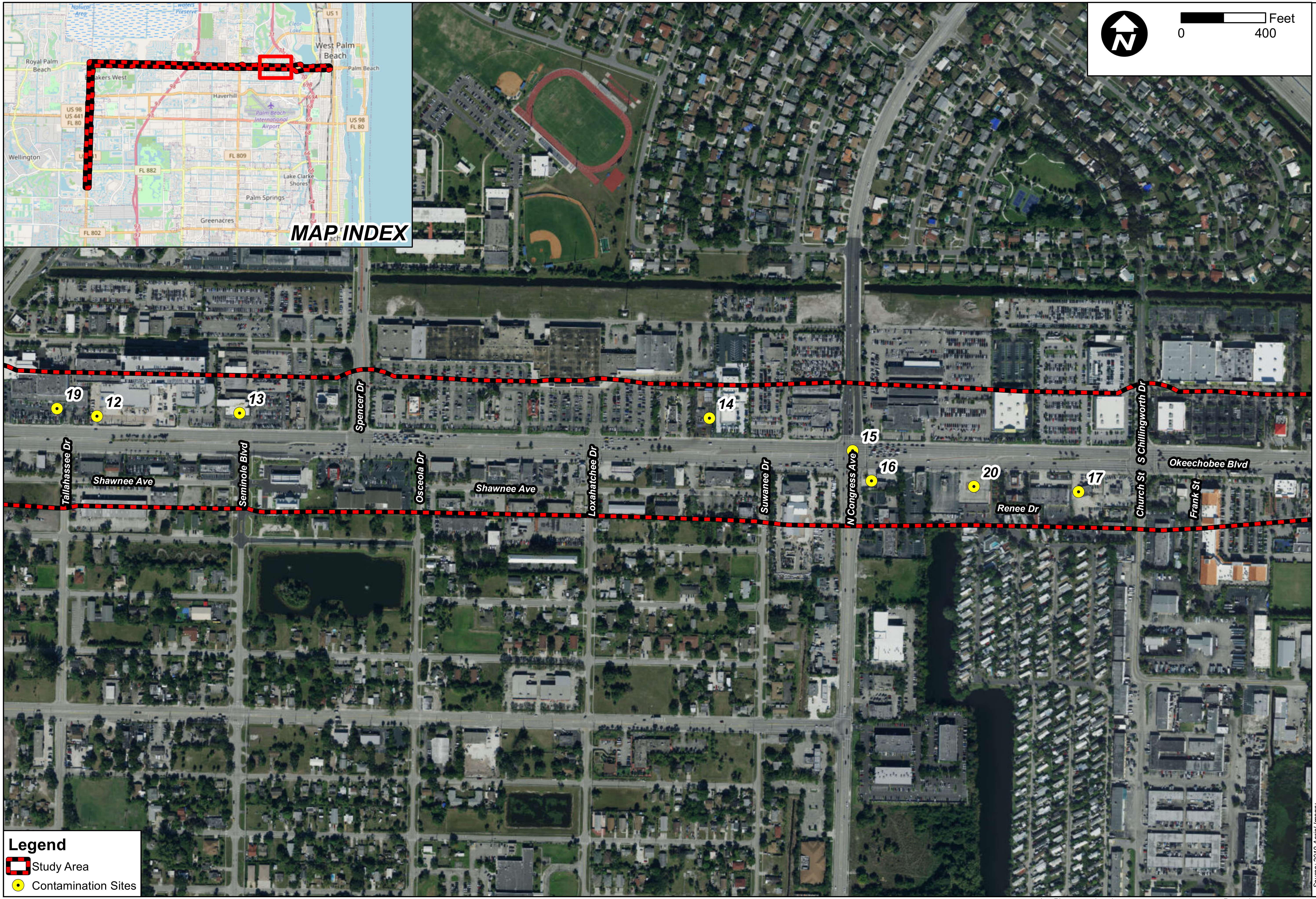

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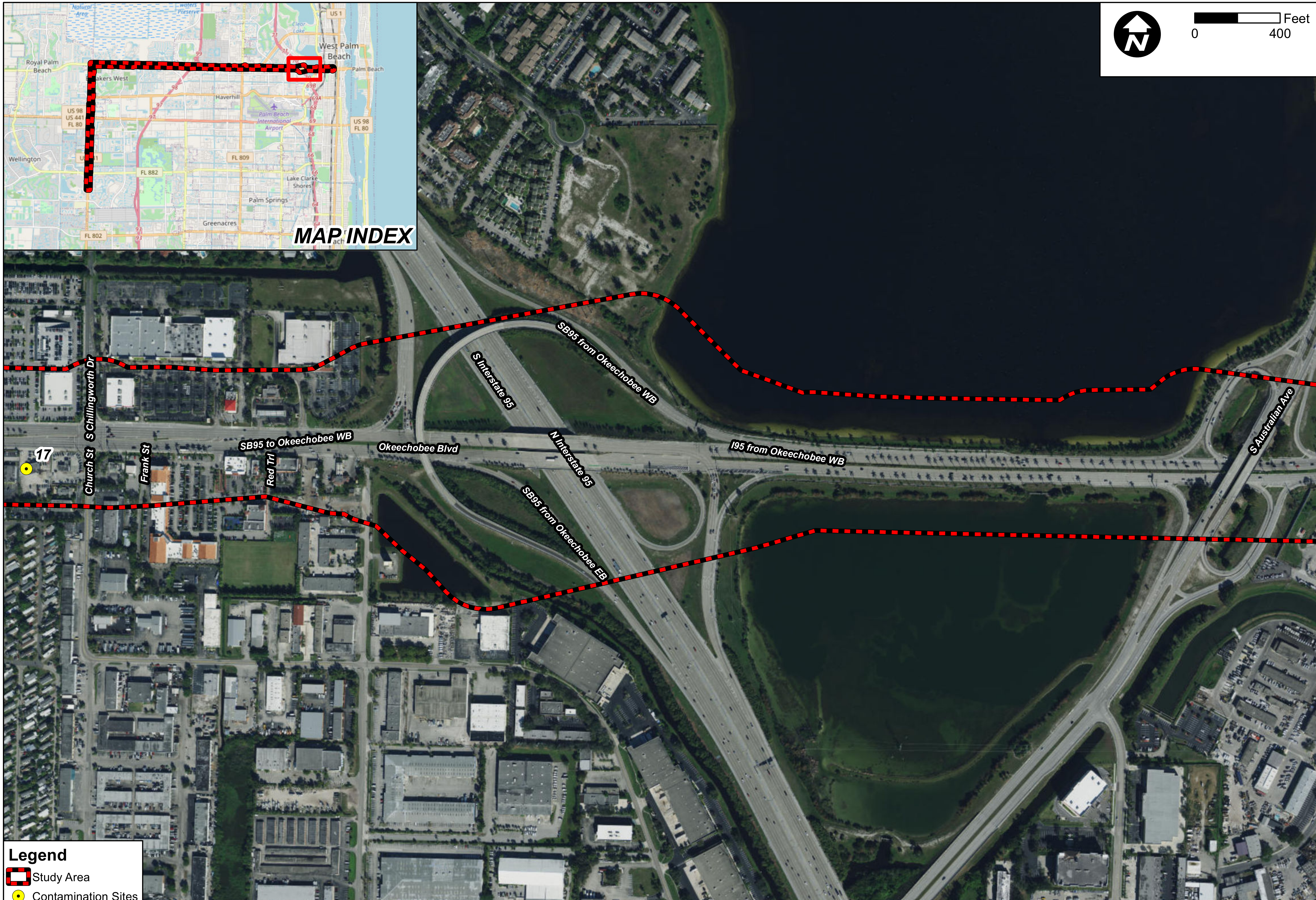

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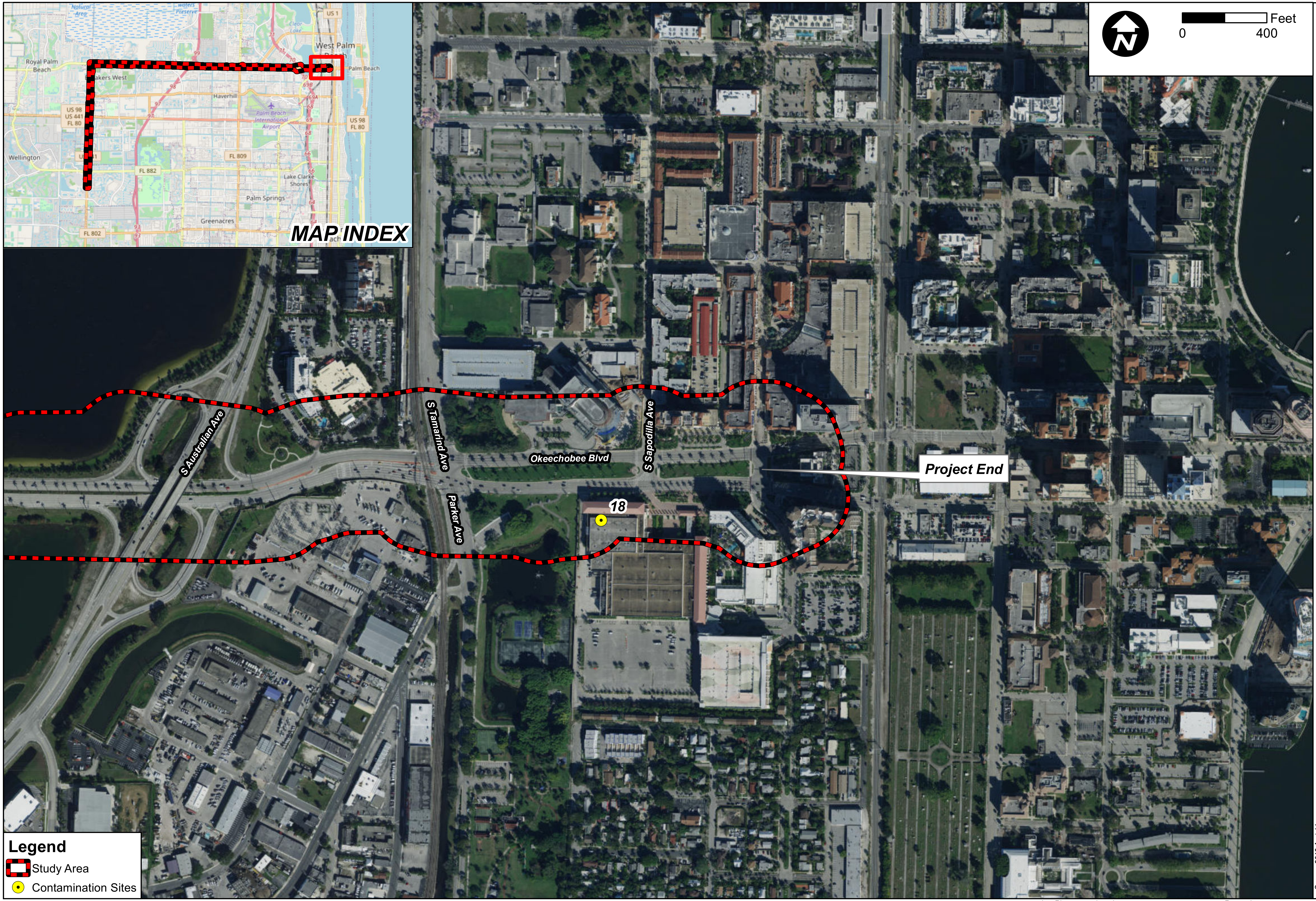

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EVALUATION METHODOLOGY

This document describes the evaluation of alternatives methodology identified for the Okeechobee Blvd. & SR 7 Multimodal Corridor Study (MCS). The evaluation of alternatives is a critical part of the alternatives analysis in which the information regarding each project alternative is presented, and key differences between alternatives are highlighted.

It is important to understand that the evaluation and planning phases of transit projects is a comprehensive process within which the technical analysis of alternatives and decisions proceeds. The process is continuous, such that a series of decisions are made throughout the analysis – modal options, alignment variations, design standards, operating policies, etc. – that together shape the definition and performance of each project alternative. Consistent with the Transit Concept and Alternative Review (TCAR) study process, various transit technologies and alignments are examined to provide technical analyses that are sufficient to understand trade-offs between alternatives to support an informed decision.

Six (6) enhanced transit alternatives will be evaluated, as well as one (1) No-Build / No-Action alternative. The evaluation criteria for this analysis will include both qualitative and quantitative measures. The intent of this evaluation is to facilitate a decision-making process for the selection of a Desired Transit Concept.

PROJECT DESCRIPTION

The Okeechobee Blvd. & SR 7 MCS evaluates transportation alternatives and transit supportive land uses to move people in a safe, efficient, and connected way, regardless of income, age, ability, or mode of travel across approximately 13.8 miles of Okeechobee Blvd./SR 704 and SR 7 as shown in Figure 1.

Okeechobee Blvd. provides a direct connection from western suburban areas to downtown West Palm Beach and regional transit connections. SR 7 is a regional north-south corridor that connects to Okeechobee Blvd. just before its northern terminus. In terms of the importance to the local transit network, Okeechobee Blvd. & SR 7 MCS intersect with 16 of Palm Tran's 32 local fixed-routes and account for approximately 15% of system ridership.

There are dedicated bicycle and pedestrian facilities along a majority of the study corridors. However, the existing non-motorized facilities do not support the land use in promoting alternate use of transportation.

The Okeechobee Blvd. & SR 7 MCS will develop a comprehensive plan to implement multimodal facilities that connect communities along the corridor through the development of a desired transit concept strategy.

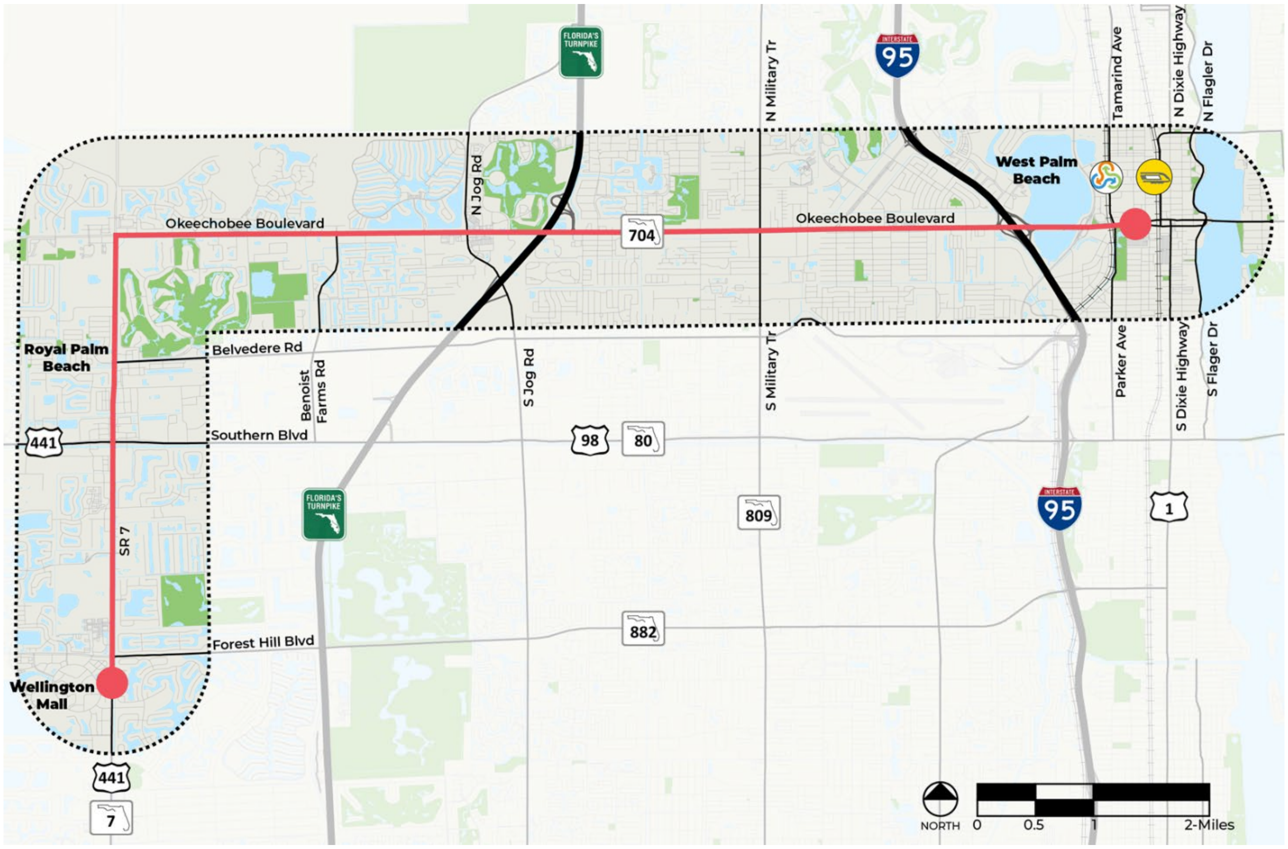


Figure 1. Okeechobee Blvd. & SR 7 MCS

EVALUATION METHODOLOGY

The purpose of the evaluation process is to identify criteria that align with the goals and objectives for the Okeechobee Blvd. & SR 7 MCS and facilitate decision making for the selection of a desired transit concept. The study's goals and objectives are based upon the adopted mission and vision of the Palm Beach Transportation Planning Agency (TPA).

Palm Beach TPA Mission

To collaboratively plan, prioritize, and fund the transportation system.

Palm Beach TPA Vision

A safe, efficient, and connected multimodal transportation system.

Project specific goals and objectives focus on multimodal access and connectivity while maximizing the value of transit service investments throughout the corridor.

These goals and associated objectives reflect the various needs and outcomes that the Okeechobee Blvd. & SR 7 MCS seeks to achieve.

Table 1 presents those project goals, objectives, and evaluation criteria for the evaluation of alternatives. The evaluation criteria may be refined through agency coordination and stakeholder outreach. Specific measures, scoring mechanisms and screening thresholds will be further defined as the project advances.

Table 1: Okeechobee Blvd. & SR 7 MCS Evaluation of Alternatives

Project Goals	Project Objectives	Evaluation Criteria
Allocate roadway space appropriately for non-motorized users, transit, and single occupancy vehicles.	A. Provide safe facilities for the most vulnerable users to create a comfortable environment. B. Maximize the corridor throughput with emphasis on shared mobility. C. Minimize travel time and delay for all users. D. Increase access to education, health care, and economic opportunity to improve community health.	• Equitable access to transit, bicycle, and pedestrian for underserved populations (low income, minority, senior citizens and/or is a zero-car household) • Transit Frequency and Service Span • Weekday Ridership • Transit Travel time
Maximize return on any investment in enhanced transit service area.	A. Locate transit stops at major existing and/or projected trip activity centers. B. Provide enhanced amenities at enhanced transit areas. C. Provide walkable and bikeable environments for first and last mile connection to improve access to transit. D. Provide capital investments that promote redevelopment/infill development that is supportive of transit.	• Station area population and employment densities • Minimizes environmental impacts • Potential for premium passenger amenities • Accommodates non-motorized modes (pedestrians, bicyclists) • Supportive land use policies • Characteristics of the transit mode that encourages redevelopment

EVALUATION CRITERIA

The type of criterion identified are those that, when applied, seek to inform a comparative analysis that distinguishes an alternative against an assessment of all project alternatives being proposed. Furthermore, these criteria were identified based upon the available information and data being prepared for this project phase of the Okeechobee Blvd. & SR 7 MCS. The evaluation criteria are aligned with the goals and objectives as previously presented (Table 2).

A ½ mile buffer will be applied along the corridor to include station stops for purposes of the analysis of the proposed alternatives.

An overview of the evaluation process is illustrated in Figure 2.

Scoring

The evaluation criteria listed in the previous section will be evaluated and assigned a score based upon available information and applicable date for each alternative. A numeric scale is proposed to conduct alternative comparison results to include the following:

- 3 – High or positive score
- 2 – Middle of moderate score
- 1 – Low score

For each criteria, a maximum score of three (3) points can be achieved as well as the lowest score being one (1). The results of each evaluation measure will be comparatively scored on a three (3) point scale by alternative

Evaluation measures with qualitative results are to be scored by assessing the relative difference between the qualitative ratings. For example, endangered species impacts the project alternatives may range from 'medium potential' to 'low potential'. An alternative with medium potential impacts receives two (2) points and alternatives with 'low impacts would receive three (3) points.

For evaluation measures where all alternatives result in exactly the same quantitative or qualitative results, all alternatives would be assigned a score of three (3).

Table 2: Okeechobee Blvd. & SR 7 MCS Alternatives Evaluation Criteria

Evaluation Criteria	
Goal: Allocate roadway space appropriately for non-motorized users, transit, and single occupancy vehicles.	
1	Minority Population (Title VI) within 1/2 mile
2	Transit Dependent Trips (zero car, under 16, over 65, low income) within 1/2 mile
3	Transit Service Frequency
	a) Peak (AM/PM)
	b) Off-Peak (Mid-day, evenings)
4	Span of Transit Service (New Service)
5	Number of Transit Stations
6	Station Accessibility
7	Estimated Average Weekday Ridership
	a) Total linked trips on project
	b) Number of new weekday linked transit trips
8	Transit Travel Time
	a) Transit vs average car commute time
9	Number of Median Opening Modifications and Closures
Goal Maximize return on any investment in enhanced transit service area.	
10	Population within 1/2 mile
11	Employment within 1/2 mile
12	Right-of-Way Impacts
13	Visual Impacts
14	Construction Impacts
15	Redevelopment / Transit Oriented Development Potential
16	Estimated Capital Cost ($000s)
17	Estimated Operating Cost ($000s)
18	No. of Peak Transit Vehicles Required to Operate Proposed Service

Project Alternatives

- No-Build/No-Action
- Mixed-traffic Bus with limited stops
- Business Access and Transit (BAT) curbside lane
- Curbside dedicated-lane Bus Rapid Transit (BRT)
- Center-platform dedicated-lane Bus Rapid Transit (BRT)
- Center-platform dedicated-lane Light Rail Transit (LRT)
- Elevated Light Rail Transit (LRT)

Input Data

- Demographic and Employment
- Ridership
- Traffic
- Land Use
- Environmental Conditions
- Right-of-Way

Analysis

- Transit Concepts
- Ridership Estimates
- Operations
- Right-of-Way
- Capital Costs
- Operations & Maintenance (O&M) Costs
- Land Use
- Economic Development

Evaluation Parameters

- Population & Employment Densities
- Multimodal Connectivity & Accessibility
- Costs
- Operational Impacts
- Environmental Impacts
- Right-of-Way Impacts
- Redevelopment / Transit Oriented Development (TOD) Potential

Desired Transit Concept to advance to PD&E phase

- No-Build/No-Action
- One Build Alternative

Figure 2. Evaluation of Conceptual Alternatives Process

ALTERNATIVES FOR EVALUATION

Preliminary planning efforts have identified a total of seven (7) Project corridor alternatives for evaluation that includes a No-Build / No-Action option and six (6) build options.

A detailed description of each alternative is presented in this section.

- No-Build/No-Action
- Mixed traffic bus with limited stops
- Business Access and Transit (BAT) curbside lanes
- Curbside dedicated-lane Bus Rapid Transit (BRT)
- Center-platform dedicated-lane BRT
- Center-platform dedicated-lane Light Rail Transit (LRT)
- Elevated grade-separated LRT

Each alternative traverses Okeechobee Blvd/SR 704 and SR 7 to connect with two (2) transit hubs as termini while serving numerous residential communities and commercial developments across three (3) municipalities.

- The Mall at Wellington Green
- Downtown West Palm Beach

The primary differences between each of the build alternatives involves the specific alignment placement within the existing right-of-way on Okeechobee Blvd. & SR 7 as well as the designated transit mode (bus, BRT, or LRT) and corresponding infrastructure improvements.

No-Build / No-Action Alternative

A No-Build / No-Action is provided as a means for a comparison with proposed build alternatives throughout the evaluation of the planning phase. The No-Build / No-Action Alternative includes all currently programmed and funded projects that will be implemented within the project corridor. These typically include both capital investments and planned service improvements that will occur without the construction of any one of the build alternatives proposed for implementation.

For the Okeechobee Blvd. & SR 7 MCS, these include improvements that are listed in the Palm Beach County Transportation Improvement Plan (TIP) FY 2021 – FY 2025. Transit service improvements are presented in the in the latest adopted Palm Tran Transit Development Plan (TDP) Annual Update (FY 2020 – FY 2029) which provides a 10-year strategic plan for transit service improvements and capital investments. The improvements programmed for the Okeechobee Blvd. & SR 7 MCS project limits include the following:

- Palm Beach TPA TIP (FY 2021 – FY 2025)
  - FM 44004561 – SR-7 at Weisman Way; Intersection Improvement
  - FM 2023991 – Belvedere Road at SR-7; Intersection Improvement
  - FM 4461771 – SR-7 from north of Southern Blvd. to Okeechobee Blvd.; Resurfacing

- FM 20239910 – Okeechobee Blvd. at Jog Road; Intersection Improvement
- FM 4415711 – Palm Tran bus shelters, various locations; Public Transportation Shelter
- FM 20219917 – Okeechobee Blvd. at Haverhill Road; Intersection Improvement
- FM 4397551 – I-95 at Okeechobee Blvd.; Interchange – Add Lanes
- 4461791 – Okeechobee Blvd. from Tamarind Avenue to West of Lakeview Avenue; Resurfacing

- Palm Tran Transit Development Plan (FY 2020 – FY 2029) includes the following service improvements for Route 43:

I. Increase Saturday morning span by two (2) hours.
II. Improve Weekday service frequency from 30 to 20 minutes.
III. Improve Saturday and Sunday service frequency from 60 minutes to 30 minutes.
IV. Extend weekday span of service one (1) AM hour and one (1) PM hour.
V. Extend weekend span of service one (1) AM hour and one (1) PM hour

Bus Rapid Transit Alternatives

Bus Rapid Transit (BRT) is a high-quality bus-based transit application that delivers fast and efficient service that may include a combination of dedicated exclusive bus lanes, traffic signal priority, off-board fare collection, level boarding platforms, and stations with higher level of amenities than a typical bus stop. BRT is often considered more reliable, convenient, and faster than regular local bus services.

The Federal Transit Administration (FTA) defines BRT as either corridor based or fixed guideway with investment features that are to emulate rail transit. Corridor based BRT operates in mixed traffic and includes capital investments to improve travel time. Fixed guideway BRT operates within an exclusive dedicated travel lane for greater than 50 percent of the alignment length during AM/PM peak travel periods. Both corridor based and fixed guideway BRT include substantial capital investment in transit signal technology, station amenities and service branding.

Mixed Traffic Bus Alternative

The Mixed Traffic Bus Alternative is a corridor based BRT project within the MCS project limits to include operational investments that will improve transit travel time and frequency. Mixed traffic bus is a common type of transit service which uses an existing outside or curbside general purpose travel lane that is shared with all other vehicular traffic (Figure 3). To load and unload passengers, buses remain in the outside traffic lane at transit stations or access a roadside bus bay if at a timed service point or layover. Currently, Palm Tran Route 43 operates along segments of Okeechobee Blvd. & SR 7 within the MCS limits as mixed bus transit service.

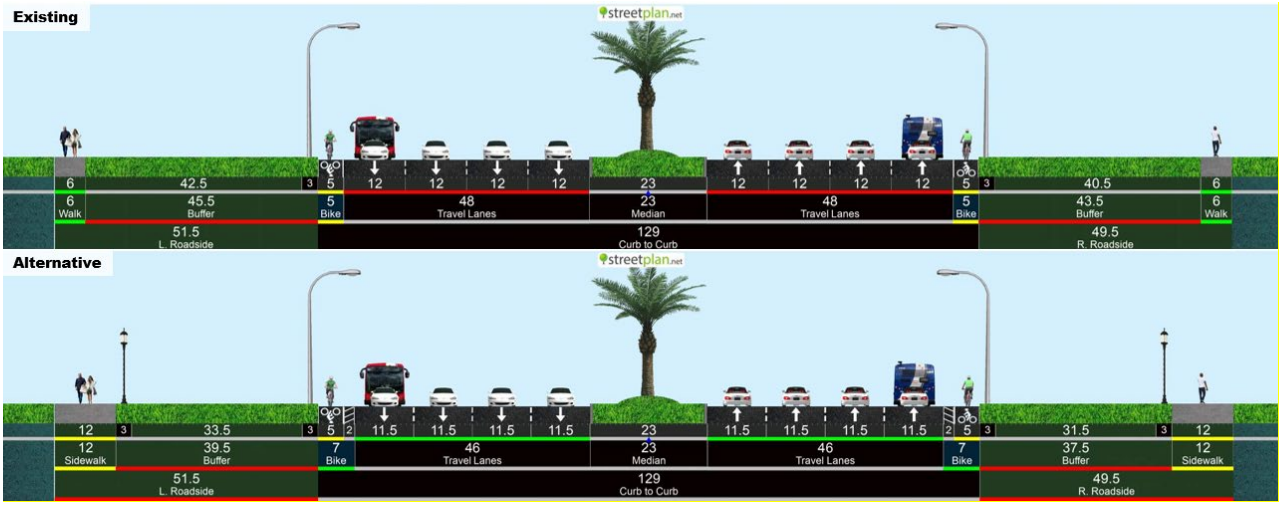


Figure 3. MCS Mixed Traffic Bus Alternative Concept

Business Access and Transit (BAT) Lanes Alternative

Business Access and Transit lanes are expressly reserved for buses with limited access for non-transit vehicles. BAT lanes are often created by converting an existing curbside general purpose travel lane for transit use only. A BAT lane is typically distinguished with additional pavement markings identifying travel lanes as bus only and, in some cases, by also applying colored pavement along the running way to visually separate the BAT lane from general purpose travel lanes. However, non-transit vehicles are allowed to access a BAT lane only when making a right-turn into a driveway or side street. Non-transit vehicles exiting a driveway or side street should turn into the nearest general purpose travel lane and only use the BAT to make this transition. Otherwise use of a BAT lane by non-transit vehicles is prohibited. Bicycles can be permitted to use BAT lanes if a dedicated bicycle lane is not provided on the street.

The MCS proposed BAT lane alternative would repurpose the existing outside or curbside travel lane on both Okeechobee Blvd. & SR 7. Since this alternative would include more than 50 percent of the alignment as a BAT lane the project meets the FTA definition of a fixed guideway BRT project. Additional investment in operation improvements such as transit signal prioritization, off-board fare collection, as well as transit stops with enhance passenger amenities are typically associated with a BAT lane option (Figure 4).

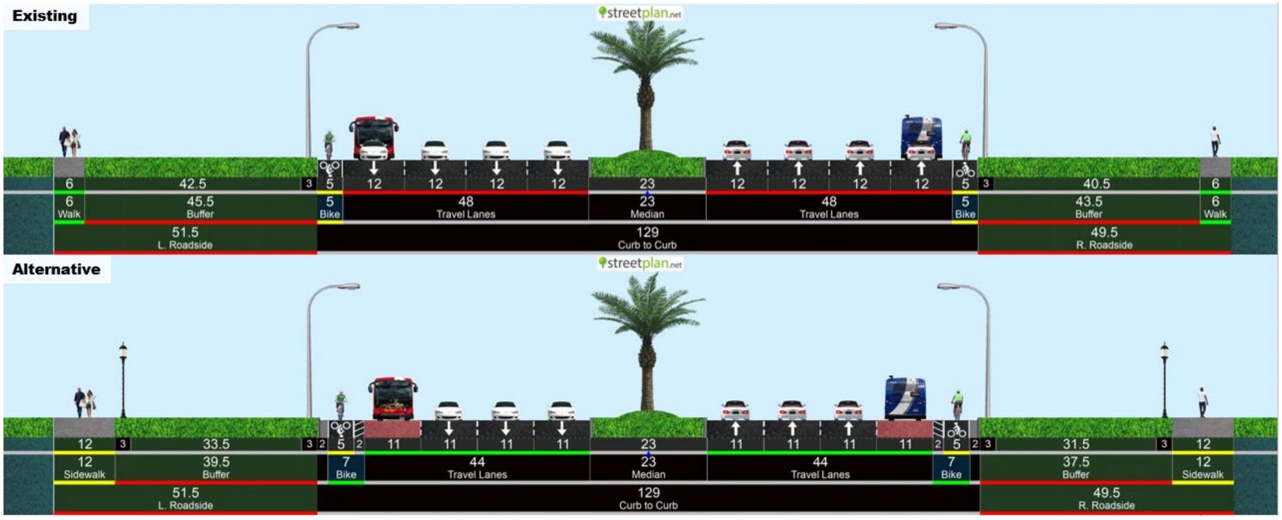


Figure 4. MCS BAT Lane Alternative Concept

Curbside Dedicated Lane BRT Alternative

The dedicated lane BRT alternative proposed for the Okeechobee Blvd. & SR 7 MCS would operate in the outside or curbside lane. This would involve the repurposing of a general use travel lane to an exclusive dedicated travel lane for bus (Figure 5). Although similar to the BAT Lanes Alternative, the dedicated BRT Lane Alternative will include an exclusive BRT lane over more than 50% along the entire length of the alignment to meet the definition of FTA Fixed Guideway BRT as well as additional investment at transit stations. However, there may also be locations along corridor segments that would allow access to adjacent driveways and side streets same as the previously described BAT Lane Alternative.

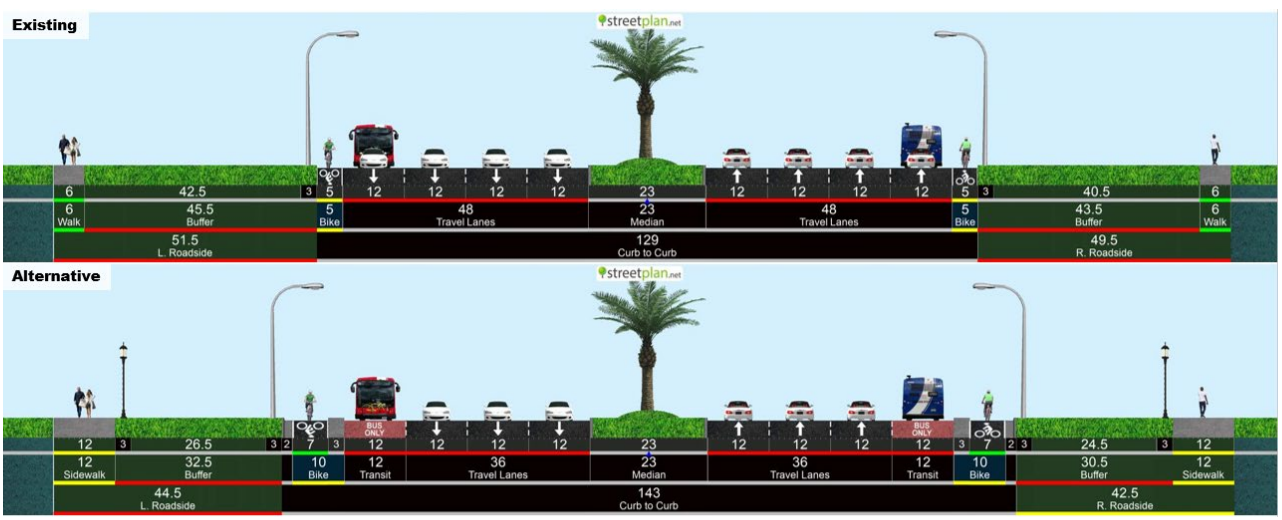


Figure 5. Dedicated BRT Lane Alternative Concept

Center Platform Dedicated Lane BRT Alternative

This alternative is a fixed guideway BRT option that would operate within a dedicated exclusive travel lane. The BRT guideway would be located in the median to include center station platforms that are accessible from both sides of a street while also creating a refuge area for pedestrian crossings. The proposed alternative would repurpose an existing inside general-purpose travel lane in each direction along the entire length of the MCS alignment for exclusive use by BRT buses (Figure 6). Stations would be located in the median at major intersections throughout the corridor.

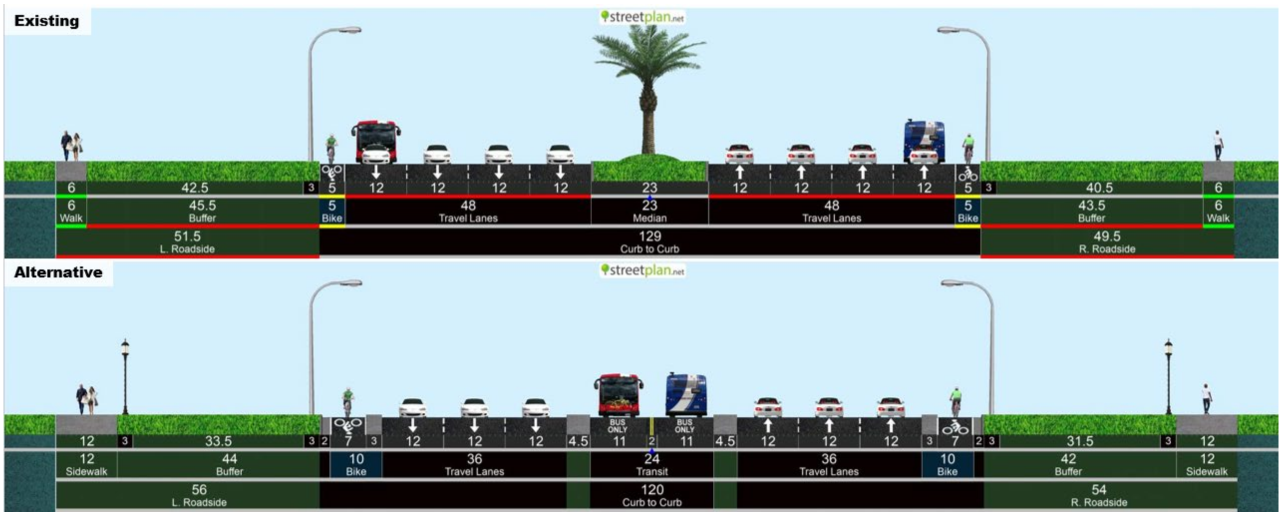


Figure 6. MCS Center Platform Dedicated Lane BRT Alternative Concept

Light Rail Transit

Light Rail Transit (LRT) is an electric powered, high-capacity rail technology capable of operating in a wide range of physical configurations. LRT typically operates in a one to two vehicle train configuration in a mostly or fully dedicated transit guideway. The two (2) primary types of light rail vehicles are streetcar and LRT. Streetcars are typically applied to a highly urbanized environment due to their smaller turning radius while also providing service more as a distributor system. LRT provides more passenger capacity and is more of a line haul service for longer distances which is more appropriate for the Okeechobee Blvd. & SR 7 MCS.

LRT systems that operate within an exclusive guideway typically operate within the roadway median. However, LRT alignments can be configured to operate in a curbside travel lane within an exclusive guideway or mixed traffic lane. Whether in dedicated or mixed-traffic lanes, the guideway must be kept clear from all but the briefest obstructions. Light Rail Vehicles (LRVs) have their own geometric needs that may differ from buses as well as being electrically powered by an overhead catenary system. LRT stations are substantial investments throughout a corridor and offer various passenger amenities such as level boarding platforms, ticket vending machines, wayfinding, station canopies and seating.

A new vehicle and maintenance and storage facility will be required for the new LRT vehicle fleet for the LRT alternatives being proposed as part of the Okeechobee Blvd. & SR 7 MCS.

Dedicated Lane Light Rail Transit (LRT) Alternative

The proposed dedicated lane LRT alternative would operate within the median of Okeechobee Blvd. & SR 7 (Figure 7). The alternative would repurpose the existing median to include a fixed guideway that would consist of tracks formed of continuously welded rails embedded at-grade in a concrete slab. An overhead catenary system that distributes electricity to LRVs would run along the entire length of the guideway. Stations would be configured as center platform stations that would be located at or near major intersections.

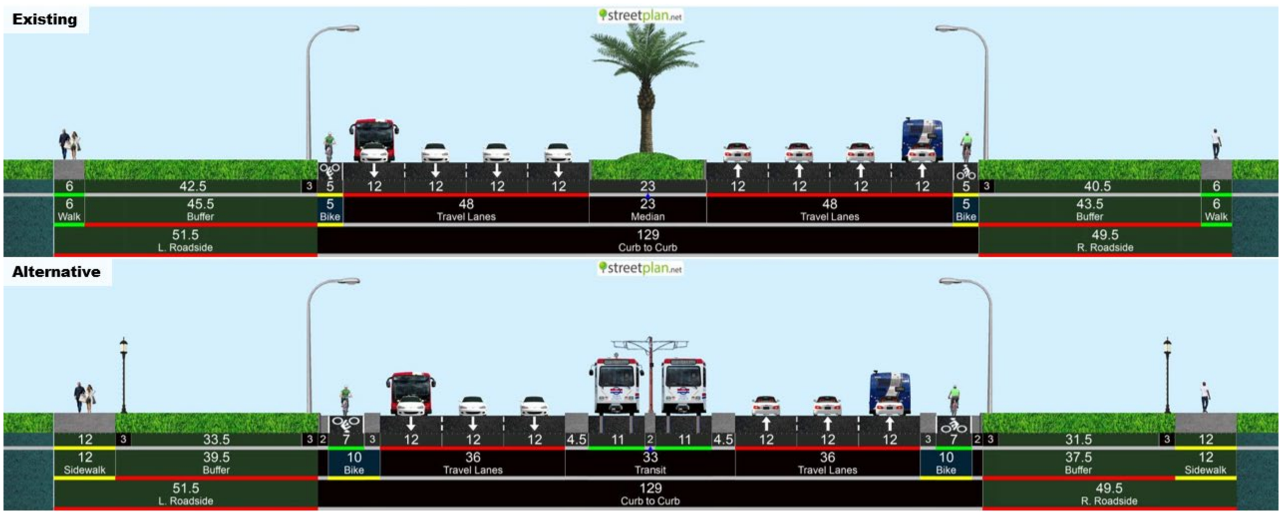


Figure 7. Dedicated Lane LRT Alternative Concept

Elevated LRT Alternative

Elevated LRT operates within an above street level exclusive guideway which eliminates any potential conflicts and therefore provides quick travel times for passengers. LRT may also follow street alignments but allows for tracing a different alignment, if necessary, crossing above streets, canals, and other rail lines. While being elevated the placement of support columns is required along the entire alignment and requires lengthy segments to span over major intersections.

Elevated LRT involves a substantial capital investment due to elevating both the guideway and station platforms along an entire alignment. The elevated LRT alternative proposed for the Okeechobee Blvd. & SR 7 MCS project would be placed along the median of each roadway (Figure 8). Stations also being elevated, would require vertical circulation for passenger access either within the median of the roadway itself or spanning to each side of the roadway.

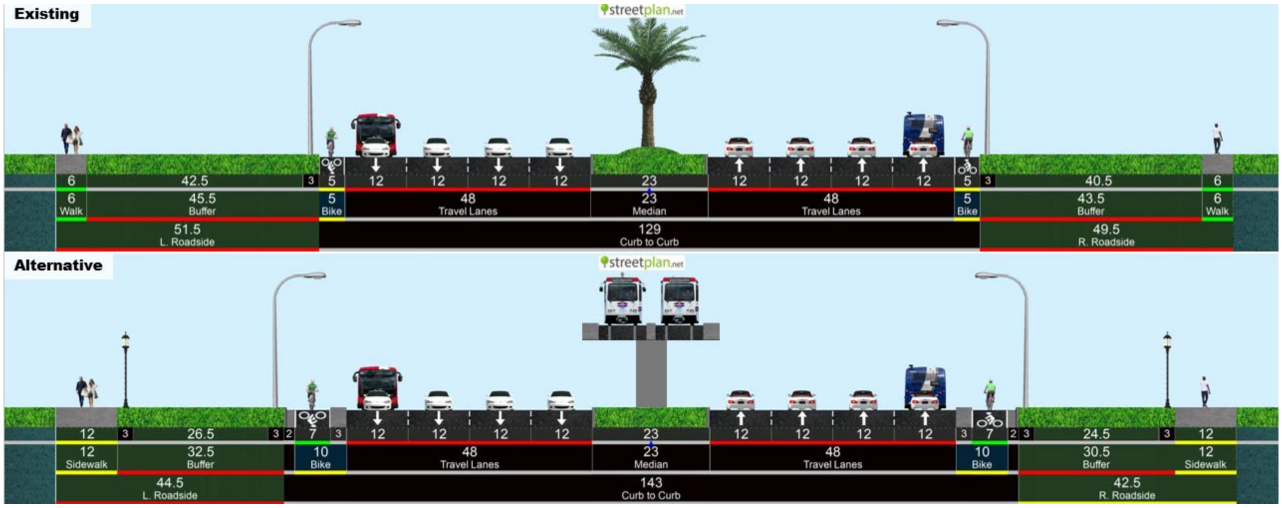


Figure 8. Elevated LRT Alternative Concept

ALTERNATIVES EVALUATION

The alternatives evaluation will be coordinated with public and stakeholder outreach for this project. Throughout the alternative evaluation, the study team, will involve various advisory committees that have been established for the Okeechobee Blvd. & SR 7 MCS.

TRANSIT SERVICE PLAN

The Okeechobee Blvd. & SR 7 Multimodal Corridor Study (MCS) will evaluate six (6) enhanced transit alternatives for purposes of improving mobility and connectivity along the corridors from the Mall at Wellington Green to Rosemary Ave in downtown West Palm Beach. This document specifies the service characteristics for each of the proposed alternative to include various modes and running way characteristics. Furthermore, the Federal Transit Administration (FTA) has established service characteristic thresholds that define Bus Rapid Transit (BRT) eligibility for Capital Investment Grant (CIG) funding – New Starts and Small Starts projects.

The Okeechobee Blvd. & SR 7 MCS transit alternatives service characteristics are defined by existing transit operations and the proposed transit mode, each of which provides a varying level of investment based upon infrastructure, technology, and passenger amenities.

A No-Build / No-Action alternative is also being evaluated for the Okeechobee Blvd. & SR 7 MCS.

- No-Build / No-Action
- Mixed traffic bus with limited stops
- Business Access and Transit (BAT) curbside lanes
- Curbside dedicated-lane BRT
- Center-platform dedicated-lane Bus Rapid Transit (BRT)
- Center-platform dedicated-lane Light Rail Transit (LRT)
- Elevated grade-separated LRT

EXISTING TRANSIT SERVICES

Service characteristics were compiled for all Palm Tran roues that operate within or on a portion of the Okeechobee Blvd. & SR 7 MCS. Data sources for route services characteristics include information that was obtained from Palm Tran. The Okeechobee Blvd. & SR 7 corridor is primarily served by Palm Tran Route 43. While Routes 40 and 52 provide service within the Okeechobee Blvd. & SR 7 Corridor on limited segments. A number of other Palm Tran routes also intersect Okeechobee & SR 7 to serve as transfer locations throughout the corridor.

Route 43

Palm Tran Route 43 provides local service in the Okeechobee Blvd. & SR 7 corridors that operates a bi-directional service between two main termini, the Mall at Wellington Green and the Intermodal Transit Center which is adjacent to the West Palm Beach Tri-Rail station. The route alignment includes segments on SR 7, Belvedere Rd, Benoist Farms Rd, Okeechobee Blvd., and Australian Avenue (Figure 1).

On weekdays, Route 43 operates at a 30-minute service frequency throughout its entire service span of 16.5 hours. On Weekends Route 43 provides 30-minute frequency on Saturdays and hourly frequency on Sunday's (Table 1). Along the SR 7 and Okeechobee Blvd. segments there are 76 stops on the Route 43 alignment.

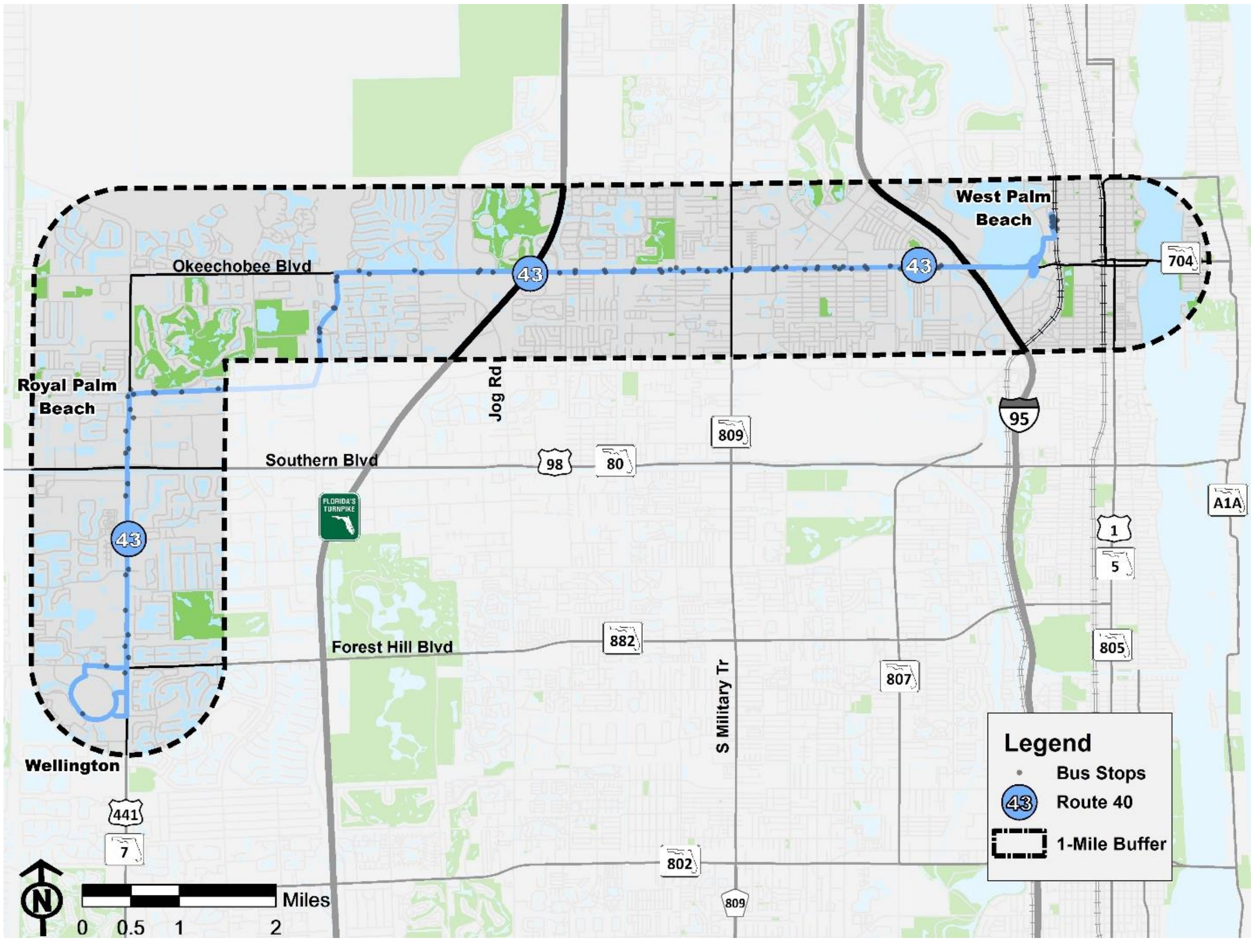


Figure 1. Palm Tran Route 43 Alignment and Station Stops

Table 1: Palm Tran Route 43 Existing Service Characteristics

Route 43	Headway (mins)	Total Service Span (Hours)	Service Span Hours AM - PM	Roundtrip Route Length (miles)	Roundtrip Travel Time (mins)	Scheduled Speed (mph)	Ridership
Weekday	30	16.5	5:38 AM – 10:06 PM	32	98.5	19.5	
Saturday	30	15.0	7:10 AM – 10:12 PM	32	90	21.3	
Sunday	60	11.0	8:10 AM – 7:12 PM	32	90	21.3	

Source: https://tripplan.palmtran.org/img/pdf/43.pdf

Route 40 and Route 52

Two (2) other Palm Tran routes operate on segments of the Okeechobee Blvd. and SR 7 corridors – Route 40 and Route 52. Route 40 is a limited stop service that operates on a segment of SR 7 between Southern Blvd. and the Mall at Wellington Green. On weekdays, Route 40 provides 30-minute service between 8:00 AM and 9:00 AM, and 60-minute frequency for all other times. For weekends, 60-minute frequency are provided on Saturday and Sunday with operations between 7:10 AM and 9:56 PM and 10:10 AM and 6:56 PM, respectively.

Route 52 operates service on SR 7 between Okeechobee Blvd. and the Mall at Wellington Green. On weekdays, Route 52 operates on 60-minute frequency between 5:43 AM and 7:22 PM. For weekends, Route 52 operates on Saturdays only with 60-minute frequency with service between 7:40 AM and 7:27 PM.

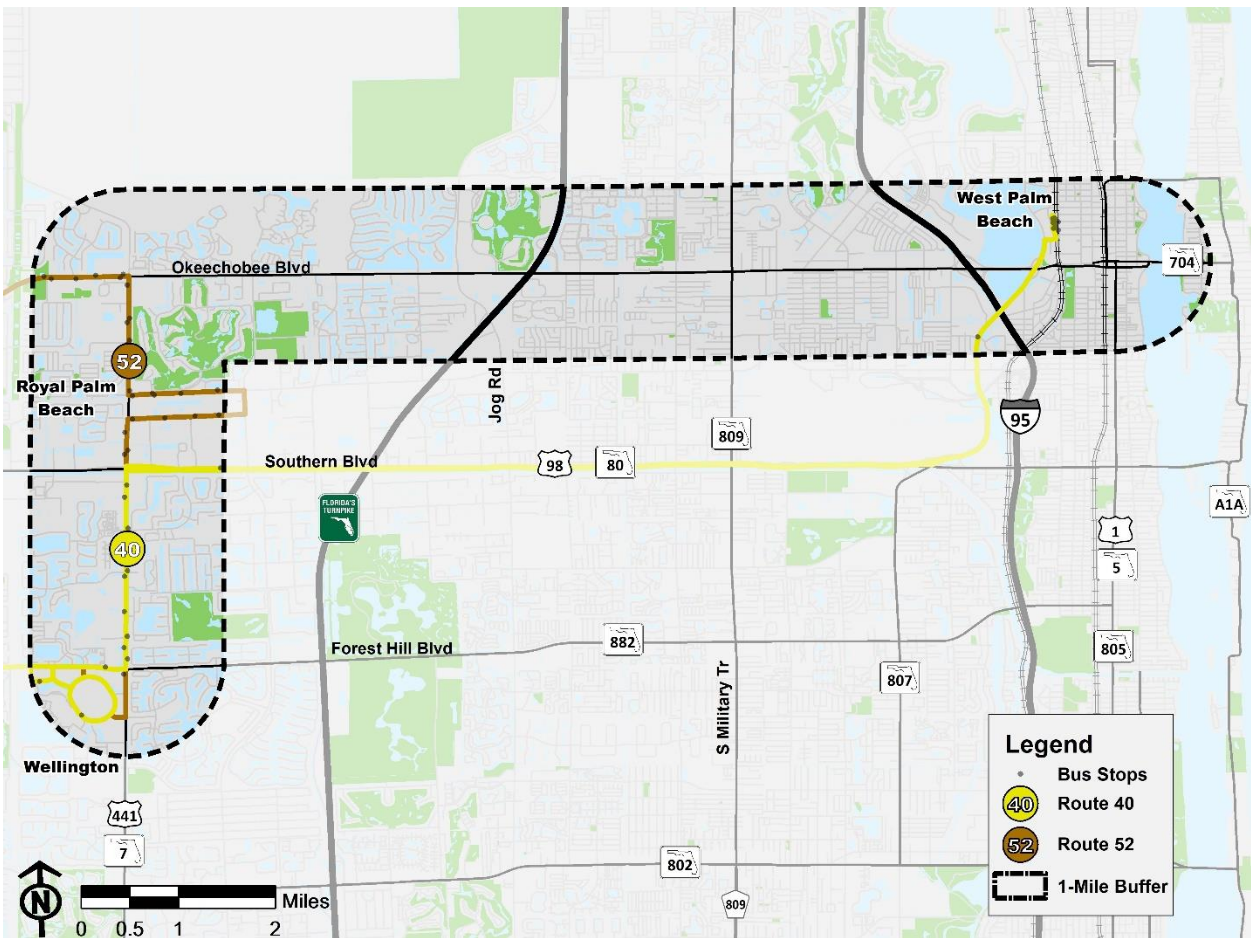


Figure 2. Palm Route 40 and 52 Alignment and Station Stops

Table 2: Palm Tran Route 40 and Route 52 Existing Service Characteristics

Route	Service Day	Headway (mins)	Total Service Span (Hours)	Service Span Hours AM - PM	Roundtrip Route Length (miles)	Roundtrip Travel Time (mins)	Scheduled Speed (mph)	Ridership
40	Weekday	60	16.5	5:35 AM – 10:40 PM	99	169	35.1	
	Saturday	60	14.75	7:10 AM – 9:56 PM	70	92	45.7	
	Sunday	60	8.75	10:10 AM – 6:56 PM	70	92	45.7	
52	Weekday	60	13.5	5:43 AM – 7:22 PM	36	90	24	
	Saturday	60	11.75	7:40 AM – 7:27 PM	36	93	23.2	

Source: https://tripplan.palmtran.org/Schedule/index

Intersecting Palm Tran Route Service

Ten (10) Palm Tran routes intersect the Okeechobee Blvd. & SR 7 corridor at various points which provide opportunities for passenger transfers and connecting service options through Palm Beach County. A map illustrating each of these route alignments is presented in Figure 3 and existing service characteristics are listed in Table 3.

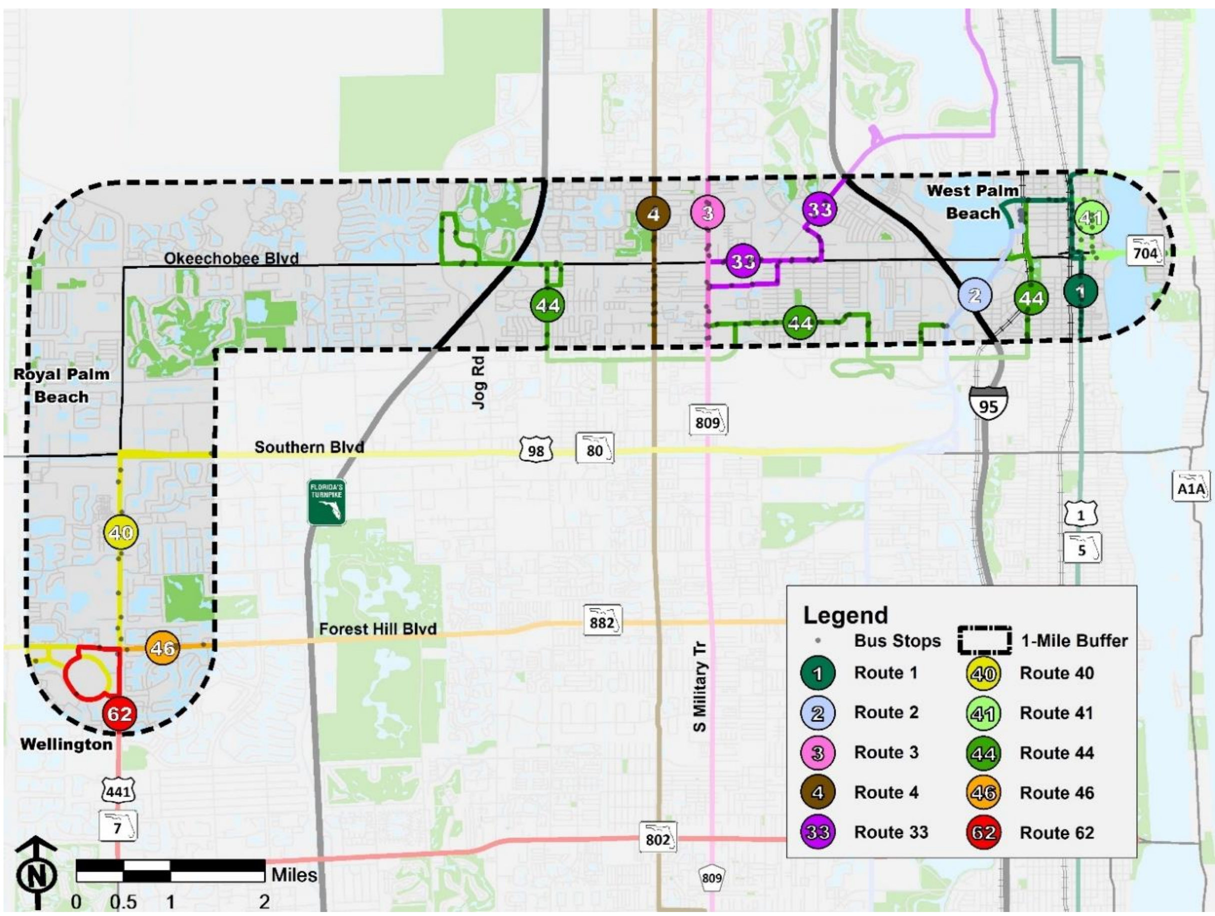


Figure 3. Existing Palm Tran Routes that intersect Okeechobee Blvd. & SR 7 MCS

Table 3. Palm Tran Routes that Intersect Okeechobee Blvd. & SR 7 Existing Service Characteristics

Route	Service Day	Headway (mins)	Total Service Span (Hours)	Service Span Hours AM - PM	Roundtrip Route Length (miles)	Roundtrip Travel Time (mins)	Scheduled Speed (mph)
1	Weekday	20	17	5:26 AM – 10:37 PM	88	325	16.2
	Saturday	30	16	6:14 AM – 10:17 PM	88	298.5	17.7
	Sunday	30	11.5	8:14 AM – 7:38 PM	88	298	17.7
2	Weekday	30	17.5	5:16 AM – 10:55 PM	62	221	16.8
	Saturday	45	15.25	7:00 AM – 10:13 PM	62	212	17.5
	Sunday	60	12.25	7:44 AM – 8:03 PM	62	196	19.0
3	Weekday	30	17.5	5:06 AM – 10:30 PM	76	275	16.6
	Saturday	30	16.5	6:00 AM – 10:35 PM	76	233	19.6
	Sunday	60	11.5	8:20 AM – 7:53 PM	76	219.5	20.8
4	Weekday	60	13.75	6:10 AM – 7:52 PM	28	92.5	18.2
	Saturday	60	12	7:30 AM – 7:21 PM	28	84	20.0
	Sunday	60	8.75	9:30 AM – 6:13 PM	28	78	21.5
33	Weekday	40	15	5:55 AM – 8:47 PM	34	131.5	15.5
	Saturday	60	13.5	7:18 AM – 8:46 PM	34	130	15.7
	Sunday	60	9.75	8:40 AM – 6:25 PM	34	130	15.7
40	Saturday	60	14.75	7:10 AM – 9:56 PM	70	92	45.7
	Sunday	60	8.75	10:10 AM – 6:56 PM	70	92	45.7
	Weekday	60	13.5	5:43 AM – 7:22 PM	36	90	24
41	Weekday	20	10.75	6:35 AM – 5:21 PM	22	60.5	21.8
	Saturday	60	9	7:35 AM – 4:30 PM	22	55	24.0
	Sunday	-	-	-	-	-	-
44	Weekday	60	13.75	5:45 AM – 7:30 PM	30	106	17.0
	Saturday	60	11.75	6:44 AM – 6:30 PM	30	96	18.8
	Sunday	60	8.75	8:40 AM – 5:28 PM	30	96	18.8
46	Weekday	30	16	5:55 AM – 9:59 PM	24	82	17.6
	Saturday	45	15	7:10 AM – 10:03 PM	24	74	19.5
	Sunday	45	10.5	8:40 AM – 7:03 PM	24	74	19.5
62	Weekday	20	16.5	5:40 AM – 10:15 PM	30	100	18
	Saturday	30	15	7:12 AM – 10:15 PM	30	100	18
	Sunday	30	10.75	8:55 AM – 7:37 PM	30	100	18

Source: https://tripplan.palmtran.org/Schedule/index

PROJECT ALTERNATIVES

For the Okeechobee Blvd. & SR 7 MCS a No-Build / No-Action alternative will be evaluated as well as six (6) enhanced transit alternatives.

No-Build / No-Action Alternative

The No-Build / No Action alternative includes the existing transit services that are in operation within the Okeechobee Blvd. & SR 7 Corridor. These include Palm Tran Routes 40, 43, and Route 52 to include their existing peak headways, service span and stop locations. Note that the Palm Tran FY 2020- 2029 Transit Development Plan (TDP) Annual Update identified improving Route 43 weekday headways from 30-minutes to 20-minutes as well as adding one hour to the AM and PM service span. Although service changes were identified in the most recent TDP, these modifications have yet to be implemented and will undergo further evaluation by Palm Tran.

Enhanced Transit Alternatives

All six (6) enhanced transit alternative alignments will operate within the existing right-of-way of the Okeechobee Blvd. & SR 7 MCS limits. These six transit alternatives include both BRT and LRT options. Fixed guideway and corridor-based transit are two (2) types of transit projects as defined by the FTA.

Fixed-guideway projects operate within an exclusive right-of-way that is dedicated for transit use only. Examples of fixed guideway projects are rail projects, such as LRT that typically operate within the median, and BRT which can operate within the median or curbside travel lanes. For a BRT project to meet FTA's definition of fixed guideway, over 50% of the BRT route must operate in a dedicated right-of-way during peak travel periods. Other traffic is allowed to make turning movements through the separated right-of-way. Business Access Transit (BAT) lanes are an example of a type of BRT option. A curbside lane is dedicated for transit use during peak travel periods but also maintains access to neighboring businesses and residential neighborhoods.

Corridor-Based alternatives are typically BRT projects that operate within mixed traffic and include capital investments that improve travel time. Both corridor based and fixed guideway BRT include substantial capital investment in transit signal technology, station amenities, and service branding.

The FTA requires that fixed guideway and corridor-based projects provide short headway, bidirectional service for a minimum of 14 hours on weekdays. Short headway service is defined as 15-minute headways throughout the entire weekday, or 10-minute headways during peak periods and no greater than 20-minute maximum headways at all other times.

A description of service characteristics for each proposed transit alternative is presented for Okeechobee Blvd. & SR 7 MCS.

Mixed Traffic Bus with Limited Stops

The mixed traffic limited stop bus Alternative will include a new service route between the Mall at Wellington Green and Intermodal Transit Center with an alignment on SR 7 and Okeechobee Blvd. The limited stop service will operate with mixed traffic in the curbside lane. This alternative would meet the FTA definition of a corridor-based BRT project. The proposed service plan will include headways of 15-minutes during the peak travel periods and a service span between 4:30 AM and 11:00 PM on weekdays.

Since this is a Limited Stop service, station stops spacing will not occur as frequent as existing fixed route bus service that operates along segment of Okeechobee Blvd. and SR 7. Transit signal priority investments will also occur to improve transit travel time which will also benefit traffic flow throughout the project limits.

Palm Tran routes (40 and 52) will remain in operation on segments of SR 7 and Okeechobee Blvd. with the same headways and stop locations as existing service.

Business Access and Transit (BAT) Curbside Lanes

Business Access and Transit lanes are expressly reserved for buses an allow limited access for non-transit vehicles. BAT lanes are often created by converting an existing curbside general purpose travel lane for transit use only. A BAT lane is typically distinguished with additional pavement markings identifying travel lanes as bus only. However, non-transit vehicles are allowed to access a BAT lane only when making a right-turn into or exiting from a driveway or side street.

According to FTA's definition, a BAT curbside lane is a form of fixed guideway BRT. The minimum peak hour service frequency for BRT is 10-minutes during the AM/PM peak and 15-minutes all other times. A minimum service span of 14 hours on weekdays and ten hours on weekends is also required by the FTA to be designated as BRT service. For the MCS evaluation, BRT service will have a service span of 18.5 hours.

Additionally, BRT service warrants a major capital investment in transit signal technology and passenger station amenities. For those guideway segments that are not exclusive, queue jumps, or signal priority are additional improvements for implementation to assure competitive transit travel times.

Curbside Dedicated-Lane BRT

The curbside dedicated lane provides for a fixed guideway BRT lane along the entire alignment as compared to the BAT lane alternative which may provide an exclusive lane separation for just over 50% of the alignment. Transit stops would be located on the adjacent curb in each direction.

The minimum peak hour service frequency for this BRT alternative is 10-minutes during the AM/PM peak travel periods and 15-minutes all other times. A minimum service span of 14 hours on weekdays and ten hours on weekends is also required. For the Okeechobee Blvd. & SR 7 MCS evaluation, Curbside Dedicated-Lane BRT would operate with a service span of 18.5 hours on weekdays.

Center-Platform Dedicated-Lane BRT

Center Platform Dedicated Lane BRT provides for a fully dedicated fixed guideway BRT along the entire alignment within the Okeechobee Blvd. & SR 7 MCS limits. Station locations would be located in the median with access provided by high emphasis crosswalks. The service frequency for this alternative will include 10-minutes during the AM/PM peak travel periods and 15-minutes all other times. For the Okeechobee Blvd. & SR 7 MCS evaluation, BRT service will have a service span of 18.5 hours.

Center-Platform Dedicated-Lane Light Rail Transit (LRT)

The proposed alternative would operate within an exclusive double tracked fixed guideway in the roadway median for the entire length of the alignment. Transit stations would also be located in the median with a center platform and with access provided by high emphasis crosswalks. The minimum peak hour service frequency for the LRT alternative is 10-minutes during the AM/PM peak travel periods and 15-minutes all other times. The LRT alternative will operate with an 18.5 hour service span.

Elevated Grade-Separated LRT

The elevated LRT alternative proposed for the Okeechobee Blvd. & SR 7 MCS project would be placed along the median for the entire alignment. The elevated exclusive fixed guideway would be double tracked. Stations also being elevated, would require vertical circulation for passenger access which could occur from each side of the roadway via an elevated walkway or from the median upon using a street level pedestrian crossing. The minimum peak hour service frequency for the elevated LRT alternative is 10-minute headways during the AM/PM peak travel periods and 15-minutes all other times. The LRT alternative will operate with an 18.5 hour service span.

Table 4: Okeechobee Blvd. & SR 7 MCS Project Alternative Service Plan Summary

Proposed Alternative	Peak Hour Headway (mins)	Off Peak Headway (mins)	Service Span (hours)	Service Span	Alignment Configuration
No Build	20	20	16.5	4:30AM – 9:00PM	Existing Service alignment in mixed traffic
Mixed Traffic bus w/Limited Stops	15	15	18.5	4:30AM – 11:00PM	Mixed Traffic
BAT Curbside Lane	10	15	18.5	4:30AM – 11:00PM	Exclusive Guideway that allows turning vehicles
Curbside Dedicated-lane BRT	10	15	18.5	4:30AM – 11:00PM	Exclusive Guideway that allows turning vehicles
Center Platform Dedicated BRT	10	15	18.5	4:30AM – 11:00PM	Dedicated Exclusive Guideway
Center Platform Dedicated-lane LRT	10	15	18.5	4:30AM – 11:00PM	Dedicated Exclusive Guideway
Elevated Grade Separated LRT	10	15	18.5	4:30AM – 11:00PM	Dedicated Exclusive Guideway

TRANSIT STATIONS

Three (3) types of transit stops are considered for the Okeechobee Blvd. & SR 7 MCS to include near-side, far-side, and median. It should be noted that roadway configuration, physical conditions, and availability of right-of-way may restrict the type of transit stop that can be feasibly implemented.

Near-Side Transit Stations

Near-side stations are located immediately before entering an intersection which allows passenger boarding and alighting to occur while a transit vehicle is stopped at a red light. A transit vehicle re-enters traffic during a green traffic light phase, once the intersection is clear of traffic. Near-side station stops allow passengers to board transit adjacent to a crosswalk, minimizing walk distances. During peak travel periods, transit vehicles that stop at near-side station may block the through lane approach to an intersection, potentially disrupting traffic flow.

Far-Side Transit Stations

Far-side stops are located immediately after an intersection, allowing transit to pass through an intersection and then stop to load and unload passengers. Far-side stops eliminate the potential for a bus to block and delay traffic on the approach to an intersection. Peak travel periods and congested conditions may cause buses and autos to queue into an intersection while waiting to access a bus stop.

Median Transit Stations

Median stations are located in the median adjacent to an intersection. Stations can be center platform or separate platforms for each direction. Since passengers must cross travel lanes to access a median station, intersection improvements are necessary to improve pedestrian safety and prioritize pedestrian movement while eliminating turn conflicts. Furthermore, each alternative will serve the same station stop location. However, the configuration of a station stop will differ according to mode and whether an alternative is operating in the median. Median or center running alignments would serve a center platform station that provides access to both directions of service. While curbside alignments will provide two (2) stations for each location identified – one (1) station for each direction of travel.

Proposed Transit Station Locations

The following intersection have been identified for potential station locations and are listed beginning in the western portion of the Okeechobee Blvd. & SR 7 MCS project limits. These stations are illustrated in Figure 4:

- Mall at Wellington Green
- Wellington Regional Medical Center
- Old Hammock Way
- Victoria Groves Blvd.
- Southern Blvd.
- Belvedere Road
- SR 7 at Okeechobee Blvd.
- Sansburys Way
- Benoist Farms Road
- Jog Road
- Meridian Road
- Haverhill Road
- Military Trail
- Palm Beach Lakes Blvd.
- Congress Ave.
- Tamarind Ave.
- Rosemary Ave.

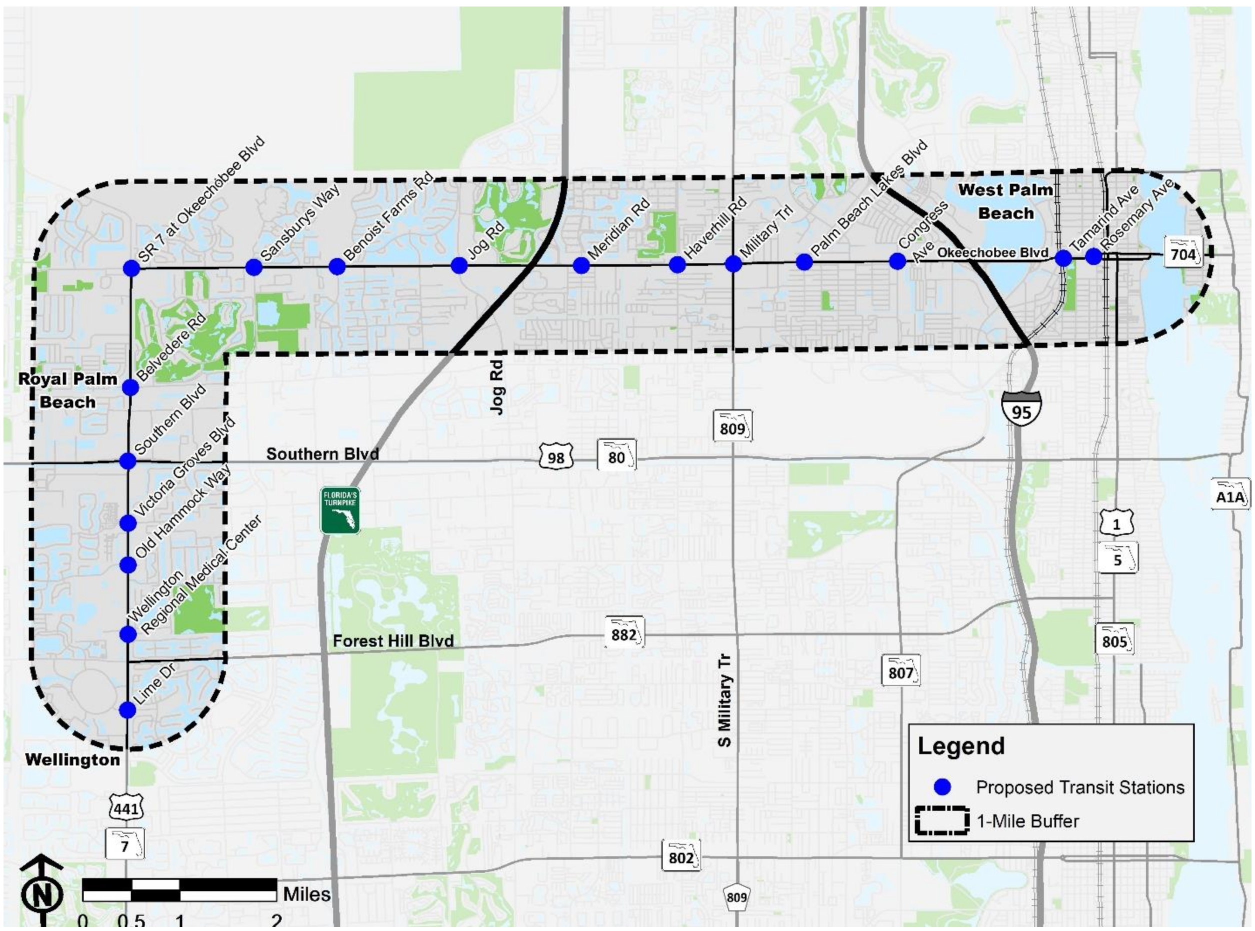


Figure 4. Proposed Transit Stations along Okeechobee Blvd. & SR 7 MCS

Table 5: Okeechobee Blvd. & SR 7 MCS Project Alternative Station Location Summary

		Proposed Station Stop Location	No Build (Existing Service)	Bus Limited Stop	Curbside BAT Lane	Curbside Dedicated-lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated-lane LRT	Elevated Grade Separated LRT
1	SR 7	Lime Drive / Mall at Wellington Green	N/A						
2	SR 7	Regional Medical Center	N/A	NB – Far-side SB -- Far-side	NB – Far-side SB -- Far-side	NB – Far-side SB – Far-side	Median	Median	Median
3	SR 7	Old Hammock Way	N/A	NB – Far-side SB -- Far-side	NB – Far-side SB -- Far-side	NB – Far-side SB – Far-side	Median	Median	Median
4	SR 7	Victoria Groves Blvd.	N/A	NB – Far-side SB -- Far-side	NB – Far-side SB -- Far-side	NB – Far-side SB – Far-side	Median	Median	Median
5	SR 7	Southern Blvd.	N/A	NB – Far-side SB – Near-side	NB – Far-side SB – Near-side	NB – Far-side SB – Near-side	Median	Median	Median
6	SR 7	Belvedere Road	N/A	NB – Far-side SB – Near-side	NB – Far-side SB – Near-side	NB – Far-side SB – Near-side	Median	Median	Median
7	SR 7	Okeechobee Blvd.	N/A	EB – Far-side SB – Far-side	EB – Far-side SB – Far-side	EB – Far-side SB – Far-side	Median	Median	Median
8	Okeechobee Blvd.	Sansburys Way	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
9	Okeechobee Blvd.	Benoist Farms Rd	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
10	Okeechobee Blvd.	Jog Road	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
11	Okeechobee Blvd.	Meridian Road	N/A	EB – Far-side WB – Near-side	EB – Far-side WB – Near-side	EB – Far-side WB – Near-side	Median	Median	Median
12	Okeechobee Blvd.	Haverhill Road	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
13	Okeechobee Blvd.	Military Trail	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
14	Okeechobee Blvd.	Congress Avenue	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
15	Okeechobee Blvd.	Palm Beach Lakes Blvd.	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
16	Okeechobee Blvd.	Tamarind Ave.	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median
17	Okeechobee Blvd.	Rosemary Ave.	N/A	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	EB – Far-side WB – Far-side	Median	Median	Median

RUNNING TIME / FLEET REQUIREMENTS

The Palm Beach Transportation Planning Agency (TPA) is the designated Metropolitan Planning Organization (MPO) serving all of Palm Beach County, Florida, and is comprised of a 21-member governing board and associated staff that maintains a long-range forecast of population, employment, and transportation projects and services that advance the regional vision. The TPA often coordinates and collectively works with Palm Tran, Palm Beach County's public transit operator. Palm Tran operates over 30 fixed routes, "Connection" paratransit service, and "GoGlades" demand response across the county.

The TPA has engaged a consultant team to conduct a planning study of the Okeechobee Blvd & SR 7 Multimodal Corridor Study (MCS). The study aims to review several transit alternatives, develop a ridership forecast, and ultimately recommend an alternative that provides safe, efficient, and connected facilities for all modes of travel along these corridors. The purpose of this memorandum is to document the methodology and develop running times utilized to forecast ridership for each transit alternative. Estimated peak vehicle requirements for each transit alternative are also provided.

TRANSIT ALTERNATIVE DEFINITIONS

A total of six (6) enhanced transit alternatives were evaluated for this effort. Palm Tran Route 43 currently operates along most of the corridor and serves as the No-Build/No Action alternative (Alternative 1). In addition to the no-build, four (4) bus alternatives and two (2) light rail transit (LRT) alternatives were investigated and are detailed below.

- Alternative 1: No Build/No Action (Palm Tran Route 43)
- Alternative 2: Mixed traffic bus with limited stops
- Alternative 3: Business access and transit (BAT) curbside lanes
- Alternative 4: Curbside dedicated-lane BRT
- Alternative 5: Center-platform dedicated-lane bus rapid transit (BRT)
- Alternative 6: Center-platform dedicated-lane LRT
- Alternative 7: Elevated grade-separated LRT

The no build (Alternative 1) follows the existing Palm Tran route 43 alignment. Alternatives 2 through 6 all follow a streamlined version of Palm Tran Route 43's alignment, via SR 7 and Okeechobee Blvd. Alternative 7 (Elevated grade-separated LRT) is not constrained to the street network. All alternatives are expected to serve the same station locations. The following describes each alternative's proposed operations. Maps of the no build and the proposed alternatives are shown in Figure 1 and additional details of operating assumptions for each alternative can be found in Appendix A.

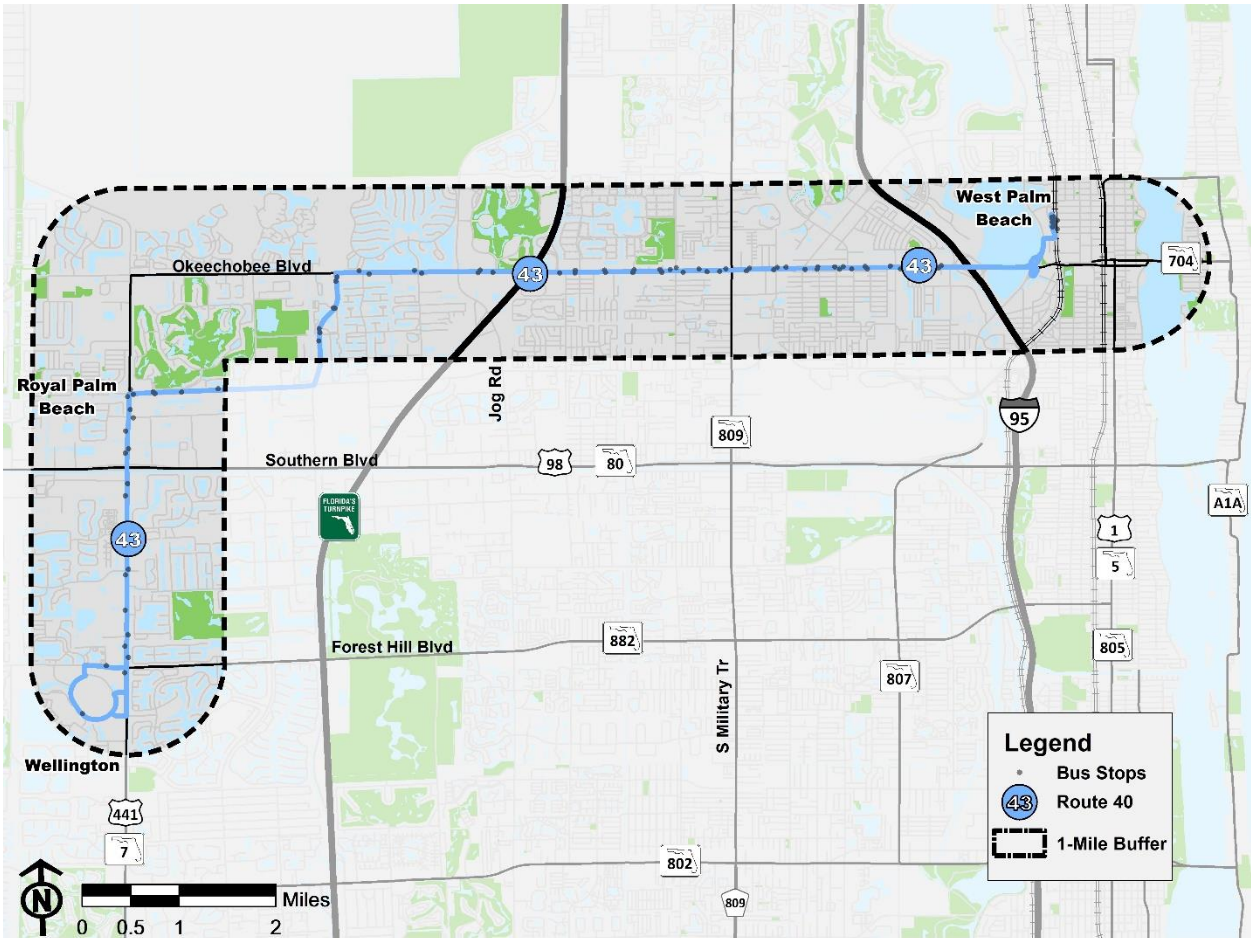


Figure 1. Existing Palm Tran Route 43

Alternative 1: No-Build/No Action (Existing Palm Tran Route 43)

Existing Palm Tran Route 43 serves as the no-build alternative. This route operates seven (7) days a week with 30-to-60-minute frequencies on weekdays and Saturdays, and 60-minute frequencies on Sundays between the Mall at Wellington Green in Wellington and the Intermodal Transit Center in the West Palm Beach. The weekday span of service is from 4:30 AM to 9:00 PM. This existing service operates in mixed traffic and achieves an average speed of approximately 16.5 mph. Palm Tran's Route Performance Maximization (RPM) study recommended an enhanced frequency for this service (20-minute frequency throughout most of the day) that was ultimately utilized in the ridership forecast model. The alignment for this alternative is shown in Figure 1.

Alternative 2: Mixed Traffic Bus with Limited Stops

Alternative 2 operates over the entire length of the study corridor, following the alignment shown in Figure 2. It is proposed to operate from 4:30 AM to 11:00 PM with 15-minute frequencies throughout the day. Alternative 2 operates a limited stop pattern in mixed traffic, only stopping at the stations identified on the map. No special treatments are applied to this alternative, and it achieves an average speed of 17.9 mph.

Alternative 3: Business Access and Transit (BAT) curbside lanes

Alternative 3 operates over the entire length of the study corridor, following the alignment shown in Figure 2. It is proposed to operate from 4:30 AM to 11:00 PM with 10-minute frequencies in the peaks and 15-minute frequencies in the off peak. Alternative 3 operates a limited stop pattern, only stopping at the stations identified on the map. Most of the alternative operates in curbside, business access and transit (BAT) lanes that are reserved for transit vehicles and right turning vehicles. In addition, transit signal priority (TSP) is applied to the entire corridor, and it achieves an average speed of 19.3 mph.

Alternative 4: Curbside dedicated-lane BRT

Alternative 4 operates over the entire length of the study corridor, following the alignment shown in Figure 2. It is proposed to operate from 4:30 AM to 11:00 PM with 10-minute frequencies in the peaks and 15-minute frequencies in the off peak. Alternative 4 operates a limited stop pattern, only stopping at the stations identified on the map. Most of the alternative operates in curbside, dedicated bus only lanes. TSP is applied to the entire corridor and queue jumps are anticipated at multiple intersections along the alignment. It achieves an average speed of 20.5 mph, which is slightly slower than the center-running alternative (Alternative 5) due to the greater opportunity for conflict in a curbside lane.

Alternative 5: Center-platform dedicated-lane Bus Rapid Transit (BRT)

Alternative 5 operates over the entire length of the study corridor, following the alignment shown in Figure 2. It is proposed to operate from 4:30 AM to 11:00 PM with 10-minute frequencies in the peaks and 15-minute frequencies in the off peak. Alternative 5 operates a limited stop pattern, only stopping at the stations identified on the map. Most of the alternative operates in center-running, dedicated bus only lanes. TSP is applied to the entire corridor, and it achieves an average speed of 20.8 mph.

Alternative 6: Center-platform dedicated-lane Light Rail Transit (LRT)

Alternative 6 operates a single consist, light rail vehicle over the entire length of the study corridor, following the alignment shown in Figure 2. It is proposed to operate from 4:30 AM to 11:00 PM with 10-minute frequencies in the peaks and 15-minute frequencies in the off peak. Alternative 6 operates a limited stop pattern, only stopping at the stations identified on the map.

Most of the alternative operates at grade, in center-running lane dedicated right of way. TSP is applied to the entire corridor, and it achieves an average speed of 22.1 mph.

Alternative 7: Elevated grade-separated LRT

Alternative 7 operates a single consist, light rail vehicle in elevated right of way over the entire length of the study corridor, following the alignment shown in Figure 2. It is proposed to operate from 4:30 AM to 11:00 PM with 10-minute frequencies in the peaks and 15-minute frequencies in the off peak. Alternative 7 operates a limited stop pattern, only stopping at the stations identified on the map. The alternative operates exclusively in its own, above grade, dedicated right of way, and achieves an average speed of 30.8 mph.

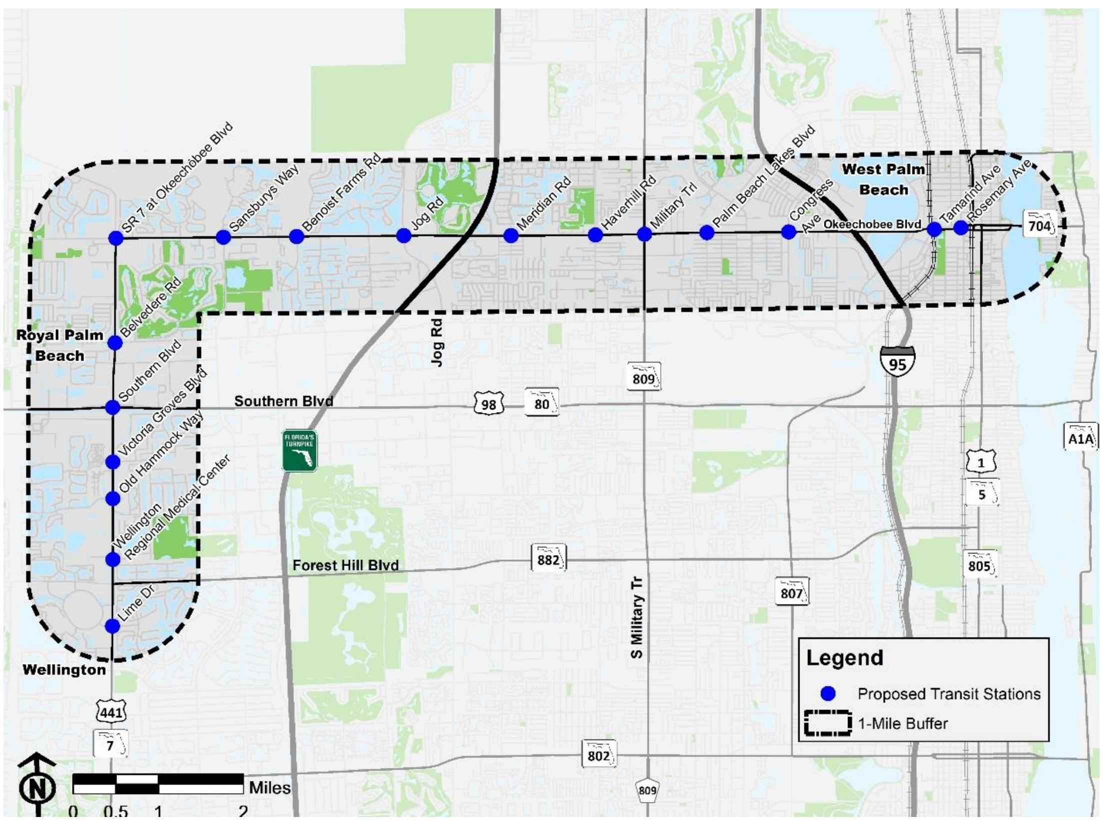


Figure 2. Proposed Alignment and General Station Locations

RUNNING TIME METHODOLOGY

Peak and off-peak running times were developed using CTG's detailed running time models. CTG's model develops station to station running times by direction for each transit alternative. Many data inputs are utilized in the model including industry standard acceleration and deceleration factors by mode, variations and adjustments for roadway and operational treatments (e.g., TSP, queue jumps, dedicated right-of-way, etc.), segment and intersection level of service (LOS), and delay and dwell assumptions. Roadway speeds and LOS data were obtained from the Florida Department of Transportation (FDOT) and Palm Beach County resources. For the elevated LRT alternative (Alternative 7), a conservative maximum speed of 55 mph was assumed. Intersection delay was assumed based on intersection class, intersection LOS, and roadway treatments.

Dwell time assumptions were based on anticipated station volumes related to existing Palm Tran ridership, land use potential, and the presence of off board fare collection. Additional details on assumptions can be found in Appendix C and Appendix D.

RUNNING TIME METHODOLOGY

All alternatives result in travel time savings over the No Build alternative during the peak period, with alternative 7 (Elevated LRT) showing the largest average one-way peak travel time savings of 23.8 min. Of the bus alternatives, alternative 5 (BRT – Center) showed the largest savings at 11.0 minutes. Alternative 4 (BRT – Curbside) is slightly slower than Alternative 5 and saves 10.5 minutes. A high-level overview of end to end running times for each alternative can be found in Table 1. Detailed, station to station running times can be found in Appendix E.

Table 1. End to end running times and peak vehicle requirements

	Alt 1: No Build	Alt 2: Limited Stop	Alt 3: BAT - Curbside	Alt 4: BRT-Curbside	Alt 5: BRT - Center	Alt 6: LRT - Center	Alt 7: Elevated LRT
EB Runtime (Peak)	52.0 min	46.6 min	43.2 min	40.6 min	40.1 min	37.7 min	27.2 min
WB Runtime (Peak)	50.0 min	46.5 min	43.1 min	40.5 min	39.9 min	37.6 min	27.2 min
Avg One Way Runtime (Peak)	51.0 min	46.5 min	43.1 min	40.5 min	40.0 min	37.7 min	27.2 min
Peak Vehicle Requirement	4	8	10	10	10	10	8
Total Vehicle Requirement (20% spare ratio)	5	10	12	12	12	12	10
Avg. One-Way Savings (Peak)	-	4.5 min	7.9 min	10.5 min	11.0 min	13.3 min	23.8 min
EB Runtime (Off-Peak)	47.0 min	42.5 min	38.7 min	38.3 min	37.6 min	35.3 min	26.2 min
WB Runtime (Off-Peak)	48.0 min	42.3 min	38.6 min	38.2 min	37.4 min	35.1 min	26.2 min
Avg One Way Runtime (Off-Peak)	47.5 min	42.4 min	38.7 min	38.2 min	37.5 min	35.2 min	26.2 min
Avg One-Way Savings (Off Peak)	-	5.1 min	8.8 min	10.0 min	9.3 min	12.3 min	21.3 min

Appendix A: Okeechobee Boulevard MCS Project Alternative Service Plan Summary

	Proposed Alternative	Peak Hour Headway (mins)	Off Peak Headway (mins)	Service Span (hours)	Service Span	Notes
Alt. 1	No Build/No Action (Palm Tran 43)	30	30	16.5	4:30AM – 9:00PM	Existing Service alignment in mixed traffic
Alt. 2	Mixed Traffic bus w/Limited Stops	15	15	18.5	4:30AM – 11:00PM	Mixed Traffic
Alt. 3	BAT Curbside Lane	10	15	18.5	4:30AM – 11:00PM	Exclusive Guideway that allows turning vehicles
Alt. 4	Curbside Dedicated-lane BRT	10	15	18.5	4:30AM – 11:00PM	Exclusive Guideway that allows turning vehicles
Alt. 5	Center Platform Dedicated BRT	10	15	18.5	4:30AM – 11:00PM	Dedicated Excusive Guideway
Alt. 6	Center Platform Dedicated-lane LRT	10	15	18.5	4:30AM – 11:00PM	Dedicated Excusive Guideway
Alt. 7	Elevated Grade Separated LRT	10	15	18.5	4:30AM – 11:00PM	Dedicated Exclusive Guideway

Appendix B: Okeechobee Boulevard MCS Project Alternative Station Location Summary

Proposed Station Stop Location	Alt 1: No Build	Alt 2: Limited Stop	Alt 3: BAT - Curbside	Alt 4: BRT-Curbside	Alt 5: BRT - Center	Alt 6: LRT - Center	Alt 7: Elevated LRT
Mall at Wellington Green	N/A	-	-	-	-	-	-
Wellington Regional Medical Center	N/A	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB – Farside	Median	Median	Median
Old Hammock Way / SR 7	N/A	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB – Farside	Median	Median	Median
Victoria Groves Boulevard / SR 7	N/A	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB – Farside	Median	Median	Median
Southern Boulevard / SR 7	N/A	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB -- Farside	SR 7 NB – Farside SR 7 SB -- Farside	Median	Median	Median
Belvedere Road / SR 7	N/A	SR 7 NB – Farside SR 7 SB – Nearside	SR 7 NB – Farside SR 7 SB – Nearside	SR 7 NB – Farside SR 7 SB – Nearside	Median	Median	Median
SR 7 / Okeechobee	N/A	Ok Blvd EB – Farside of SR 7/Ok Blvd SR 7 SB – Farside of Ok Blvd /SR 7	Ok Blvd EB – Farside of SR 7/Ok Blvd SR 7 SB – Farside of Ok Blvd /SR 7	Ok Blvd EB – Farside of SR 7/Ok Blvd SR 7 SB – Farside of Ok Blvd /SR 7	Median	Median	Median
Sansburys Way / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median

Proposed Station Stop Location	Alt 1: No Build	Alt 2: Limited Stop	Alt 3: BAT - Curbside	Alt 4: BRT-Curbside	Alt 5: BRT - Center	Alt 6: LRT - Center	Alt 7: Elevated LRT
Benoist Farms Rd / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Jog Road / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Meridian Road / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Nearside	Ok Blvd EB – Farside Ok Blvd WB – Nearside	Ok Blvd EB – Farside Ok Blvd WB – Nearside	Median	Median	Median
Haverhill Road / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Military Trail / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Palm Beach Lakes Blvd	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Congress Avenue / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Tamarind Ave / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median
Rosemary Ave / Okeechobee	N/A	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Ok Blvd EB – Farside Ok Blvd WB – Farside	Median	Median	Median

Appendix C: Table of Assumptions: Alternatives

Alternatives		TSP	Queue Jumps		BAT Lanes	Dedicated ROW
			Eastbound	Westbound		
Alt 1	No Build/No Action - Existing Route 43	No	No	No	No	No
Alt 2	Mixed traffic with limited stops	No	No	No	No	No
Alt 3	BAT Curbside Lane	Yes. Entire Corridor	No	No	Yes. SR7/Lime to Okeechobee/ Tamarind (exc. WB from Baywinds to SR7)	No
Alt 4	Curbside dedicated-lane BRT	Yes. Entire Corridor	Yes. Okeechobee/ Sansburys Way, Okeechobee/Jog, Okeechobee/ Military Trail, SR7/Forest Hill, SR7/Belvedere	Yes. Okeechobee/ Tamarind, Okeechobee/ Military Trail, Okeechobee/Toll Plaza, Okeechobee/ Baywinds, SR7/Belvedere, SR7/Forest Hill	No	Yes
Alt 5	Center dedicated-lane BRT	Yes. Entire Corridor	No	No	No	Yes
Alt 6	Center dedicated-lane LRT	Yes. Entire Corridor	No	No	No	Yes
Alt 7	Elevated grade separated LRT	N/A	No	No	No	Yes*

**A conservative maximum speed of 55 mph was assumed*

Appendix D: Table of Assumptions: Intersections and Station

Intersections			
Name	**Main Street**	**Cross Street**	**Class**
SR 7 & Lime Drive	SR 7	Lime Drive Station (Mall at Wellington Green)	Class 2
SR 7 & Forest Hill Blvd	SR 7	Forest Hill Blvd	Class 1
SR 7 & Old Hammock Way	SR 7	Old Hammock Way Station	Class 2
SR 7 & Victoria Groves Blvd	SR 7	Victoria Groves Blvd Station	Class 2
SR 7 & Southern Blvd	SR 7	Southern Blvd Station	Class 1
SR 7 & Weisman Way	SR 7	Weisman Way	Class 2
SR 7 & Belvedere	SR 7	Belvedere Station	Class 2
SR 7 & Business Park Way	SR 7	Business Park Way	Class 3
SR 7 @ Regal Cinemas 18	SR 7	Regal Cinemas 18 @ SR 7	Class 3
SR 7 & Okeechobee	SR 7	Okeechobee Station	Class 1
Okeechobee & Flagler Pkwy	Okeechobee	Flagler Pkwy	Class 3
Okeechobee & Sansburys Way	Okeechobee	Sansburys Way Station	Class 2
Okeechobee & Andros Isle	Okeechobee	Andros Isle	Class 3
Okeechobee & Benoist Farms Rd	Okeechobee	Benoist Farms Rd Station	Class 2

Intersections			
Name	Main Street	Cross Street	Class
Okeechobee & Golden Lakes Blvd	Okeechobee	Golden Lakes Blvd	Class 3
Okeechobee & Skees Rd	Okeechobee	Skees Rd	Class 2
Okeechobee & Jog Rd	Okeechobee	Jog Rd Station	Class 1
Okeechobee & Vista Pkwy	Okeechobee	Vista Pkwy	Class 2
Okeechobee & Okeechobee Toll Plaza	Okeechobee	Okeechobee Toll Plaza	Class 1
Okeechobee & Meridian Rd	Okeechobee	Meridian Rd Station	Class 2
Okeechobee @ Palm Beach County Fire Station Signal	Okeechobee	Palm Beach County Fire Station Signal	Class 3
Okeechobee & Haverhill Rd	Okeechobee	Haverhill Rd Station	Class 1
Okeechobee & Military Trail	Okeechobee	Military Trail Station	Class 1
Okeechobee & Biscayne Blvd	Okeechobee	Biscayne Blvd	Class 3
Okeechobee & Indian Rd	Okeechobee	Indian Rd	Class 2
Okeechobee & Palm Beach Lakes Blvd	Okeechobee	Palm Beach Lakes Blvd Station	Class 2
Okeechobee & Spencer Dr	Okeechobee	Spencer Dr	Class 2
Okeechobee & Loxahatchee Dr	Okeechobee	Loxahatchee Dr	Class 3
Okeechobee & Congress Ave	Okeechobee	Congress Ave Station	Class 1

Intersections			
Name	**Main Street**	**Cross Street**	**Class**
Okeechobee & Church St	Okeechobee	Church St	Class 2
Okeechobee (West Side) & I-95	Okeechobee (West Side)	I-95	Class 2
Okeechobee (East Side) & I-95	Okeechobee (East Side)	I-95	Class 2
Okeechobee RRX @ Tamarind		Okeechobee RRX @ Tamarind	RRX
Okeechobee & Tamarind Ave	Okeechobee	Tamarind Ave	Class 2
Okeechobee & Sapodilla Ave	Okeechobee	Sapodilla Ave	Class 2
Okeechobee & Rosemary Square	Okeechobee	Rosemary Square Station	Class 2

**Road class assumptions were estimated to assist in projecting intersection delay.*

Stations			
Station Name	**Main Road**	**Cross Street**	**Assumed Passenger Volume**
Mall at Wellington Green	SR 7	Lime Drive	High
Wellington Regional Medical Center Station	SR 7	17th Street	Moderate
Old Hammock Way Station	SR 7	Old Hammock Way	Low
Victoria Groves Blvd Station	SR 7	Victoria Groves Blvd	Low

Stations			
Station Name	Main Road	Cross Street	Assumed Passenger Volume
Southern Blvd Station	SR 7	Southern Blvd	Moderate
Belvedere Station	SR 7	Belvedere	Moderate
Okeechobee Station	SR 7	Okeechobee	Moderate
Sansburys Way Station	Okeechobee	Sansburys Way	Low
Benoist Farms Rd Station	Okeechobee	Benoist Farms Rd	Low
Jog Rd Station	Okeechobee	Jog Rd	Moderate
Meridian Rd Station	Okeechobee	Meridian Rd	Moderate
Haverhill Rd Station	Okeechobee	Haverhill Rd	Moderate
Military Trail Station	Okeechobee	Military Trail	High
Palm Beach Lakes Blvd Station	Okeechobee	Palm Beach Lakes Blvd	Moderate
Congress Ave Station	Okeechobee	Congress Ave	Moderate
Tamarind Ave Station	Okeechobee	Tamarind Ave	Moderate
Okeechobee & Rosemary Square Station	Okeechobee	Rosemary Square	Moderate

**Estimates utilized to assist in determining dwell times only and are not reflective of ridership forecasting.*

Appendix E: Station to Station Running Times by Direction

Eastbound												
	Alt 2: Limited Stop		Alt 3: BAT - Curbside		Alt 4: BRT - Curbside		Alt 5: BRT - Center		Alt 6: LRT – At Grade		Alt 7: Elevated LRT	
Station	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
Mall at Wellington Green Station	-	-	-	-	-	-	-	-	-	-	-	-
Wellington Regional Medical Center Station Station	0:04:46	0:04:19	0:04:33	0:04:04	0:04:15	0:04:01	0:04:19	0:04:02	0:04:24	0:04:07	0:02:21	0:02:16
Old Hammock Way Station	0:02:02	0:01:57	0:01:54	0:01:51	0:01:54	0:01:51	0:01:51	0:01:48	0:01:40	0:01:38	0:01:56	0:01:56
Victoria Groves Blvd Station	0:01:32	0:01:30	0:01:28	0:01:25	0:01:28	0:01:25	0:01:28	0:01:25	0:01:18	0:01:15	0:01:02	0:01:02
Southern Blvd Station	0:02:20	0:02:01	0:02:11	0:01:52	0:02:00	0:01:52	0:01:58	0:01:50	0:01:48	0:01:40	0:01:20	0:01:15
Belvedere Station	0:02:35	0:02:15	0:02:25	0:02:03	0:02:08	0:02:00	0:02:12	0:02:02	0:02:01	0:01:51	0:01:29	0:01:24
Okeechobee Station	0:03:41	0:03:16	0:03:22	0:02:56	0:03:08	0:02:56	0:03:02	0:02:50	0:02:51	0:02:39	0:02:22	0:02:17
Sansburys Way Station	0:02:52	0:02:43	0:02:38	0:02:30	0:02:30	0:02:28	0:02:29	0:02:25	0:02:19	0:02:14	0:02:25	0:02:25
Benoist Farms Rd Station	0:02:17	0:02:12	0:02:07	0:02:01	0:02:06	0:02:01	0:02:03	0:01:59	0:01:53	0:01:49	0:01:25	0:01:25

Eastbound												
	Alt 2: Limited Stop		Alt 3: BAT - Curbside		Alt 4: BRT - Curbside		Alt 5: BRT - Center		Alt 6: LRT – At Grade		Alt 7: Elevated LRT	
Station	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
Jog Rd Station	0:03:38	0:03:13	0:03:19	0:02:53	0:03:00	0:02:50	0:03:00	0:02:48	0:02:51	0:02:38	0:01:52	0:01:47
Meridian Rd Station	0:03:43	0:03:20	0:03:23	0:02:57	0:03:10	0:02:57	0:03:05	0:02:52	0:02:54	0:02:41	0:01:53	0:01:48
Haverhill Rd Station	0:03:01	0:02:41	0:02:46	0:02:26	0:02:36	0:02:26	0:02:31	0:02:21	0:02:22	0:02:12	0:01:36	0:01:31
Military Trail Station	0:02:19	0:02:07	0:02:11	0:01:58	0:01:50	0:01:45	0:01:54	0:01:46	0:01:46	0:01:38	0:01:19	0:01:14
Palm Beach Lakes Blvd Station	0:02:33	0:02:24	0:02:21	0:02:09	0:02:21	0:02:09	0:02:17	0:02:05	0:02:09	0:01:57	0:01:22	0:01:17
Congress Ave Station	0:03:16	0:02:56	0:03:00	0:02:37	0:02:50	0:02:37	0:02:45	0:02:32	0:02:35	0:02:22	0:01:34	0:01:29
Tamarind Ave Station	0:04:52	0:04:28	0:04:24	0:03:59	0:04:14	0:03:59	0:04:03	0:03:48	0:03:53	0:03:38	0:02:19	0:02:14
Okeechobee & Rosemary Square Station	0:01:10	0:01:08	0:01:08	0:01:03	0:01:08	0:01:03	0:01:08	0:01:03	0:01:02	0:00:56	0:00:56	0:00:51
Total:	0:46:37	0:42:30	0:43:10	0:38:44	0:40:35	0:38:20	0:40:05	0:37:36	0:37:44	0:35:15	0:27:11	0:26:11
Savings:	0:05:23	0:07:30	0:08:50	0:11:16	0:11:25	0:11:40	0:11:55	0:12:24	0:14:16	0:14:45	0:24:49	0:23:49

Westbound												
	Alt 2: Limited Stop		Alt 3: BAT - Curbside		Alt 4: BRT-Curbside		Alt 5: BRT - Center		Alt 6: LRT – At Grade		Alt 7: Elevated LRT	
Station/Location	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
Okeechobee & Rosemary Square Station	-	-	-	-	-	-	-	-	-	-	-	-
Tamarind Ave Station	0:01:52	0:01:36	0:01:47	0:01:26	0:01:32	0:01:23	0:01:37	0:01:26	0:01:32	0:01:19	0:00:56	0:00:51
Congress Ave Station	0:05:04	0:04:40	0:04:34	0:04:09	0:04:25	0:04:09	0:04:15	0:03:59	0:04:04	0:03:48	0:02:19	0:02:14
Palm Beach Lakes Blvd Station	0:02:54	0:02:44	0:02:39	0:02:27	0:02:39	0:02:27	0:02:34	0:02:22	0:02:25	0:02:13	0:01:34	0:01:29
Military Trail Station	0:03:07	0:02:54	0:02:53	0:02:35	0:02:31	0:02:22	0:02:33	0:02:21	0:02:25	0:02:13	0:00:00	0:00:00
Haverhill Rd Station	0:02:09	0:01:52	0:02:01	0:01:43	0:01:51	0:01:43	0:01:49	0:01:41	0:01:41	0:01:33	0:01:27	0:01:22
Meridian Rd Station	0:02:48	0:02:29	0:02:35	0:02:16	0:02:25	0:02:16	0:02:21	0:02:11	0:02:11	0:02:02	0:01:14	0:01:09
Jog Rd Station	0:03:56	0:03:31	0:03:32	0:03:06	0:03:14	0:03:03	0:03:16	0:03:02	0:03:05	0:02:52	0:01:36	0:01:31
Benoist Farms Rd Station	0:03:09	0:03:00	0:02:53	0:02:43	0:02:50	0:02:43	0:02:45	0:02:38	0:02:35	0:02:28	0:01:53	0:01:48
Sansburys Way Station	0:02:18	0:02:12	0:02:07	0:02:01	0:02:06	0:02:01	0:02:04	0:01:59	0:01:53	0:01:48	0:03:12	0:03:12

Westbound												
	Alt 2: Limited Stop		Alt 3: BAT - Curbside		Alt 4: BRT-Curbside		Alt 5: BRT - Center		Alt 6: LRT – At Grade		Alt 7: Elevated LRT	
Station/Location	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
Okeechobee Station	0:03:21	0:02:56	0:03:11	0:02:43	0:02:57	0:02:41	0:02:45	0:02:35	0:02:36	0:02:26	0:02:30	0:02:25
Belvedere Station	0:03:29	0:03:04	0:03:13	0:02:47	0:02:53	0:02:45	0:02:53	0:02:41	0:02:43	0:02:31	0:02:22	0:02:17
Southern Blvd Station	0:02:48	0:02:28	0:02:35	0:02:13	0:02:23	0:02:13	0:02:21	0:02:11	0:02:12	0:02:02	0:01:29	0:01:24
Victoria Groves Blvd Station	0:01:52	0:01:48	0:01:45	0:01:42	0:01:44	0:01:42	0:01:43	0:01:40	0:01:32	0:01:30	0:01:15	0:01:15
Old Hammock Way Station	0:01:32	0:01:30	0:01:28	0:01:25	0:01:28	0:01:25	0:01:28	0:01:25	0:01:17	0:01:15	0:01:02	0:01:02
Wellington Regional Medical Center Station	0:01:59	0:01:39	0:01:54	0:01:38	0:01:43	0:01:38	0:01:40	0:01:35	0:01:30	0:01:25	0:02:01	0:01:56
Mall at Wellington Green Station	0:04:09	0:03:57	0:03:55	0:03:42	0:03:48	0:03:39	0:03:53	0:03:40	0:03:55	0:03:42	0:02:21	0:02:16
Total:	0:46:27	0:42:20	0:43:04	0:38:36	0:40:29	0:38:10	0:39:54	0:37:26	0:37:38	0:35:07	0:27:11	0:26:11
Savings:	0:03:33	0:06:40	0:06:56	0:10:24	0:09:31	0:10:50	0:10:06	0:11:34	0:12:22	0:13:53	0:22:49	0:22:49

RIDERSHIP FORECAST

The Palm Beach Transportation Planning Agency (TPA) is the designated Metropolitan Planning Organization (MPO) serving all of Palm Beach County, Florida, and is comprised of a 21-member governing board and associated staff that maintains a long-range forecast of population, employment, and transportation projects and services that advance the regional vision. The TPA often coordinates and collectively works with Palm Tran, Palm Beach County's public transit operator. Palm Tran operates over 30 fixed routes, "Connection" paratransit service, and "GoGlades" demand response across the county.

The TPA has engaged a consultant team to conduct a planning study of the Okeechobee Blvd & SR 7 Multimodal Corridor Study (MCS). The study aims to review several transit alternatives, develop a ridership forecast, and ultimately recommend an alternative that provides safe, efficient, and connected facilities for all modes of travel along these corridors. The purpose of this memorandum is to document the methodology and estimated forecast ridership for each transit alternative.

TRANSIT ALTERNATIVES DEFINITION

A total of seven (7) enhanced transit alternatives were evaluated for this effort. Palm Tran Route 43 currently operates along most of the corridor and serves as the No-Build/No Action alternative (Alternative 1). In addition to the no-build, four (4) bus alternatives and two (2) light rail transit (LRT) alternatives were investigated and are detailed below.

- Alternative 1: No Build/No Action (Palm Tran Route 43)
- Alternative 2: Mixed traffic bus with limited stops
- Alternative 3: Business access and transit (BAT) curbside lanes
- Alternative 4: Curbside dedicated-lane bus rapid transit (BRT)
- Alternative 5: Center-platform dedicated-lane BRT
- Alternative 6: Center-platform dedicated-lane LRT
- Alternative 7: Elevated grade-separated LRT

The no build (Alternative 1) follows the existing Palm Tran route 43 alignment. Alternatives 2 through 6 all follow a streamlined version of Palm Tran Route 43's alignment, via SR 7 and Okeechobee Blvd. Alternative 7 (Elevated grade-separated LRT) is not constrained to the street network.

All alternatives are expected to serve the same 17 station locations (Figure 1). Two park-and ride lots are assumed for the project to be located in the vicinity of Okeechobee Blvd & SR 7 and near the Wellington Mall.

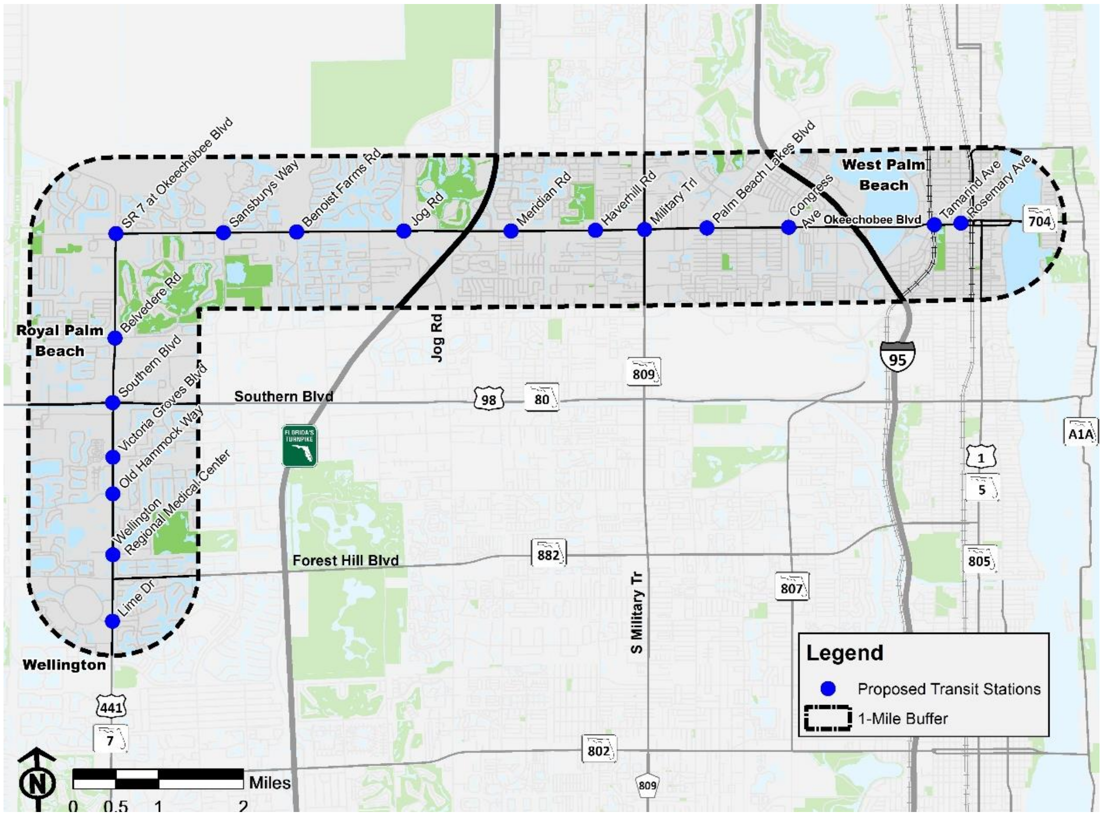


Figure 1. Proposed Station Locations

ESTIMATED RIDERSHIP RESULTS

The Federal Transit Administration (FTA) Simplified Trips-on-Project Software (STOPS) was applied to estimate potential ridership for the Okeechobee Blvd & SR 7 MCS transit alternatives. The STOPS model calibration year was 2015 to include the 2015 transit on-board survey and ridership levels. January 2020 transit network service levels (pre-COVID) were applied as the basis for evaluating the No-Build and Build Alternatives.

The No Build Network includes the existing Route 43 alignment to include a headway of 20 minutes.

The Build Network includes Route 43 with a 60-minute headway included for each build alternative. The mixed traffic bus alternative would operate at a 15-minute headway for peak and off-peak. While all other build alternatives operate on a 10-minute peak and 15-minute off-peak headway.

Table 1 presents the estimated ridership for each of the proposed build alternatives. The LRT alternatives attract the highest level of estimated ridership due to their exclusive guideway running time.

Table 1. Proposed Alternative Estimated Ridership

Proposed Alternative	Project Headway (peak/mid-day)	Route 43 Headway (peak/mid-day)	Total Corridor Boardings
No Build	N/A	20/20	3,200
Mixed Traffic bus w/Limited Stops	15/15	60/60	2,800-3,400
BAT Curbside Lane	10/15	60/60	3,200-3,800
Curbside Dedicated-lane BRT	10/15	60/60	3,900-5,400
Center Platform Dedicated BRT	10/15	60/60	4,300-6,000
Center Platform Dedicated-lane LRT	10/15	60/60	6,300-8,600
Elevated Grade Separated LRT	10/15	60/60	8,600-10,300

Station Level Activities

The proposed station locations with the highest passenger boarding/alighting activity include Military Trail, Rosemary Avenue, Congress Avenue, Meridian Road and Jog Road. Additionally, high transfer stations are identified at Rosemary Avenue, Military Trail and Plam Beach Lakes Boulevard.

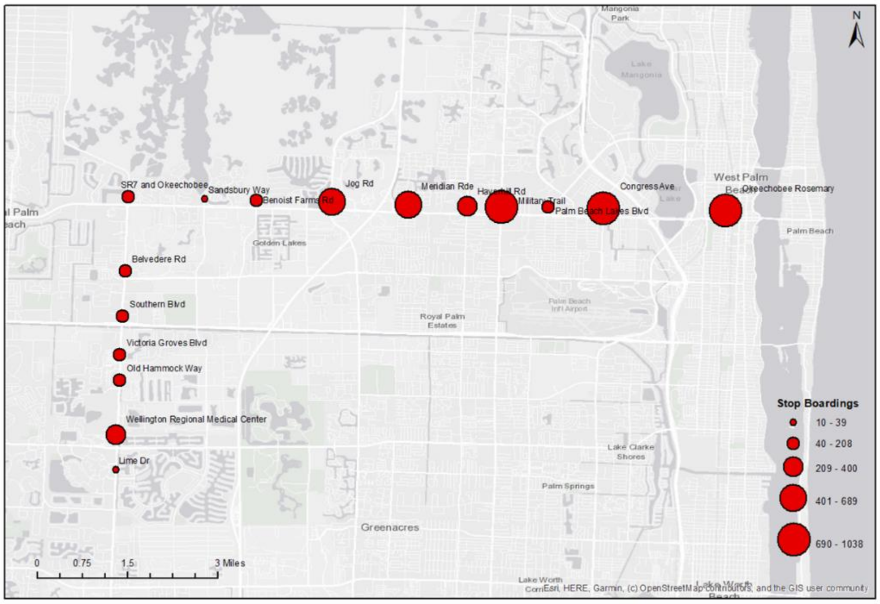


Figure 2. 2045 Station Boardings

OPERATIONS & MAINTENANCE COSTS

This methodology report describes the process developed to estimate operating and maintenance (O&M) cost estimates for two (2) transit technology alternatives evaluated for the Okeechobee Blvd. & SR 7 Multimodal Corridor Study (MCS): Bus and Light Rail Transit (LRT). The preparation of O&M estimates for the Okeechobee Blvd. & SR 7 MCS is based upon the resource build-up approach which is consistent with Federal Transit Administration (FTA) guidance for O&M cost estimation for projects seeking Capital Investment Grant (New Starts/Small Starts) funding.

The document provides an overview of the cost estimating process and describes the data needs and processes that are applied to develop O&M cost estimates for each transit technology.

O&M Estimate Methodology

The development of O&M cost estimates for the Okeechobee Blvd. & SR 7 MCS project alternatives is based upon available O&M cost data as reported to the FTA for inclusion in the National Transit Database (NTD). From this data, four (4) unit cost factors are determined which include cost per vehicle revenue hour, cost per vehicle mile, cost per vehicle required in maximum service (peak vehicles), and cost per guideway or track mile.

The O&M cost for each alternative is then calculated by multiplying each cost factor by the estimated future values of that variable for each alternative and adding the result for each variable together to generate the total future O&M cost, as shown in Figure 1.

Estimated Future Revenue Vehicle Hours	X	Revenue Vehicle Hour Cost Factor	=	Estimated O&M Costs associated with Revenue Vehicle Hours
Estimated Future Revenue Vehicle Miles	X	Revenue Vehicle Mile Cost Miles	=	Estimated O&M Costs associated with Revenue Vehicle Miles
Estimated Future Vehicles Required in Maximum Service	X	Vehicles Required in Maximum Service Cost Factor	=	Estimated O&M Costs associated with Vehicles Required in Maximum Service
Estimated Future Guideway Miles	X	Guideway Miles Cost Factor	=	Estimated O&M Costs associated with Guideway Miles
				Total Estimated O&M Costs

Figure 1. O&M Cost Estimation Calculation

O&M Unit Cost Factors

The most recent NTD submissions (2019) were used to develop unit cost factors to estimate the O&M costs for each of the two (2) transit technologies. The four-unit cost factors help estimate the proposed total O&M costs for each of the proposed transit technologies for the Okeechobee Blvd. & SR 7 MCS.

Unit Cost Factors – Bus/BRT Alternatives

Costs estimates for the each of the proposed bus alternatives were derived from Palm Tran's most recently available O&M cost data from the FTA NTD. Unit costs are calculated by dividing the line-item expense by the value of the supply variable. The supply variables correspond to the number of revenue vehicle hours and revenue vehicle miles of service and the number of peak vehicles operated in maximum service. *Table 1* presents the line-item assignments and cost drivers for bus. Table 2 provides the line-item unit costs as determined from the specific supply variable as reported to the FTA NTD for 2019.

Table 1: Assignment of O&M Expenses / Key Variable for Bus

	Revenue Hours	Revenue Miles	Peak Vehicles
Vehicle Operations Labor			
Operator Salaries and Wages	X		
Other Salaries and Wages	X		
Fringe Benefits	X		
Services	X		
Vehicle Operations Materials and Supplies			
Fuel and Lubricants		X	
Tires and Tubes		X	
Other Materials/Supplies		X	
Utilities		X	
Casualty and Liability		X	
Taxes			X
Miscellaneous			X
Expense Transfers			X
Vehicle Maintenance Labor			
Other Salaries and Wages		X	
Fringe Benefits		X	
Services		X	
Vehicle Maintenance Materials and Supplies			
Fuel and Lubricants		X	
Tires and Tubes		X	
Other Materials/Supplies		X	
Utilities		X	

	Revenue Hours	Revenue Miles	Peak Vehicles
Casualty and Liability		X	
Taxes			X
Miscellaneous		X	
Expense Transfers			X
Non-Vehicle Maintenance Labor			
Other Salaries and Wages			X
Fringe Benefits			X
Services			X
Non-Vehicle Maintenance Materials and Supplies			
Fuel and Lubricants			
Tires and Tubes			
Other Materials/Supplies			X
Utilities			
Casualty and Liability		X	
Taxes			
Miscellaneous			
Expense Transfers			
General Administration			
Other Salaries and Wages			X
Fringe Benefits			X
Services			X
Fuel and Lubricants			X
Tires and Tubes			X
Other Materials/Supplies			X
Utilities			X
Casualty and Liability		X	
Taxes			X
Miscellaneous			X
Expense Transfers			X

Table 2: Assignment of O&M Expenses for Bus (Palm Tran 2019 NTD)

	Annual Expense (2019)	Revenue Hours Unit Cost	Revenue Miles Unit Cost	Peak Vehicles Unit Cost	Supply Value	Variable
Vehicle Operations Labor						
Operator Salaries and Wages	$14,918,848	$29.38			507,726	Revenue Hours
Other Salaries and Wages	$4,618,134	$9.10			507,726	Revenue Hours
Fringe Benefits	$10,456,832	$20.60			507,726	Revenue Hours
Services	$737,340	$1.45			507,726	Revenue Hours
Vehicle Operations Materials and Supplies						
Fuel and Lubricants	$5,063,190		$0.70		7,207,289	Revenue Miles
Tires and Tubes	$749,038		$0.10		7,207,289	Revenue Miles
Other Materials/Supplies	$13,260		$0.00		7,207,289	Revenue Miles
Utilities	$0		$0.00		Kw/hr	
Casualty and Liability	$0		$0.00		7,207,289	Revenue Miles
Taxes	$0				118	Peak Vehicles
Miscellaneous	$25,275			$214.19	118	Peak Vehicles
Expense Transfers	$0			$0.00	118	Peak Vehicles
Vehicle Maintenance Labor						
Other Salaries and Wages	$5,621,892		$0.78		7,207,289	Revenue Miles
Fringe Benefits	$2,630,552		$0.36		7,207,289	Revenue Miles
Services	$973,009		$0.14		7,207,289	Revenue Miles
Vehicle Maintenance Materials and Supplies						
Fuel and Lubricants	$106,268		$0.01		7,207,289	Revenue Miles
Tires and Tubes	$15,286		$0.00		7,207,289	Revenue Miles
Other Materials and Supplies	$3,429,295		$0.48		7,207,289	Revenue Miles
Utilities	$0				7,207,289	Revenue Miles

	Annual Expense (2019)	Revenue Hours Unit Cost	Revenue Miles Unit Cost	Peak Vehicles Unit Cost	Supply Value	Variable
Casualty & Liability	$0				7,207,289	Revenue Miles
Taxes	$0				118	Peak Vehicles
Miscellaneous	$9,358		$0.00		7,207,289	Revenue Miles
Expense Transfer	$0				118	Peak Vehicles
Non-Vehicle Maintenance Labor						
Other Salaries and Wages	$251,612			$2,132.31	118	Peak Vehicles
Fringe Benefits	$120,585			$1,021.91	118	Peak Vehicles
Services	$606,359			$5,138.64	118	Peak Vehicles
Non-Vehicle Maintenance Materials & Supplies						
Fuel and Lubricants	$0.00					Guideway Miles
Tires and Tubes	$0.00					Guideway Miles
Other Materials and Supplies	$12,677			$107.43	118	Peak Vehicles
Utilities	$0.00					Guideway Miles
Casualty & Liability	$0.00				7,207,289	Revenue Miles
Taxes	$0.00					Guideway Miles
Miscellaneous	$0.00					Guideway Miles
Expense Transfer	$0.00					Guideway Miles
General Administration						
Other Salaries and Wages	$5,513,025			$46,720.55	118	Peak Vehicles
Fringe Benefits	$2,892,266			$24,510.73	118	Peak Vehicles
Services	$2,262,278			$19,171.85	118	Peak Vehicles
Fuel and Lubricants	$0.00				118	Peak Vehicles
Tires and Tubes	$0.00				118	Peak Vehicles
Other Materials and Supplies	$300,251			$2,544.50	118	Peak Vehicles

	Annual Expense (2019)	Revenue Hours Unit Cost	Revenue Miles Unit Cost	Peak Vehicles Unit Cost	Supply Value	Variable
Utilities	$529,335			$4,485.89	118	Peak Vehicles
Casualty and Liability	$565,002		$0.08		7,207,289	Revenue Miles
Taxes	$0.00				118	Peak Vehicles
Miscellaneous Expense	$261,705			$2,217.84	118	Peak Vehicles
Expense Transfers	$0.00				118	Peak Vehicles

The unit costs are the sum of the line-item costs listed for each of the three (3) columns as presented in Table 2 – revenue hours, revenue miles and peak vehicles. The total unit cost values are applied against an adjustment factor to escalate to 2021 dollars based on the Bureau of Labor Statistics Consumer Price Index using the Inflation calculator on https://www.bls.gov/bls/inflation site. At present, the model illustrates an adjustment of 9 percent; the actual index at the time of the O&M cost calculation is being applied.

The calculated unit costs for bus are presented in *Table 3*.

Table 3: O&M Unit Costs for Bus

Cost per Revenue Hour	Cost per Revenue Mile	Cost per Peak Vehicle
$65.97	$2.90	$118,009.76

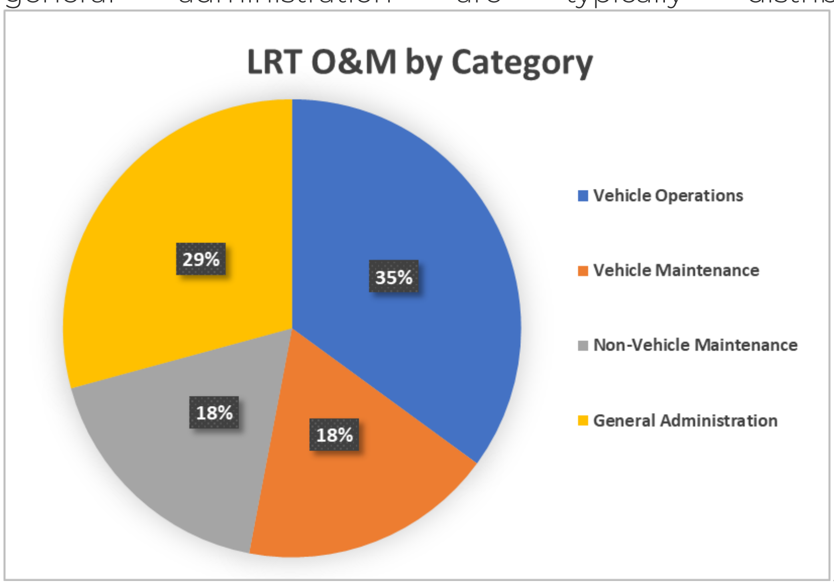
Unit Cost Factors – Light Rail Transit Alternatives

As LRT technology is not currently operated by Palm Tran an alternate approach to estimate O&M costs was applied. Substitute O&M cost factors were used and based upon expense data from a number of existing LRT operations throughout the U.S. The FTA data maintained in the NTD was used to determine cost and efficiency characteristics for the LRT mode. Cost characteristics for seven (7) LRT operations were analyzed to establish the cost by category for the Okeechobee Blvd. & SR 7 MCS LRT alternatives.

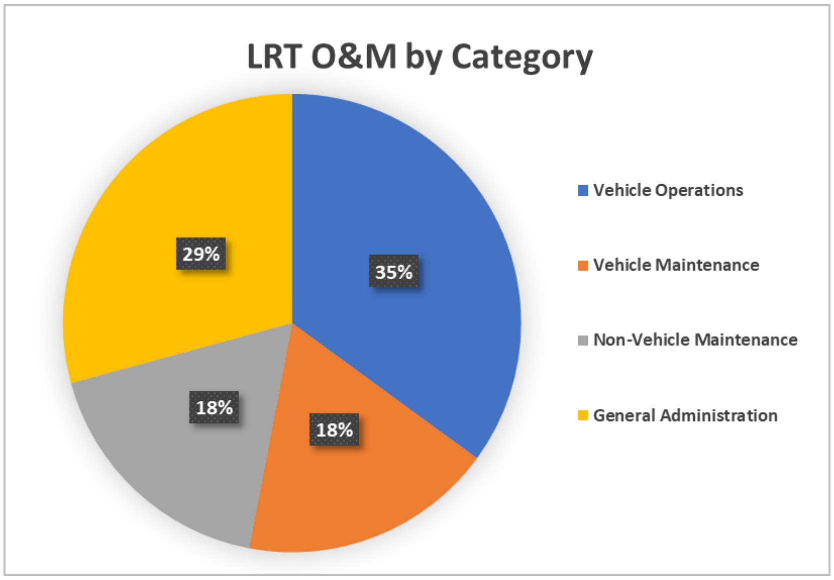
The LRT systems referenced in the analysis include:

- Valley Metro Rail, Inc, (AZ)
- Metro Transit (MN)
- San Diego Metropolitan Transit System (CA)
- Denver Regional Transportation District (CO)
- Massachusetts Bay Transportation Authority (MA)
- Charlotte Area Transit (NC)
- Metropolitan Transit Authority Harris County (TX)

O&M costs for vehicle operations, vehicle maintenance, non-vehicle maintenance and general administration are typically distributed as shown in



. Approximately 35 percent of the O&M costs are attributable to transit operations, which represents the largest part of annual O&M expenditures. This is followed by general administration at 23 percent, and vehicle maintenance and non-vehicle maintenance at approximately 18 percent each.



Source: National Transit Database, 2019

Figure 2. O&M Cost Distribution – Selected U.S. LRT Systems

The LRT cost model uses the resource build-up approach favored by FTA. *Table 4* lists the line-item assignments and cost drivers for LRT.

Table 4: O&M Expenses / Key Variables for LRT

	Revenue Hours	Revenue Miles	Peak Vehicles	Guideway Miles
Vehicle Operations Labor				
Operator Salaries and Wages	X			
Other Salaries and Wages	X			
Fringe Benefits	X			
Services	X			
Vehicle Operations Materials and Supplies				
Fuel and Lubricants		X		
Tires and Tubes		X		
Other Materials/Supplies		X		
Utilities		X		
Casualty and Liability		X		
Taxes			X	
Miscellaneous			X	
Expense Transfers			X	
Vehicle Maintenance Labor				
Other Salaries and Wages		X		
Fringe Benefits		X		
Services		X		
Vehicle Maintenance Materials and Supplies				

	Revenue Hours	Revenue Miles	Peak Vehicles	Guideway Miles
Fuel and Lubricants		X		
Tires and Tubes		X		
Other Materials/Supplies		X		
Utilities		X		
Casualty and Liability		X		
Taxes			X	
Miscellaneous		X		
Expense Transfers			X	
Non-Vehicle Maintenance Labor				
Other Salaries and Wages				X
Fringe Benefits				X
Services				X
Non-Vehicle Maintenance Materials and Supplies				
Fuel and Lubricants				X
Tires and Tubes				X
Other Materials/Supplies				X
Utilities				X
Casualty and Liability		X		
Taxes				X
Miscellaneous				X
Expense Transfers				X
General Administration				
Other Salaries and Wages			X	
Fringe Benefits			X	
Services			X	
Fuel and Lubricants			X	
Tires and Tubes			X	
Other Materials/Supplies			X	
Utilities			X	
Casualty and Liability		X		
Taxes			X	
Miscellaneous			X	
Expense Transfers			X	

The development of LRT unit cost factors was determined from line item assignment costs calculated from an average of line item individual costs for each of the seven (7) LRT systems as previously identified (*Table 5*).

Table 5: Assignment of O&M Expenses for LRT

	Revenue Hours Unit Cost	Revenue Miles Unit Cost	Peak Vehicles Unit Cost	Guideway Unit Cost
Vehicle Operations Labor				
Operator Salaries and Wages	$22.18			
Other Salaries and Wages	$14.51			
Fringe Benefits	$15.40			
Services	$6.77			
Vehicle Operations Materials and Supplies				
Fuel and Lubricants		$0.00		
Tires and Tubes		$0.00		
Other Materials/Supplies		$0.08		
Utilities		$0.12		
Casualty and Liability		$0.00		
Taxes			$846.38	
Miscellaneous			$41,054.87	
Expense Transfers			$0.00	
Vehicle Maintenance Labor				
Other Salaries and Wages		$1.66		
Fringe Benefits		$0.71		
Services		$0.15		
Vehicle Maintenance Materials and Supplies				
Fuel and Lubricants		$0.04		
Tires and Tubes		$0.01		
Other Materials and Supplies		$0.74		
Utilities		$0.00		
Casualty & Liability		$0.00		
Taxes			$79.58	
Miscellaneous		$0.02		
Expense Transfer			$0.00	
Non-Vehicle Maintenance Labor				
Other Salaries and Wages				$111,780.66
Fringe Benefits				$46,134.10
Services				$46,516.58
Non-Vehicle Maintenance Materials and Supplies				

	Revenue Hours Unit Cost	Revenue Miles Unit Cost	Peak Vehicles Unit Cost	Guideway Unit Cost
Fuel and Lubricants				$0.00
Tires and Tubes				$0.00
Other Materials and Supplies				$20,231.14
Utilities				$0.00
Casualty & Liability			$0.00	
Taxes				$0.04
Miscellaneous				$1,008.98
Expense Transfer				$0.00
General Administration				
Other Salaries and Wages			$95,376.51	
Fringe Benefits			$44,457.03	
Services			$110,847.58	
Fuel and Lubricants			$0.00	
Tires and Tubes			$0.00	
Other Materials and Supplies			$11,758.22	
Utilities			$19,838.71	
Casualty and Liability		$0.35		
Taxes			$49.76	
Miscellaneous Expense			$5,259.35	
Expense Transfers			$0.00	

The unit costs are the sum of the line-item costs listed for each of the four (4) columns as presented in Table 5 – revenue miles, revenue hours, peak vehicles, and guideway. These total unit cost values are applied against an adjustment factor to escalate to 2021 dollars based on the Bureau of Labor Statistics Consumer Price Index using the Inflation calculator on https://www.bls.gov/bls/inflation site. At present, the model illustrates an adjustment of 9 percent; the actual index at the time of the O&M cost calculation is being applied.

The calculated unit costs for LRT are presented in *Table 6*.

Table 6: O&M Unit Costs for LRT

Cost per Revenue Hour	Cost per Revenue Mile	Cost per Peak Vehicle	Cost Pre-Guideway Mile
$64.15	$4.24	$359,229.12	$245,981.92

Development of Service Statistics

The model cost drivers are the service statistics and proposed units of service to be provided, for each Okeechobee Blvd. & SR 7 MCS alternative. These are the estimated number of revenue vehicle hours, revenue vehicle miles, peak vehicles, and guideway miles that would be required to operate each proposed alternative. The estimates for each of these statistics is based on a proposed service plan for each transit technology and project alternative.

The operating plan includes inputs that differ among the seven (7) alternatives, such as travel speed, acceleration-deceleration rates, as well as inputs that are the same among the alternative modes, such as the miles of alignment, the number and location of stations, and the desired service frequency by time of day (peak and off-peak).

Peak and off-peak running times were developed using detailed running time models (*Table 7*). Many data inputs are utilized in the model including industry standard acceleration and deceleration factors by mode, variations and adjustments for roadway and operational treatments (e.g., TSP, queue jumps, dedicated right-of-way, etc.), segment and intersection level of service (LOS), and delay and dwell assumptions. Roadway speeds and LOS data was obtained from the Florida Department of Transportation (FDOT) and Palm Beach County resources. Station dwell time assumptions were based on anticipated station volumes related to existing Palm Tran ridership, land use potential, and the presence of off board fare collection at transit stations.

Table 7. End to End Running Times and Peak Vehicle Requirements

	Alt 1: No Build	Alt 2: Limited Stop	Alt 3: BAT - Curbside	Alt 4: BRT- Curbside	Alt 5: BRT - Center	Alt 6: LRT - Center	Alt 7: Elevated LRT
Avg One Way Runtime (Peak)	51.0 min	46.5 min	43.1 min	40.5 min	40.0 min	37.7 min	27.2 min
Avg One Way Runtime (Off-Peak)	47.5 min	42.4 min	38.7 min	38.2 min	37.5 min	35.2 min	26.2 min

Proposed Transit Service Plan

The proposed transit alignment operates along Okeechobee Blvd. & SR 7 between downtown West Plam Beach and the Mall at Wellington Green. The Okeechobee Blvd. & SR 7 MCS corridor is approximately 13.8 miles long in each direction and would serve 17 stations.

The No Build / No Action Alternative would operate 16.5 hours between 4:30AM and 9:00PM. Service would be provided on a 20-minute headway for the entire service span.

The proposed service plan is identical among the five (5) of the (6) transit alternatives. Service would operate an 18.5-hour service span for both weekdays and weekends. Service would begin at 4:30 AM and run until 11:00 PM every day including weekends.

For the mixed traffic limited stop bus alternative, headways would be 15-minutes for the entire 18.5 hours service span. The BAT Lane, BRT and LRT alternatives all have identical service headways. The AM and PM peak service headway would be 10-minutes, with midday, evening, and weekend service operating every 15-minutes (*Table 8*).

Table 8: Okeechobee Blvd. & SR 7 MCS Project Alternative Service Plan Summary

Proposed Alternative	Peak Hour Headway (mins)	Off Peak Headway (mins)	Service Span (hours)	Service Span
No Build / No Action	20	20	16.5	4:30AM – 9:00PM
Mixed Traffic bus w/Limited Stops	15	15	18.5	4:30AM – 11:00PM
BAT Curbside Lane	10	15	18.5	4:30AM – 11:00PM
Curbside Dedicated-lane BRT	10	15	18.5	4:30AM – 11:00PM
Center Platform Dedicated BRT	10	15	18.5	4:30AM – 11:00PM
Center Platform Dedicated-lane LRT	10	15	18.5	4:30AM – 11:00PM
Elevated Grade Separated LRT	10	15	18.5	4:30AM – 11:00PM

The statistics for the service plan for each of the Okeechobee Blvd. & SR 7 MCS alternatives is presented in *Table 9*.

Table 9: Proposed Okeechobee Blvd. & SR 7 MCS Service Plan Statistics

	No Build	Bus Limited Stop	Curbside BAT Lane	Curbside Dedicated -lane BRT	Center Platform Dedicated -lane BRT	Center Platform Dedicated -lane LRT	Elevated Grade Separated LRT
Annual Revenue Hours	24,376	38,972	38,630	37,594	36,969	34,742	21,468
Annual Revenue Miles	241,680	364,635	392,175	392,175	392,175	392,175	392,175
Peak Vehicle Requirements	4	8	10	10	10	10	8

Operation and Maintenance Estimates Results

The operation and maintenance cost estimates developed for each of the Okeechobee Blvd. & SR 7 MCS alternatives is summarized in *Table 10* in 2021 US Dollars for the service plan as previously described.

Table 10: Operation & Cost Estimates for Okeechobee Blvd. & SR 7 MCS Alternatives

Proposed Alternative	Annual O&M Expense
No Build / No Action	$2,790,000
Mixed Traffic bus w/Limited Stops	$4,580,000
BAT Curbside Lane	$4,870,000
Curbside Dedicated-lane BRT	$4,800,000
Center Platform Dedicated BRT	$4,760,000
Center Platform Dedicated-lane LRT	$13,410,000
Elevated Grade Separated LRT	$16,820,000

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APPENDIX – NTD LINE-ITEM EXPENSES GLOSSARY

Casualty and Liability: The cost elements covering protection of the transit agency from loss through insurance programs, compensation of others for their losses due to acts for which the transit agency is liable, and recognition of the cost of corporate losses.

Fringe Benefits: The payments or accruals to others (insurance companies, governments, etc.) on behalf of an employee and payments and accruals direct to an employee arising from something other than a piece of work. These payments are transit agency costs over and above labor costs, but still arising from the employment relationship.

Fuels and Lubricants: The costs of gasoline, diesel fuel, propane, lubricating oil, transmission fluid, grease, etc., for use in vehicles.

General Administration: All activities associated with the general administration of the transit agency, including: Transit service development; Injuries and damages; Safety; Personnel administration; Legal services; Insurance; Data processing; Finance and accounting; Purchasing and stores; Engineering; Real estate management; Office management and services; Customer services; Promotion; Market research; and Planning.

Miscellaneous [Expenses]: The expenses that cannot be attributed to any of the other major expense categories, fringe benefits, services, materials and supplies, utilities, casualty and liability costs, taxes and purchased transportation.

Non-Vehicle Maintenance: All activities associated with facility maintenance, including: Administration; Repair of buildings, grounds and equipment as a result of accidents or vandalism; Operation of electric power facilities; Maintenance of: Vehicle movement control systems; Fare collection and counting equipment; Structures, tunnels and subways; Roadway and track; Passenger stations, operating station buildings, grounds and equipment; Communication systems; General administration buildings, grounds and equipment; and Electric power facilities.

Operators Salaries and Wages: The labor of employees of the transit agency who are classified as revenue vehicle operators or crew.

Other Materials and Supplies: The costs of materials and supplies not specifically identified in object classes fuel and lubricants and tires and tubes issued from inventory or purchased for immediate consumption.

Other Salaries and Wages: The labor of employees of the transit agency who are not classified as revenue vehicle operators or crew.

Taxes: The taxes levied against the transit agency by Federal, state, and local governments.

Tires and Tubes: The lease payments for tires and tubes rented on a time period or mileage basis, or the cost of tires and tubes for replacement of tires and tubes on vehicles.

Utilities: The payments made to various utilities for utilization of their resources (e.g., electric, gas, water, telephone, etc.). Utilities include: Propulsion power purchased from an outside utility company and used for propelling electrically driven vehicles; and Other utilities such as electrical power for purposes other than for electrically driven vehicles, water and sewer, gas, garbage collection and telephone.

Vehicle Maintenance: All activities associated with revenue and non-revenue (service) vehicle maintenance, including: Administration; Inspection and maintenance; and Servicing (cleaning, fueling, etc.) vehicles. In addition, vehicle maintenance includes repairs due to vandalism and accident repairs of revenue vehicles.

Vehicle Operations: All activities associated with vehicle operations, including: Transportation.

CAPITAL COSTS

This document provides a framework for the presentation of methods, cost data and assumptions applied to develop planning level conceptual capital costs estimates for the Okeechobee Blvd. & SR 7 Multimodal Corridor Study (MCS). The Okeechobee Blvd. & SR 7 MCS is evaluating seven (7) alternatives to include a No-Build / No-Action Alternative. Since there is not sufficient detail to prepare detailed construction costs, capital cost estimates were prepared for each alternative according to representative unit costs or allowances on a per unit cost basis that is consistent with the current level of project definition. These capital cost estimates will be further refined as a capital expansion project advances into future phases of project evaluation and development.

PROJECT DESCRIPTION

The Okeechobee Blvd. & SR 7 MCS evaluates transportation alternatives and transit supportive land uses to move people in a safe, efficient, and connected way, regardless of income, age, ability, or mode of travel across approximately 13.8 miles of Okeechobee Blvd./SR 704 and SR 7 as shown in Figure 1.

Okeechobee Blvd. provides a direct connection from western suburban areas to downtown West Palm Beach and regional transit connections. SR 7 is a regional north-south corridor that connects to Okeechobee Blvd. just before its northern terminus. In terms of the importance to the local transit network, Okeechobee Blvd. & SR 7 MCS intersect with 16 of Palm Tran's 32 local fixed-routes and account for approximately 15% of system ridership.

There are dedicated bicycle and pedestrian facilities along a majority of the study corridors. However, the existing non-motorized facilities do not support the land use in promoting alternate use of transportation. The Okeechobee Blvd. & SR 7 MCS will develop a comprehensive plan to implement multimodal facilities that connect communities along the corridor through the development of a recommended enhanced transit strategy.

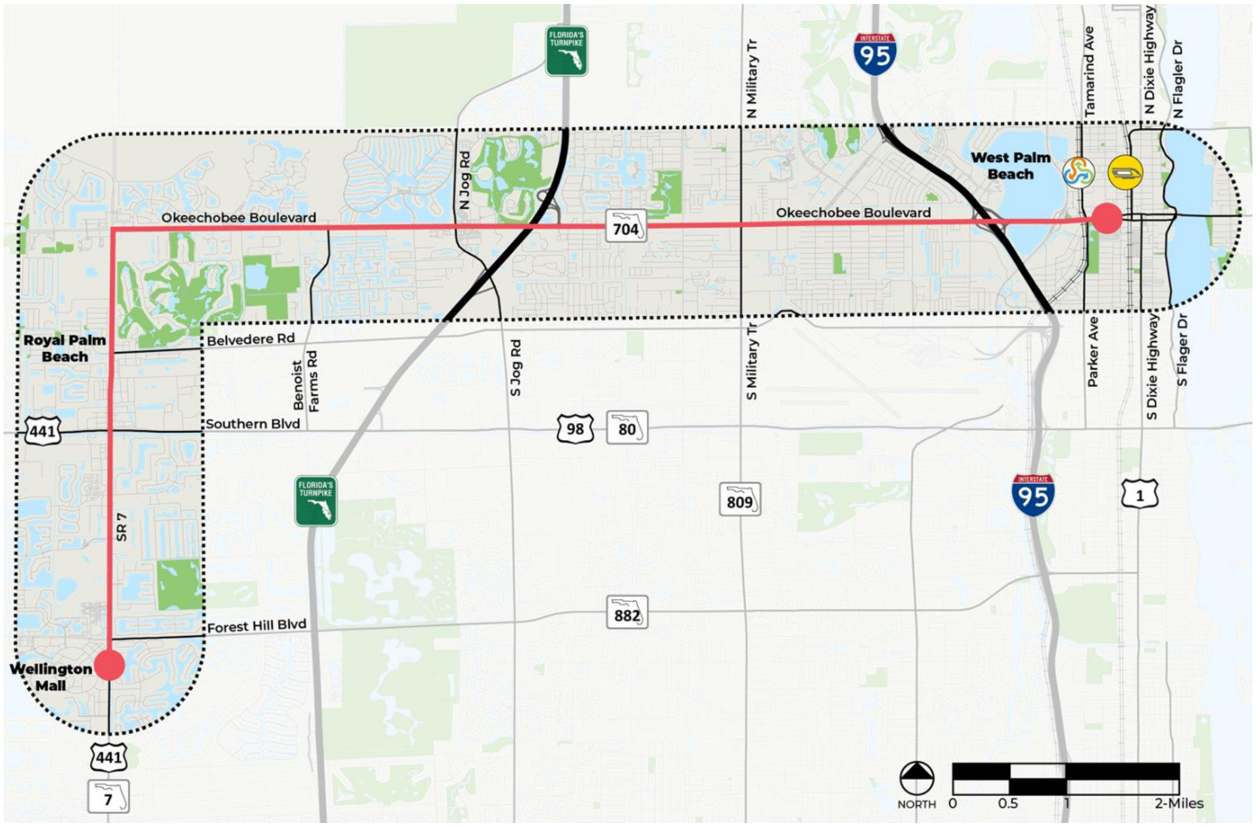


Figure 1: Okeechobee Blvd. & SR 7 MCS Study Limits

METHODOLOGY

The methodology to be used in preparing capital cost estimates has been developed in general accordance with Federal Transit Administration (FTA) guidelines for estimating capital costs. Part of the FTA guidelines call for cost estimates to be prepared and reported using the latest revision of the FTA's Standard Cost Categories (SCC). In the estimates, cost components for the capital expansion projects will be developed and summarized into the SCC.

These cost categories form the basis for the format and structure that will be used for the conceptual capital costs developed for the Okeechobee Blvd. & SR 7 MCS project alternatives.

Capital Cost Categories

In accordance with the latest version of the FTA's SCC, the capital cost components for each proposed Okeechobee Blvd. & SR 7 MCS project alternative will be classified into the following cost categories.

- 10 Guideway and Track Elements
- 20 Station, Stops, Terminals, Intermodal
- 30 Support Facilities: Yards, Shops, and Administration Buildings
- 40 Sitework and Special Conditions
- 50 Systems
- 60 Right-of-Way (ROW), Land, Existing Improvements
- 70 Vehicles
- 80 Professional Services
- 90 Unallocated Contingency
- 100 Finance Charges

The following provides some brief descriptions of these cost categories and their constituent elements.

Cost Category 10 – Guideway and Track Elements

Guideway and track elements are portions of a transit system that can be assigned costs at a fairly aggregate level with an acceptable level of accuracy. Guideway and track elements are subdivided into a number of sub-categories. These categories can be described by three primary types of construction, at-grade construction, aerial structure construction, and retained cut or fill/underground construction. This cost category is typically used for bus and rail-based transit modes such Bus Rapid Transit (BRT) and Light Rail Transit (LRT).

Cost Category 20 – Station, Stops, Terminals, Intermodal

Category 20 consists of any cost associated with the passenger stations including: grading, excavation, ventilation structures and equipment, station power and lighting, platforms, canopies, finishes, equipment, landscaping, mechanical and electrical components, access control, security, artwork, station furnishings (benches, trash receptacles, etc.) and signage.

Cost Category 30 – Support Facilities: Yards, Shops, and Administrative

Category 30 is comprised of vehicle storage and maintenance buildings; track for storage of vehicles; office support areas; major shop equipment and bus maintenance facilities; costs associated with clearing and grubbing, rough grading, excavation, construction of building structures, drainage facilities, roadways, asphalt pathways, lighting, mechanical and electrical components, landscaping, access control, safety and security, fueling stations; and other items necessary for construction and operation of a storage and maintenance facility.

Cost Category 40 – Sitework and Special Conditions

The development of a functional transit system often requires that a number of ancillary infrastructure and mitigation requirements related to the proposed transit service be addressed. These sitework and special conditions often include items that cannot be adequately represented by a typical cross-section because of complexity, uncertain alignment, special site conditions, or other unique circumstances. The sitework and special condition cost category is sub-divided into the following.

Demolition

This cost category generally includes costs for the demolition of special features such as buildings (if not included as part of right-of-way), large structures (bridges or retaining walls), or other existing features that fall outside of the guideway construction envelope.

Utility Relocations

Generally, one of the largest cost elements within cost category 40 is the relocation of existing utilities from within the guideway construction envelope. These relocations can include both public and private utilities, subject to any agreements that may apply to franchised utilities that exist within public right-of-way. Typically, utility relocation information is not available during the planning phase of project development, therefore, several levels of utility relocation allowances with average costs based on historical experience and professional judgement are applied.

Hazardous Material and Environmental Mitigation

Any special hazardous material or environmental mitigation costs, such as contaminated soil or ground water, wetlands mitigation, etc. would be included under this category. Typically engineering and design information is not available during the planning phase of a project on which to develop a quantity-based cost estimate. Therefore, an allowance is applied based upon best professional judgement.

Site Structures

This cost category typically includes structures such as retaining walls, sound walls, etc., that are outside of the guideway construction envelope. Structures such as retaining walls for retained cut or fill guideway and bridge or aerial structure used for aerial guideway are included in cost category 10 Guideway and Track Elements. For projects in the planning phase of development, site structures costs are typically applied on a cost per square foot basis.

Pedestrian Access, Landscaping

Typically, pedestrian access and landscaping information is not well developed during the planning phase of project development; therefore, several levels of pedestrian access and landscaping allowances with average unit costs based on historical experience and professional judgement will be utilized. Landscaping costs associated with park-and-ride facilities are included in the composite cost developed for those particular items and included in other cost categories.

Automobile Accessways, Parking Lots

This cost category can include new and reconstructed roadways, streets, surface parking areas, sidewalks, curbs and gutters, and related roadway facilities associated with construction of the rail guideway. Roadway and parking area cost estimates will be based on parametric unit costs.

Temporary Facilities

This cost category can include costs for mobilization, demobilization, project phasing; temporary construction associated with weather, construction easements, or temporary site access and to mitigate construction impacts. For the planning phase of project development, these costs are typically included as a percentage allowance mark-up based upon professional judgement.

Cost Category 50 – Systems

The systems cost category includes capital costs for many elements, including train control signals; traffic signals and crossing protection, communication systems; central control hardware and software; traction power substations; overhead catenary systems; underground duct banks; fare collection; grade crossing protection; and roadway traffic signal systems. For projects in the planning phase of development, limited detail on the various system components for a proposed transit project is provided. Therefore, systems costs are based upon historical experience and professional judgement.

Traffic Signals and Crossing Protection

For transit systems that are constructed to operate either within existing streets or with at-grade crossing of existing roadways, there is often a need for modifying existing traffic signals or constructing new traffic signals or other crossing protection. This cost category includes the signaling and control systems required for items such as vehicle and pedestrian signals, traffic signal pre-emption, and protection at hazardous guideway/highway at-grade crossings (flashing lights, bells, and signs).

Communications

The communications system provides the necessary subsystems to support the total operational requirements of the transit technology. The communications system costs provide for subsystems such as two-way radios, public address systems, telephone systems, variable message signs, interfaces to the fare collection and ticket vending equipment and equipment for the hearing impaired, etc.

Fare Collection

Costs for elements in this category are based upon a self-service, barrier-free, proof of payment fare collection system. Ticket vending machines (TVM) costs shall be based on a microprocessor-controlled coin or bill accepting machine capable of optionally accepting credit, debit, and stored value cards. The unit cost for fare collection includes all equipment costs and installation costs. The hardware includes provisions for fare vending facilities.

Central Control

The cost category includes all of the civil, structural, architectural, mechanical, electrical, and systems costs for providing for the remote monitoring of train operations, track conditions, substations, and station support facilities. The need for a central control facility is dependent on the operational analysis and assumptions that will be made for the given transit technology. Central control costs are typically associated with rail systems.

Cost Category 60 – ROW, Land, Existing Improvements

This cost category covers all land acquisition and acquisition related costs required to obtain various real property needed for the construction, operation, and maintenance of the proposed alignments. Costs include the fee acquisition of permanent and temporary easements, relocation costs, business damages and other miscellaneous costs. During the planning phase of a project, right-of-way (ROW) costs are not typically available due to the level of conceptual development of a project to accurately determine the acquisition of property (full or partial take). An allowance based upon historical experience is one method for estimation. However, the recent volatility of the real estate market requires specific market information for purposes of ROW valuation for acquisition.

Cost Category 70 – Vehicles

This cost category is generally subdivided into revenue (identified by transit mode) and non-revenue vehicles (where non-revenue vehicles include maintenance-of-way vehicles, and agency trucks and automobiles). During the planning phase of project development, the unit costs for vehicles will typically include costs for engineering, procurement, spare parts, etc. and is based on historical data from recent transit projects and available industry information.

Cost Category 80 – Professional Services

This cost category includes allowances for preliminary engineering, final design, project and construction management, agency program management, project insurance, surveys and testing, and start-up costs. These allowances are computed by applying a percentage to the total construction cost estimated for each cost category (excluding right-of-way and vehicle costs). Right-of-way and vehicle costs typically are calculated to include the management and administration costs associated with these activities and are therefore excluded from the calculation of professional services.

Cost Category 90 – Unallocated Contingency

Unallocated contingency is similar to allocated contingency in that it is primarily applied as an allowance for unknowns and uncertainties due to the level of project development completed. These contingencies are typically broader and address changes in project scope and schedule.

Cost Category 100 – Finance Charges

Finance charges are those costs that are anticipated to be paid prior to the completion of a project or the fulfillment of the New Starts funding commitment, whichever occurs first. Typically, finance charges are determined from a project's financial plan that is based upon an analyses of funding sources and funding use.

Since the project costs presented are for conceptual planning purposes, finance charges will not be included for conceptual capital costs estimates.

COST DATA

Cost data for the Okeechobee Blvd. & SR 7 MCS will be developed using several sources and will be comparable to those in the Southeast Florida region for similar types of construction. Planning level cost data has been developed based upon the level of conceptual planning which provides a beginning point for the development of a Unit Cost Library (UCL).

Unit Cost Library

For those unit costs that are principally found on a transit construction project, capital cost data specific to Palm Beach County or recent construction of other transit systems throughout the United States will be compared and adjusted to specific project needs based upon professional judgement. Unit cost associated with civil and structural construction elements that are generally common to both transit and highway construction projects will use cost data found in the Florida Department of Transportation (FDOT) Long Range Estimate (LRE) Average Unit Costs.

For transit specific costs items serval BRT and PRT projects were identified to assist in the preparation of conceptual cost estimates. For BRT, the METRO Gold Line, Cleveland Health Line, and IndyGo Red Line were referenced. LRT projects that were referenced include the Valley Metro LRT, METRO Blue Line LRT Extension (Bottineau, LRT) and Salt Lake City LRT.

Unit costs the Okeechobee Blvd. & SR 7 MCS will be developed as described in the following sections. This cost data will be compiled into a database format to form a UCL. The key elements of the UCL are typically an Item Code, Item Description, Unit of Measure, and Unit Cost.

The unit costs do not include items such as engineering, construction management, owner's administrative costs and allowances for contingencies. These costs will be included as percentage add-ons to the cost estimate under other cost categories.

Cost Development for Cost Category 10 – Guideway and Track Elements

The guideway cost estimates are based on parametric unit cost information on a per mile unit cost basis. For all BRT options other than median running, there are no guideway costs since the services will operate within an existing travel lane. Median running BRT guideway costs are based on widening six (6) lane urban divided arterial to eight (8) lane urban divided arterial costs from the FDOT Cost Per Mile Models for Long Range Estimating.

Both of the LRT options are based off of the 90 percent engineering costs estimates obtained from the FTA SCC workbook for the METRO Blue Line LRT Extension. These estimates include at-grade and elevated guideway and track on a per mile basis.

Cost Development for Cost Category 20 – Station, Stops, Terminals, Intermodal

The station costs estimates are based on varying levels of station investment for the BRT project alternatives according to reference projects as well as based on professional judgement. All BRT stations are at-grade and based on a per station cost to capture passenger shelter, off-board fare collection, level boarding and other passenger amenities. Median running BRT station costs are estimated using reference information from both Cleveland Euclid Ave BRT and IndyGo Red Line BRT capital costs.

The at-grade LRT stations referenced ValleyMetro LRT station costs that informed the estimate for the Okeechobee Blvd & SR 7 MCS. Elevated LRT stations are based upon professional opinion that factors in a vertical circulation component passenger access.

A park-and-ride facility is captured in the conceptual cost estimates to include a surface lot with a 100-car parking capacity. The conceptual cost estimate is based upon recent available local information and professional opinion.

Cost Development for Cost Category 30 – Support Facilities, Yards, Shops, and Administrative Buildings

There are no support facilities for the BRT alternatives identified since the assumption is that BRT vehicles would be maintained and stored at an existing Palm Tran facility. A new vehicle maintenance and storage facility will be required for any of the LRT project alternatives. An estimated capital cost is determined based upon the number of light rail vehicles and informed by the METRO Blue Line LRT maintenance and storage facility costs and professional engineering judgement.

When potential site options for the maintenance facility and layover facility are identified include sufficient engineering data is available, these costs will be updated. At the current level of project definition, no cost for land acquisition is included in the estimate for the vehicle maintenance and storage facility.

Cost Development for Cost Category 40 – Sitework and Special Conditions

Sitework costs for all Okeechobee Blvd & SR 7 MCS alternatives are based on the FDOT LRE costs and applied various assumptions according to an alternative. For utility relocation and environmental mitigation an allowance was applied based upon professional judgement to capture an estimated cost for each project alternative.

Cost Development for Cost Category 50 – Systems

Assumed quantities for the various category items were determined at the conceptual level for each of the proposed corridor expansion projects. Unit costs and allowances were applied to various items based upon professional engineering opinion that is appropriate for the scope of conceptual level plans.

Cost Development for Cost Category 60 – ROW, Land, Existing Improvements

Right-of-Way costs are not included in any of the project alternative capital cost estimates due to a lack of sufficient engineering information and data currently available. However, for the LRT alternatives, property will need to be acquired for the construction of a vehicle maintenance and storage facility. A preliminary conceptual cost estimate was provided as a placeholder. The cost is based upon the appraised market value as obtained from the latest available Palm Beach County property appraisers office.

Cost Development for Cost Category 70 – Vehicles

The BRT vehicle costs applied to the conceptual cost estimates are based on the historical costs for Cleveland Euclid Ave BRT, IndyGo Red Line BRT, as well as factoring in professional engineering judgment. The LRT vehicle costs are based upon information received from Kinkisharyo International, the vehicle manufacturer for ValleyMetro LRV.

The total vehicle costs include the required number of peak vehicles that are required to operate a proposed service as well as an applied 20 percent spare ratio.

Cost Development for Cost Category 80 – Professional Services

The following list of the professional services or soft costs percentage multipliers are being applied to the total construction costs for the proposed Okeechobee & SR 7 MCS alternatives. These total 32% of construction costs. Transit construction costs have historically incurred professional service costs of approximately 31% of construction costs[1]:

80.01	Preliminary Engineering	4.0%
80.02	Final Design	10.0%
80.03	Project Management for Design and Construction	8.0%
80.04	Construction Administration & Management	5.0%
80.05	Insurance	1.0%
80.06	Legal; Permits; Review Fees, etc.	2.0%
80.07	Surveys, Testing, Investigation, Inspection	1.0%
80.08	Start up	1.0%
		32.0%

Cost Development for Cost Category 90 – Unallocated Contingency

Unallocated contingency is added to the base price as an allowance for overall project unknowns and uncertainties associated with the level of project development not yet completed. For the BRT project alternatives, a 25 percent contingency was applied to capture the cost of uncertainty of the estimated costs for the project. A 30 percent contingency was applied to the LRT alternatives due to the added complexity and lack of engineering that has been completed in the early planning phase of the Okeechobee Blvd. & SR 7 MCS study.

Cost Development for Cost Category 100 – Finance Charges

An estimate of finance charges was not included since this information is not available. For finance charges to be determined, a specific financial instrument and mechanism needs to be identified to fund and deliver the project. At this point of conceptual development, it is too early to identify these specifics and therefore an amount is not included in the cost estimate study.

[1] TCRP Report 138: Estimated Soft Costs for Major Public Transportation Fixed Guideway Projects

ESTIMATED CAPITAL COSTS

An estimate of conceptual capital costs for each of the Okeechobee Blvd. & SR 7 MCS project alternatives are presented in the following table.

Table 1: Okeechobee Blvd & SR 7 MCS Conceptual Cost Estimates (2021$)

	Mixed	BAT	BRT - Curbside	BRT Median	LRT - At-Grade	LRT - Elevated
Guideway & Track Elements	-	-	-	$4,175,000	$50,406,000	$625,505,000
Stations, Stops, Terminal, Intermodal	$4,040,000	$8,840,000	$12,040,000	$15,240,000	$37,640,000	$66,440,000
Support Facilities: Yards, Shops, Admin. Bldgs	-	-	-	-	$37,800,000	$37,800,000
Sitework & Special Conditions	$31,144,000	$34,870,000	$61,832,000	$118,866,000	$80,679,000	$95,827,000
Systems	$190,000	$4,579,000	$7,452,000	$15,458,000	$220,725,000	$209,483,000
ROW, Land, Existing Improvements	-	-	-	-	$25,000,000 – $35,000,000*	$25,000,000 – $35,000,000*
Vehicles	$15,000,000	$18,000,000	$18,000,000	$18,000,000	$60,000,000	$60,000,000
Professional Services	$11,320,000	$15,453,000	$26,024,000	$49,196,000	$136,720,000	$331,218,000
Total:	$77,118,000	$102,178,000	$156,684,000	$276,168,000	$856,661,000	$1,899,655,000
Cost Per Mile:	$5,241,000	$6,944,000	$10,648,000	$18,768,000	$58,217,000	$129,096,000

*Preliminary ROW estimate for maintenance and storage facility site

MAINTENANCE AND STORAGE FACILITY

The Okeechobee Blvd. & SR 7 Multimodal Corridor Study (MCS) is evaluating six (6) enhanced transit alternatives of various modes to include Light Rail Transit (LRT). Since the existing Palm Tran system does not currently operate LRT as a transit mode, a designated facility and associated infrastructure will be necessary for Light Rail Vehicle (LRV) storage and maintenance activities. A subtask of the Okeechobee Blvd. & SR 7 MCS is to perform a site assessment to identify potential Maintenance and Storage Facility (M&SF) locations that could accommodate an LRT fleet. The area limits for this assessment are the same as for the Okeechobee Blvd. & SR 7 MCS study which extends from the Mall at Wellington Green on SR 7 to Rosemary Ave. in Downtown West Palm Beach via Okeechobee Blvd.

This memorandum defines specific criteria for identifying potential M&SF site locations for consideration followed by a preliminary evaluation and recommendation of site(s) for further study if an LRT alternative is selected as the recommended alternative for the Okeechobee Blvd. & SR 7 MCS.

MAINTENANCE AND STORAGE FACILITY CRITERIA

As part of the Okeechobee Blvd. & SR 7 MCS, a preliminary analysis is being conducted to define M&SF site requirements for purposes of identifying potential locations for consideration. A site must be large enough to accommodate fleet requirements of the specific transit operating plan to include spare vehicles. Based upon preliminary estimates a vehicle fleet of up to 12 LRVs is anticipated when assuming a 15-minute service frequency with two-car train sets.

Key parameters for the Okeechobee Blvd. & SR 7 MCS LRT M&SF assessment include:

- Location near an endpoint of the LRT alignment
- A site that is rectangular
- Minimum practical site size, approximately six (6) acres to accommodate up to12 vehicles.
- Site must be level across long dimension; up to two (2) percent grade difference acceptable across narrow dimension.
- Site that is as close to the LRT alignment as possible
- Site should be west of the South Florida Rail Corridor (SFRC) and Florida East Coast Railroad (FECR)

Site Configuration

An LRT M&SF site should be large enough to accommodate vehicle maintenance, vehicle storage, a LRV washing facility, a substation for traction power, stormwater retention, central control, maintenance of way and structures facility, storage and employee and visitor parking. Storage space for an initial fleet size of 12 vehicles would be desirable plus additional capacity to handle fleet storage and maintenance needs of potential future extensions. Typically, the M&SF site should be oblong or rectangular in shape.

Land Use Compatibility

The M&SF site ideally would be in an area with compatible surrounding land uses due to potential noise and lighting impacts from related activities at the facility. The M&SF typically involves a 24-hour operation with vehicle maintenance that occurs primarily throughout the night (1:00 a.m. to 5:00 a.m.) when the LRV fleet is out of service.

Rail Access

The M&SF should be located either adjacent to the Okeechobee Blvd. & SR 7 MCS main line alignment, or close enough to the main line alignment, to require as short a non-revenue (dead-head) connection as possible to the main line. If future phases or extensions are planned, the location of the facility can be assessed to include these considerations. Placing the facility adjacent to the main line alignment also minimizes the length of non-revenue track to be built.

The site should be located west of the SFRC and FEC Railroad due to associated difficulty to reach an acceptable agreement to cross an active railroad. Therefore, all MCS trains entering and exiting the M&SF would occur west of these existing railroads in the project limits.

Roadway Access

The site should be easily accessible from major streets for employees and delivery trucks. Access to the M&SF should not require employees and delivery trucks to traverse a residential area.

Acquisition Considerations

The evaluation of suitable M&SF locations should also consider the following as related to property acquisition.

- Reasonable cost in a relative sense.
- To extent possible, minimize business and residential displacements.
- If there are perceived impacts on any adjacent properties, an assessment of the possibility for mitigation should be addressed; some assessment of the cost should be addressed in the acquisition assessment.
- Some assessment, consistent with location should be made of the potential of the facility for joint use (i.e., facility on first floor with parking, commercial or industrial office needs above facility).
- Consideration of joint development at M&SF
- Consideration of sharing M&SF site with propose park and ride location

Assessment Approach

This is a preliminary assessment for the purpose of identifying potential site locations during an initial phase of the planning process. If an LRT alternative is identified as the recommended alternative, detailed technical analysis, environmental documentation and extensive public outreach and stakeholder involvement would be required far in advance of any property acquisition activities.

Based upon the parameters as previously identified, candidate sites were initially identified through a desktop analysis. Due to the urbanized environment of the Okeechobee Blvd. & SR 7 MCS corridor, a site may often an assemblage of property to meet the minimum acreage necessary to locate a M&SF of an appropriate size for the Okeechobee Blvd. & SR 7 MCS.

The first step of this assessment involved a search of vacant parcels that were within a close proximity (less than 1,000 feet) from the study corridor. Each location identified was further evaluated based upon the parameters previously identified – proximity to proposed LRT alignment, land use, parcel size and configuration, site accessibility.

POTENTIAL M&SF SITES

The following sites have been identified as potential M&SF locations and are listed beginning in the eastern portion of the Okeechobee Blvd. & SR 7 MCS project limits. These stations are illustrated in Figure 1:

- Site A – 1310 Mercer Ave.
- Site B – 5976 Okeechobee Blvd.
- Site C – 6255 Okeechobee Blvd.
- Site D – 6350 Okeechobee Blvd.
- Site E – 6500 Okeechobee Blvd.
- Site F – Okeechobee Blvd. & SR 7
- Site G – 1131 SR 7
- Site H – S SR 7
- Site I – 1381 SR 7

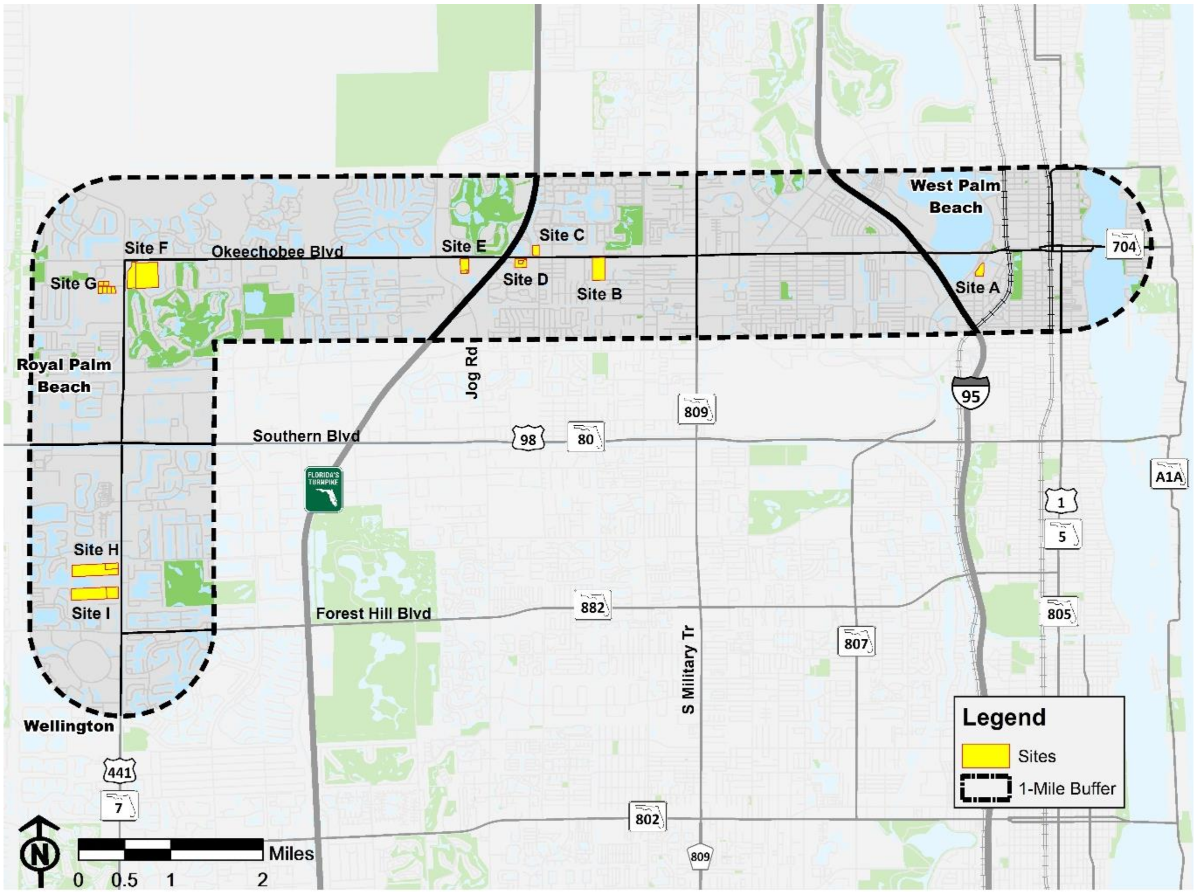


Figure 1. Sites Map

Site A (1310 Mercer Ave.):

The site is located near the eastern terminus point of the Okeechobee Blvd. & SR 7 MCS alignment and is publicly owned by the City of West Palm Beach. The site is zoned for industrial use and is approximately 5.5 acres. The surrounding land use is a mixture of industrial and institutional lots. An aerial of the parcel can be found in Figure 2 and maps detailing existing land use and zoning can be found in Appendix A.

Table 1. Site A Details

Parcel Size (Acres)	5.46
Configuration	Polygon
Land Use Designation	Institutional
Surrounding Land Use	Industrial and Institutional
Assemblage	Single Property
Accessibility	750ft from LRT Alignment
Ownership	Public

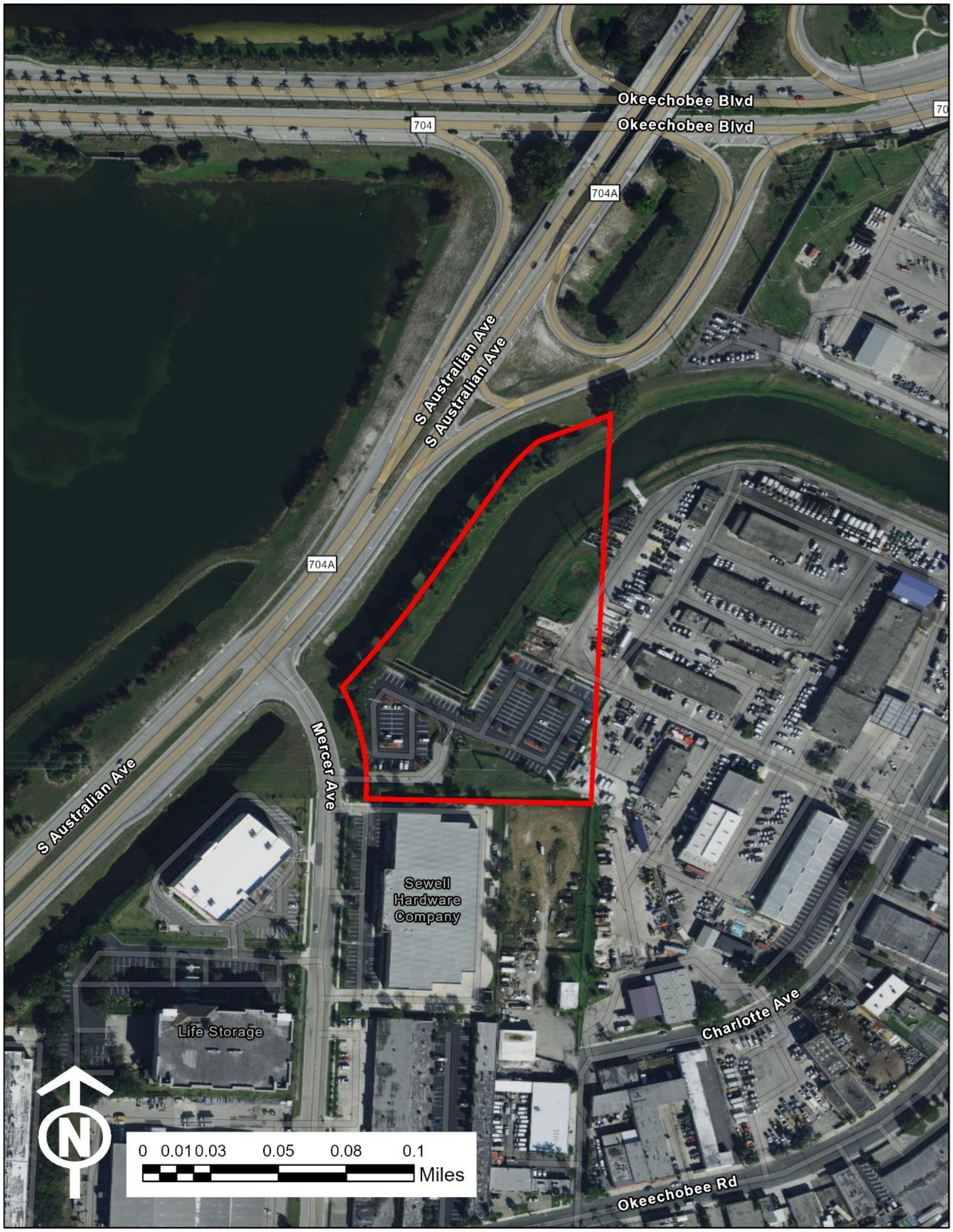


Figure 2. Aerial View of Site A

Site B (5976 Okeechobee Blvd.):

The site is located near the midpoint of the Okeechobee Blvd. & SR 7 MCS alignment, east of Haverhill Road, and is publicly owned by the City of West Palm Beach. The site is zoned for residential use and is approximately 18.7 acres. The surrounding land use is primarily a mixture of commercial and residential. An aerial of the parcel can be found in Figure 3 and maps detailing existing land use and zoning can be found in Appendix A.

Table 2. Site B Details

Parcel Size (Acres)	18.68
Configuration	Rectangle
Land Use Designation	Institutional
Surrounding Land Use	Commercial and Residential
Assemblage	Single Property
Accessibility	On LRT Alignment
Ownership	Public

Figure 3. Aerial View of Site B

Site C (6255 Okeechobee Blvd.):

The site is located near the midpoint of the Okeechobee Blvd. segment of the Okeechobee Blvd. & SR 7 MCS alignment and is privately owned by DS Investments 1 LLC. The site is zoned for commercial use and is approximately 4.6 acres. The surrounding land use is a mixture of commercial, residential, and other/vacant. An aerial of the parcel can be found in Figure 4 and maps detailing existing land use and zoning can be found in Appendix A.

Table 3. Site C Details

Parcel Size (Acres)	4.60
Configuration	Rectangle
Land Use Designation	Other/Vacant
Surrounding Land Use	Commercial, Residential, and Other/Vacant
Assemblage	Single Property
Accessibility	On LRT Alignment
Ownership	Private

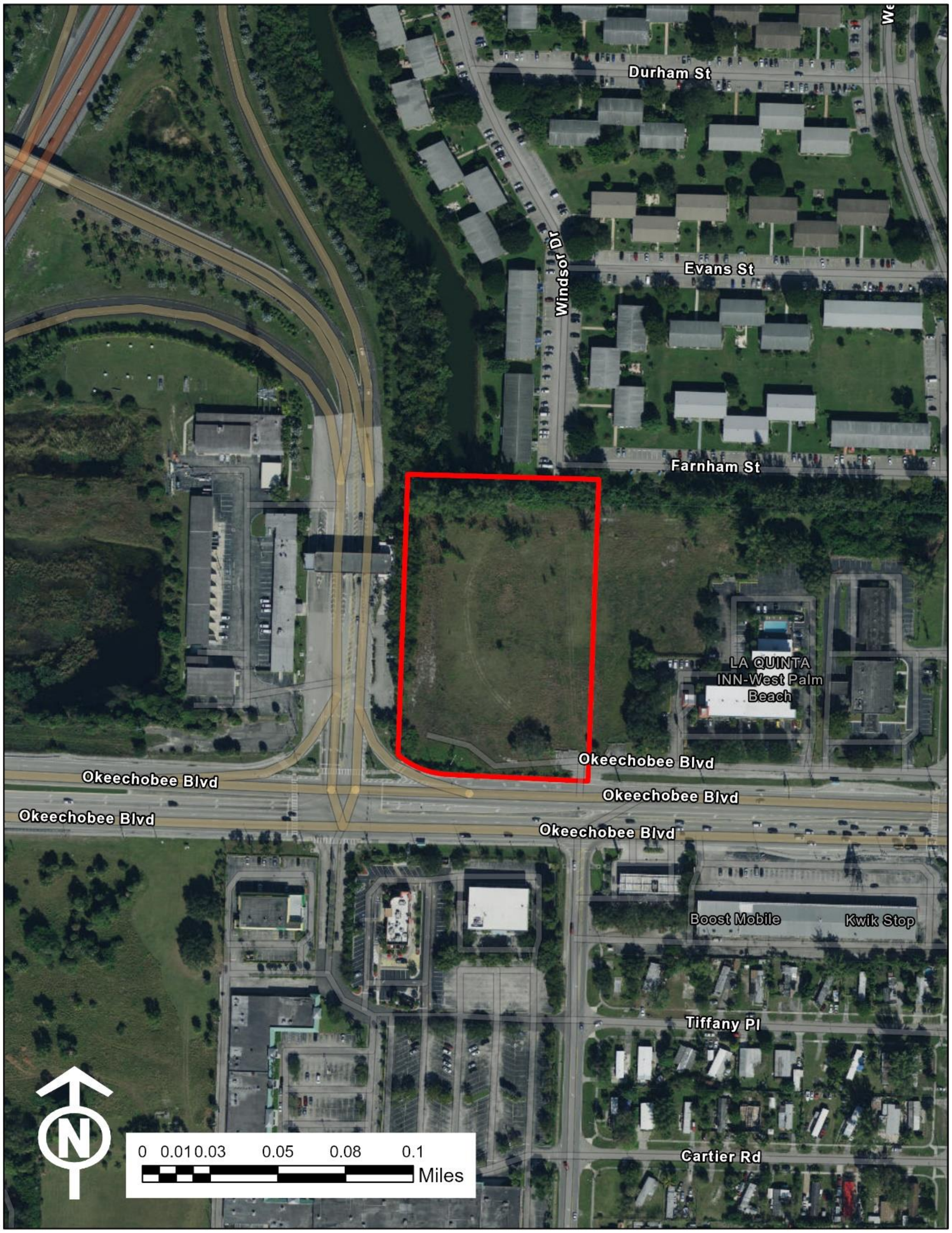


Figure 4. Aerial View of Site C

Site D (6350 Okeechobee Blvd.):

The site is located near the midpoint of the Okeechobee Blvd. segment of the Okeechobee Blvd. & SR 7 MCS alignment and is privately owned by Gold Coast Premier Properties VI LLC. The site is zoned for commercial use and is approximately 7.2 acres. The surrounding land use is a mixture of commercial and residential. An aerial of the parcel can be found in Figure 5 and maps detailing existing land use and zoning can be found in Appendix A.

Table 4. Site D Details

Parcel Size (Acres)	7.22
Configuration	Rectangle
Land Use Designation	Other/Vacant
Surrounding Land Use	Commercial and Residential
Assemblage	Multi-Property (Single Owner)
Accessibility	On LRT Alignment
Ownership	Private

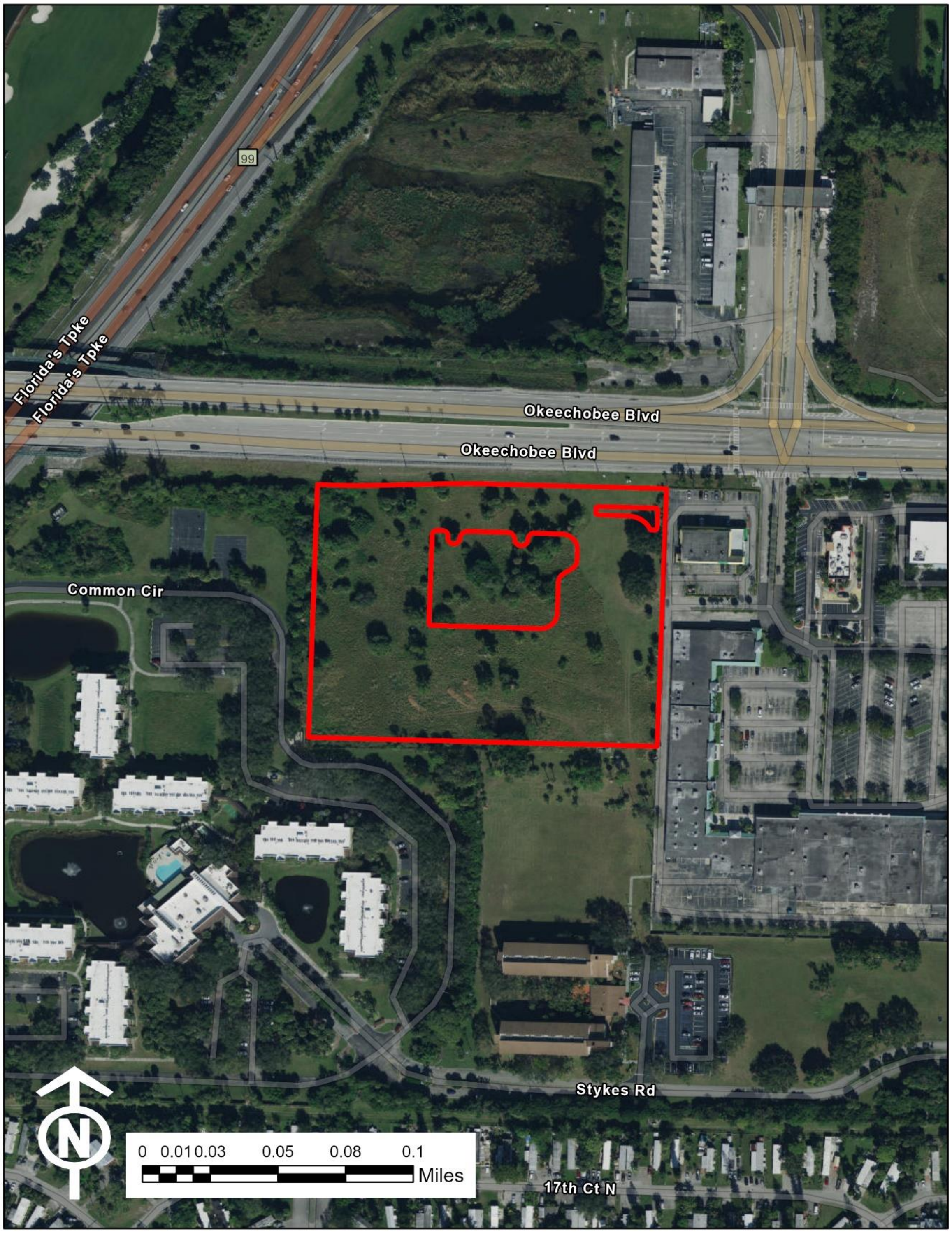


Figure 5. Aerial View of Site D

Site E (6500 Okeechobee Blvd.):

The site is located near the midpoint of the Okeechobee Blvd. segment of the Okeechobee Blvd. & SR 7 MCS alignment and is privately owned by Arrigo Enterprises. The site is zoned for commercial use and is approximately 8.2 acres. The surrounding land use is commercial. An aerial of the parcel can be found in Figure 6 and maps detailing existing land use and zoning can be found in Appendix A.

Table 5. Site E Details

Parcel Size (Acres)	8.23
Configuration	Rectangle
Land Use Designation	Commercial
Surrounding Land Use	Commercial
Assemblage	Multi-Property (Single Owner)
Accessibility	On LRT Alignment
Ownership	Private

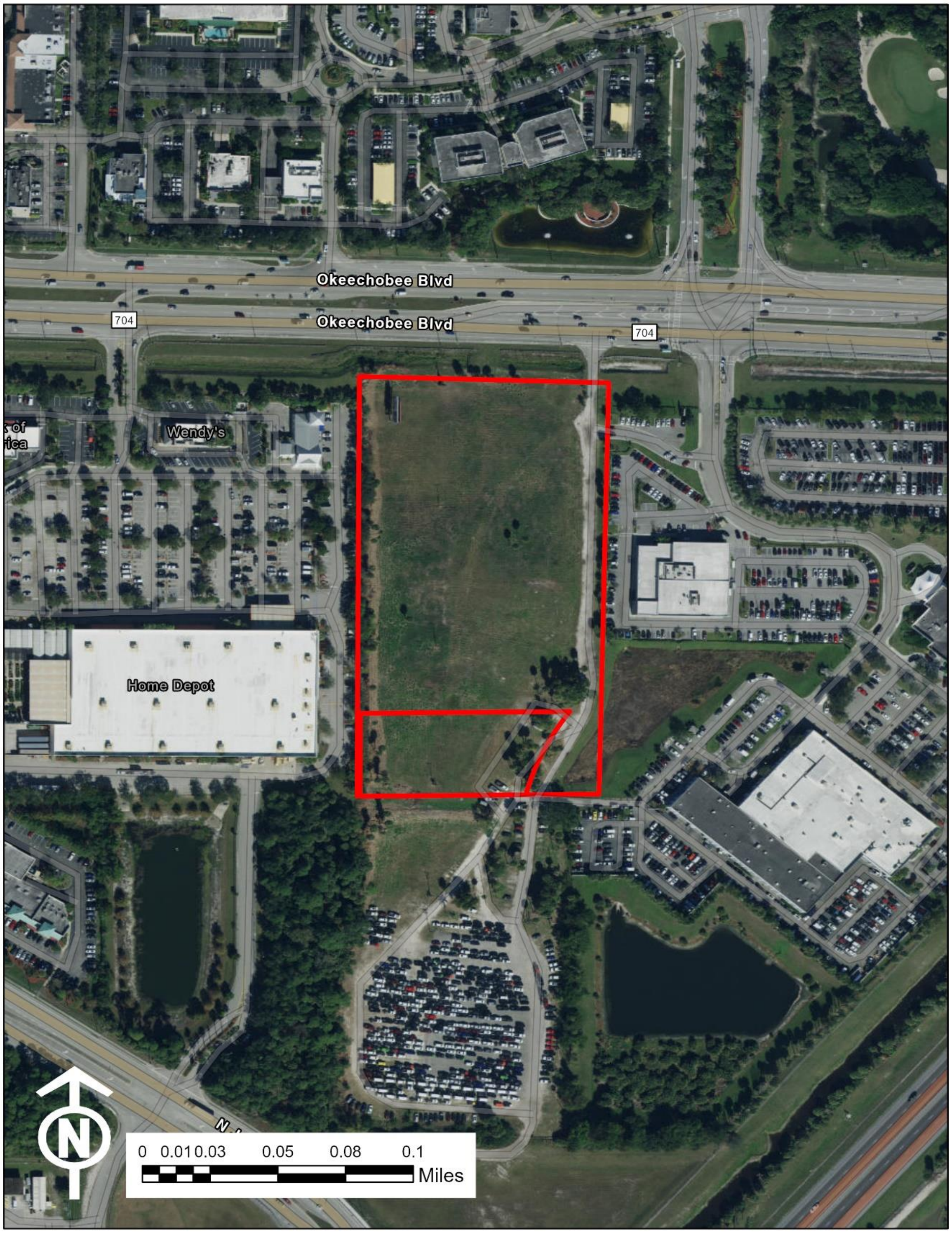


Figure 6. Aerial View of Site E

Site F (Okeechobee Boulevard & SR 7):

The site is located at the intersection of Okeechobee Blvd. and SR 7 of the MCS alignment and is privately owned by Atlas Royal Palm LLC. The site is zoned for commercial use and is approximately 50.7 acres. The surrounding land use is a mixture of commercial, residential, and open space. An aerial of the parcel can be found in Figure 7 and maps detailing existing land use and zoning can be found in Appendix A.

Table 6. Site F Details

Parcel Size (Acres)	50.77
Configuration	Rectangle
Land Use Designation	Other/Vacant
Surrounding Land Use	Commercial, Residential, and Open Space
Assemblage	Multi-Property (Single Owner)
Accessibility	On LRT Alignment
Ownership	Private

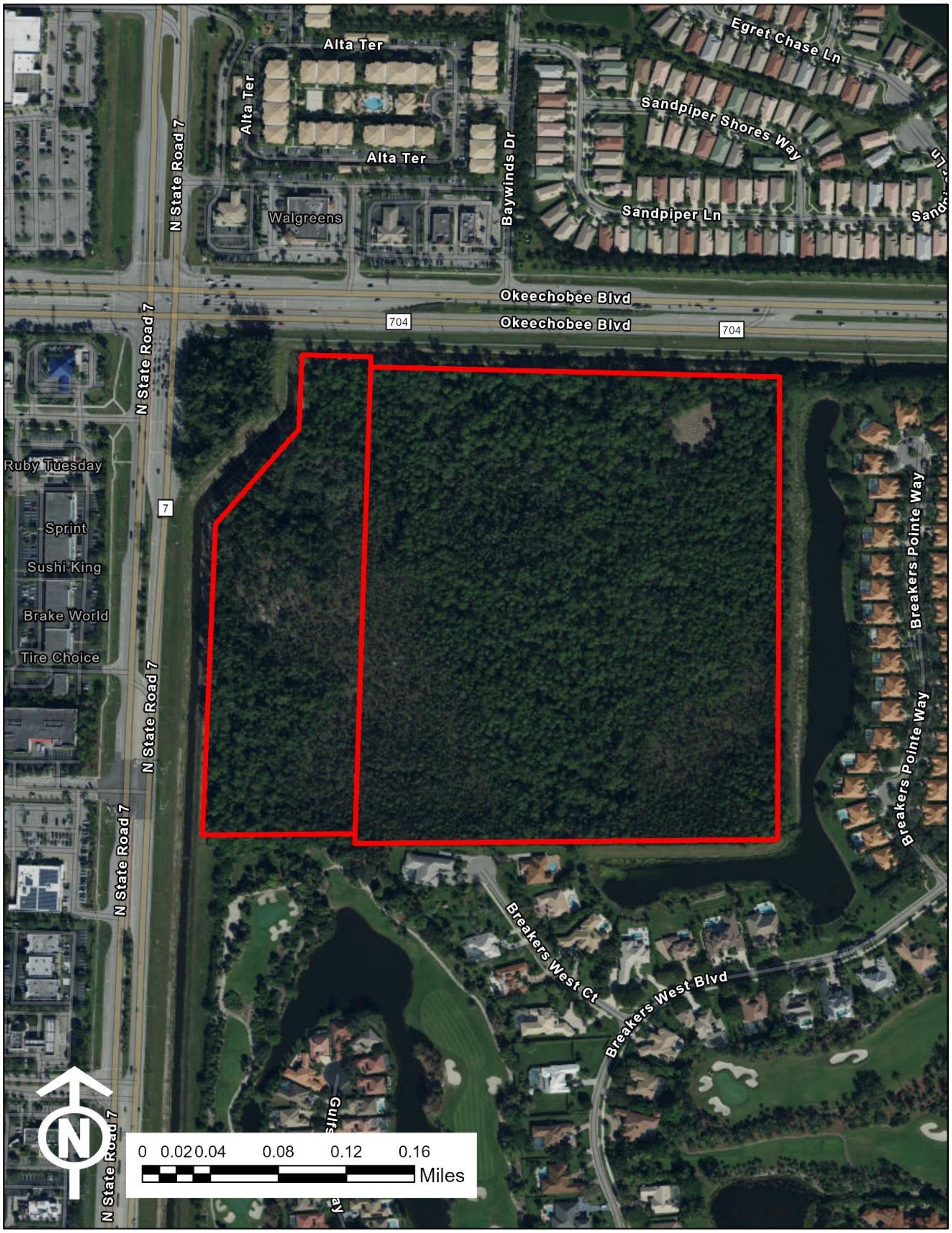


Figure 7. Aerial View of Site F

Site G (1131 SR 7):

The site is located near the intersection of Okeechobee Blvd. and SR 7 of the MCS alignment and is privately owned by Absolute Holdings of S FL LLC. The site is zoned for industrial use and is approximately 10.8 acres. The surrounding land use is a mixture of commercial, industrial, and residential. An aerial of the parcel can be found in Figure 8 and maps detailing existing land use and zoning can be found in Appendix A.

Table 7. Site G Details

Parcel Size (Acres)	10.80
Configuration	Rectangle
Land Use Designation	Other/Vacant
Surrounding Land Use	Commercial, Industrial, and Residential
Assemblage	Multi-Property (Single Owner)
Accessibility	450ft from LRT Alignment
Ownership	Private

Figure 8. Aerial View of Site G

Site H (South SR 7):

The site is located near the southern terminus point of the Okeechobee Blvd. & SR 7 MCS alignment and is privately owned by 441 Partners Inc. The site is zoned for residential use and is approximately 35.9 acres. The surrounding land use is a mixture of commercial, industrial, residential, and other/vacant. An aerial of the parcel can be found in Figure 9 and maps detailing existing land use and zoning can be found in Appendix A.

Table 8. Site H Details

Parcel Size (Acres)	35.92
Configuration	Rectangle
Land Use Designation	Other/Vacant
Surrounding Land Use	Commercial, Industrial, Residential, and Other/Vacant
Assemblage	Multi-Property (Single Owner)
Accessibility	On LRT Alignment
Ownership	Private

Figure 9. Aerial View of Site H

Site I (1381 SR 7):

The site is located near the southern terminus point of the Okeechobee Blvd. & SR 7 MCS alignment and is privately owned by Lotis Wellington LLC. The site is zoned for commercial use and is approximately 36.2 acres. The surrounding land use is a mixture of commercial, industrial, institutional, and other/vacant. An aerial of the parcel can be found in Figure 10 and maps detailing existing land use and zoning can be found in Appendix A.

Table 9. Site I Details

Parcel Size (Acres)	36.15
Configuration	Rectangle
Land Use Designation	Other/Vacant
Surrounding Land Use	Commercial, Industrial, Institutional, and Other/Vacant
Assemblage	Multi-Property (Single Owner)
Accessibility	On LRT Alignment
Ownership	Private

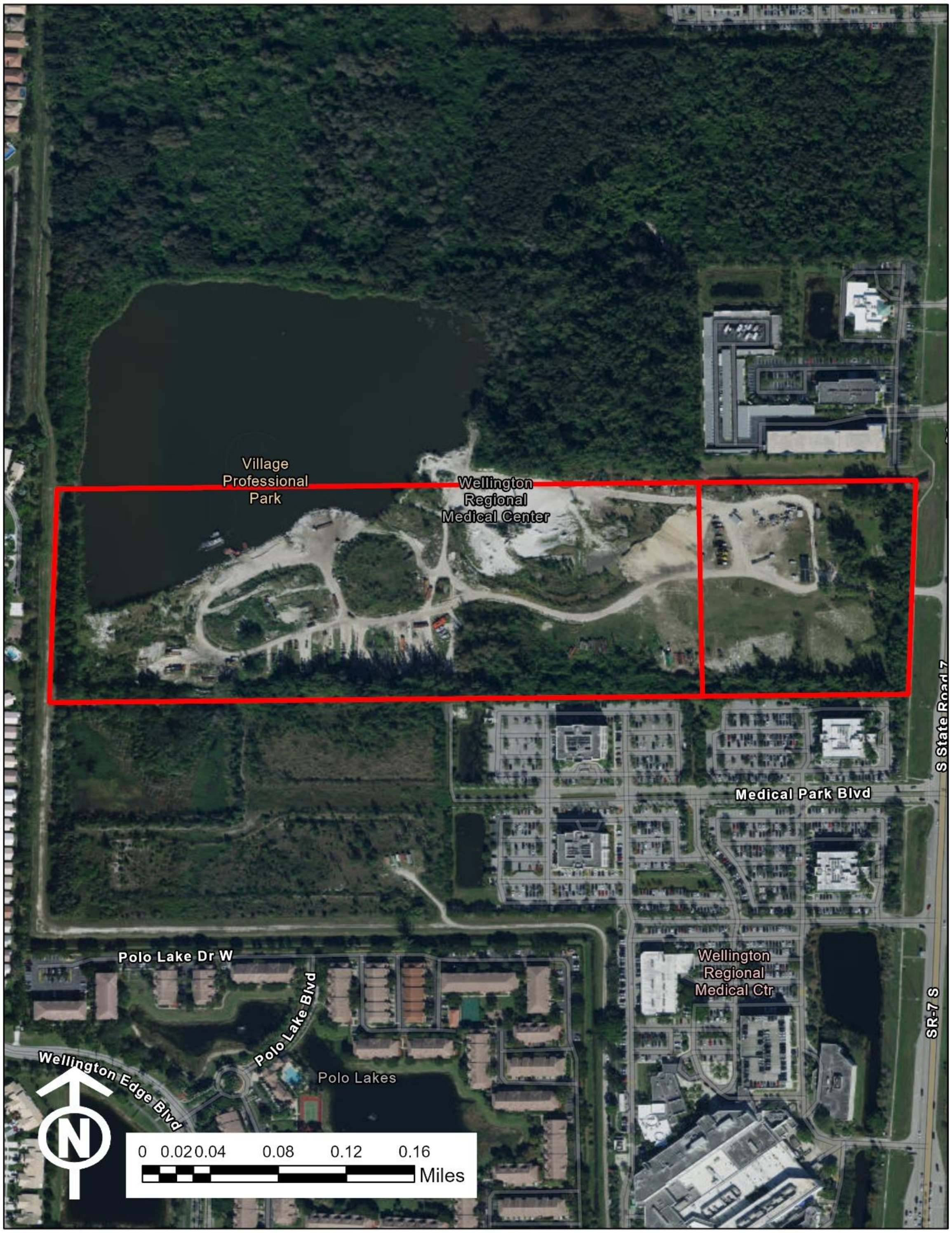


Figure 10. Aerial View of Site I

Table 10. Site Details

Details	Site A 1310 Mercer Ave.	Site B 5976 Okeechobee Blvd.	Site C 6255 Okeechobee Blvd.	Site D 6350 Okeechobee Blvd.	Site E 6500 Okeechobee Blvd.	Site F Okeechobee Blvd. & SR 7	Site G 1131 SR 7	Site H S SR 7	Site I 1381 SR 7
Parcel Size (Acres)	5.46	18.68	4.60	7.22	8.23	50.77	10.80	35.92	36.15
Configuration	Polygon	Rectangle	Rectangle	Rectangle	Rectangle	Rectangle	Rectangle	Rectangle	Rectangle
Land Use Designation	Institutional	Institutional	Other/ Vacant	Other/ Vacant	Commercial	Other/ Vacant	Other/ Vacant	Other/ Vacant	Other/ Vacant
Surrounding Land Use	Industrial and Institutional	Commercial and Residential	Commercial Residential and Other/ Vacant	Commercial and Residential	Commercial	Commercial Residential and Open Space	Commercial Industrial and Residential	Commercial Industrial Residential and Other/ Vacant	Commercial Industrial Institutional and Other/ Vacant
Assemblage	Single Property	Single Property	Single Property	Multi-Property (Single Owner)	Multi-Property (Single Owner)	Multi-Property (Single Owner)	Multi-Property (Single Owner)	Multi-Property (Single Owner)	Multi-Property (Single Owner)
Accessibility	750ft from LRT Alignment	On LRT Alignment	On LRT Alignment	On LRT Alignment	On LRT Alignment	On LRT Alignment	450ft from LRT Alignment	On LRT Alignment	On LRT Alignment
Ownership	Public	Public	Private	Private	Private	Private	Private	Private	Private

SITE(S) SELECTION RECOMMENDATIONS

The nine (9) M&SF locations generally meet the criteria established to perform an initial assessment of identifying a MS&F site(s) for the two (2) LRT alternatives being evaluated for Okeechobee Blvd. & SR 7 MCS. All sites have one (1) owner which will facilitate an assemblage of multiple properties if necessary and is often a primary challenge with locating a site when having to deal with multiple owners when proceeding through property acquisition. Two (2) locations are public owned while the remaining seven (7) sites are on privately owned land.

A listing of each site location below includes a brief conclusion and indicates whether the location should be advanced for further analysis pending whether one of the LRT project alternatives are identified as a recommended alternative for the Okeechobee Blvd. & SR 7 MCS.

Three (3) locations have been recommended to be advanced into the next project phase to include Site B, Site E and Site F.

Site A – 1310 Mercer Ave. (Not Recommended)

The land parcel is publicly owned to include compatible surrounding land use. However, parcel size is below minimum lot size to accommodate a M&SF facility with limited opportunity for expansion. Also, would need to mitigate for any displacement of existing canal.

Site B – 5976 Okeechobee Blvd. (Recommended)

Since parcel is publicly owned this site should be kept for further analysis. Compatible land use and the parcel size is more than the minimum lot size required to accommodate a M&SF facility.

Site C – 6255 Okeechobee Blvd. (Not Recommended)

Parcel size is too small with residential development as a neighboring land use.

Site D – 6350 Okeechobee Blvd. (Not Recommended)

Site D exceeds the parcel size requirement and is adjacent to the project corridor however, medium density residential development is a neighboring land use.

Site E – 6500 Okeechobee Blvd. (Recommended)

Site E provides an adequately sized parcel with compatible surrounding land use and is adjacent to the corridor. The parcels of land are privately owned and future development plans for this location are unknown and would require additional due diligence to further advance this location into the next phase of the Okeechobee Blvd. & SR 7 MCS.

Site F – Okeechobee Blvd. & SR 7 (Recommended)

This is a large parcel with a portion that could be utilized to locate a M&SF. Furthermore, this location is being considered as a designated park-and-ride lot for the Okeechobee Blvd. & SR 7 MCS. Exact location of the M&SF site could be configured to mitigate impacts on neighboring residential development.

Site G – 1131 SR 7 (Not Recommended)

Multiple parcels (six (6) in total) would need to be acquired from the single private landowner. Two (2) parcels are physically separated by an existing roadway which limits the amount of available land for a MS&F site as well as restricts facility configuration options. All land parcels are privately owned and future development plans for this location are unknown.

Site H – S SR 7 (Not Recommended)

Multi-family residential and mixed-use development have been identified for this privately owned land.

Site I – 1381 SR 7 (Not Recommended)

Multi-family residential and mixed-use development have been identified for this privately owned land.

NO BUILD/NO-ACTION

DECEMBER 2021

OKEECHOBEE BLVD. & SR 7
MULTIMODAL STUDY

PALM BEACH Transportation Planning Agency

MIXED TRAFFIC BUS WITH LIMITED STOPS

DECEMBER 2021

**OKEECHOBEE BLVD. & SR 7
MULTIMODAL STUDY**

PALM BEACH
Transportation
Planning Agency

BUSINESS ACCESS AND TRANSIT (BAT) CURBSIDE LANES

DECEMBER 2021

OKEECHOBEE BLVD. & SR 7
MULTIMODAL STUDY

PALM BEACH Transportation Planning Agency

CURBSIDE DEDICATED-LANE BRT

DECEMBER 2021

OKEECHOBEE BLVD. & SR 7
MULTIMODAL STUDY

PALM BEACH
Transportation
Planning Agency

CENTER-PLATFORM DEDICATED-LANE BUS RAPID TRANSIT (BRT)

DECEMBER 2021

OKEECHOBEE BLVD. & SR 7 MULTIMODAL STUDY

PALM BEACH Transportation Planning Agency

CENTER-PLATFORM DEDICATED-LANE LIGHT RAIL TRANSIT (LRT)

DECEMBER 2021

OKEECHOBEE BLVD. & SR 7
MULTIMODAL STUDY

PALM BEACH
Transportation
Planning Agency

D: Health Impact Assessment

Executive Summary

The Palm Beach Transportation Planning Agency (TPA) conducted a Health Impact Assessment (HIA) to assess health effects of a no-build scenario compared with proposed multimodal alternatives as part of the Okeechobee Boulevard and SR-7 Multimodal Corridor Study in Palm Beach County, Florida.

Health Impact Assessment

A HIA is a process that analyzes and quantifies how a policy or investment influences people's health. The HIA process consists of six main components: screening, scoping, assessment, recommendations, reporting, and monitoring and evaluation. Use of evidence-based approaches to predict potential health risks and benefits within a community, supported the HIA as a valuable source of evidence that facilitates the process to develop and select alternative systems focused on health promotion and risk mitigation.

1. **Screening**: Determine the HIA's value to the TPA's decision-making process; Assess timeliness & feasibility of the HIA; Evaluate the project based on TPA's Performance Measures.
2. **Scoping**: Define scope of investigation; Develop assessment plan using the Transportation-Alternative Health Analysis framework
3. **Assessment**: Evaluate health impacts of the no-build scenario and proposed multimodal alternatives in terms of air quality and resilience, physical activity, and road safety.
4. **Recommendations**: Use assessment findings to develop recommendations that align with the TPA's Performance Measures and optimize health promotions for each proposed scenario.
5. **Reporting**: Present HIA finds to the community.
6. **Monitoring & Evaluation**: Track the impact of HIA findings on the TPA's selection of a multimodal alternative.

Transportation-Alternative Health Analysis

The Transportation-Alternative Health Analysis scale was used to weigh health outcomes associated with specific design elements for each of the alternatives considered by the TPA. Categories deemed most relevant in evaluating the multimodal alternatives considered by the TPA were air quality and resilience, physical activity, and road safety. The Transportation-Alternative Health Analysis criteria categories were composed of factors that were individually assessed across the various alternatives. Impacts of an alternative's design were assigned value, based on their resulting effects on health using a likert scale system from -2 (impact on health is negative) to 2 (impact on health is positive).

Integrated Transport and Health Impact Model

As part of the larger Transportation-Alternative Health Analysis score, the Integrated Transport and Health Impact Model (ITHIM) is a modeling tool that quantifies the impact of changes to active travel behavior patterns on health. Depending on the design features included within the proposed scenarios considered by the Palm Beach TPA, the ITHIM predicts shifts in the number of vehicle miles traveled (VMT) to personal miles traveled (PMT).

Assuming transportation scenarios will increase bus ridership and active travel (e.g., biking), there was an expected redistribution from personal driving miles to miles traveled in active travel behaviors. As such, the ITHIM modeled health impacts across baseline (no-build) and three (3) scenarios. Scenarios shift 5, 10, or 15-percentage of overall miles traveled (vehicle and personal) from VMT to PMT. Projected ridership, informed by technical expertise and literature review, was utilized as a measure of such shifts in travel behavior. Proposed alternatives were categorized into one of the three scenarios based on their estimated changes in ridership.

Quantitative & Qualitative Analyses

A literature review, feedback provided during two Working Group meetings and public workshops, and results from polling activities informed the research questions and methodology established for assessment. These collaborative efforts helped to ensure the relevance of research objectives to the focus of the HIA. In response, the Transportation-Alternative Health Analysis was developed as a particularly effective approach to promote positive health impacts while also developing strategies to combat negative health impacts experienced within each of the proposed scenarios. Incorporating both qualitative and quantitative data elements, the Transportation-Alternative Health Analysis scale value quantifies the impact of each measure on health.

Working Group Engagement

Relevant interest groups were identified for their involvement in the HIA based on their expertise and value in the decision-making process. The project team assembled a Technical Steering Committee composed of field experts from the Palm Beach County TPA, FDOT, Palm Tran, and the City of West Palm Beach. Technical Steering Committee members offer content knowledge about planning, engineering, and health. Together with the technical team, public engagement and key informant interviews provided an opportunity to facilitate discussions with the community, thereby incorporating the public voice in guiding the HIA.

Findings & Recommendations by Alternative

No-Build

If selected, the no-build scenario would have a somewhat negative impact on health within the study area (Overall Transportation-Alternative Health Composite Score= -0.83). Compared with other proposed multimodal alternatives, the transportation health analysis predicts the no-build scenario would have the most negative implications on air quality and resilience, as well as physical activity. Features such as 6’ wide sidewalks, existing multimodal facilities, higher vehicle speeds associated with 12’ wide travel lanes, and narrow bicycle lanes do little to encourage public transit ridership, and pedestrian or bicycle activity. Existing emission trends, combined with the highest rates of air-quality and physical activity-related diseases, contribute toward the no-action scenario as the worst overall for health.

However, the no-build alternative possesses several health benefits that must be balanced with potentially negative health outcomes. While the lack of a bicycle lane buffer and limited width increase ambient stress and risk amongst bicyclists, those features are also associated with increased attentiveness on part of vehicle operators. The limited construction impacts involved with the no-build scenario bolster the aesthetic appeal along the corridor, an important consideration when assessing both short- and long-term impacts during the implementation phase of this project.

Under current transportation infrastructure, active travel behaviors (i.e. walking and bicycling) remain low, meaning fewer individuals are less likely to be involved in a crash resulting in injury or death. Although reduced activity levels positively influence road safety outcomes, discouraging pedestrian and bicycle engagement is not a suitable response. Instead, countermeasures such as enhancements to bicycle and pedestrian facilities (i.e., increased lighting, landscaping, tree canopy, and/or wider bicycle lanes and sidewalks) may help to reduce the negative health impacts experienced under the no-build scenario.

Mixed Traffic with Limited Bus Stops

The mixed traffic alternative with limited stops scored as the second highest alternative in terms of negative health impacts (Overall Transportation-Alternative Health Composite Score= -0.13). Given the slight increase in ridership from an added service route, this alternative may raise the convenience for residents to utilize multimodal options without the significant construction impacts characteristic of some other alternatives (i.e., center platforms for BRT or LRT uses). The mixed traffic alternative retains the potential for green space seen in the no-build scenario, while also enjoying a reduction in air quality and physical activity related diseases. Furthermore, perceived safety is positively impacted under proposed conditions, arising from wider sidewalks (uniform over all alternatives except no-build), wider, designated bicycle lanes, and slower traffic speeds (a byproduct of narrower travel lanes).

If selected, additional strategies should be developed to address areas of concern among bicyclists and roadway efficiency. In spite of equivalent risks of injury, designated bicycle lanes lack the physical barrier attributed to separated bicycle lanes. As a result, bicyclists may experience elevated levels of ambient stress than alternatives which include plans for separated bicycle lanes. From an air quality perspective, the mixed traffic option does not present the most efficient strategy to promote public-transportation use. Though rises in public transit ridership are predicted, the convenience and efficiency afforded by bus-dedicated lanes seen in the BAT curbside lane, and curbside BRT alternatives, are missing in the mixed traffic scenario. Mitigation strategies to ameliorate public transit efficiency, should aim to reduce the time spent in traffic among bus service routes, and in turn, encourage more users to use public transportation options.

Business Access and Transit Curbside Lane

The Business Access and Transit (BAT) curbside lane option falls ahead of the mixed traffic alternative according to the overall Transportation-Alternative Health Analysis score (0.45). Unsurprisingly, both alternatives share similar health benefits, such as wider sidewalks, equidistant buffer setbacks, designated bicycle lanes, availability of green space, and comparable ridership rates. Unlike the mixed traffic alternative, the BAT curbside option is unique in its integration of dedicated BAT lanes and some elements of BRT into design plans. Dedicated curbside lanes possess several health benefits. In addition to reducing pedestrian exposures when boarding and deboarding buses, exclusive bus lanes help to reduce travel times when utilizing public-transit services. As a consequence of enhanced efficiency, the BAT curbside lane enjoys increased ridership than the mixed traffic alternative, while averting an increased risk of road traffic fatalities and injury. A further health benefit of the BAT curbside lane is the width of individual travel lanes. As the alternative with the narrowest travel lanes (11' wide), the BAT curbside lane scenario entails the greatest reduction in vehicle speeds associated with such metrics.

Curbside Dedicated Lane Bus Rapid Transit

As the best rated alternative in the Transportation-Alternative Health Analysis, the curbside dedicated lane BRT alternative has some of the most positive overall health impacts of all the proposed scenarios (overall Transportation-Alternative Health Composite Score = 0.78). Despite its scoring in the Transportation-Alternative Health Analysis, the potential for greatest health impacts relate to LRT alternatives for reasons that will be discussed in greater depth within their specific recommendations.

BRT is a highly efficient and cost-effective transportation system that is similar to LRT. BRT is less burdensome from an operational and maintenance approach, even though the capacity for riders is somewhat diminished compared to LRT. In contrast to the BAT curbside lane option, the curbside BRT boasts enhanced efficiency through use of off-board fare collection and traffic signal priority, in addition to dedicated bus lanes. Supplementing it's appeal from an emissions and convenience standpoint, BRT is considered more accessible than traditional bus services, due to features such as elevated platforms, which may aid in addressing disparities in transportation access among the disabled or aging populations. Improvements to ridership also assist in modifying travel behaviors and thus alleviate the burden of chronic diseases related to poor air quality and lack of physical activity.

However, fewer travel lanes may increase congestion and in turn slow traffic speeds, reducing the risk of a crash. The smaller buffer setback between the roadway and sidewalk may negatively impact the perceived safety of pedestrians (although this is mitigated by the outer lanes being dedicated to transit-related travel), as well as their exposure to traffic-related pollutants. Further attention should also be paid to the increased risk of injury resulting from wider traffic lanes (12' wide) and heightened vehicle speeds.

Center Platform Bus Rapid Transit

The center platform BRT alternative is one of two alternatives that involve converting the existing median space into two (2) separated lanes dedicated for public-transit use. Overall, the center platform BRT lags behind the curbside dedicated lane BRT with regard to positive health impacts associated with air quality, physical activity, and road safety (overall Transportation-Alternative Health Composite Score = 0.56). Key differences between this alternative and the others considered by the TPA, center on the construction of a center platform. Positive health impacts of this alternative surround the rise in ridership, wherein physical activity is increased, and emissions of environmental pollutants are cut back from the reduction in personal vehicle travel. Bicyclists are similarly benefitted to other alternatives that incorporate a separated buffer lane design.

There exists several potentially negative health outcomes as a result of the center platform BRT option, many of which pertain to construction impacts. Given the significant effort and investment required to build the center platform, existing health disparities along the study corridor may worsen over time. Construction may discourage residents from engaging in active travel modes by compromising the aesthetic appeal of the roadway. By developing the median, health benefits related to the presence of green spaces (i.e., reducing exposures to vehicle emissions, ambient stress, and lower home values) are lost. If selected, this alternative should make effective use of the buffer setback from the roadway to the sidewalk as an area for landscaping and vegetation in order to offset the consequences of converting the median.

Center Platform Light Rail Transit

The center platform dedicated LRT alternative is one of two proposed designs that incorporate LRT technology. Despite being a highly sophisticated and modern transportation mode, LRT requires substantial financial investment to construct and maintain over time. As such, the center platform LRT option does not positively impact health to the same extent as previous designs that supply accessible, efficient, and connected transportation services. The Transportation-Alternative Health Analysis score identifies the center platform LRT as an alternative that has a somewhat positive health impact related to air quality and resilience, physical activity, and road safety (overall Transportation-Alternative Health Composite Score = 0.57).

LRT systems provide several distinct advantages in terms of health. As an electric technology with a high capacity for ridership, LRT use may significantly reduce roadway emissions produced by personal vehicle use. In a ten-year follow up study, Valley Metro found that implementation of LRT in Maricopa County, Arizona, triggered significant improvements to quality of life in the affected communities. Over 35,000 jobs have since been created in ½ mile of the Valley Metro's LRT (Valley Metro, n.d.). Other benefits include improved access to education and areas of interest in a single trip, a reduction in bicycle and pedestrian crashes, and increased affordability within the LRT corridor when compared with the average for Maricopa County (Valley Metro, n.d.). Increased public-transit use is also associated with a greater number of individuals satisfying their daily exercise requirements.

Despite its advantages, LRT is not the best suited option for all metropolitan areas. The sizable cost and construction required to build a center platform, may quell the positive effects of the alternative on emissions and physical health. However, these potentially negative impacts must be balanced for long-term outcomes as demonstrated by Valley Metro, wherein public transit ridership soared 487%, and 81% of users walk ¼ mile or less to access transit options since the implementation of LRT in 2008 (n.d.).

This specific alternative shares in some negative aspects experienced as result of limited available green spaces, fewer travel lanes for public and general roadway-use, and risk of higher vehicle speeds associated with wider travel lanes. Similar to recommendations formulated toward the center-platform BRT design, strategies to mitigate adverse health impacts aim to make active travel modes more desirable. Primarily, use of landscaping as a means to improve aesthetic appeal, help to reduce ambient stress caused by increased vehicle speeds and/or traffic congestion, and encourage walking or bicycling.

Elevated Grade-Separated Light Rail Transit

Much like the center platform design, the elevated grade-separated LRT has similar health impacts. A distinct feature of this alternative is the elevated and separated design for the LRT system, which would minimize obstructions to the roadway and alleviate traffic congestion. As a consequence, the elevated LRT option allows for four (4) travel lanes, as opposed to the three (3) lanes proposed in other alternatives (*e.g.*, center platform LRT and BRT). Decreased frustration among vehicle operators, congestion, and time spent in traffic are among some of the benefits experienced by the elevated LRT design, however from the perspective of road safety, these factors are negative in their effects on road traffic speeds and crash risk.

While four travel lanes may be advantageous for drivers along the study corridor, pedestrians are not so fortunate. In contrast, the greater distance across the roadway increases pedestrian's exposure and risk of injury when crossing the street. This issue is compounded by the frequency at which LRT users may need to cross the roadway in order to access the platform. Similarly, a reduction in buffer setback space between the roadway and sidewalk could diminish the sense of safety among pedestrians and discourage walking as a travel mode. Mitigation strategies to improve pedestrian safety and crash risk include plans for crosswalk enhancements, and integration of greenery in the available spaces below the LRT platform.

General Recommendations

In addition to the alternative-specific recommendations, this HIA formulated further evidence-based considerations that should be considered by the TPA, regardless of the selected alternative. The following is an abbreviated list of the aforementioned recommendations:

1. **Prioritize transportation infrastructure aimed at connectivity, in order to bolster equitable access to healthy living.**
    a. Minority populations, older adults, low income, and people living with disabilities are disproportionately impacted by limited transportation systems (Institute of Medicine, 2007; Shrestha et al., 2017).
2. **Prioritize projects using Performance Measures to achieve health equity.**
3. **Facilitate appropriate investments in efficient public transit infrastructure improvements that increase ridership and achieve health equity.**

a. Infrastructure like BRT are advantageous in that they produce fewer emissions than traditional buses, and reduce travel times through off-board fare collection and traffic-signal priority (FTA, 2015).

4. **Consider transportation design elements that promote pedestrian activity.**

   a. Sidewalks that are 12 feet wide, further away from vehicular traffic, and slower roadway speeds are among the features discussed between proposed alternatives that can effectively encourage pedestrian activity (Clarke & George, 2005; Heinrich et al., 2008; Galea et al., 2005).

5. **Prioritize crosswalk enhancements to increase health and safety.**

6. **Consider transportation design elements that promote bicyclist activity.**

   a. Separated bicycle lanes substantially improve the perceived safety of bicyclists, which may in turn bolster existing modeshare splits for bicycling.

7. **Develop an architectural ITHIM to be used in corridor-level analysis that emphasizes equity, gathers environmental inputs from TPA Performance Measures, and informs a regional travel-demand ITHIM mechanism.**

8. **Collaborate with FDOT to develop a monitoring plan for each of the main corridors/throughout the County.**

9. **Consider short-term changes that enhance facilities and build a culture to support a Safe System approach.**

   a. Though crashes are inevitable, the Safe System approach attempts to reduce the risk of human error, and also minimize the severity of injury in the event of such incidents (Federal Highway Administration, 2021).

10. **Encourage an environment of conscious construction practices.**

    a. Sustainable construction projects may integrate solar technologies, source biodegradable materials, recycle existing materials during any demolition process (i.e., steel and/or concrete), utilize locally sourced materials, and ensure the availability of green spaces (Construction World, 2019).

11. **Incorporate landscaping and green space considerations into future transportation projects.**

    a. Availability of green spaces is supported by an array of literature for its beneficial effects in reducing ambient stress, slower traffic speeds, enhanced bicycle and pedestrian activity, minimized exposure to air pollutants, mitigation of urban heat island effects, and increased perceived safety for those walking or bicycling in the area of interest (de Hartog et al., 2010; Dijkstra et al., 2008; Dill et al., 2010; McDonald et al., 2006; Rabl & Nazelle, 2012; Safe Routes to School National Partnership, 2012).

12. **Consider investing in an air monitor system to measure air quality.**

    a. States are responsible for developing their own monitoring plans that ensure the ambient air monitoring networks meet minimum requirements set by the Clean Air Act. By situating an air monitoring system along the study corridor, decision makers can better aim interventions in highlighted areas of need.

Future Considerations

As mentioned in relation to the curbside dedicated lane BRT recommendations, this HIA may underscore the full potential of LRT alternatives in affecting the community's health. Reports such as the quality of life study published by Valley Metro, and results from Commute Seattle's 2019 Center City Commuter Mode Split Survey point toward investments in LRT systems as a significant source of commuter mode split, reduction in single occupancy vehicle trips, in face of increasing employment. In Seattle, transit-related investments such as LRT have led to a 9% reduction in single-occupancy vehicle commutes despite an increase of 90,000 jobs in the downtown Seattle area from 2010-2019 (Commute Seattle, 2019). Limitations experienced in this HIA to fully capture the magnitude of LRT on health factors could be addressed in future studies through use of a Cost-Benefit Analysis and forecasting of long-term health impacts. Considering the substantial upfront costs of LRT systems, it is necessary for subsequent analyses to evaluate changes in health over an extended period of time, to not miss potential developments that may significantly affect health, as supported by findings by Valley Metro (n.d.) and Commute Seattle (2019).

Housing affordability is an additional area for future investigations to measure the impact of transportation alternatives on health. Given the demonstrated need for affordable housing in the greater Palm Beach area, the Okeechobee Blvd and SR7 corridor could benefit from the expansion of high-capacity transit systems that incentivize public and private investment in the development of affordable housing options. In a large-scale study of four metropolitan hubs (Atlanta, Denver, Seattle, and Washington D.C.), Enterprise Community Partners built on previous research by AARP, the National Housing Trust, and Reconnecting America, wherein more than 250,000 privately owned, federally subsidized apartments were within walking distance to quality transit services across 20 metropolitan areas (2010). Two third of which were covered by federal housing contracts (AARP, 2010). Similar opportunities exist in the Okeechobee Blvd and SR7 study corridor. Implementation of transit services with high ridership capacity, such as LRT, should be evaluated for their ability to encourage the development of additional affordable housing options and expand transit-oriented development.

Introduction

The Palm Beach Transportation Planning Agency (TPA) conducted a Health Impact Assessment (HIA) on the proposed multimodal alternatives for the Okeechobee Boulevard and SR-7 Multimodal Corridor Study in Palm Beach County. A HIA is a process that analyzes and quantifies how a policy or investment influences people's health. The purpose of this memorandum is to document the HIA process, how the study could potentially impact health from the perspective of mitigating disparities while optimizing air quality, physical activity, and road safety.

As one of the five components of the larger Okeechobee Blvd & SR7 Multimodal Corridor Study, the intent of the HIA was to consider health outcomes in evaluating the no-build and proposed multimodal alternatives. Performance of the HIA, in conjunction with other aspects of the planning study, specifically the roadway and transit alternatives analysis, and Land Use & Economic Development Analysis, demonstrated an interest in balancing optimal transit alternatives with those that produce the most beneficial health outcomes in the study area population.

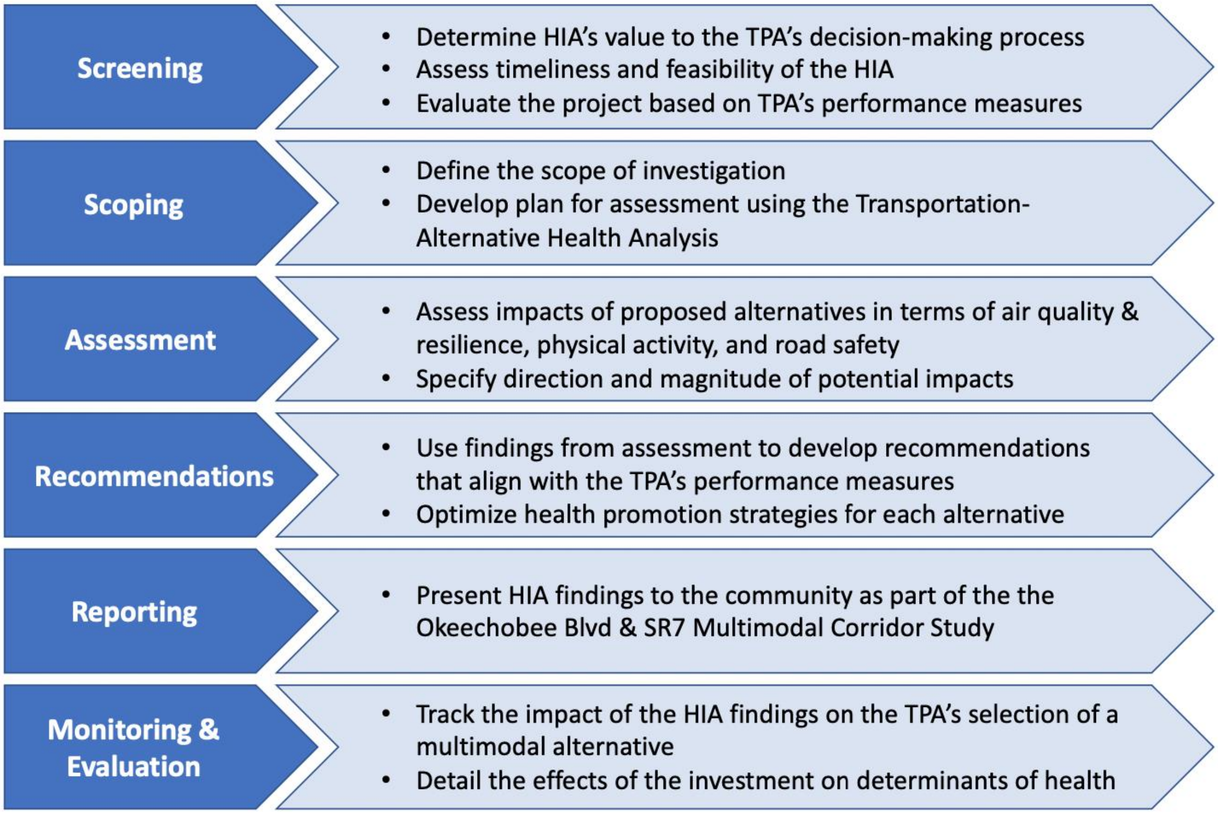
About the HIA Process

HIAs are performed assuming a holistic approach to health, acknowledging that many factors may directly or indirectly influence the health of the community (Human Impact Partners, 2011). This HIA intended to evaluate the potential impact of multimodal alternatives on the state of health and equity along the corridor, and to provide recommendations to facilitate the TPA's intended outcomes or mitigate unintended outcomes.

HIAs are developed under a highly collaborative and democratic process. Through listening to feedback from those that live, play, and work, in the study area, the HIA approach values engagement from affected populations. In combining evidence-based strategies with commentary from stakeholders, policy makers, and community members, HIAs help to foster a broader understanding of the unique challenges communities face, particularly for vulnerable groups (Human Impact Partners, 2011). Collaborative efforts enable all involved parties to increase their competencies between various sectors, in addition to strengthening the contents of policies or projects that account for opinions across different areas of expertise (Bourcier et al., 2015). In doing so, HIAs possess potential for increased credibility and empowerment within their impacted communities.

The HIA process consists of six main components: screening, scoping, assessment, recommendations, reporting, and monitoring, detailed in Figure 1. Each stage is to be expanded upon further in its relation to the Okeechobee Boulevard and SR-7 Multimodal Corridor Study.

Figure 1. Health Impact Assessment Stages and Purpose



Screening

In the first stage of a Health Impact Assessment (HIA), Screening, the project team aimed to establish the value and feasibility of the assessment. Data about the proposed project, measurement of potential health impacts, the existence of a demonstrated need for such a change, and evidence that the proposed project would result in substantial effects on public health were documented.

Timing

For the multimodal analysis along the Okeechobee Blvd and SR-7 study corridor, the project team determined that the HIA time frame is June 2021 to February 2022. A total of four (4) Technical Steering Committee meetings were conducted, a series of key informant interviews, a community-wide survey, and three (3) public meetings.

Health Impacts

As part of the Palm Beach TPA's 2045 Long Range Transportation Plan (LRTP), the 561 Plan identified the Okeechobee Blvd and SR-7 as one of six east-west and five north-south priority transit corridors respectively (Palm Beach Transportation and Planning Agency [TPA], 2020a). In addition to its significance as a major transit corridor, the 561 Plan also expects the Okeechobee Boulevard corridor to increase by 70,000 residents and 14,000 jobs by 2045. With such considerable growth anticipated in the future, present concerns related to commuter mode split within the study corridor and surrounding areas may worsen over time (TPA, 2020a). Specific performance measures set forth by the TPA describe desired reductions in single-occupancy vehicle trips, improved mode shares for walking, bicycling, and public-transit use, in addition to the development of infrastructure conducive for enhanced movement of freight throughout the county (TPA, 2020b). For the purposes of this HIA, multimodal alternatives to address current transportation-related improvements along the Okeechobee Blvd and SR7 study corridor were considered in terms of their potential impacts on the health of the surrounding community.

Population Characteristics of Okeechobee Blvd & SR-7

Passing through the Village of Wellington, Royal Palm Beach, and the City of West Palm Beach, the study corridor contains several distinct character areas each facing its individual needs and challenges, as detailed in the "Okeechobee Boulevard Transit-Supportive Land Use and Economic Development Analysis: Existing Conditions Report" performed by the Palm Beach TPA (2020a). Baseline conditions described in the Existing Conditions Report justified use of the HIA as a tool to assess multimodal alternatives for revised pedestrian, bicycle, public transportation, and freight designs to address discrepancies in health outcomes across the distinct sub-sections within the study area.

Population. The target population of interest for this HIA were the people that live, work, and play within the study corridor of Okeechobee Blvd and SR7. Of particular interest were segments of the population disproportionately affected by poor health outcomes and social vulnerability. Special considerations were made to socially vulnerable groups with specific transportation needs, such as aging adults, people living with disabilities, and low-income subsets of the population.

Baseline Conditions. Findings established in the "Existing Conditions Report" contextualize the study corridor as an area that could be substantially impacted by enhanced multimodal transportation options (TPA, 2020a). Transportation enhancement strategies consider a multitude of factors such as the availability of pedestrian and bicycle-friendly facilities, sidewalk or crosswalk improvements, and close gaps in transit coverage, with the greater goal of creating transportation systems that are accessible, efficient, and help to strengthen connection with communities (Todd, 2006). Indicators of particular relevance in the study area include:

- The demographic breakdown of the study population indicates groups that have unique transportation needs or may be underserved by current transportation infrastructure along the corridor:
    - Among the study population, 35% are either under 18 or over 65 years old, both of which entail special considerations in terms of transportation access and connectivity.
    - Less than 10% of workers live and work in the study area
    - There is a considerably higher concentration of the population living in the study area living at or below the federal poverty level (21%) as opposed to the county average rate (12%).
    - Indicators of housing and transportation affordability suggest the study area is more likely to be cost-burdened by housing and transportation-related costs.
- Some tracts within the corridor exceed county averages by more than double the rates for heart disease, stroke, nutritional deficiencies, diabetes, disability, and homicides.
- Only 11.3% of the study area is considered walkable.
- Between 2013-2018, 79% of bicycle and pedestrian crashes on the study corridor roadway resulted in injuries or fatalities

The conditions depict several demographic characteristics of the target population that justified further exploration into the potential impact of proposed multimodal alternatives on the state of health disparities in the study corridor.

Social Vulnerability & Areas of Greatest Concern

The CDC and Agency for Toxic Substances and Disease Registry's (ATSDR) Social Vulnerability Index (SVI) measures the impact of external stressors on health during times of emergency. Importantly, social vulnerability is a measure of community resilience. The social vulnerability index is composed of 15 factors from the US Census that identify subsets of a population with increased susceptibility to human suffering and economic losses in event of an emergency. Overall, there are four primary themes that affect social vulnerability, which are:

housing and transportation, race/ethnicity/language, socioeconomic status, and household composition (Centers for Disease Control and Prevention [CDC], 2020).

Using data from the American Community Survey 5-year estimates, the total population within the study corridor included 86,736 residents (2019). The total population of the study area represents 61% of the total population of all census tracts, including those that intersect the region of interest. The Project Team looked closer at different elements of health at the corridor-level, specifically social vulnerability (see Figure 2, page 5), life expectancy (see Figure 3, page 6), converging health outcomes (see Figure 4, page 7), and social vulnerability overlayed with converging health outcomes (see Figure 5, page 8).

Figure 2. Overall Social Vulnerability in the Okeechobee Blvd & SR7 Study Corridor, CDC/ATSDR Social Vulnerability Index 2020

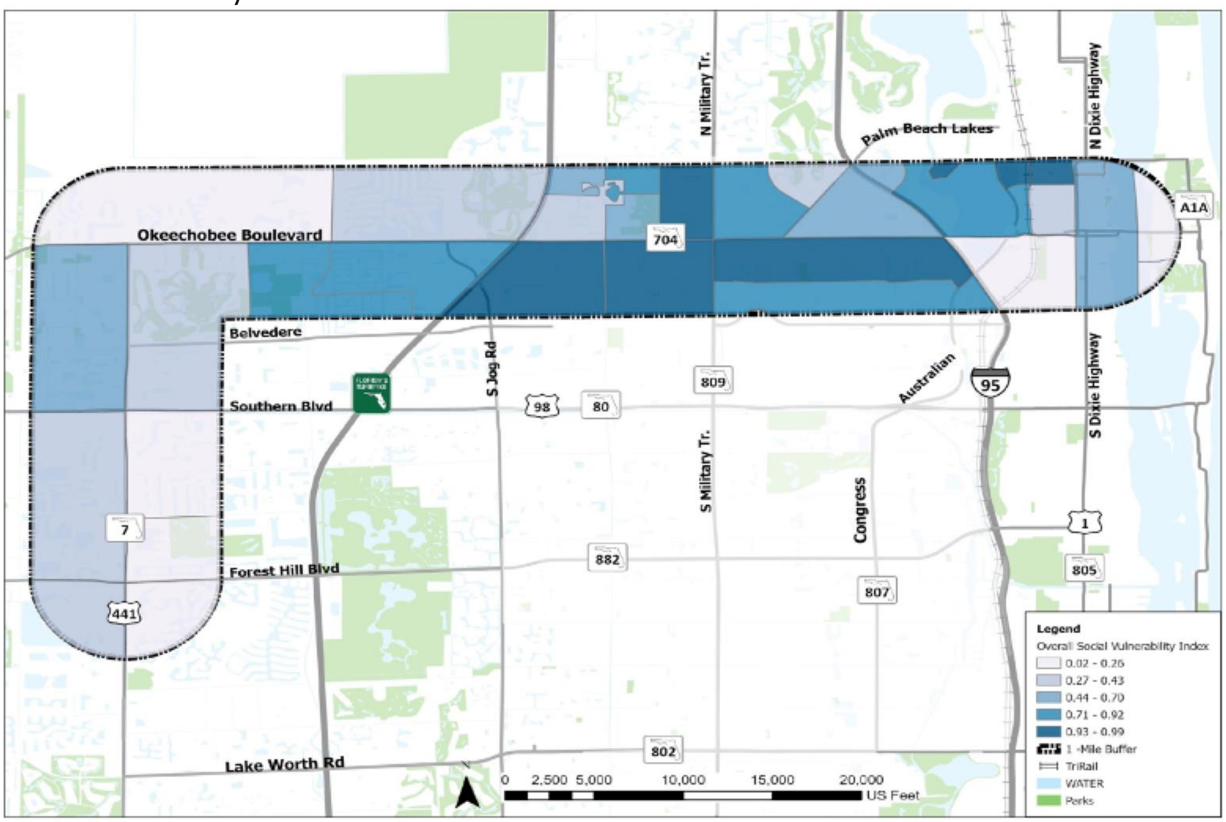


Figure 3. Life Expectancy in the Okeechobee Blvd & SR7 Study Corridor, Florida CHARTS, 2019

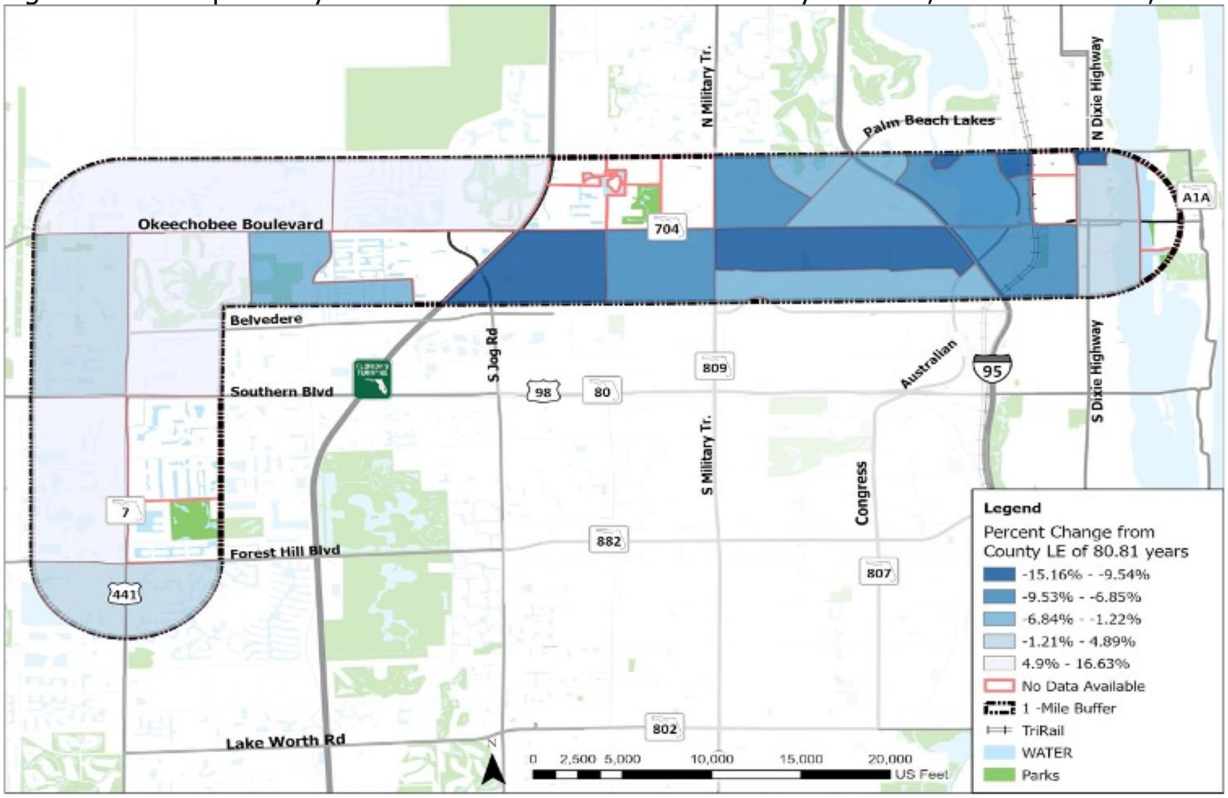


Figure 4. Percent of Converging Health Outcomes* in the Okeechobee Blvd & SR7 Study Corridor, PLACES Project, Centers for Disease Control and Prevention 2020

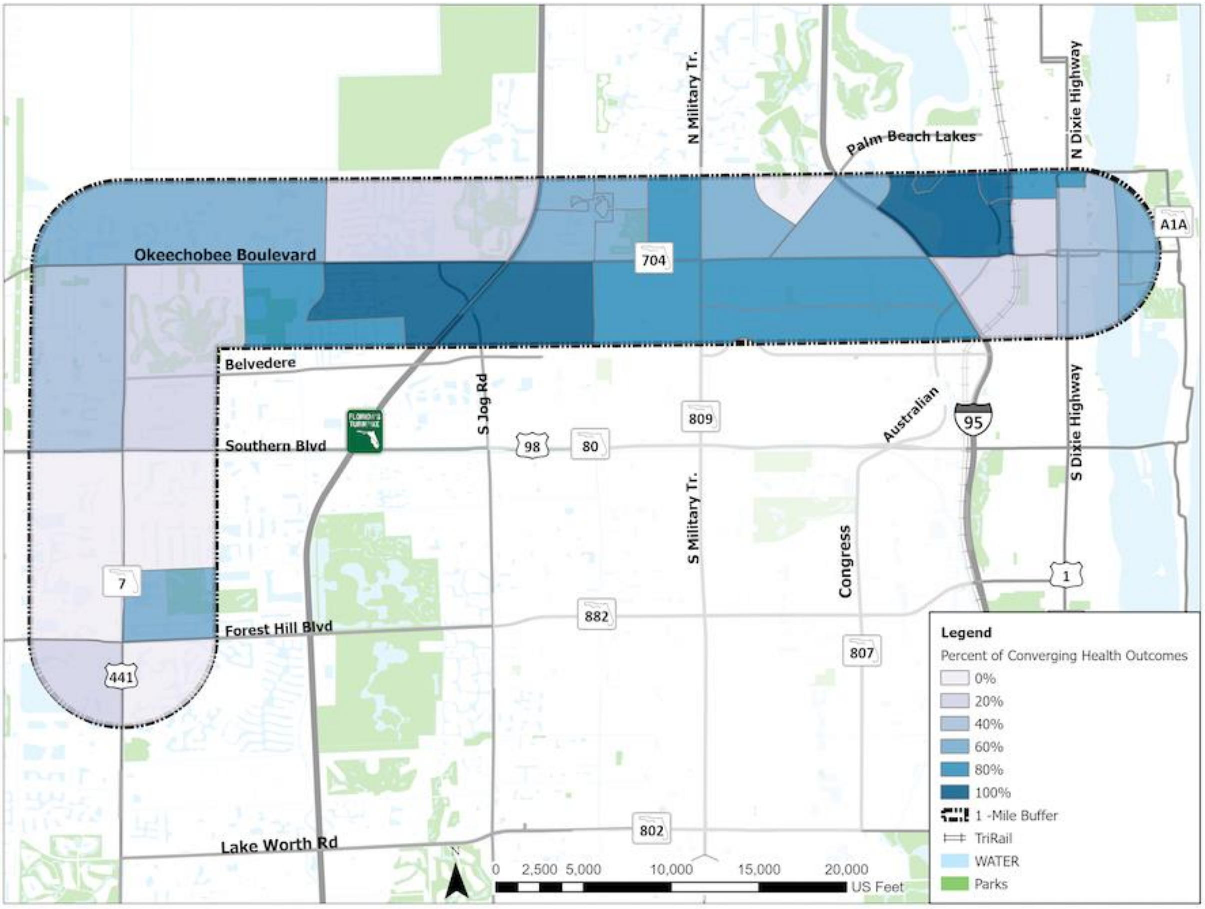


Figure 5. Areas with High Social Vulnerability Index & High Rates of Converging Health Outcomes* in the Okeechobee Blvd & SR7 Study Corridor, CDC 2020

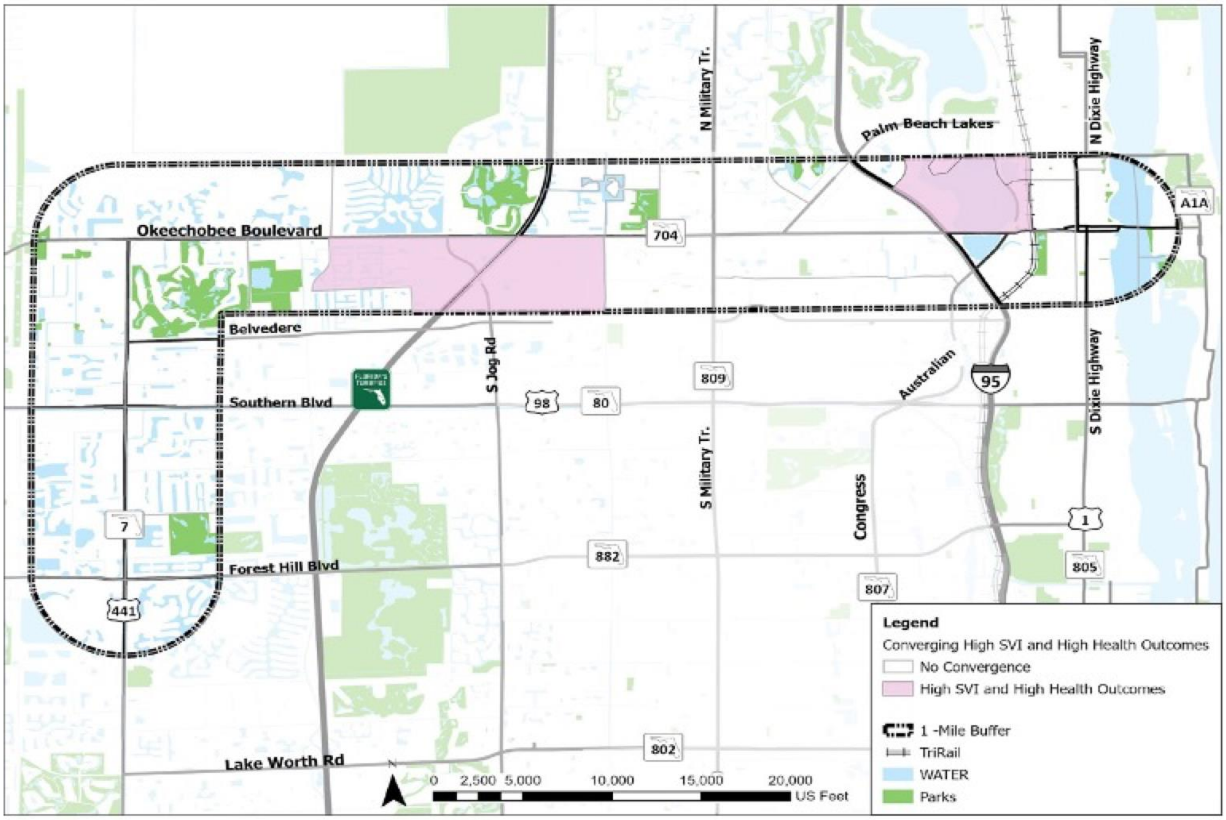


Figure 2 illustrates a sizable proportion of the census tracts along Okeechobee Blvd experiencing higher rates of social vulnerability than tracts on SR7 (darker blue shades are representative of increasing SVI). Similarly, census tracts along Okeechobee Blvd shared similar trends in life expectancy (darker blue shades indicate negative decreases in life expectancy) and poor health outcomes (Figure 3, page 6, and Figure 4, page 7). While the majority of census tracts had either elevated rates of health disparities or social vulnerability, four (4) tracts were found to have high scores for social vulnerability and poor health outcomes (see Figure 5, above). These tracts were concentrated near the Tri-Rail and southern portion of the Turnpike transect. Considerations were made toward these areas of greatest concern during the recommendations phase of the HIA. **Converging Health Outcomes are representative of the four health outcomes in the study area that exceed the Palm Beach County rates: asthma, diabetes, cancer, poor mental health.*

Potential Impacts of HIA Process and Findings

Health has been identified as a consideration in the TPA's selection of no-build or multimodal alternatives. As mentioned previously, the decision to perform the HIA was intended to evaluate the no-build scenario and proposed alternatives in terms of their potential impact on health indicators within the community. Such a consideration, in conjunction with other aspects of the multimodal corridor study, specifically the roadway and transit alternatives analysis, and Land Use & Economic Development Analysis, prove an interest in balancing optimal transportation alternatives with those that produce the most beneficial health outcomes in the study area population. Utilizing previous studies, such as the "Okeechobee Boulevard Transit-Supportive Land Use and Economic Development Analysis: Existing Conditions Report," baseline conditions are well documented and support the use of the HIA as a tool to assess differences in premature morbidity and mortality across the no-build and multimodal alternatives in terms of their impact on air quality and resilience, physical activity and road safety.

In addition to its influence on existing health conditions, the HIA process was identified for its potential to help evaluate existing goals, and achieve the TPA's vision of a "safe, efficient, and connected multimodal transportation system." (TPA, 2020b). Evidence-based recommendations developed through the HIA phases, possess great potential to inform the TPA which alternatives or approaches may help to achieve existing desired outcomes within their performance measures, and aid in the selection of alternatives that most closely align with industry standards.

Existing variability in transportation infrastructure and access implies variable needs for multimodal options. One of the strengths of the HIA, is to weigh identified areas of concern and to recommend strategies that strengthen the selected alternative for the greatest magnitude and breadth of impact on overall health. Findings from the HIA could enhance collaboration and cohesion among community members through the implementation of multimodal alternatives aimed at reducing the health inequities identified in previous studies of the area.

Stakeholder Interest & Capacity

Vast differences in demographic trends exist from portion-portion of the study area. Stark contrasts in health determinants are linked to a variety of poor health outcomes, which may contribute to a divide in the communities along the study corridor (Thornton et al., 2016). With knowledge of the distinct character areas along the corridor, it is especially important to incorporate community feedback on the proposed scenarios, some of which if implemented, may have differing effects on residents and community members along the 13.8-mile-long study corridor. For example, communities utilizing the eastern segment of the study area enjoy improved walkability, bicycle infrastructure, and transportation coverage, whereas areas of the study corridor along SR7 (particularly in the north-western segment) have a higher prevalence of narrow (4'-7' feet wide) sidewalks, and gaps in bus route coverage (TPA, 2020a).

Relevant interest groups were identified for their involvement in the HIA based on their expertise and value in the decision-making process. The project team assembled a Technical Steering Committee composed of field experts from the Palm Beach County TPA, FDOT, Palm Tran, and the City of West Palm Beach. Technical Steering Committee members offer content knowledge about planning, engineering, and health. Together with the technical team, public engagement and key informant interviews provided an opportunity to facilitate discussions with the community, thereby incorporating the public voice in guiding the HIA. Concerns regarding current state of health outcomes along the study corridor have been documented prior to the HIA, as stated in the "Okeechobee Boulevard Transit-Supportive Land Use and Economic Development Analysis: Existing Conditions Report" (TPA, 2020a).

During the evaluation meeting for the HIA's approval, stakeholders noted existing needs within the study corridor that could benefit from the HIA process and expressed their interest to participate. Of the 30 individuals that attended and approved the use of the HIA, a significant amount (16, 53%) had previously participated in HIAs and detailed their priority health considerations.

Stakeholder Feedback in Screening

One (1) meeting was held by the Project Team to accomplish the tasks outlined in the screening phase. As mentioned earlier, Working Group members were invited to participate interactively, using a Mentimeter platform. Mentimeter allowed the Project Team to receive real-time feedback in various formats (e.g. multiple choice answers, ranking and polling, word clouds/open-ended responses) submitted by virtually stakeholders (Mentimeter, n.d.).

Figure 6. Health Considerations Shared by the HIA Corridor Working Group at Meeting #1, June 2021

There were 26 participants that provided open-ended responses highlighting their primary areas of interest for investigation within the HIA. Word cloud terms appear larger, the more a specific response was submitted. Notably, access, walkability, safety, proximity to services, air quality, and equity were among the most popular considerations established by the technical team during the June 29th meeting.

Scoping

During the scoping phase of the Okeechobee Blvd and SR7 HIA, the project team determined project roles, scope of investigation, and detailed methodology to be employed during the assessment.

Determining Roles

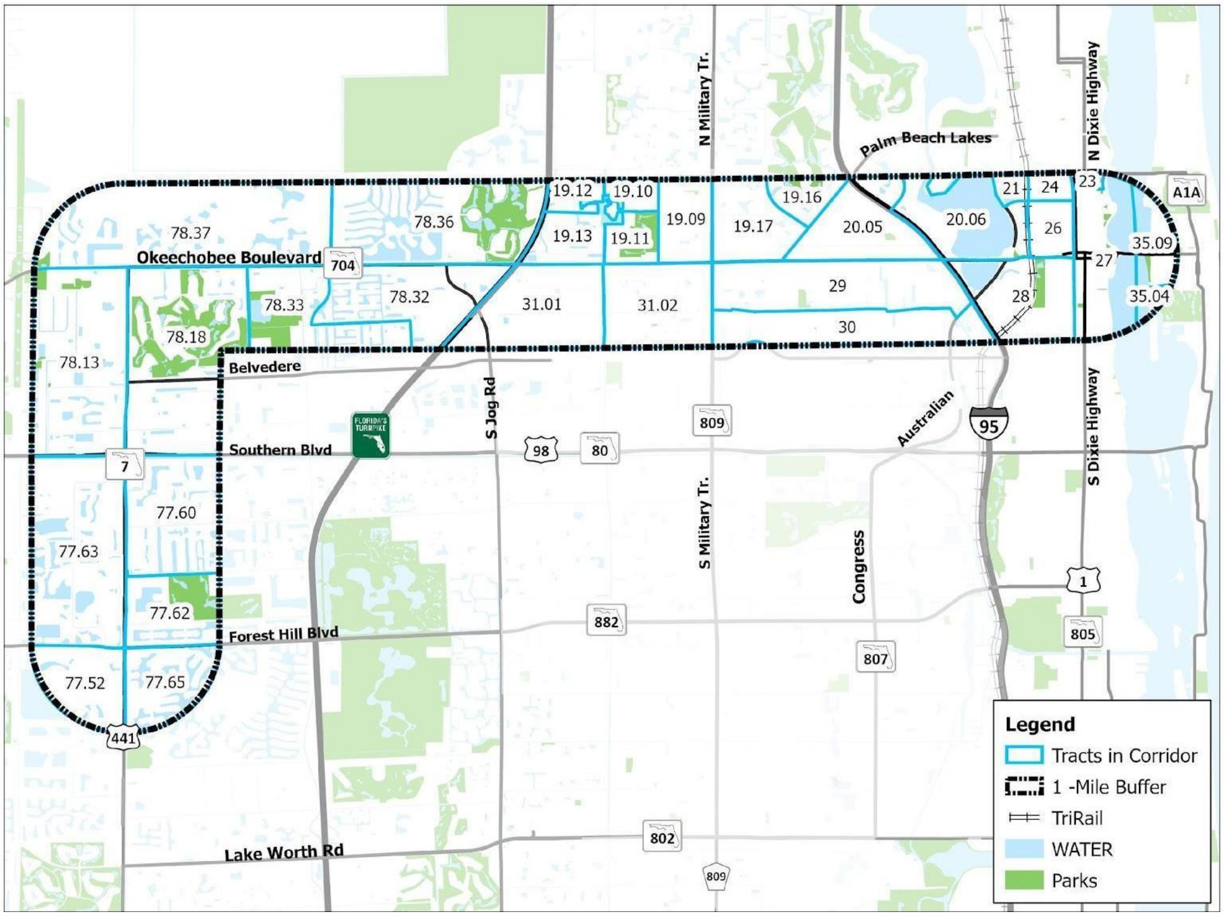
Roles for the HIA were determined by the project team, and the HIA Working Group Members. The project Working Group met bi-monthly to discuss project developments and provide feedback that informed the direction of the HIA. During Working Group meetings, members were provided a presentation describing the purpose of each HIA stage, reviewed materials, and participated in discussions on HIA findings for each of the respective steps. Working Group members also engaged in an interactive polling platform that captured both open-ended and multiple-choice responses.

In addition to the project Working Group, feedback from the community brought forth key insights on the priority areas to be addressed during the HIA. Through the public workshops, community members were provided a platform that informed the HIA in a different manner from the project Working Group. As opposed to technical discussions, public workshops allowed the Project Team to incorporate the first-hand experiences of the community into the HIA. By incorporating both technical and community-based perspectives, the scoping stage of this HIA developed an assessment plan that accurately reflected the conditions and needs specific to the study corridor.

Defining the Scope of Inquiry

Geographic Boundaries. The geographic boundaries evaluated in this HIA adhere to previous definitions established by the TPA in the "Existing Conditions Report" (2020a). Such boundaries are also replicated in other components of the Okeechobee Blvd & SR7 Multimodal Corridor Study. Most population data was collected at the census tract level. Within the study corridor, there were 32 census tracts, representing 61% of the intersection tract total population (United States [U.S.] Census Bureau, 2015-2019).

Figure 7. Census Tracts in the Okeechobee Blvd & SR7 Study Corridor, U.S. Census Bureau, 2015-2019



Qualitative Analysis. A literature review, feedback provided during both Working Group meetings and public workshops, and results from polling activities informed the research questions and methodology established for assessment. These collaborative efforts helped to ensure the relevance of research objectives to the focus of the HIA. Three (3) pathways arose from such interactions. Pathways were selected based on the areas with the greatest potential to impact health and equity in considering the proposed multimodal alternatives, which were: air quality and resilience, physical activity, and road safety.

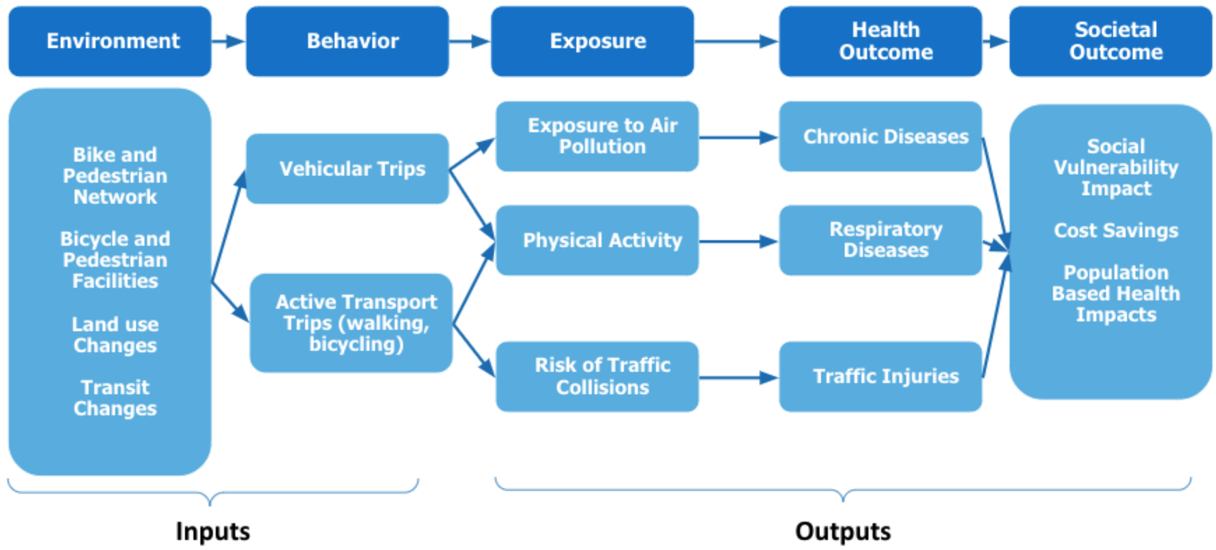
In response, the Transportation-Alternative Health Analysis was developed as a particularly effective approach to promote positive health impacts while also developing strategies to combat negative health impacts experienced within each of the proposed scenarios. Incorporating both qualitative and quantitative data elements, the Transportation-Alternative Health Analysis scale value quantifies the impact of each measure on health for each of the listed scenarios. Qualitative values are assigned based on literature review as well as professional and technical expertise.

Quantitative Analysis. Combined with the Transportation-Alternative Health Analysis, the Integrated Transport and Health Impact Model, or ITHIM, captured quantitative measures of physical activity, air pollution, and road traffic injuries. Statistical analyses of the ITHIM utilized R Software to run the modeling tool, adapted from California Integrated Transport and Health Impact Model (University of California, Davis, 2019). Data sources used to run the ITHIM tool are listed in Appendix A.

Pathways & Health Indicators

Within a HIA, pathways are a visual tool that help illustrate associations between environmental factors and health outcomes. As part of the iterative process, several pathways were presented to Working Group members and the public and underwent revisions during the scoping phase. In concluding scoping, it was determined that the pathways of air quality and resilience, physical activity, and road safety were the most pertinent subject areas to assess when comparing the alternatives considered by the TPA. Figure 8 outlines the pathways through which factors of air quality and resilience, physical activity, and road safety impact health.

Figure 8. Okeechobee Blvd & SR7 Corridor Study HIA Pathways, Adapted from Center for Health Impact Evaluation & County of Los Angeles Public Health Department, 2018



The pathways shown in Figure 8 provide a guide for the inputs and potential outputs of this HIA. Environmental inputs for the ITHIM would include the bike and pedestrian network, facilities, changes in land use, vehicle parking, and transportation. Behavioral inputs are impacted by the environmental inputs, specifically related to the number of vehicle trips taken in the study area, and the modes of active transportation engagement (walking or bicycling). Interactions between environmental and behavioral inputs determine outputs of the ITHIM tool, namely exposures, health outcomes, and societal outcomes for the study corridor population along Okeechobee Blvd and SR7.

Research Question

The scope of investigation for this HIA aimed to compare the no-build scenario and various proposed alternatives in terms of their potential health impacts. As such, the Project Team established the following research question:

1. How will the no-build and proposed transportation alternatives along Okeechobee Blvd and SR7 impact health in terms of air quality and resilience, physical activity, and road safety?

Transportation-Alternative Health Analysis

The Transportation-Alternative Health Analysis scale was used to weigh health outcomes associated with specific design elements for each of the alternatives considered by the TPA. Previous HIAs evaluated proposed transportation projects using a similar scoring framework to measure potential health impacts, like the Public Health Assessment performed by the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning (2020). To develop their project scoring framework, information was compiled through literature review and key informant interviews with transportation and public health officials from seven (7) states. Categories considered by ten (10) previous health prioritization frameworks are listed in Table 1, below.

Table 1. Previous HIAs Utilizing Health Criteria in Project Prioritization Frameworks, adapted from MassDOT, 2020

State/MPO	Air-Quality & Resiliency	Physical Activity	Road Safety	Accessibility	Health Equity
Department of Transportation (State-level)					
California	✓	✓	✓	✓	
Minnesota		✓	✓	✓	✓
Massachusetts	✓	✓	✓	✓	✓
Maryland	✓	✓	✓	✓	✓
North Carolina		✓	✓	✓	
Ohio	✓		✓	✓	
Tennessee		✓	✓	✓	✓
Virginia	✓		✓	✓	✓
Metropolitan Planning Organization (MPO) (Regional)					

Nashville	✓	✓	✓	✓	
Sacramento Area Council of Governments	✓	✓	✓		

Based on prior frameworks nationally employed by various MPOs, as well as state departments of transportation and departments of public health to evaluate proposed transportation alternatives, the Transportation-Alternative Health Analysis deployed in this HIA is similarly aligned. The categories deemed most relevant in evaluating the multimodal alternatives considered by the TPA were air quality and resilience, physical activity, and road safety. In contrast to the MassDOT categories, health equity and accessibility were assessed from a qualitative perspective and referred to in the recommendations. Further modifications were made to the MassDOT scoring framework wherein each health-related criteria category was assigned a weight. Though the weighing system remains relevant to emphasize areas with the greatest potential to impact health, the methodology employed in the MassDOT evaluation and similar reports, such as the Virginia DOT's SmartScale, was not in context for this HIA. Within these studies, weights represented values generated from public engagement. Though public engagement in the form of public workshops was an important factor in guiding the HIA, such interactions did not inform this aspect of the project. As a result, this should be considered a limitation of the assessment, and remains a potential strategy to be deployed in future studies.

The Transportation-Alternative Health Analysis criteria categories were composed of factors that were individually assessed across the various alternatives. Factors were unique to each category, as displayed in Table 2 (below).

Table 2. Okeechobee Blvd & SR7 Corridor Study Transportation-Alternative Health Analysis Factors by Category

Category	Transportation-Alternative Health Analysis Factors
Air Quality	• Chronic diseases associated with air quality • PM2.5 and NO2 concentration ○ Green technology ○ Buffers for pedestrian exposure to emissions • Integrated Transport and Health Impact Model
Physical Activity	• Chronic diseases (CHD, cancer, dementia, diabetes, stroke) associated with physical activity ○ Enhanced ped/bike facilities ○ Connectivity • Integrated Transport and Health Impact Model

Safety	• Ped/bike crashes • Ped/bike fatalities • Integrated Transport and Health Impact Model
Accessibility	• Access to jobs • Access to other goods & services through active transport modes • Transportation access for socially vulnerable populations
Health Equity	• Construction impacts • Aging-in place • Distribution of diseases • Social vulnerability

A likert scale, similar to the grading systems established in the MassDOT grading framework, was established to indicate the magnitude and direction of health impacts for each of the factors. Impacts of an alternative's design were assigned value, based on their resulting effects on health. Those with negative health effects received either a -2 or -1 score, depending on the severity of the impact. Likewise, health promoting features were assigned positive values. The scoring system and specified values are defined in Table 3, below.

Table 3. Okeechobee Blvd & SR7 Corridor Study Transportation-Alternative Health Analysis Scale

Transportation-Alternatives Health Analysis Scale Value	-2	-1	0	1	2
Transportation - Alternatives Health Analysis Scale Description	Impact on health is negative - -	Impact on health is somewhat negative -	Impact on health is neutral -/+	Impact on health is somewhat positive +	Impact on health is positive + +

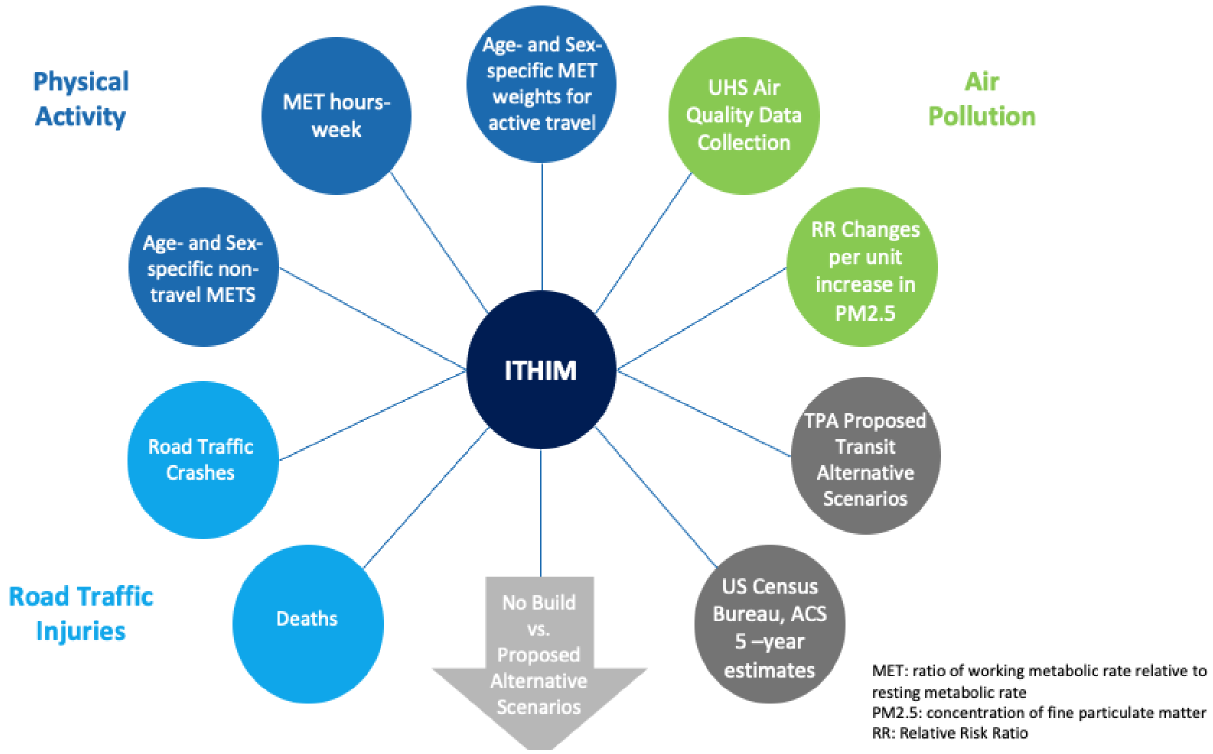
A detailed review of the specific rationale and sub score values assigned to each indicator is described in Appendix C. The composite scores (also seen in Appendix C) were calculated by averaging the sub-score values assigned to each Transportation-Alternative Health Analysis indicator.

Integrated Transport and Health Impact Model

As part of the larger Transportation-Alternative Health Analysis score, the ITHIM is a modeling tool that quantifies the impact of changes to active travel behavior patterns on health. Depending on the design features included within the multimodal alternatives considered by the Palm Beach Transportation and Planning Agency (TPA), the **ITHIM predicts shifts disease burden (air quality and physical activity-related chronic diseases, and road traffic crashes) as a result of changes in the number of vehicle miles traveled (VMT) redistributed to Personal miles traveled (PMT).**

Utilizing data sources across 3 levels of government (federal, state, and local sources), the model requires 14 calibration items. Data inputs within the ITHIM tool include existing travel patterns (pedestrian, bicycle, vehicular transport), physical activity levels, air pollution concentration (as defined by fine particulate matter), in addition to the burden of disease and injuries within the study population and various travel scenarios (University of Wisconsin-Madison Global Health Institute, 2021; Whitfield et al., 2017). Figure 9 below shows the specific inputs and output of the ITHIM.

Figure 9. Overview of the Okeechobee Blvd & SR7 Corridor Study Integrated Transport and Health Impact Model, Adapted from University of California, Davis, 2019



Use of the ITHIM tool in a HIA is well established for its ability to quantify the impact of transportation infrastructure on health, specifically by looking at physical activity, road traffic injury risk, and exposure to fine particulate matter (PM2.5) air pollution. The Office of Research and Development within the United States Environmental Protection Agency endorsed the ITHIM Tool in 2016. Global applications of the ITHIM tool are documented in England, Wales, India, the Netherlands, Switzerland, and Brazil (Götschi et al., 2015; Sá et al., 2017; Woodcock et al., 2009, 2013, 2014). Nationally, Metropolitan Planning Organizations (MPOs) in Nashville, Tennessee, Oregon, and California have successfully implemented the ITHIM tool as part of a growing interest in the field of health-integrated transportation planning (Iroz-Elardo et al., 2014; Mazlish et al., 2013; Whitfield et al., 2017; Wu et al., 2019).

Similar interest in the ITHIM tool is echoed locally in the South Florida region. A recent study commissioned by the Florida Department of Transportation (FDOT) assessed health integration in transportation planning, which identified the ITHIM tool as a best practice and provided guidance on localized applications of the ITHIM, which are adhered to in this HIA. Additionally, the FDOT study recommended a framework that combined regional travel demand modeling with ITHIM, to effectively consider health within a transportation planning process that could be endorsed by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) (Lee & Jin, 2020). The Project Team has taken these models and frameworks to devise an ITHIM methodology specific to the Okeechobee Blvd and SR7 corridor study.

ITHIM Methodology

Methodology in this HIA was guided by the California Integrated Transport and Health Impact Model (University of California, Davis, 2019). Assuming transportation scenarios will increase bus ridership and active travel (e.g., biking), there was an expected redistribution from vehicle miles traveled (VMT) to personal miles traveled (PMT). As such, the ITHIM modeled health impacts across baseline (no-build) and three (3) scenarios. Scenarios shift 5, 10, or 15-percentage of overall miles traveled (vehicle and personal) from VMT to PMT. Projected ridership, informed by technical expertise and literature review, was utilized as a measure of such shifts in travel behavior. Proposed alternatives were categorized into one of the three scenarios, as seen in Table 4.

Table 4. Okeechobee Blvd & SR7 Corridor Study Categorization of Alternatives by ITHIM Scenarios

Category	Baseline	5% Shift in VMT to PMT	10% Shift in VMT to PMT	15% Shift in VMT to PMT
Alternative	• No-Build /No-Action Alternative	• Mixed Traffic Bus w/ Limited Stops • Business Access and Transit (BAT) Lane	• Curbside Dedicated Lane BRT* • Center Platform Dedicated Lane BRT*	• Center Platform Dedicated Lane LRT** • Elevated Grade LRT**
Projected Corridor Boardings*	3,200	2,800 - 3,800	3,900 - 6,000	6,300 - 10,300

Data elements consisted of Okeechobee Corridor census tract-level data combined with California estimates and percentage shift changes (*i.e.,* average, minimum, maximum for non-travel Metabolic Equivalent Task hours (METS), and baseline PMT and VMT). Formula coefficients and unit-change values are based on previous meta-analysis research. Baseline was defined as Okeechobee Corridor's current state of health. Death and road traffic data were averaged over 2018-2020 to increase reliability due to probable fluctuations due to the 2020 pandemic. Changes in vehicle and personal miles traveled based on transportation scenarios were hypothesized by UHS based on literature reviews.

Although previous ITHIM applications resort to Disability Adjusted Life Years (DALYs) as a measure of health impacts, this HIA makes use of a similar metric, the Population Attributable Fraction (PAF). DALYs, unlike PAFs, is a measure of the burden of a disease over an individual's lifetime, equating the years of life lost due to premature mortality and years lost living in a suboptimal state of health (WHO, n.d.-a). Instead, the PAF **indicates the proportion of a disease in a population that is attributable to a certain exposure** (WHO, n.d.-b). Additionally, the PAF assumes a causal relationship, where the disease burden could be avoided by adding or eliminating the exposure, presuming no other changes. Use of the PAF, as opposed

*Bus Rapid Transit (BRT)
**Light Rail Transit (LRT)

to DALYs, was justified given the availability of corridor-level data and the similarities between both metrics.

To understand the magnitude of deaths prevented in the corridor, cause-specific deaths for Palm Beach County (i.e., three-year average from the Florida CHARTS) were divided by the corridor's population and multiplied by the respective PAF. Diseases without well-defined death estimates were omitted from these transformations (i.e., acute respiratory infections, depression). Scenario health impacts were ranked by an overall composite score of mean PAFs summed across diseases. Disease-specific PAFs included acute respiratory infection, breast cancer, colon cancer, lung cancer, dementia, depression, diabetes, heart disease, stroke, and road traffic injuries. Scores were then multiplied by 100. A higher relative score corresponded to great positive impacts on health.

Air Quality. Changes in air quality were impacted by the concentration of fine particulate matter (PM2.5) in the study corridor. More specifically, shifts in VMT across each of the modeled scenarios, projected differences in future PM2.5 concentration and the relative risk of developing an air-quality-related illness. The association between certain exposure levels of fine particulate matter and risk of heart disease, stroke, acute respiratory infections, and lung cancer was established by Woodcock et al. and required by the ITHIM to estimate health impacts affected by air quality changes (2010). Data regarding the concentration of PM2.5 was not previously available at the corridor-level prior to this HIA. As a response, a field collection of PM2.5, 0.3MuM, 10MuM, percent Relative Humidity, and temperature (°F) using a PerfectPrime AQ9600, PM 0.3/2.5/10 Mm Air Quality Particle/Dust Detector/Counter at transit station stops located within the study corridor was performed.

Physical Activity. Physical activity levels were measured by shifts in PMT affecting the prevalence of heart disease, diabetes, stroke, dementia, depression, colon cancer, and breast cancer. Baseline data for disease states were obtained from the Florida CHARTS (2019). Active travel time, or PMT, was multiplied by weights in order to generate the Metabolic Equivalent Task (MET) hours (University of California Los Angeles, 2009). The ITHIM outputs (Population Attributable Fractions, or PAFs) related to physical activity account for age- and sex- specific differences in metabolic rates for active travel, as set forth by Woodcock et al.(2011). Existing literature on the relationship between the relative risk and health conditions support health outcome estimates modeled by the ITHIM (Krewski et al., 2009).

Road Safety. Road traffic crash data was obtained from the Signal Four Analytics System (2020). The data was averaged across three years (2018-2020) due to probable pandemic impacts on travel behaviors. Rates of road traffic crashes were based on the PAF and multiplied by baseline road traffic fatalities with the corridor population denominator. Road safety outcomes are expressed as potential road traffic fatalities.

ITHIM Limitations

Florida specific travel behavior was not available to serve as baselines for vehicle and personal miles traveled. In the absence of this measure a range of values (*i.e.,* mean, minimum, and maximum to calculate non-travel METs; Baseline PMT and VMT for Florida) were used from California's travel survey estimates. Future ITHIM applications could benefit from the availability of region-specific data of VMT and PMT measures, which could be administered in the form of a Travel Survey similar to the version used in California (University of California Los Angeles, Center for Health Policy Research, 2012).

In addition, corridor census tract-level deaths were not available. To combat this limitation, the mortality per 100,000 residents was used, based on a Palm Beach County death numerator and a corridor population denominator. Future work may consider gathering tract-specific deaths by cause for more precise estimation of the Corridor's health impact.

While road traffic estimates do account for mode of striking vehicle or pedestrian, and severity of incident, the ITHIM was unable to account for the protection conferred by additional safety measures within each of the modeled scenarios. Countermeasures may include improvements to lighting, curb extensions (as seen in several of the proposed designs, such as the Curbside dedicated lane BRT, which has the shortest roadway distance of all the alternatives), high visibility markings for crosswalks at midblock crossings or uncontrolled intersections, and additional "YIELD" or "STOP" signage leading up to crosswalks. Given this significant limitation, caution is urged in interpreting ITHIM outputs related to road safety, as they are likely a substantial overestimation of crash risk. Inclusion of such safety measures are expected to counteract the frequency and severity of traffic-related crashes. Therefore, the ITHIM's road safety outputs should be understood as areas where such safety countermeasures are essential considerations. Future research could benefit through the development of constants, coefficients, or formulas to be applied in the ITHIM in order to project the effects of road safety countermeasures.

Changes in mortality were chosen as this study's primary outcome given our methodology was adapted from California's Integrated Transport and Health Impact Model (ITHIM). California's ITHIM incorporated relative risk change in mortality per unit increase/decrease in air particulate matter and physical activity exposure. Additional areas for future investigations may include estimating changes to corridor morbidity (e.g., non-fatal outcomes) upon appropriate changes in methodology and data elements. Currently within the corridor, road traffic injuries (as opposed to road-traffic fatalities) are the one measure that provided insight on road-safety related morbidity. Such a recalibration of the ITHIM mechanism could help provide an alternative form of analysis and better capture the current state of health within the Okeechobee Blvd & SR7 corridor.

ASSESSMENT

For assessment, the Project Team evaluated the direction and magnitude of potential health impacts related to air quality and resilience, physical activity, and road safety.

Design Elements & Health Outcomes

The associations between transportation design and health outcomes are well established in literature. Differences across the proposed alternatives in terms of sidewalks, bicycle lanes, travel lanes, buffer zones, median, and transportation types are compared across the Transportation-Alternative Health Analysis categories. Features unique to each of the proposed alternatives can differentially impact areas of focus within this HIA. Oftentimes, certain design elements impact health in similar ways, a point that is illustrated in Table 5 (below).

Table 5. Okeechobee Blvd & SR7 Corridor Study Design Elements by Transportation-Alternative Health Analysis Categories

Design Element	Air Quality & Resilience	Physical Activity	Road Safety	Accessibility	Health Equity
Sidewalk Width	✓	✓	✓	✓	✓
Bicycle Lane Width	✓	✓	✓		✓
Travel Lane Width			✓		
Buffer Zone Width	✓	✓	✓	✓	✓
Type of Bicycle Lane	✓	✓	✓		✓
Median Green Space	✓	✓	✓		
Type of Transit	✓			✓	✓
Construction Impacts	✓	✓	✓		

One example are the health effects resulting from designs that encourage walking or bicycling, as opposed to driving a car. Wider sidewalks and buffered bicycle lanes promote pedestrian and bicyclist activity through related mechanisms (Appendix B). Both design features (i.e. broader walkways, and a physical barrier between oncoming traffic and bicyclists) increase the perceived safety of walking or bicycling along such areas, and may in turn promote physical activity (Appendix B). As such, design elements that increase active transportation engagement will also improve rates of physical activity, air quality, and their related diseases. The relationship between transportation designs and some of their related health outcomes are featured in Table 6.

Table 6. Okeechobee Blvd & SR7 Corridor Study Transportation Design Elements & Health-Related Outcomes*

Design Element	Behavioral Outcomes	Associated Health Outcomes
Sidewalk Width	Wider sidewalks are associated with … Increased perceived safety [1,6,7] Greater pedestrian activity when sidewalks are considered more desirable [3,6,7,20,21] Enhanced walkability from sidewalks is associated with higher land values [12, 13] Improved air quality (fewer vehicle emissions) [15,17]	• Enhanced business activities (e.g., shopping, access to goods & services) [4,11,20, 27] • Increase in spending at businesses [11,27] • Increase in the number of individuals meeting daily exercise requirements [14,26] • Reduce burden of chronic diseases associated with physical activity [21,23,25] • Improve mental health [22] • Risk of exposure to air pollution [15,16,17,18,19] • Risk of respiratory illnesses linked to poor air quality [15,16,17,18,19]
Bicycle Lane Width	Wider bicycle lanes are associated with … Increased perceived safety for bicyclists [36] Decreased attentiveness by vehicle operators [10]	• Increase in the number of individuals meeting daily exercise requirements [14,26] • Reduce the burden of chronic diseases associated with physical activity [21,23,25] • No significant association with green spaces and mixed land uses [30] • Risk of vehicle and bicycle crash increases [10] • Risk of exposure to air pollution [31**]
Travel Lane Width	Lane widths measuring 10 feet positively impact street safety without compromising traffic capacity [41,42,43] Narrower travel lanes promote slower traffic speeds [44,45]	• Narrower lanes reduce pedestrian exposure at crossings and intersections [44,46] • Crash rates are reduced or unchanged between 10 ft and 12 ft wide travel lanes [47,48] • Higher traffic speeds increase the risk of more severe crashes, with serious injuries and fatalities [49]
Buffer Zone Width	Wider buffer zones between roadway and sidewalk are associated with … Increased perceived safety [1,8] Increased pedestrian activity [8] Enhanced aesthetic appeal and opportunity for green spaces [50]	• Greater buffer widths reduce risk of pedestrian exposure to air pollution (PM2.5 NO2) [51,52] • Risk of respiratory illnesses linked to poor air quality [15,16,17,18,19] • Increased protection for pedestrians from out-of-control motorists [50]
Type of Bicycle Lane	Increased perceived safety [36,37] Buffered bicycle lanes provide increased safety as opposed to wider bike lanes [9] Increased bicyclist activity [38,39] Fewer vehicle emissions & traffic congestion [40]	• Decrease in crash odds across all types of bicycle lane (separated, designated) [32] • Improve mental and physical health [33,34,35] • Lessened air and noise pollution exposure in surrounding communities [40]
Median Green Space	Presence of green spaces is associated with …	• Reduce ambient stress [24] • Reduce the risk of pedestrian exposure to

*The corresponding numbered reference list is included in Appendix B.
**Within this specific study, vehicle operators experienced elevated levels of PM2.5 exposure as compared to bicyclist exposure.

Design Element	Behavioral Outcomes	Associated Health Outcomes
	Increased perceived safety for pedestrians and bicyclists [1,24] Increased pedestrian and bicycle activity [1,2,55] Slower traffic speeds [5] Enhanced aesthetic appeal and opportunity for green spaces [50] Reduced greenhouse gas emissions [53]	air pollution (PM2.5 NO2) [51,52] • Risk of respiratory illnesses linked to poor air quality [15,16,17,18,19] • Mitigate urban heat island effects [53] • Presence of tree canopy is linked with elevated property values [54]
Type of Transit	Availability of enhanced, multimodal transit options relates to ... Sustainable infrastructure in the form of green technology investments [56] Reduction in greenhouse gas emissions [61]	• Improve functional capacity in performing daily activities [23] • Increase the number of individuals meeting daily exercise requirements [26] • Lower BMI [28,29] • Increase social interactions within the community [60] • Reduce vehicle crashes [59] • Equitable access to employment opportunities, and goods and services, especially for low-income individuals, older adults, or people living with disabilities [57,58]
Construction Impacts	Construction efforts are often associated with changes to daily living. The intensity and duration of such projects are linked with impacts such as … Aesthetic appearance [68] Increased noise pollution [62] Construction-related emittance of air pollutants [66] Disruption of existing traffic patterns [64]	• Risk of ambient stress, sleep disturbances, and high blood pressure, typically associated with noise pollution [62,63] • Traffic delays may increase frustration among vehicle operators [64,65] • Compromised quality of life due to noise and air pollutants [66,67] • Discourage physical activity [68] • Increase in exposure to air pollutants [68] • Risk of bicycle and pedestrian crashes increase [68]

*The corresponding numbered reference list is included in Appendix B.
**Within this specific study, vehicle operators experienced elevated levels of PM2.5 exposure as compared to bicyclist exposure.

Air Quality & Resilience

Background

Reliance on personal vehicles as a primary mode of transportation presents several challenges to health. Within the larger Palm Beach County, the percentage of commuters driving to work alone (80%) exceeded the national average (75%), whereas less than 2% utilized public-transit alternatives. Nationally, the transportation sector contributes to 29% of the United States' greenhouse gas emissions, passenger cars being one of the main sources of emissions (United States Environmental Protection Agency, 2021b). Increases in greenhouse gasses are associated with a multitude of negative health outcomes including heat-related illnesses, lung cancer, asthma, displacement, and increased prevalence of communicable disease (National Institute for Environmental Health Sciences, 2019).

Aims to reduce greenhouse gas emissions caused by personal vehicle travel may be accomplished through upgraded multimodal alternatives that may diminish health impacts linked to climate change. Such are aligned with established goals within the Palm Beach TPA. The TPA, alongside the Broward Metropolitan Planning Organization (MPO), and the Miami-Dade Transportation Planning Organization (TPO), led the "South Florida Climate Change Vulnerability and Adaptation Pilot Project," intended to "conduct climate change and extreme weather vulnerability assessments of transportation infrastructure and to analyze options for adapting and improving resiliency." As a result, the final report concludes that southeast Florida (including Palm Beach County) is one of the most vulnerable areas in the country to extreme weather events and future impacts of climate change (Broward Metropolitan Planning Organization & Parsons Brinckerhoff, Inc., 2015). By promoting the use of alternative forms of multimodal transportation that emit less greenhouse gasses, this HIA explored the resulting impacts of proposed measures on mitigating negative health outcomes rooted from a warming climate.

Features of Proposed Alternatives Affecting Air Quality & Resiliency

Specific design elements within each of the alternatives possessed potential to differ in their impact on air quality and resiliency factors. The factors of interest within this HIA were adapted from the MassDOT project scoring criteria and include the burden of chronic diseases associated with air quality, use of eco-friendly technology, and buffers for pedestrian and bicyclist exposure to emissions (2020).

Table 7. Transportation-Alternative Health Analysis Factors Related to Air Quality & Resiliency

Transportation-Alternative Health Analysis Factors Related to Air Quality & Resiliency		
Burden of chronic diseases associated with air quality - Heart Disease - Stroke - Lung cancer	Use of eco-friendly technology - Vehicle Emissions - Electric forms of energy	Buffers for pedestrian exposure to emissions - Green space - Landscaping - Tree canopy

A comparison between design specifications of each of the alternatives are listed in Table 8 (below). Design elements listed are those that may impact the Transportation-Alternative Health Analysis factors of interest. The specific health factors within air quality and resilience are later discussed in relation to their impact on health.

Table 8. Okeechobee Blvd & SR7 Corridor Study Design Elements Affecting Air Quality & Resilience

Design Elements	No Build	Mixed Traffic with Limited Bus Stops	Business Access and Transit (BAT) Curbside Lane	Curbside Dedicated Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Total width of the sidewalk (per side)	6 ft width	12 ft width	12 ft width	12 ft width	12 ft width	12 ft width	12 ft width
Total width of the bicycle lane (per side)	5 ft width	7 ft width	7 ft width	10 ft width	10 ft width	10 ft width	10 ft width
Type of bicycle lane buffer	Designated No marked buffer)	Designated 2 ft buffer	Designated 2 ft buffer	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side
Median Green Space	Green space available	Green space available	Green space available	Green space available	Center platform for BRT	Center platform for LRT	Elevated platform, some green space available
Width of Left/Right sidewalk buffer	Left: 45.5 ft Right: 43.5 ft	Left: 39.5 ft Right: 37.5 ft	Left: 39.5 ft Right: 37.5 ft	Left: 32.5 ft Right: 30.5 ft	Left: 44 ft Right: 42 ft	Left: 39.5 ft Right: 37.5 ft	Left: 32.5 ft Right: 30.5 ft
Eco-friendly Technology	No	Possible	Possible	Yes	Yes	Yes	Yes

Health Outcomes Associated with Air Quality & Resiliency Factors

Chronic Diseases Associated with Air Quality & Resiliency. The Integrated Transport and Health Impact Model (ITHIM) projected health effects of PM2.5 concentration on the following outcomes: heart disease, stroke, and lung cancer. The mortality rates (per 10,000 corridor residents) at baseline and 5%/10%/15% scenarios are illustrated in Table 9.

Table 9. Mortality Rate per 10,000 Corridor Residents due to Air-Quality-Related Diseases

Cause of Mortality	Baseline	5% Shift in VMT to PMT	10% Shift in VMT to PMT	15% Shift in VMT to PMT
Heart Disease	452	431	411	393
Stroke	138	131	125	120
Lung Cancer	83	<83	<83	<83

Based on findings shown in Table 10, there is a clear reduction across all chronic conditions associated with air quality with increasing shifts in VMT to PMT. Though the 15% shift represents the most significant difference in mortality rates, it is important to note ITHIM outputs must also be considered in conjunction with the broader Transportation-Alternative Health Analysis. More specifically, the two alternatives: center platform dedicated LRT and elevated LRT, do not necessarily represent the alternatives with the most beneficial impacts on health even though they represent the greatest shift in active travel behavior. Such is due to the fact that the 5%/10%/15% scenarios are defined by their estimated ridership and lack measured shifts in walking and bicycling patterns. Similar considerations must be considered when interpreting ITHIM findings related to physical activity and road safety.

Use of Eco-friendly technology. From an environmental perspective, alternatives that alter travel behaviors, namely, a reduction in single-occupancy vehicle trips, directly influence the amount of carbon dioxide emissions released into the air resulting from the combustion of petroleum-based products, most commonly gasoline and diesel (United States Environmental Protection Agency, 2021). Namely, the reduction in vehicle emissions that result from engaging in walking, bicycling, and public transportation are outcomes of particular interest that affect air quality and resilience. Within public transportation, the prioritization of multimodal options that make use of green technology (*e.g,* electric fleets, LRT), or more efficient transit routes that reduce time spent in traffic may significantly impact emission levels along the study corridor.

A key difference between the alternative designs is the impact each scenario may have on air quality. Traditional bus routes are generally regarded as less efficient than services like BRT. For context within this HIA, it is important to note that there is potential for Palm Tran to electrify their fleet of buses. If so, there would be a great impact on the air quality and resilience scoring, particularly among the no-build, mixed-traffic with limited bus stops, and Business Access and Transit (BAT) lane alternatives. Existing scores for these scenarios rely on the assumption that buses are not electric.

BRT services are often characterized by dedicated bus lanes, off-board fare collection, traffic signal priority, elevated platforms, and expanded station facilities compared to more conventional bus stations. Investments in BRT have been endorsed by the Federal Transit Administration (FTA) as appropriate, and affordable transit alternatives suitable for application in big cities and mid-sized metropolitan areas, like the study corridor (FTA, 2015). Mimicking elements of light rail transit (LRT), BRT alternatives are regarded as more reliable and efficient than regular bus systems. Dedicated bus lanes and traffic signal priority reduce the amount of time spent in traffic, making the alternative a more desirable transportation option over single-occupancy vehicles, while also lessening the amount of emissions released into the atmosphere.

LRTs best suited within the context of Okeechobee Blvd and SR7 are capable of high capacity, long haul trips. Powered by a catenary system, LRT systems are fully electric and possess substantial impact to reduce emissions resulting from vehicles and other forms of public transportation. Challenges to LRT require an appropriate balancing between the design of a comfortable and efficient service, without spending excessive capital on an alternative that exceeds the need of the study area and affected communities (RailSystem, n.d.). At the same time, in a 10-year follow-up study of their LRT system, findings from Valley Metro in Maricopa County, Arizona, indicate that the potential for long-term health benefits of LRT implementation may warrant the substantial up-front costs. Since its implementation, over 35,000 jobs have since been created in ½ mile of the Valley Metro's LRT (Valley Metro, n.d.). Other benefits include improved access to education and areas of interest in a single trip, a reduction in bicycle and pedestrian crashes, and increased affordability within the LRT corridor when compared with the average for Maricopa County (Valley Metro, n.d.). As such, the lasting health impacts must also be weighed against the initial investment and construction efforts.

Buffers for pedestrian exposure to emissions. Availability of green space is associated with several positive health impacts. Not only do green spaces increase perceived safety among pedestrians and bicyclists, they also play a role in reducing greenhouse gasses, mitigating urban heat island effects, elevate property values, and provide a buffer between pedestrians and vehicular traffic emissions (Bowker et al., 2007; Dijkstra et al., 2008; Dill et al., 2010; Kweon et al., 2021; Netusil et al., 2010; Safe Routes to School National Partnership, 2010). As a result, exposures to air pollutants like PM2.5 and NO_2 are minimized, accompanied by a diminished risk of contracting a respiratory illness associated with poor air quality. Alternatives that develop the median green space, or reduce the buffer between the roadway and sidewalk, must weigh the potential benefits of increased public transit ridership with the decreased potential for green space and landscaping.

Table 10. Air Quality & Resilience-Related Health Outcomes by Alternative According to References Listed in Appendix B

Alternative	Potential Health Outcomes
No-Build*	• Existing pedestrian and bicycle activity levels [69] • Perceived safety without a bicycle buffer [36,38,39] • Green space is available along some corridor sections [69] • Buffer set-back from roadway to sidewalk, that provides increased sense of safety for pedestrians & protection from vehicle emissions [69,70] • Persistent emission trends [70,74] • Estimated ridership [73] • Rates of heart disease, stroke, and lung cancer [70,72,73,74,75,76,77]

Mixed Traffic with Limited Bus Stops	• Minimal increase in public transit ridership from an added service route (Mall at Wellington Green and Intermodal Transit Center) & BRT option [73] • Mixed traffic lanes may impact efficiency of the alternative in reducing emissions/ time spent in traffic [15,17,40,56,61] • Increase in pedestrian activity from wider sidewalks (equal across all alternatives except no-build) [3,6,7,20,21] • Minimal reduction in mortality from heart disease, stroke, and lung cancer [70,72,73,74,75,76,77] • Minimal increase in perceived safety for bicyclists due to wider bicycle lanes and designated buffer [36,38,39] • Green space is available along some corridor sections [69] • Minimal reduction in perceived safety for pedestrians & protection from vehicle emissions due to smaller buffer set-back from roadway to sidewalk [3,8,51,52]
BAT Curbside Lane	• Minimal increase in ridership from implementation of Business Access and Transit Lane (reduce travel times) [73] • Minimal potential reduction in emissions (> Mixed Traffic with Limited Bus stops) [15,17,40,56,61,78] • Increase in pedestrian activity from wider sidewalks (equal across all alternatives except no-build) [3,6,7,20,21] • Minimal reduction in perceived safety for pedestrians & protection from vehicle emissions due to smaller buffer set-back from roadway to sidewalk (= Mixed Traffic with Limited Bus stops) [3,8,51,52] • Minimal reduction in mortality from heart disease, stroke, and lung cancer [70,72,73,74,75,76,77] • Minimal increase in perceived safety for bicyclists due to wider bicycle lanes and designated buffer [36,38,39] • Green space is available along some corridor sections [69]
Curbside Dedicated Lane BRT	• Moderate increase in ridership from implementation of dedicated BRT lane & BRT option [73] • Increase in pedestrian activity from wider sidewalks (equal across all alternatives except no-build) [3,6,7,20,21] • Separated buffer provides the maximum increase in perceived safety for bicyclists [36,38,39] • Small buffer area between roadway and sidewalk, leading to a decreased sense of safety and increased exposure to emissions for pedestrians [3,8,51,52] • Reduction in emissions due to BRT usage, and increases in bicycle activity [15,17,40,56,61] • Moderate reduction in mortality from heart disease, stroke, and lung cancer [70,72,73,74,75,76,77] • Green space is available along some corridor sections [69]

Center Platform Dedicated BRT	• Moderate increase in ridership by having dedicated BRT lanes (< travel time than curbside dedicated BRT lane alternative due to elimination of non-transit vehicles) [73] • Increase in pedestrian activity from wider sidewalks (equal across all alternatives except no-build) [3,6,7,20,21] • Separated buffer provides the maximum increase in perceived safety for bicyclists [36,38,39] • Minimal reduction buffer area between roadway and sidewalk compared to no-build scenario, impacting the sense of safety and exposure to emissions for pedestrians [3,8,51,52] • Moderate reduction in emissions from increases in ridership & bicycle activity [15,17,40,56,61] • Moderate reduction in mortality from heart disease, stroke, and lung cancer [70,72,73,74,75,76,77] • Less green space is available because of converting the median [69]
Center Platform Dedicated LRT	• LRT is powered by electricity and has a high ridership capacity, leading to a significant reduction in emissions [73] • Increase in pedestrian activity from wider sidewalks (equal across all alternatives except no-build) [3,6,7,20,21] • Separated buffer provides the maximum increase in perceived safety for bicyclists [36,38,39] • Moderate reduction in buffer area between roadway and sidewalk compared to no-build scenario, impacting the sense of safety and increased exposure to emissions for pedestrians [3,8,51,52] • Maximum reduction in emissions from increases in ridership & bicycle activity [15,17,40,56,61] • Significant reduction in mortality from heart disease, stroke, and lung cancer [70,72,73,74,75,76,77] • Less green space is available because of converting the median [69]
Elevated Grade Separated LRT	• LRT is powered by electricity and has a high ridership capacity, leading to a significant reduction in emissions (> ridership than Center platform LRT) [73] • Increase in pedestrian activity from wider sidewalks (equal across all alternatives except no-build) [3,6,7,20,21] • Separated buffer provides the maximum increase in perceived safety for bicyclists [36,38,39] • Small buffer area between roadway and sidewalk, leading to a decreased sense of safety and increased exposure to emissions for pedestrians [3,8,51,52] • Maximum reduction in emissions from increases in ridership & bicycle activity [15,17,40,56,61] • Significant reduction in mortality from heart disease, stroke, and lung cancer [70,72,73,74,75,76,77] • Green space is available underneath the elevated platform [69]

Transportation-Alternative Health Analysis Scores for Air Quality & Resiliency Factors

The composite score was an average of all the scores assigned to each potential health outcome listed in Table 10 (above). A detailed table for individual scores by alternative can be found in Appendix C.

Table 11. Composite Transportation-Alternative Health Analysis Scores for Air Quality & Resiliency

Composite Score	No Build	Mixed Traffic with Limited Bus Stops	BAT Curbside Lane	Curbside Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Air Quality & Resiliency	-1.14	-1	0	1	0.86	1	1.57

In light of the aforementioned considerations related to air quality and resilience, the elevated grade separated LRT scored the highest in terms of its potential health impacts. Similar to many of the proposed alternatives, wider sidewalks and separated bicycle lanes were two components that positively impacted air quality and resilience by encouraging pedestrian and bicycle activity. The availability of green spaces was maintained in this alternative underneath the elevated platform, whereas the center platform BRT and LRT options traded the median space for a decreased impact on traffic flow.

Though the elevated LRT scored the highest according to the Transportation -Alternative Health framework, there remains a need to analyze each alternative in terms of health promotion and mitigation of disparities based on findings across the areas of air-quality, physical activity, and road safety. In the Recommendations section, these strategies are outlined in greater detail.

Physical Activity

Background

Multimodal alternatives proposed in the Okeechobee Blvd and SR7 may contribute toward individual level health via increases in physical activity. Such a phenomenon may be accomplished by encouraging residents to walk and bicycle, as opposed to driving. Increasing the proportion of individuals who walk or bike to get places are also identified as an important component of Healthy People 2030's Transportation Objectives, and TPA performance measures (Health.gov., n.d.-c; TPA, 2020b). Like Healthy People 2030, the TPA aims to accomplish a target objective of 5% for those walking to work, and 3% of commuters that bike by 2030. Regular physical activity is one of the most important strategies for people of all ages to improve their health. The built environment plays an essential role in determining pedestrian and bicycle activity (Ferrari et al., 2020). On this note, safe and continuous multimodal facilities for bicyclists, as well as pedestrian crossing opportunities are identified needs within the "Okeechobee Boulevard Transit-Supportive Land Use and Economic Development Analysis: Existing Conditions Report" (2020).

Features of Proposed Alternatives Affecting Physical Activity

Factors with relevance to physical activity within each of the proposed alternative designs include the prevalence of chronic diseases such as heart disease, cancer, dementia, diabetes, and stroke, availability of enhanced pedestrian and bicycle facilities, and connectivity. Like factors of air quality and resilience, measures associated with physical activity were also adapted from the MassDOT project scoring framework and modified to reflect the priorities of this HIA.

Table 12. Transportation-Alternative Health Analysis Factors Related to Physical Activity

Transportation-Alternative Health Analysis Factors Related to Physical Activity		
Burden of chronic diseases associated with physical activity - Heart Disease - Cancer - Diabetes - Dementia - Stroke	Availability of bicycle and pedestrian facilities - Appealing environment	Connectivity - Daily exercise requirements

The design elements with the most potential to impact physical activity are seen in Table 13, below. The specific health outcomes associated with each of the design alternatives are discussed later in this section.

Table 13. Okeechobee Blvd & SR7 Corridor Study Design Elements Affecting Physical Activity

Design Elements	No Build	Mixed Traffic with Limited Bus Stops	BAT Curbside Lane	Curbside Dedicated Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Total width of the sidewalk (per side)	6 ft width	12 ft width	12 ft width	12 ft width	12 ft width	12 ft width	12 ft width
Total width of the bicycle lane (per side)	5 ft width	7 ft width	7 ft width	10 ft width	10 ft width	10 ft width	10 ft width
Type of bicycle lane buffer	Designated No marked buffer)	Designated 2 ft buffer	Designated 2 ft buffer	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side
Width of Left/Right sidewalk buffer	Left: 45.5 ft Right: 43.5 ft	Left: 39.5 ft Right: 37.5 ft	Left: 39.5 ft Right: 37.5 ft	Left: 32.5 ft Right: 30.5 ft	Left: 44 ft Right: 42 ft	Left: 39.5 ft Right: 37.5 ft	Left: 32.5 ft Right: 30.5 ft

Health Outcomes Associated with Physical Activity Factors

Chronic Diseases Associated with Physical Activity. The health effects of increased active travel were measured on the following outcomes: heart disease, breast cancer, colon cancer, dementia, diabetes, and stroke. The mortality rates (per 10,000 corridor residents) at baseline and 5%/10%/15% scenarios are illustrated in Table 14.

Table 14. Mortality Rate per 10,000 Corridor Residents due to Physical Activity-Related Diseases

Cause of Mortality	Baseline	5% Shift in VMT to PMT	10% Shift in VMT to PMT	15% Shift in VMT to PMT
Heart Disease	452	431	411	393
Breast Cancer	31	<31	<31	<31
Colon Cancer	31	30	29	28
Dementia	38	35	33	31
Diabetes	39	37	36	34
Stroke	138	131	125	120

As shown in Table 14, increases in active transportation was shown to have an inverse effect on the mortality rate of all measured diseases associated with physical activity. Per earlier discussions on limitations of the ITHIM, it is not necessarily true that the 15% shift in VMT to PMT alternatives (both LRT options) are the most beneficial to improve rates of physical activity, but rather are more reflective of ridership.

Despite ITHIM limitations, the availability of enhanced multimodal options relates to a greater proportion of individuals meeting daily exercise requirements (Li et al., 2008). Design elements that engage and promote active travel behaviors will have a positive impact on reducing chronic conditions associated with reduced levels of physical activity.

Availability of Bicycle and Pedestrian Facilities. Many elements of a built environment may help to encourage physical activity participation. Most often, facilities such as sidewalks, and bicycle lanes can either promote or discourage such activities by enhancing the perceived safety to either walk or bicycle along the area of interest. Facilities that improve safety are also those that increase a sense of comfort. As mentioned previously, an area's desirability is often associated with a greater willingness to participate in active travel behaviors. Structural improvements, trees/landscaping, and sufficient sidewalk space are among the considerations that can improve pedestrian and bicyclist engagement within the proposed scenarios.

Connectivity. When places are more connected, individuals are more likely to opt for active travel modes when traveling shorter distances. In place of analyzing gaps in pedestrian and bicycle networks across the alternatives, this HIA measures connectivity as the number of individuals meeting daily exercise requirements by means of active travel. The likelihood of satisfying daily exercise requirements are estimated using design elements such as sidewalk and bicycle lane width, as well as public transportation use. Though not traditionally associated with physical activity, literature supports a positive relationship between public transit use and fulfilling daily exercise requirements. Alternatives with enhanced bicycle and pedestrian facilities, and increased public transit ridership were considered the most connected.

Table 15. Physical Activity-Related Health Outcomes by Alternative According to References Listed in Appendix B

Alternative	Potential Health Outcomes
No-Build	• Existing number of individuals meeting daily exercise requirements [14,26,73] • Sidewalk width [3,6,7,20,21,69] • High ambient stress among bicyclists and pedestrians due to narrow lanes [36,37,69] • Aesthetic appeal given lack of construction impacts [68,69] • Aesthetic appeal is not compromised over an extended period of time [69,79] • Large buffer set-back from roadway to sidewalk, that provides increased sense of safety for pedestrians [3,8,50,69] • Rates of heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75]
Mixed Traffic with Limited Bus Stops	• Minimal increase in the number of individuals meeting daily exercise requirements related to public transit use [14,26,73] • Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build) [3,6,7,20,21,69] • Aesthetic appeal given lack of construction impacts [62,68,69] • Aesthetic appeal is not compromised over an extended period of time required to implement the transportation alternative [69,79] • Minimal reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75] • Ambient stress for bicyclists that have wider lanes, but no physical barrier [36,37,69] • Some reduction in perceived safety for pedestrians due to smaller buffer set-back from roadway to sidewalk [3,8,50,69]
BAT Curbside Lane	• Minimal increase in the number of individuals meeting daily exercise requirements related to public transit use [14,26,73] • Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build) [3,6,7,20,21,69] • Aesthetic appeal is maintained given limited construction required to implement a BAT curbside lane [62,68,69] • Aesthetic appeal is not compromised over an extended period of time required to implement the transportation alternative [69,79] • Minimal reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75] • Ambient stress for bicyclists that have wider lanes, but no physical barrier [36,37,69] • Moderate reduction in perceived safety for pedestrians due to small buffer set-back from roadway to sidewalk [3,8,50,69]
Curbside Dedicated Lane BRT	• Moderate increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (BRT) [14,26,73] • Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build) [3,6,7,20,21,69]

	• Aesthetic appeal is maintained given limited construction required to implement a BRT curbside lane [62,68,69] • Aesthetic appeal is not compromised over an extended period of time required to implement the transportation alternative [69,79] • Moderate reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75] • Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier [36,37,69] • Small buffer setback in combination with a dedicated bus lane provides minimal reduction in perceived safety [3,8,50,69]
Center Platform Dedicated BRT	• Moderate increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (BRT) (>Curbside Dedicated BRT) [14,26,73] • Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build) [3,6,7,20,21,69] • Aesthetic appeal is compromised due to significant construction efforts required to build a center platform dedicated lane [62,68,69] • Negative aesthetic impacts experienced over a longer period given the extensiveness of the project [69,79] • Moderate reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75] • Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier [36,37,69] • Minimal increase in perceived safety among pedestrians due to small buffer setback from roadway to sidewalk as compared to no build, yet pedestrian dedicated onboarding area in the center platform promotes slower traffic speeds [3,8,50,69]
Center Platform Dedicated LRT	• Maximum increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (LRT has a high ridership) [14,26,73] • Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build) [3,6,7,20,21,69] • Aesthetic appeal is compromised due to significant construction efforts required to build a center platform dedicated lane [62,68,69] • Negative aesthetic impacts experienced over a longer period given the extensiveness of the project [69,79] • Significant reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75] • Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier [36,37,69] • Minimal increase in perceived safety among pedestrians due to small buffer setback from roadway to sidewalk as compared to no build, yet pedestrian dedicated onboarding area in the center platform promotes slower traffic speeds [3,8,50,69]
Elevated Grade Separated LRT	• Maximum increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (Elevated LRT has the highest ridership) [14,26,73]

	• Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build) [3,6,7,20,21] • Aesthetic appeal is compromised due to significant construction efforts required to build an elevated platform dedicated lane [62,68,69] • Negative aesthetic impacts experienced over a longer period given the extensiveness of the project [69,79] • Significant reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke [69,72,73,75] • Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier [36,37,69] • Increase in perceived safety among pedestrians due to buffer setback from roadway to sidewalk as compared to no build, yet pedestrian dedicated onboarding area on the elevated platform and below the LRT space, promotes slower traffic speeds [3,8,50,69]

Transportation-Alternative Health Analysis Scores for Physical Activity Factors

The composite score was an average of all the scores assigned to each potential health outcome listed in Table 15 (above). A detailed table for individual scores by alternative can be found in Appendix C.

Table 16. Composite Transportation-Alternative Health Analysis Scores for Physical Activity

Composite Score	No Build	Mixed Traffic with Limited Bus Stops	BAT Curbside Lane	Curbside Dedicated Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Physical Activity	-0.86	-0.14	-0.14	0.71	0.43	0.71	0.86

The transportation alternatives with the best scores in terms of physical activity-related factors were the elevated grade LRT, followed by the center platform dedicated LRT and the curbside dedicated BRT options. All of which possess significant increases in ridership capacity compared to the no-build scenario, and promote an environment of perceived safety and decreased ambient stress for pedestrians and bicyclists with wider lanes.

Notably, the most substantial differences across alternatives exist due to the impact of construction on aesthetic appeal. While the elevated and separated LRT transportation alternatives require substantial construction efforts, their ridership capacity enables an added reduction in vehicle emissions, similar to the curbside BRT. The highest scoring alternatives also address some design flaws in the no-build scenario that do not effectively promote physical activity (*i.e.*, narrow sidewalks and bicycle lanes, and reduced ridership).

Additional considerations for each of the multimodal transportation alternatives are made in the Recommendations section.

Road Safety

Background

With respect to road traffic safety, the Palm Beach TPA established a goal for a combined walking, biking, and transit mode share of 15% by 2030, also part of their performance objectives. At present, just under 2% of Palm Beach County residents walk as a means of accessing their employment centers, and fewer than 1% elect to ride a bicycle. In response, the need to assess alternatives that create an environment that facilitates efficient and safe active transportation options became apparent, particularly for those walking and bicycling along the study corridor. In the United States, unintentional injuries are the leading cause of death in children, adolescents, and adults under 45 (Herron, 2019). Preventing crashes is a priority of the TPA's vision for safer, efficient, and connected multimodal transportation systems. Similarly, the TPA's "Vision Zero Plan" describes the mechanisms through which they hope to achieve zero traffic-related fatalities and serious injuries. Between 2013 and 2018, there were a total of 281 bicycle and pedestrian crashes on the study corridor roadway, 79% of which, resulting in fatalities or injuries (TPA, 2020a). Of which more than half of the bicycle and pedestrian crashes were not intersection related. With a majority of bicycle and pedestrian crashes occurring along the study corridor roadway, and not at intersections, there may be a significant opportunity to reduce unintentional injury and death in the study area through increased safety precautions in the design of bicycle and pedestrian routes.

Features of Proposed Alternatives Affecting Road Safety

Design elements within each of the alternatives possessed potential to differ in their impact on road safety factors. The factors of interest within this HIA include the rate of pedestrian and bicycle crashes, as well as fatalities. Proposed alternatives were assessed based on their potential to impact traffic-related injuries and fatalities.

Table 17. Transportation-Alternative Health Analysis Factors Related to Road Safety

Transportation-Alternative Health Analysis Factors Related to Road Safety	
Pedestrian & Bicycle Crashes	Pedestrian & Bicycle Fatalities

The design elements with the most potential to impact road safety are seen in Table 18, below. The specific health outcomes associated with each of the design alternatives are discussed later in this section.

Table 18. Okeechobee Blvd & SR7 Corridor Study Design Elements Affecting Road Safety

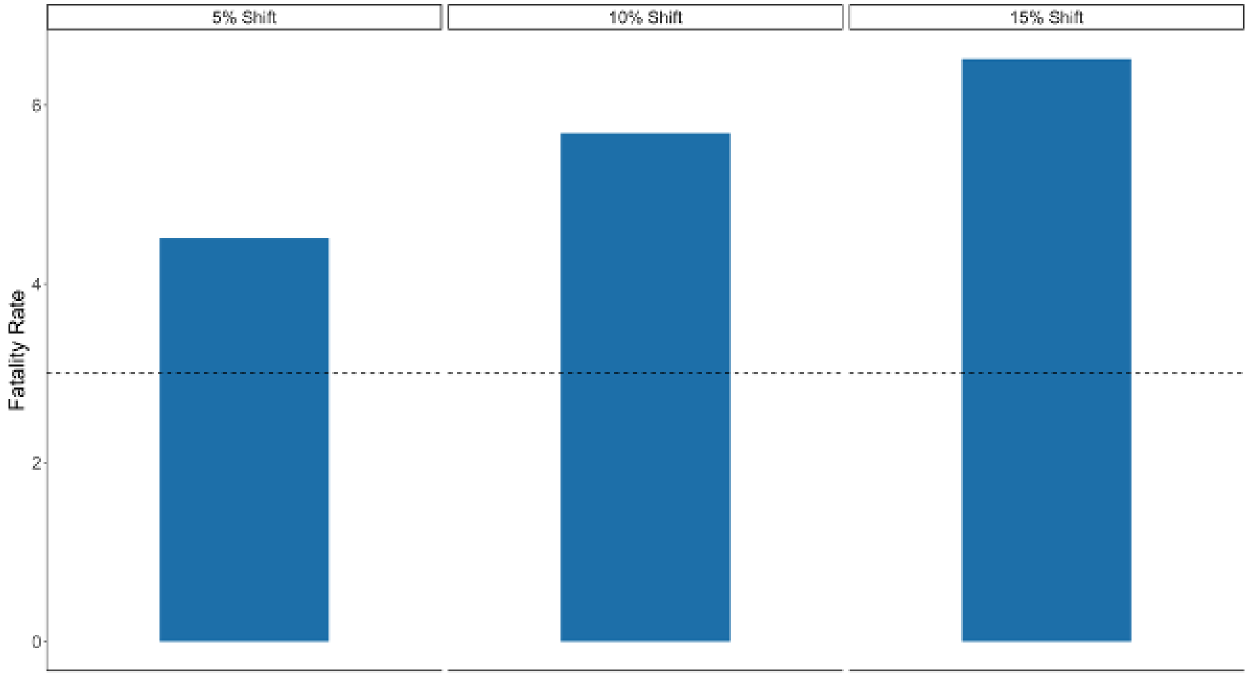
Design Elements	No Build	Mixed Traffic with Limited Bus Stops	BAT Curbside Lane	Curbside Dedicated Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Total width of the bicycle lane (per side)	5 ft width	7 ft width	7 ft width	10 ft width	10 ft width	10 ft width	10 ft width
Type of bicycle lane buffer	Designated No marked buffer)	Designated 2 ft buffer	Designated 2 ft buffer	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side	Separated 2ft and 3ft buffers on either side
Width of Left/Right sidewalk buffer	Left:45.5 ft Right: 43.5 ft	Left: 39.5 ft Right: 37.5 ft	Left: 39.5 ft Right: 37.5 ft	Left: 32.5 ft Right: 30.5 ft	Left: 44 ft Right: 42 ft	Left: 39.5 ft Right: 37.5 ft	Left: 32.5 ft Right: 30.5 ft
Total width of Travel Lanes per side	48 ft width	46 ft width	44 ft width	36 ft width	36 ft width	36 ft width	48 ft width
Width of Individual Travel Lane	12 ft width	11.5 ft width	11 ft width	12 ft width	12 ft width	12 ft width	12 ft width
Total Number of Non-Transit Exclusive Lanes	8 lanes	8 lanes	6 lanes	6 lanes	6 lanes	6 lanes	8 lanes

Health Outcomes Associated with Road Safety Factors

Pedestrian & Bicycle Crashes. Baseline conditions point toward road traffic injuries as a consistent cause of morbidity in the study corridor. Within the study area alone, there was an average of 519 road traffic injuries annually (3-Year Average). As mentioned previously, the 3-year average was calculated from the periods of 2018 through 2020, to mitigate potential fluctuations in travel-related behavior resulting from the COVID-19 pandemic in 2020.

Pedestrian and Bicycle Fatalities. Potential road traffic fatalities were modeled using the ITHIM tool. Under the no-build, or baseline scenario, there are an estimated three (3) road traffic fatalities per 100,000 corridor residents. Baseline fatalities are shown in Figure 10 as a dotted line within each of the 5%, 10%, and 15% shift scenarios in VMT to PMT. The estimates shown in Figure 10 are based on mean starting values for personal and vehicle miles traveled. The number of traffic fatalities was calculated by multiplying road traffic injury-specific attributable fractions by corresponding 3-year average road traffic fatality rate (*i.e.,* fatality numerator and corridor population denominator). Traffic fatalities per 100,000 corridor residents are rounded to the nearest whole number. Notably, ITHIM outputs for road safety should consider that road traffic estimates do not account for additional safety measures that may be incorporated into transportation-alternative designs.

Figure 10. Potential Road Traffic Fatalities per 100,0000 Corridor Residents in the Okeechobee Blvd & SR7 Study Corridor



Rises in road traffic injuries and fatalities are consistent with previous findings, due to the increased presence of active travelers as opposed to personal-vehicle occupants. While the mean estimates for traffic fatalities increase under the 10% and 15% scenarios, the 5% shift may yield the same, if not reduced burden of road traffic deaths. The decreased risk is likely due to the *safety in numbers* phenomenon. The safety in numbers concept is a phenomenon where rates of traffic injuries slow in response to higher activity levels among pedestrians and bicyclists, though it appears some threshold exists whereby the safety in numbers concept concedes some of its protective effects (Jacobsen, 2003). Such, is used with reference to ITHIM applications in Los Angeles and Nashville (Nicholas et al., 2018; Whitfield et al., 2017).

Limitations of the ITHIM discussed in previous sections also apply to road safety models. However, additional regard must be provided to potential road safety strategies when interpreting traffic fatality outputs modeled by the ITHIM, which are not integrated into the model's calculations. As a result, ITHIM outputs are likely an overestimation of crash risk. Given these additional factors in calculating crash risk, ITHIM outputs should be interpreted as areas where such safety countermeasures are essential considerations.

Table 19. Road Safety-Related Health Outcomes by Alternative According to References Listed in Appendix B

Alternative	Potential Health Outcomes
No-Build	• Narrow bicycle lane leads to maximum exposure to roadway traffic [9,36,37,69] • Risk of injury without a designated or separated buffer [32,69] • Large buffer set-back from roadway to sidewalk, that reduces pedestrian exposure to vehicular traffic [1,8,50,69] • Travel lane width of 12' is linked with high travel speeds and risk of severe injury and/or fatality [47,28,49,69] • Minimal risk of road traffic fatalities compared to other travel scenarios projected by ITHIM [69,71,73] • Maximum distance across travel lanes, increasing time and risk for pedestrians crossing the roadway [44,46,69] • Number of travel lanes for non-transit vehicles to meet road capacity (decrease congestion and increase traffic speeds) [69,80] • Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access) [69,81]
Mixed Traffic with Limited Bus Stops	• Wide bicycle lane reduces bicyclist exposures to roadway traffic [9,36,37,69] • Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present [32,69] • Pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk [1,8,50,69] • Reduced travel lane widths promote slower traffic speed [41,42,43,44,45,69] • Minimal risk of road traffic fatalities projected by ITHIM (equal to BAT Curbside Lane) [69,71,73] • Minimal reduction in roadway width compared to no-build, similar time and exposure for pedestrians to cross the roadway [44,46,69] • Number of travel lanes for non-transit vehicles to meet road capacity (decrease congestion and increase traffic speeds) [69,80] • Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access) [69,81]
BAT Curbside Lane	• Wide bicycle lane reduces bicyclist exposures to roadway traffic [9,36,37,69] • Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present [32,69] • Pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk [1,8,50,69] • Maximum reduction in vehicle speeds due to travel lane width [47,28,49,69] • Minimal risk of road traffic fatalities projected by ITHIM [69,71,73] • Moderate reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway [44,46,69] • Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds) and dedicated bus lane provides an additional safety buffer for pedestrians and bicyclists [69,80] • Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access) [69,81]
Curbside Dedicated Lane BRT	• Wide bicycle lane reduces bicyclist exposures to roadway traffic [9,36,37,69] • Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present [32,69] • Maximum pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk [1,8,50,69]

Alternative	Potential Health Outcomes
	• Travel lane widths of 12' are associated with increased travel speeds and increased risk of injury [47,28,49,69] • Moderate risk of road traffic fatalities projected by ITHIM [69,71,73] • Maximum reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway [44,46,69] • Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds) and dedicated bus lane provides an additional safety buffer for pedestrians and bicyclists [69,80] • Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access) [69,81]
Center Platform Dedicated BRT	• Wide bicycle lane reduces bicyclist exposures to roadway traffic [9,36,37,69] • Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present [32,69] • Pedestrian exposure to vehicular traffic is somewhat increased due to the buffer size from roadway to sidewalk [1,8,50,69] • Travel lane widths of 12' are associated with increased travel speeds and increased risk of injury [47,28,49,69] • Moderate risk of road traffic fatalities projected by ITHIM [69,71,73] • Maximum reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway [44,46,69] • Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds) [69,80] • Maximum risk of road crashes for BRT users crossing the roadway from the center platform to the sidewalk [69,81]
Center Platform Dedicated LRT	• Wide bicycle lane reduces bicyclist exposures to roadway traffic [9,36,37,69] • Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present [32,69] • Pedestrian exposure to vehicular traffic is increased due to the buffer size from roadway to sidewalk (= Mixed Traffic alternative & BAT Curbside Lane) [1,8,50,69] • Travel lane widths of 12' are associated with increased travel speeds and increased risk of injury [47,28,49,69] • Significant risk of road traffic fatalities projected by ITHIM (equal to Elevated LRT) [69,71,73] • Maximum reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway [44,46,69] • Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds) [69,80] • Maximum risk of road crashes among LRT users crossing the roadway from the center platform to the sidewalk [69,81]
Elevated Grade Separated LRT	• Wide bicycle lane reduces bicyclist exposures to roadway traffic [9,36,37,69] • Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present [32,69] • Maximum pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk [1,8,50,69] • Travel lane widths of 12' are associated with increased travel speeds and increased risk of injury [47,28,49,69] • Significant risk of road traffic fatalities projected by ITHIM (equal to Center Platform LRT) [69,71,73]

Alternative	Potential Health Outcomes
	• Greatest distance across travel lanes, increasing time and risk for pedestrians crossing the roadway [44,46,69] • Number of travel lanes for non-transit vehicles to meet road capacity (decrease congestion and increase traffic speeds) [69,80] • Maximum risk of road crashes among LRT users crossing the roadway from the elevated platform to the sidewalk [69,81]

Transportation-Alternative Health Analysis Scores for Road Safety Factors

The composite score was an average of all the scores assigned to each potential health outcome listed in Table 19 (above). A detailed table for individual scores by alternative can be found in Appendix C.

Table 20. Composite Transportation-Alternative Health Analysis Scores for Road Safety

Composite Score	No Build	Mixed Traffic with Limited Bus Stops	BAT Curbside Lane	Curbside Dedicated Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Road Safety	-0.50	0.75	1.5	0.63	0.38	0	-1

The BAT curbside lane scored the highest in it's potential to positively impact road safety-related health outcomes. Elements of the BAT curbside lane alternative that promoted road safety included wider bicycle lanes, fewer travel lanes and reduced vehicle speeds, and like the Mixed traffic option, the lowest risk of road traffic fatalities projected by the ITHIM. In addition to slower roadway traffic speeds resulting from the number of travel lanes, the BAT curbside option and curbside BRT options are also advantageous to road safety given that exterior lanes are composed of slower-moving, dedicated bus lanes.

Considering mortality estimates are similar if not elevated in the no-build scenario, and increase across the other alternatives as there is a greater shift in ridership, it is likely the 5% shift scenario experienced by the mixed traffic and BAT curbside lane alternatives yield the protective effects of the safety in number concept. Mitigation strategies are still needed to address increased risk of traffic-related injuries and fatalities resulting from reduced buffer sizes.

It is worth noting that the type of bicycle lane produces fewer health impacts associated with road safety than previous evaluations for air quality and resilience, or physical activity. Wider bicycle lanes confer the same reduced risk of traffic crashes regardless of whether the bicycle lane is designated or separated by a physical buffer (Hunter et al., 2005). Further examination is also required when considering vehicle operators in relation to the type of bicycle lane buffers. Some literature indicates that drivers may drive more attentively when the width of bicycle lanes are reduced. Despite the increased protection supported by these studies, closer analysis must also be made to the distracted driving behaviors, such as texting while driving, which present an increased crash risk (Atwood et al., 2018). In 2018 (the most recently available data), Palm Beach

County experienced a total of 2,509 distracted driving crashes (Morse, 2019). With one of the highest county rates of distracted driving-related crashes in the State of Florida, the project team decided to exclude the driver attentiveness outcome in relation to bicycle lane widths (Morse, 2019).

Additional considerations for each of the multimodal alternatives are made in the Recommendations section.

RECOMMENDATIONS

Recommendations formulated by the HIA will not advocate one alternative for implementation by the TPA, but rather discuss potential strategies that promote health across the alternatives. The recommendations are evidence-based, utilizing findings from previous HIA stages to inform areas of air quality and resilience, physical activity, and road safety.

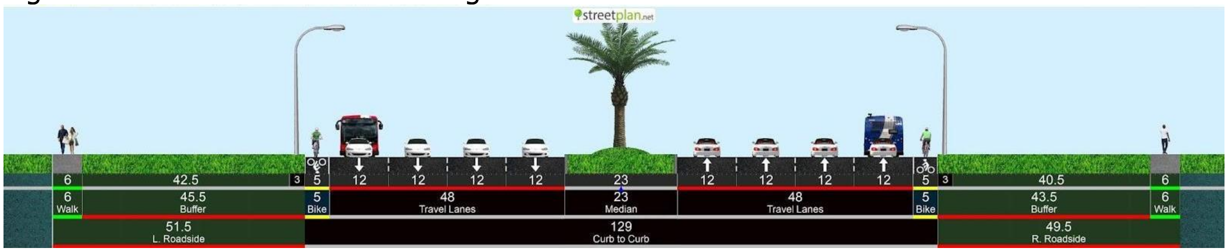
A brief summary of the Transportation-Alternative Health Analysis Scores by alternative are visualized in Table 21, below.

Table 21. Okeechobee Blvd & SR7 Corridor Study Composite Transportation-Alternative Health Analysis Scores

Category	No-Build	Mixed Traffic with Limited Bus Stops	BAT Curbside Lane	Curbside Dedicated Lane BRT	Center Platform Dedicated BRT	Center Platform Dedicated LRT	Elevated Grade Separated LRT
Air Quality & Resiliency	-1.14	-1	0	1	0.86	1	1.57
Physical Activity	-0.86	-0.14	-0.14	0.71	0.43	0.71	0.86
Road Safety	-0.50	0.75	1.5	0.63	0.38	0	-1
Overall	-0.83	-0.13	0.45	0.78	0.56	0.57	0.48

No-Build/ No-Action

Figure 11. No-Build Alternative Design Plan



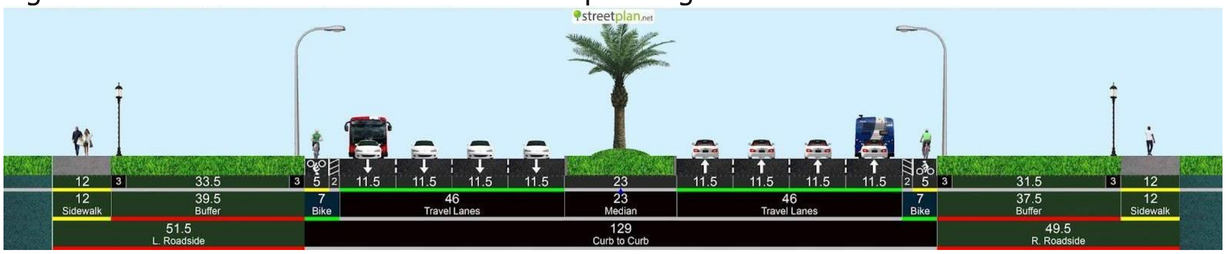
Under the no-build/action scenario, several considerations must be made toward health promotion and risk mitigation strategies. Though the no-build scenario encapsulates currently planned and funded projects, this HIA evaluated health based on the design specifications and traffic patterns currently in practice along the Okeechobee Blvd & SR7 corridor. If selected, the no-build scenario would have a somewhat negative impact on health within the study area (Overall Transportation-Alternative Health Composite Score= -0.83). Compared with other proposed multimodal alternatives, the transportation health analysis predicts the no-build scenario would have the most negative implications on air quality and resilience, as well as physical activity. Features such as 6′ wide sidewalks, existing multimodal facilities, higher vehicle speeds associated with 12′ wide travel lanes, and narrow bicycle lanes do little to encourage public transit ridership, and pedestrian or bicycle activity. Existing emission trends, combined with the highest rates of air-quality and physical activity-related diseases, contribute toward the no-action scenario as the worst overall for health.

Importantly, the no-build alternative possesses several health benefits that must be balanced with potentially negative health outcomes. While the lack of a bicycle lane buffer and limited width increase ambient stress and risk amongst bicyclists, those features are also associated with increased attentiveness on part of vehicle operators. Adverse effects on the perceived and physical safety among study corridor residents may be mitigated by use of available green space and large setbacks between the roadway and sidewalks. The limited construction impacts involved with the no-build scenario bolster the aesthetic appeal along the corridor, an important consideration when assessing both short- and long-term impacts during the implementation phase of this project.

The no-build scenario also boasts one of the lowest road-traffic fatality and injury rates relative to the other proposed alternatives. Under current transportation infrastructure, active travel behaviors (i.e., walking and bicycling) remain low, meaning fewer individuals are less likely to be involved in a crash resulting in injury or death. Although reduced activity levels positively influence road safety outcomes, discouraging pedestrian and bicycle engagement is not a suitable response. Instead, satisfying the safety in numbers threshold, and/or weighing the potentially positive health outcomes related to air quality and physical activity should also be evaluated.

Mixed Traffic with Limited Bus Stops

Figure 12. Mixed Traffic with Limited Bus Stops Design Plan



The mixed traffic alternative with limited stops scored as the second highest alternative in terms of negative health impacts (Overall Transportation-Alternative Health Composite Score= -0.13). With negative composite scores covering air quality, and physical activity, the mixed traffic alternative regains some positive health impacts related to road safety, compounded by improvements to the no-build plan. Though the mixed traffic scenario is not the highest-ranking alternative in terms of ridership, it appears the increase in public transit users may trigger the protective effects of the safety in numbers phenomenon. Estimated ridership levels for both the mixed traffic and BAT curbside lane alternatives yield the same, if not reduced, risk of road traffic fatality, as projected by the ITHIM tool.

Given the slight increase in ridership from an added service route, this alternative may raise the convenience for residents to utilize multimodal options without the significant construction impacts characteristic of some other alternatives (i.e., center platforms for BRT or LRT uses). The mixed traffic alternative retains the potential for green space seen in the no-build scenario, while also enjoying a reduction in air quality and physical activity related diseases. Furthermore, perceived safety is positively impacted under proposed conditions, arising from wider sidewalks (uniform over all alternatives except no-build), wider, designated bicycle lanes, and slower traffic speeds (a byproduct of narrower travel lanes).

If selected, additional strategies should be developed to address areas of concern among bicyclists and roadway efficiency. In spite of equivalent risks of injury, designated bicycle lanes lack the physical barrier attributed to separated bicycle lanes. As a result, bicyclists may experience elevated levels of ambient stress than alternatives which include plans for separated bicycle lanes. From an air quality perspective, the mixed traffic option does not present the most efficient strategy to promote public-transportation use. Though rises in public transit ridership are predicted, the convenience and efficiency afforded by bus-dedicated lanes seen in the BAT curbside lane, and curbside BRT alternatives, are missing in the mixed traffic scenario. With a compromised ability to navigate through traffic, particularly during peak travel hours, the mixed traffic alternative may have negative impacts on air quality. Mitigation strategies to ameliorate public transit efficiency, should aim to reduce the time spent in traffic among bus service routes, and in turn, encourage more users to use public transportation options.

Business Access and Transit (BAT) Curbside Lane

Figure 13. BAT Curbside Lane Design Plan

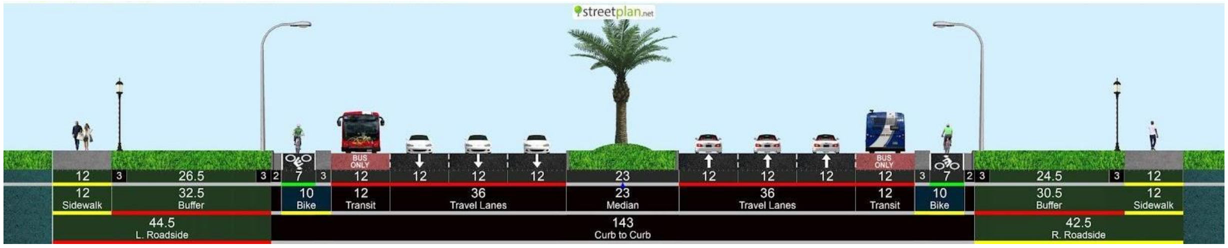
The Business Access and Transit (BAT) curbside lane option falls ahead of the mixed traffic alternative according to the overall Transportation-Alternative Health Analysis score (0.45). Unsurprisingly, both alternatives share similar health benefits, such as wider sidewalks, equidistant buffer setbacks, designated bicycle lanes, availability of green space, and comparable ridership rates. Given the ITHIM methodology, both the BAT curbside lane and the mixed traffic alternatives are included in the 5% shift in VMT to PMT scenario. Accordingly, both alternatives share the same outputs related to a reduction in heart disease, stroke, diabetes, dementia, and cancer.

Unlike the mixed traffic alternative, the BAT curbside option is unique in its integration of dedicated BAT lanes and some elements of BRT into design plans. Dedicated curbside lanes possess several health benefits. In addition to reducing pedestrian exposures when boarding and deboarding buses, exclusive bus lanes help to reduce travel times when utilizing public-transit services. As a consequence of enhanced efficiency, the BAT curbside lane enjoys increased ridership than the mixed traffic alternative, while averting an increased risk of road traffic fatalities and injury. Rises in ridership while maintaining the safety in numbers effect, mean that the mixed traffic and BAT curbside options enjoy the positive aspects with increases in active travel, such as increased physical activity and enhanced access and spending at businesses. A further health benefit of the BAT curbside lane is the width of individual travel lanes. As the alternative with the narrowest travel lanes (11′ wide), the BAT curbside lane scenario entails the greatest reduction in vehicle speeds associated with such metrics.

In order to acquire improved efficiency and ridership from a dedicated lane, the BAT curbside lane poses challenges to single-occupancy vehicle operators in the form of heightened traffic congestion. Resulting from the downgrade of four (4) travel lanes to three (3) travel lanes, drivers may be more vulnerable to frustration and risky driving behaviors. A distinguishing element of the BAT curbside lane, as opposed to the mixed traffic alternative, is the intensified need for construction. Though not nearly as intense as other proposed designs, the BAT curbside lane will require slightly more intensive construction efforts that may obstruct traffic patterns and dissuade active travel behaviors.

Curbside Dedicated Lane Bus Rapid Transit (BRT)

Figure 14. Curbside Dedicated BRT Design Plan



As the best rated alternative in the Transportation-Alternative Health Analysis, the curbside dedicated lane BRT alternative has some of the most positive overall health impacts of all the proposed scenarios (overall Transportation-Alternative Health Composite Score = 0.78). Benefits from the transit-exclusive lanes as seen in the BAT recommendations are also reflected in this option, however the integration of BRT systems pose a heightened advantage.

BRT is a highly efficient and cost-effective transportation system that is similar to LRT. BRT is less burdensome from an operational and maintenance approach, even though the capacity for riders is somewhat diminished compared to LRT. In contrast to the BAT curbside lane option, the curbside BRT boasts enhanced efficiency through use of off-board fare collection and traffic signal priority, in addition to dedicated bus lanes. Supplementing it's appeal from an emissions and convenience standpoint, BRT is considered more accessible than traditional bus services, due to features such as elevated platforms, which may aid in addressing disparities in transportation access among the disabled or aging populations. Improvements to ridership also assist in modifying travel behaviors and thus alleviate the burden of chronic diseases related to poor air quality and lack of physical activity.

Akin to the BAT alternative, the curbside lane design protects BRT-users during boarding and deboarding periods, where in other designs, they may face increased risk of road traffic crashes when crossing the roadway to access public-transportation facilities. The risk of injury to bicyclists in the BRT curbside lane is equivalent to the designated bicycle lanes, featured in the mixed traffic and BAT curbside lane alternatives. These options do however differ in terms of ambient stress levels and perceived safety among bicyclists, which may play a role in either encouraging or discouraging bicycle activity. Presence of physical barriers, as seen in the separated bicycle lanes planned in the curbside dedicated BRT alternative, help to address such safety concerns.

In contrast to previous options, the curbside BRT plan suffers slightly more negative outcomes from the perspective of road safety despite its strengths with regard to air quality and physical activity. However, fewer travel lanes may increase congestion and in turn slow traffic speeds, reducing the risk of a crash. The smaller buffer setback between the roadway and sidewalk may negatively impact the perceived safety of pedestrians (although this is mitigated by the outer lanes being dedicated to transit-related travel), as well as their exposure to traffic-related pollutants. Further attention should also be paid to the increased risk of injury resulting from wider traffic lanes (12' wide) and heightened vehicle speeds.

Center Platform BRT

Figure 15. Center Platform BRT Design Plan

The center platform BRT alternative is one of two alternatives that involve converting the existing median space into two (2) separated lanes dedicated for public-transit use. Overall, the center platform BRT lags behind the curbside dedicated lane BRT with regard to positive health impacts associated with air quality, physical activity, and road safety (overall Transportation-Alternative Health Composite Score = 0.56). Key differences between this alternative and the others considered by the TPA, center on the construction of a center platform.

Some similarities between the center platform BRT and alternatives like curbside lane BRT and BAT options are the traffic challenges that arise from the existence of fewer travel lanes for single-occupancy vehicles. In addition to these commonalities, the center platform BRT shares the same reduction in heart disease, stroke, cancer, diabetes and dementia, and advantages of the BRT system as established under the BRT curbside lane alternative.

Positive health impacts of this alternative surround the rise in ridership, wherein physical activity is increased, and emissions of environmental pollutants are cut back from the reduction in personal vehicle travel. Bicyclists are similarly benefitted to other alternatives that incorporate a separated buffer lane design.

There exists several potentially negative health outcomes as a result of the center platform BRT option, many of which pertain to construction impacts. Given the significant effort and investment required to build the center platform, existing health disparities along the study corridor may worsen over time. Construction may discourage residents from engaging in active travel modes by compromising the aesthetic appeal of the roadway. By developing the median, health benefits related to the presence of green spaces (i.e., reducing exposures to vehicle emissions, ambient stress, and lower home values) are lost. If selected, this alternative should make effective use of the buffer setback from the roadway to the sidewalk as an area for landscaping and vegetation in order to offset the consequences of converting the median.

In addition to the aforementioned concerns, the center platform BRT poses an increased motivation among public transit users to cross Okeechobee Blvd & SR7 in order to utilize the BRT service. As a consequence, the risk of road traffic crashes is substantially intensified with the increasing frequency at which pedestrians cross the roadway.

Center Platform Dedicated Light Rail Transit (LRT)

Figure 16. Center Platform Dedicated LRT Design Plan

The center platform dedicated LRT alternative is one of two proposed designs that incorporate LRT technology. Despite being a highly sophisticated and modern transportation mode, LRT requires substantial financial investment to construct and maintain over time. The Transportation-Alternative Health Analysis score identifies the center platform LRT as an alternative that has a somewhat positive health impact related to air quality and resilience, physical activity, and road safety (overall Transportation-Alternative Health Composite Score = 0.57).

Comparable with alternatives already discussed in this report, this alternative provides an increased sense of safety among pedestrians and bicyclists due to wider, more separated lanes. LRT systems also provide several distinct advantages in terms of health. As an electric technology with a high capacity for ridership, LRT use may significantly reduce roadway emissions produced by personal vehicle use. As shown in previous studies, LRT may improve quality of life, through increased access to education, job opportunities, and education (Valley Metro, n.d.). Increased public-transit use is also associated with a greater number of individuals satisfying their daily exercise requirements. Accordingly, the ITHIM hails both the center platform and elevated grade LRT options as the alternatives with the greatest reduction in air quality and physical activity-related diseases, such as heart disease, dementia, cancer, stroke, and diabetes.

Despite its advantages, the development of a center platform may exacerbate predicted trends in traffic-related fatalities arising from shifts in pedestrian patterns, who may cross the roadway more frequently in order to access the LRT systems. This, coupled with the sizable cost and construction required to build a center platform, may quell the positive effects of the alternative on emissions and physical health. However, these potentially negative impacts must be balanced for long-term outcomes as demonstrated by Valley Metro, wherein public transit ridership soared 487%, and 81% of users walk ¼ mile or less to access transit options since the implementation of LRT in 2008 (n.d.).

Limited availability of green spaces, fewer travel lanes for public and general roadway-use, and risk of higher vehicle speeds associated with wider travel lanes should also be considered. Similar to recommendations formulated for previous designs, strategies to mitigate adverse health impacts aim to make active travel modes more desirable. Primarily, use of landscaping as a means to improve aesthetic appeal, help to reduce ambient stress caused by increased vehicle speeds and/or traffic congestion, and encourage walking or bicycling.

Elevated Grade-Separated LRT

Figure 17. Elevated Grade-Separated LRT

Much like the center platform design, the elevated grade-separated LRT has similar health impacts. Increases in ridership between the center platform LRT and the elevated grade LRT are expected to differ regarding the magnitude of health impacts. This is reflected in the Transportation-Alternative Health Analysis, where the elevated grade LRT excels in areas of air quality and resilience, and physical activity, when compared with the center platform LRT option. The magnitude of impacts also applies to negative effects on health. The elevated grade LRT score reflects the most negative health impacts among all the proposed alternatives regarding road safety. In spite of its shortcomings related to road safety, the elevated grade LRT alternative maintains a neutral-to-somewhat-positive overall score (0.48).

Like the center platform LRT, the elevated grade LRT is advantageous in improving air quality, reducing single-occupancy vehicle use, promoting enticing and efficient transit options, and encourages active travel behaviors. With increased ridership, the elevated LRT option is expected to exceed the center platform LRT design in reducing the burden of chronic diseases associated with poor air quality and minimal physical activity.

A distinct feature of this alternative is the elevated and separated design for the LRT system, which would minimize obstructions to the roadway and alleviate traffic congestion. As a consequence, the elevated LRT option allows for four (4) travel lanes, as opposed to the three (3) lanes proposed in other alternatives (*e.g.*, center platform LRT and BRT). Decreased frustration among vehicle operators, congestion, and time spent in traffic are among some of the benefits experienced by the elevated LRT design, however from the perspective of road safety, these factors are negative in their effects on road traffic speeds and crash risk.

While four travel lanes may be advantageous for drivers along the study corridor, pedestrians are not so fortunate. In contrast, the greater distance across the roadway increases pedestrian’s exposure and risk of injury when crossing the street. This issue is compounded by the frequency at which LRT users may need to cross the roadway in order to access the platform. Similarly, a reduction in buffer setback space between the roadway and sidewalk could diminish the sense of safety among pedestrians and discourage walking as a travel mode.

General Recommendations

Prioritize transportation infrastructure aimed at connectivity, in order to bolster equitable access to healthy living. Among Census Block Groups, areas with higher education rates and decreased proportion of minorities are more likely to engage in physical activity (Gordon-Larsen et al., 2006). Older adults, individuals with disabilities, minorities, and low-income populations are evidenced in literature as subsets of the population disproportionately affected by the negative health impacts of limited transportation systems (Institute of Medicine, 2007; Shrestha et al., 2017). Equitable access to opportunities such as employment, businesses, healthy foods education, medical care, and social connection have significant potential to reduce health disparities (Badger, 2012; National Association of City Transportation Officials, n.d.). As part of the "Connected" metrics established in the TPA's Performance Measures, establish percentage goals of federal aid eligible mileage in relation to pedestrian facilities' proximity to elementary schools (within 2 miles), traditionally underserved communities (within 0.25 mile) and the proximity of pedestrian and bicycle facilities to transit hubs (respectively within 1 mile and 3 miles) (TPA, 2020b). Alternatives that increase equitable living through the availability of improved pedestrian and bicycle facilities, are aligned with existing performance goals by the TPA.

Prioritize projects using Performance Measures to achieve health equity. It is recommended that proposed transportation projects should be evaluated using the Performance Measures to best align the implementation of plans with achieving broader organizational goals. Similar actions have been taken place by State-level DOTs and MPOs as described on page 13 of this report.

Facilitate appropriate investments in efficient public transit infrastructure improvements that increase ridership and achieve health equity. By implementing policies that expand transit-ridership, users are more likely to engage in physical exercise, spend at local businesses, reduce the burden of chronic diseases, improve their mental health, and facilitate access to equitable employment opportunities, as well as goods and services. An essential component of these investments is ensuring they are contextual to the needs of those that live, work, and play in the study corridor. As such, over-spending on infrastructure better suited for densely populated cities may not be the best use of funding for the 86,736 residents that inhabit the study area. Implementing transit-exclusive service lanes, closing coverage gaps, and acquiring BRT vehicles are cost-effective options that can positively impact health and reduce disparity in the study area. Infrastructure like BRT are advantageous in that they produce fewer emissions than traditional buses, and reduce travel times through off-board fare collection and traffic-signal priority (FTA, 2015). In turn, similar investments may aid the TPA in achieving performance measure goals related to the decrease in the Daily Vehicle Miles Traveled per Person, and transit commute time (versus car commute time) (TPA, 2020b).

Consider transportation design elements that promote pedestrian activity. Several design elements set forth in the multimodal alternatives, can substantially impact a person's decision to walk along the study corridor. Sidewalks that are 12 feet wide, further away from vehicular traffic, and slower roadway speeds are among the features discussed between proposed alternatives that can effectively encourage pedestrian activity (Clarke & George, 2005; Heinrich et al., 2008; Galea et al., 2005). Prioritizing pedestrian-friendly designs may jointly reduce the burden of chronic diseases such as heart disease, diabetes, dementia, and cancer, and help the TPA achieve its commuter mode split target of 5% choosing to walk to work by 2030 (below target) (TPA, 2020b).

Prioritize crosswalk enhancements to increase health and safety. Across all alternatives, pedestrian safety may be improved through implementation of countermeasures that bolster crosswalk visibility. As a major commuting corridor, Okeechobee Blvd & SR7 experiences between 45,000 and 67,000 in Annual Average Daily Traffic (AADT) prior to the section consisting of the downtown West Palm Beach area (in this region the AADT is approximately 21,500) (TPA, 2020a). The current AADT along the study corridor exceeds the threshold identified by the Federal Highway Administration (FHWA) for additional crosswalk enhancements beyond the use of marked crosswalks (2018; Zegeer, 2005). Features such as high visibility markings at midblock pedestrian crossings and uncontrolled intersections (more than the standard parallel lines), increased "YIELD" or "STOP" signage prior to crosswalks, or curb extensions to reduce crossing distances are among some of the considerations to reduce pedestrian-related crashes in the study corridor (FHWA, 2018).

Consider transportation design elements that promote bicyclist activity. Differences in perceived safety and risk of injury among bicyclists are discussed in depth throughout this HIA report. Separated bicycle lanes substantially improve the perceived safety of bicyclists, which may in turn bolster existing modeshare splits for bicycling. However, a sense of safety must also be balanced with regard to inconveniences associated with building a separate bicycle lane, and the unchanging risk of injury, as compared to designated buffer lanes (Apasnore et al., 2019; Morrison et al., 2019). As a means to accelerate existing rates of the biking commuter mode share (0.61% of commuters in 2019) to the TPA's goal of 3% in 2030, the implementation of designs involving separated bicycle lanes is a recommended strategy to achieve such results (TPA, 2020b).

Plan future investigations of land use and displacement risk ratio as a measure of equity. The Displacement Risk Ratio (DRR), as developed by the Reinvestment Fund, is a measure of housing stability. The DRR identifies neighborhood shifts in housing affordability, relative to rises in income over a specified time period. As a result, the DRR allows decision makers to discern areas where vulnerable populations may have been involuntarily displaced due to a rise in housing prices that exceeds that of income (Dowdall, 2016). Land use may substantially influence the availability and cost of housing, which poses an opportunity for future research concerned with matters of equity.

Develop an architectural ITHIM tool to be used in corridor-level analysis that emphasizes equity, gathers environmental inputs from TPA Performance Measures, and informs a regional travel-demand ITHIM mechanism. Developing an ITHIM compatible at the corridor-level possesses potential to remediate existing limitations of the tool used in this HIA. Previous studies conducted in metropolitan areas such as Los Angeles, developed a customized version of the ITHIM in order to accurately reflect the potential health impacts of several proposed alternatives. Inputs collected from the TPA Performance Measures could help overcome existing barriers in data collection regarding travel behaviors available at the corridor-level.

Collaborate with FDOT to develop a monitoring plan for each of the main corridors/throughout the County. Such, will facilitate future multimodal corridor studies in Palm Beach County, and encourage the consideration of health into the transportation and planning field. Future studies may benefit by including cost-benefit analyses, and forecasting of long term health impacts due to transportation infrastructure investments.

Consider short-term changes that enhance facilities and build a culture to support a Safe System approach. A Safe System approach entails transportation infrastructure that is designed with human error in mind. Though crashes are inevitable, the Safe System approach attempts to reduce the risk of human error, and also minimize the severity of injury in the event of such incidents (Federal Highway Administration, 2021). Such strategies may help the TPA in achieving their "Vision Zero Plan", which is an identified target area included as part of their performance measures (TPA, 2020b). In addition to these considerations, the timeline for funding and implementation of any selected alternative must be weighed against existing health outcomes and disparities. States of health may significantly change and even deteriorate over time if the selected alternative is extremely extensive in design and execution.

Encourage an environment of conscious construction practices. Construction projects can be a significant contributor of environmental air pollutants, noise pollution, and may negatively impact the visual appeal of a community. By employing environmentally friendly techniques, sustainable construction projects may integrate solar technologies, source biodegradable materials, recycle existing materials during any demolition process (i.e., steel and/or concrete), utilize locally sourced materials, and ensure the availability of green spaces (Construction World, 2019). Investment in transportation infrastructure often leads to broader economic growth, which results from improved services that facilitate mobility, time, and cost savings. Development of novel transportation systems may substantially benefit from integrating sustainable, health conscious practices, in addition to economic incentives.

Incorporate landscaping and green space considerations into future transportation projects. Availability of green spaces is supported by an array of literature for its beneficial effects in reducing ambient stress, slower traffic speeds, enhanced bicycle and pedestrian activity, minimized exposure to air pollutants, mitigation of urban heat island effects, and increased perceived safety for those walking or bicycling in the area of interest (de Hartog et al., 2010; Dijkstra et al., 2008; Dill et al., 2010; McDonald et al., 2006; Rabl & Nazelle, 2012; Safe Routes to School National Partnership, 2012). By incorporating green elements into proposed transportation designs, health may substantially influenced to promote healthier lifestyles and reduce the negative health impacts associated with certain multimodal designs (e.g., increases in travel time due to traffic congestion; elevated traffic speeds resulting from wider lanes; reduction in buffer setbacks between the sidewalk and roadway).

Consider planting trees that have a larger surface area of leaves to generate more photosynthesis, rather than conifers that absorb more heat. Species with enhanced ability to conduct greater levels of photosynthesis also have greater capacity for reducing emissions, and may reduce the urban heat island effect along Okeechobee Blvd and SR7 (Dill et al., 2010).

Consider investing in an air monitor system to measure air quality. States are responsible for developing their own monitoring plans that ensure the ambient air monitoring networks meet minimum requirements set by the Clean Air Act. Often, states choose to situate monitors in areas with higher concentrations and/or higher population since the minimum monitoring requirements are based on population size. By situating an air monitoring system along the study corridor, decision makers can better aim interventions in highlighted areas of need.

Future Considerations

Light Rail Transit (LRT)

As mentioned in relation to the curbside dedicated lane BRT recommendations, this HIA may underscore the full potential of LRT alternatives in affecting the community's health. Reports such as the quality of life study published by Valley Metro, and results from Commute Seattle's 2019 Center City Commuter Mode Split Survey point toward investments in LRT systems as a significant source of commuter mode split, reduction in single occupancy vehicle trips, in face of increasing employment. In Seattle, transit-related investments such as LRT have led to a 9% reduction in single-occupancy vehicle commutes despite an increase of 90,000 jobs in the downtown Seattle area from 2010-2019 (Commute Seattle, 2019).

Housing Affordability & Transit-Oriented Development

Housing affordability is an additional area for future investigations to measure the impact of transportation alternatives on health. The provision of affordable housing is defined as housing options that do not cost more than 30% of an individual's income (HUD User, 2017). Staying below the 30% housing cost, is intended to provide households enough financial flexibility to pay for other non-discretionary costs (HUD User, 2017). In addition to housing, transportation costs are often the second-most burdensome expense among households. The Center for Neighborhood Technology's (CNT) Housing and Transportation Affordability Index is a direct measure of affordability, as determined by the combined cost of housing and transportation expenses (2018). Under the Housing and Transportation Affordability Index, the county of Palm Beach exceeds the combined affordability benchmark of 45%, where 66% of Palm Beach County household income is spent on housing and transportation expenses (CNT, 2018; TPA, 2020a). Use of public-transit options, as opposed to personal vehicles, could save households approximately $10,000 a year (American Public Transportation Association (APTA), 2017; Valley Metro, n.d.).

Given the demonstrated need for affordable housing in the greater Palm Beach area, the Okeechobee Blvd and SR7 corridor could benefit from the expansion of high-capacity transit systems that incentivize public and private investment in the development of affordable housing options. In a large-scale study of four metropolitan hubs (Atlanta, Denver, Seattle, and Washington D.C.), Enterprise Community Partners built on previous research by AARP, the National Housing Trust, and Reconnecting America, wherein more than 250,000 privately owned, federally subsidized apartments were within walking distance to quality transit services across 20 metropolitan areas (2010). Two thirds of which were covered by federal housing contracts (AARP, 2010). The selection of Atlanta, Denver, Seattle, and Washington D.C. in this case study was due to existing commitments in expanding transit service such as the addition of light rail coverage, bus rapid transit, and facility improvements. Similar opportunities exist in the Okeechobee Blvd and SR7 study corridor. Implementation of transit services with high ridership capacity, such as LRT, should be evaluated for their ability to encourage the development of additional affordable housing options and expand transit-oriented development.

Limitations experienced in this HIA to fully capture the magnitude of LRT on health factors could be addressed in future studies through use of a Cost-Benefit Analysis and forecasting of long-term health impacts. Considering the substantial upfront costs of LRT systems, it is necessary for subsequent analyses to evaluate changes in health over an extended period of time, to not miss potential developments that may significantly affect health, as supported by findings by Valley Metro (n.d.) and Commute Seattle (2019).

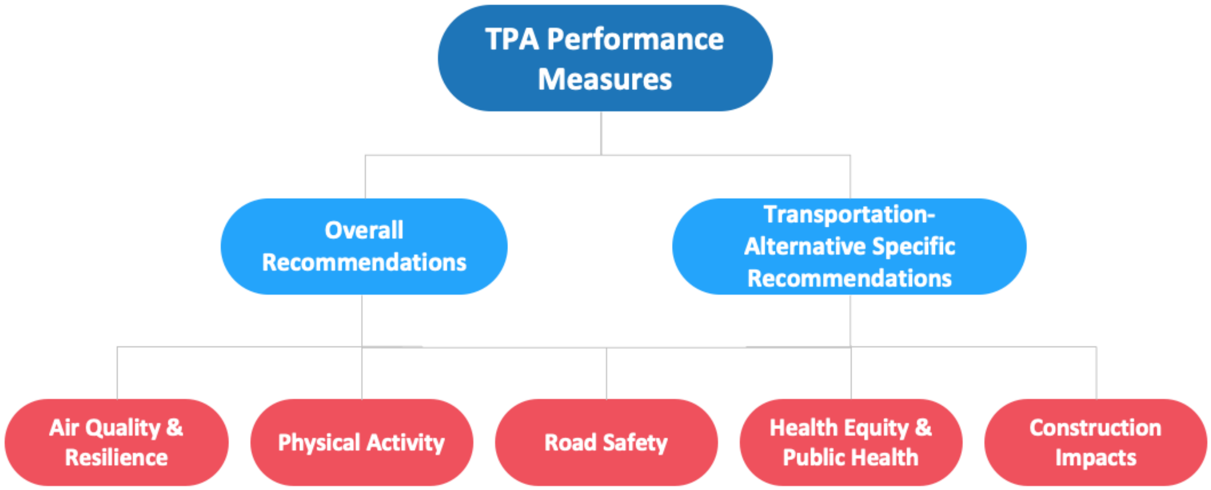
MONITORING & EVALUATION

The goal of the monitoring and evaluation phase is to track the impact of HIA findings and recommendations on the selection and implementation of a specific multimodal transportation alternative. In completion of this stage, this HIA identified indicators and variables of interest for continued evaluation aligned with the Transportation Planning Agency (TPA) Performance Measures.

Monitoring & Evaluation Plan

The monitoring and evaluation plan set forth by this HIA are a continuation of overall recommendations. Informed by considerations related to air quality and resilience, physical activity, and road safety, the monitoring plan describes indicators for continued evaluation that pertain to overall recommendations and draw from mitigation strategies mentioned across the transportation-alternative scenarios.

Figure 18. Monitoring & Evaluation Overview



This HIA recommends the Palm Beach TPA adhere to a monitoring plan that answers the following points:

1. Which of the transportation-alternatives evaluated in this HIA have been selected to promote health and reduce disparities in the Okeechobee Blvd and SR7 corridor? Depending on the selected alternative, which of the specific recommendations in this HIA were enacted?
2. As a consequence of the transportation-alternative specific recommendations issued by this HIA, what evidence is there to support changes in the community's health along the Okeechobee Blvd & SR7 corridor?
3. As a consequence of the Overall Recommendations issued by this HIA, what evidence is there to support changes in the community's health along the Okeechobee Blvd & SR7 corridor?

Tables 22 through 26, highlight existing TPA Performance measures that should undergo continued evaluation in relation to the findings and recommendations established in this HIA. Currently available data for each of the indicators are listed as baseline statistics. Goal metrics are also listed to provide additional context of current conditions in the Okeechobee Blvd and SR7 corridor.

1. Air Quality & Resilience
2. Physical Activity
3. Road Safety
4. Health Equity & Public Health
5. Construction Impacts

Table 22. Monitoring & Evaluation Indicators for Air Quality & Resilience

Air Quality & Resilience		
Indicator	**Statistical Agency**	**TPA Performance Measure & Timeframe**
Travel Time Reliability on Non-Interstate Roads	INRIX, Inc.	**Baseline**: 98% of vehicles in 2020 **Goal**: ≥93% of vehicles by 2025 **Timing**: 2 years
Daily Fuel Use per person	Palm Beach TPA	**Baseline**: 1.14 gallons in 2020 **Goal:** ≤1.25 gallons by 2030 **Timing**: 10 years
Vehicle Miles Traveled (VMT) per Person	Palm Beach TPA	**Baseline**: 24.4 VMT per capita in 2020 **Goal**: ≤21 VMT per capita by 2030 **Timing**: 10 years
Percent of Federal Aid Roadways Susceptible to 1% Annual Flood Risk	Palm Beach TPA	**Baseline**: 26.7% of roadways in 2021 **Goal**: <25% of roadways by 2030 **Timing**: 10 years
Percent of Federal Aid Roadways Susceptible to 1.2′ of Sea Level Rise	Palm Beach TPA	**Baseline**: 3.9% of roadways in 2021 **Goal**: <3% of roadways by 2030 **Timing**: 10 years
PM2.5 and NO2 Concentration	Palm Beach TPA	To be considered for development by the TPA.
Vegetation Coverage	Palm Beach TPA	To be considered for development by the TPA.
Daily Fuel Use per person	Palm Beach TPA	**Baseline**: 1.14 gallons in 2020 **Goal:** ≤1.25 gallons by 2030 **Timing**: 10 years
Percent of Electric Vehicles in Bus Fleet	Palm Tran	**Baseline**: 0% of vehicles in 2020 **Goal**: 75% of vehicles by 2030 **Timing**: 10 years
Transit v. Car Average Commute Time	U.S. Census Bureau	**Baseline**: 2.11 ratio of transit commute time to single-driver commutes in 2019 **Goal**: 1.75 ratio of transit commute time to single-driver commutes by 2030 **Timing**: 10 years

Table 23. Monitoring & Evaluation Indicators for Physical Activity

Physical Activity		
Indicator	**Statistical Agency**	**TPA Performance Measure & Timeframe**
Miles of Separated Bike Lanes	Palm Beach TPA	**Baseline**: 0.21 miles of separated bike lanes in 2021 **Goal**: 20 miles of separated bike lanes by 2030 **Timing**: 10 years
10' Shared Use Paths	Palm Beach TPA	**Baseline**: 87 miles in 2021 **Goal**: 100 miles by 2030 **Timing**: 10 years
8 to ft Paved Pathways on Federal-Aid Roads	Palm Beach TPA	**Baseline**: 293 miles in 2021 **Goal**: 305 miles by 2030 **Timing**: 10 years
Buffered Bike Lanes	Palm Beach TPA	**Baseline**: 12 miles of buffered bike lanes in 2021 **Goal**: 20 miles of buffered bike lanes by 2030 **Timing**: 10 years
Designated Bike Lanes	Palm Beach TPA	**Baseline**: 246 miles of buffered bike lanes in 2021 **Goal**: 300 miles of buffered bike lanes by 2030 **Timing**: 10 years
Sidewalks	Palm Beach TPA	**Baseline**: 1,183 miles in 2021 **Goal**: 1,300 miles by 2030 **Timing**: 10 years
Commuter Mode Split - Walking	U.S. Census Bureau	**Baseline**: 1.35% of commuters in 2019 **Goal**: 5% of commuters in 2030 **Timing**: 10 years
Commuter Mode Split - Biking	U.S. Census Bureau	**Baseline**: 0.61% of commuters in 2019 **Goal**: 3% of commuters in 2030 **Timing**: 10 years
Commuter Mode Split - Transit	U.S. Census Bureau	**Baseline**: 1.63% of commuters in 2019 **Goal**: 7% of commuters in 2030 **Timing**: 10 years

Table 24. Monitoring & Evaluation Indicators for Road Safety

Road Safety		
Indicator	**Statistical Agency**	**TPA Performance Measure & Timeframe**
Crash Fatalities	Department of Transportation (FDOT)	**Baseline**: 178 fatalities in 2020 **Goal**: 0 fatalities in 2020 **Timing**: Annual
Serious Injuries	Department of Transportation (FDOT)	**Baseline**: 917 injuries in 2020 **Goal**: 0 injuries in 2020 **Timing**: Annual
Pedestrian & Bicycle Crash Fatalities	Department of Transportation (FDOT)	**Baseline**: 189 injuries in 2020 **Goal**: 0 injuries in 2020 **Timing**: Annual
Crosswalk Enhancements	Palm Beach TPA	To be considered for development by the TPA.*

Table 25. Monitoring & Evaluation Indicators for Health Equity and Public Health

Health Equity		
Indicator	**Statistical Agency**	**TPA Performance Measure & Timeframe**
Percent of Bike Facilities within 3 Miles of Transit Hub	Palm Beach TPA	**Baseline**: 20.6% of facilities in 2020 **Goal**: 100% of facilities in 2030 **Timing**: 10 years
Percent of Pedestrian Facilities within 3 Miles of Transit Hub	Palm Beach TPA	**Baseline**: 85% of facilities in 2020 **Goal**: 100% of facilities in 2030 **Timing**: 10 years
Percent of Pedestrian Facilities within 2 Miles of Elementary Schools	Palm Beach TPA	**Baseline**: 79.6% of facilities in 2020 **Goal**: 90% of facilities in 2030 **Timing**: 10 years
Corridor-Level ITHIM tool	Palm Beach TPA	To be considered for development by the TPA.
Percent of Pedestrian Facilities within 1/4 Mile of Underserved Communities	Palm Beach TPA U.S. Census Bureau	**Baseline**: 70.9% of facilities in 2020 **Goal**: 70% of facilities in 2030 **Timing**: 10 years
Displacement Risk Ratio (DRR)	Reinvestment Fund	To be considered for development by the TPA.

Table 26. Monitoring & Evaluation Indicators for Construction Impacts

Construction Impacts		
Indicator	**Statistical Agency**	**TPA Performance Measure & Timeframe**
Aesthetic Appeal	Palm Beach TPA	To be considered for development by the TPA.
Ambient Stress	Palm Beach TPA	To be considered for development by the TPA.
Noise Pollution	Palm Beach TPA	To be considered for development by the TPA.
PM2.5 and NO2 Concentration near Construction Sites	Palm Beach TPA	To be considered for development by the TPA.
Quality of Public Water Systems and Groundwater	Palm Beach TPA	To be considered for development by the TPA.
Material Waste	Palm Beach TPA	To be considered for development by the TPA.

Dictionary of Terms

- **Active Travel:** opting to travel in physically active forms, that can include walking, and bicycling (Paths for all, n.d.).
- **Affordable Housing:** The provision of affordable housing is defined as housing options that do not cost more than 30% of an individual's income (HUD User, 2017). Staying below the 30% housing cost, is intended to provide households enough financial flexibility to pay for other non discretionary costs (HUD User, 2017).
- **Business Access and Transit (BAT):** business access and transit (BAT) lanes allow for buses to navigate more efficiently through traffic and improve access to business as they are curbside lanes. BAT lanes are restricted for buses and turning vehicles (LTD, n.d.).
- **Bus Rapid Transit (BRT):** Bus rapid transit, or BRT is a bus-based transit system, characterized by dedicated bus lanes, off-board fare collection, traffic signal priority, elevated platforms, and expanded station facilities compared to more traditional bus stations. Investments in BRT have been endorsed by the Federal Transit Administration (FTA) as appropriate, and affordable transit alternatives suitable for application in big cities and mid-sized metropolitan areas, like the study corridor (2015). Mimicking elements of light rail transit (LRT), BRT alternatives are regarded as more reliable and efficient than regular bus systems. Dedicated bus lanes and traffic signal priority reduce the amount of time spent in traffic, making the alternative a more desirable transportation option over single-occupancy vehicles, while also lessening the amount of emissions released into the atmosphere (FTA, 2015).
- **Disability-Adjusted Life Years (DALYs):** DALYs measure of the burden of a disease over an individual's lifetime, equating the years of life lost due to premature mortality and years lost living in a suboptimal state of health (WHO, 2022).

- **Health Impact Assessment (HIA):** a process that analyzes and quantifies how a policy or investment influences people's health. The purpose of the HIA is to identify positive health impacts and reduce any negative health impacts of a potential policy or investment. In combining evidence-based strategies with commentary from stakeholders, policy makers, and community members, HIAs help to foster a broader understanding of the unique challenges communities face, particularly for vulnerable groups (Human Impact Partners, 2011).
- **Health Equity:** the opportunity for all to attain their full health potential regardless of socioeconomic status or individual circumstances. In order to work toward health equity, it is important to identify health disparities, use evidence-based mitigation strategies, and to incorporate health equity considerations into the decision-making process (Braveman et al., 2017; CDC, 2020; Weil, 2018).
- **Integrated Transportation and Health Impact Model (ITHIM):** ITHIM is a modeling tool that quantifies the impact of changes to active travel behavior patterns on health. Use of the ITHIM tool in a HIA is well established for its ability to quantify the impact of transportation infrastructure on health, specifically by looking at physical activity, road traffic injury risk, and exposure to fine particulate matter (PM2.5) air pollution. The Office of Research and Development within the United States Environmental Protection Agency endorsed the ITHIM Tool in 2016.
- **Greenhouse Gas Emissions:** Greenhouse gas emissions related to the transportation sector result from the burning of fossil fuels (often gasoline and diesel) by vehicles, trucks, ships, trains, and planes. Nationally, the transportation sector contributes to 29% of the United States' greenhouse gas emissions, passenger cars being one of the main sources of emissions (United States Environmental Protection Agency, 2021b). Increases in greenhouse gases are associated with a multitude of negative health outcomes including heat-related illnesses, lung cancer, asthma, displacement, and increased prevalence of communicable disease (National Institute for Environmental Health Sciences, 2019).
- **Fine Particulate Matter ($PM_{2.5}$):** $PM_{2.5}$ is also referred to as particle pollution, which forms as a result of chemical reactions between pollutants emitted from power plants, industries, and vehicles. PM2.5 is characterized by small inhalable particles, measuring ≤2.5 micrometers in size (United States Environmental Protection Agency, n.d.).
- **Light Rail Transit (LRT):** Light rail transit, or LRT, is a rail-based transit system capable of high capacity, long haul trips, as compared with traditional tram-systems. Powered by a catenary system, LRT systems are fully electric and possess substantial impact to reduce emissions resulting from vehicles and other forms of public transportation. Challenges to LRT require an appropriate balancing between the design of a comfortable and efficient service, without spending excessive capital on an alternative that exceeds the need of the study area and affected communities (RailSystem, n.d.).
- **Metabolic Equivalent Task (MET):** a measure of the intensity of an exercise or activity. In technical terms, the MET is a ratio of working metabolic rate to resting metabolic rate. At resting, an individuals' MET value would equal 1, whereas a MET

value of 4 (such as during a light jog) indicates the body is exerting four times the amount of energy than it does at the resting metabolic rate (Bubnis, 2019). Changes in the body's metabolism depending on age and sex are reflected in age- and sex-specific MET weights. The MET is an important output of the ITHIM tool. Active travel time is multiplied by weights in order to generate MET hours, which allow the ITHIM to estimate changes in chronic diseases related to air quality and physical activity (University of California Los Angeles, 2009).

- **Nitrogen Dioxide (NO_2):** NO_2 is a byproduct of burning fuel associated with vehicle emissions (United States Environmental Protection Agency, 2021a).
- **Personal Miles Traveled (PMT):** are a measure of miles traveled from active travel modes, such as walking or bicycling (University of California, Davis, 2019).
- **Population Attributable Fraction (PAF):** Population Attributable Fractions, or PAFs, indicate the proportion of a disease in a population that is attributable to a certain exposure. The PAF assumes a causal relationship, where the disease burden could be avoided by adding or eliminating the exposure, presuming no other changes (World Health Organization (WHO), n.d.-b). PAFs predicted by the ITHIM tool account for age- and sex- specific differences in metabolic rates for active travel, as set forth by Woodcock et al. (2011).
- **Relative Risk:** ratio that calculates the probability of a certain event occurring in an exposed group versus the probability of the same event occurring in a non-exposed group (Tenny & Hoffman, 2021).
- **Resilience:** a community's ability to endure a disturbance or emergency while maintaining its functions and structures (Cariolet et al., 2018). In context of this HIA, the project team adapts the term resilience to air quality, specifically strategies to reduce concentrations and exposure to air pollution emissions along the Okeechobee Blvd & SR-7 study corridor.
- **Safety in numbers:** a protective phenomenon where rates of traffic injuries slow in response to higher activity levels among pedestrians and bicyclists. Though safety increases when more bicyclists and pedestrians are engaged in active travel behaviors, it appears a threshold exists whereby the safety in numbers concept concedes some of its protective effects (Jacobsen, 2003). Such, is used with reference to ITHIM applications in Los Angeles and Nashville (Nicholas et al., 2018; Whitfield et al., 2017).
- **Safe System approach:** is transportation infrastructure designed with human error in mind. Though crashes are inevitable, the Safe System approach attempts to reduce the risk of human error, and also minimize the severity of injury in the event of such incidents (Federal Highway Administration, 2021).
- **Vehicle Miles Traveled (VMT):** measures the total amount of driving over a given area (City of Los Altos, n.d.).

- **Vision Zero:** the "Vision Zero Plan" as established by the Palm Beach Transportation and Planning Agency, describes the mechanisms through which they hope to achieve zero traffic-related fatalities and serious injuries.

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Appendix A: Data sources used in the ITHIM

Data	Source	Year(s)	Notes
Air Quality	UHS	2021	
American Community Survey	United States Census Bureau	2019	5-year estimates
Road Traffic Crashes	Signal Four Analytics	2018-2020 Average	Averaged across three years due to probable pandemic changes.
Deaths	Florida Charts	2018-2020 Average	For all of Palm Beach County (tract-level deaths not available); Averaged across three years due to probable pandemic changes.
*Relative risk changes per unit increase in air particulate matter	Woodcock et al., 2009		
*Relative risk changes per unit increase in MET hour-weeks	CARB recommendations based on Krewski et al., 2009		
*Baseline Personal & Vehicle Miles Traveled	California Household Travel Survey, 2012		Includes age and sex specific active travel. Average, minimum, and maximum estimates were retained as possible Florida baselines given Florida travel surveys were not available.
*Age- and sex-specific non-travel METS	California Health Interview Survey (Adult Survey), 2009		Average, minimum, and maximum estimates were retained as possible Florida baselines given Florida travel surveys were not available.
*Age-, sex-, and travel mode-specific MET weights for active travel	James Woodcock, 2011		

*Incorporated into the California ITHIM model.
MET: ratio of working metabolic rate relative to resting metabolic rate.
California Air Resources Board (CARB)
California Integrated Transport and Health Impact Model (University of California, 2019).

Appendix B: Reference List for Tables 6, 10, & 15 Transportation Design Elements & Health-Related Outcomes

Tables 6, 10, & 15 Transportation Design Elements & Health-Related Outcomes for Air Quality and Resilience, Physical Activity, & Road Safety References
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Appendix C: Transportation-Alternative Health Analysis Score Calculations

Air Quality & Resilience

Alternative	Potential Health Outcomes	Transportation-Alternative Health Score
No-Build	Existing pedestrian and bicycle activity levels	-2
	Perceived safety without a bicycle buffer	-2
	Green space is available along some corridor sections	0
	Buffer set-back from roadway to sidewalk, that provides increased sense of safety for pedestrians & protection from vehicle emissions	2
	Persistent emission trends	-2
	Estimated ridership	-2
	Rates of heart disease, stroke, and lung cancer	-2
		Composite Score: -1.14
Mixed Traffic with Limited Bus Stops	Minimal increase in public transit ridership from an added service route (Mall at Wellington Green and Intermodal Transit Center) & BRT option	-1
	Mixed traffic lanes may impact efficiency of the alternative in reducing emissions/ time spent in traffic	-2
	Increase in pedestrian activity from wider sidewalks (= across all alternatives except no-build)	2
	Minimal reduction in mortality from heart disease, stroke, and lung cancer	0
	Minimal increase in perceived safety for bicyclists due to wider bicycle lanes and designated buffer	-1
	Green space is available along some corridor sections	0
	Minimal reduction in perceived safety for pedestrians & protection from vehicle emissions due to smaller buffer set-back from roadway to sidewalk	1

		Composite Score: -1
BAT Curbside Lane	Minimal increase in ridership from implementation of Business Access and Transit Lane (reduce travel times)	-1
	Minimal potential reduction in emissions (> Mixed Traffic with Limited Bus stops)	0
	Increase in pedestrian activity from wider sidewalks (= across all alternatives except no-build)	2
	Minimal reduction in perceived safety for pedestrians & protection from vehicle emissions due to smaller buffer set-back from roadway to sidewalk (= Mixed Traffic with Limited Bus stops)	0
	Minimal reduction in mortality from heart disease, stroke, and lung cancer	0
	Minimal increase in perceived safety for bicyclists due to wider bicycle lanes and designated buffer	-1
	Green space is available along some corridor sections	0
		Composite Score: 0
Curbside Dedicated Lane BRT	Moderate increase in ridership from implementation of dedicated BRT lane & BRT option	1
	Increase in pedestrian activity from wider sidewalks (= across all alternatives except no-build)	2
	Separated buffer provides the maximum increase in perceived safety for bicyclists	2
	Small buffer area between roadway and sidewalk, leading to a decreased sense of safety and increased exposure to emissions for pedestrians	-1
	Reduction in emissions due to BRT usage, and increases in bicycle activity	2
	Moderate reduction in mortality from heart disease, stroke, and lung cancer	1
	Green space is available along some corridor sections	0
		Composite Score: 1
Center Platform Dedicated BRT	Moderate increase in ridership by having dedicated BRT lanes (< travel time than curbside dedicated BRT lane alternative due to elimination of non-transit vehicles)	2

	Increase in pedestrian activity from wider sidewalks (= across all alternatives except no-build)	2
	Separated buffer provides the maximum increase in perceived safety for bicyclists	2
	Minimal reduction buffer area between roadway and sidewalk compared to no-build scenario, impacting the sense of safety and exposure to emissions for pedestrians	0
	Moderate reduction in emissions from increases in ridership & bicycle activity	1
	Moderate reduction in mortality from heart disease, stroke, and lung cancer	1
	Less green space is available because of converting the median	-2
		Composite Score: 0.86
Center Platform Dedicated LRT	LRT is powered by electricity and has a high ridership capacity, leading to a significant reduction in emissions	2
	Increase in pedestrian activity from wider sidewalks (= across all alternatives except no-build)	2
	Separated buffer provides the maximum increase in perceived safety for bicyclists	2
	Moderate reduction in buffer area between roadway and sidewalk compared to no-build scenario, impacting the sense of safety and increased exposure to emissions for pedestrians	-1
	Maximum reduction in emissions from increases in ridership & bicycle activity	2
	Significant reduction in mortality from heart disease, stroke, and lung cancer	2
	Less green space is available because of converting the median	-2
		Composite Score: 1
Elevated Grade Separated LRT	LRT is powered by electricity and has a high ridership capacity, leading to a significant reduction in emissions (> ridership than Center platform LRT)	2
	Increase in pedestrian activity from wider sidewalks (= across all alternatives except no-build)	2
	Separated buffer provides the maximum increase in perceived safety for bicyclists	2

	Small buffer area between roadway and sidewalk, leading to a decreased sense of safety and increased exposure to emissions for pedestrians	-1
	Maximum reduction in emissions from increases in ridership & bicycle activity	2
	Significant reduction in mortality from heart disease, stroke, and lung cancer	2
	Green space is available underneath the elevated platform	2
		Composite Score: 1.57

Physical Activity

Alternative	Potential Health Outcomes	Transportation-Alternative Health Score
No-Build	Existing number of individuals meeting daily exercise requirements	-2
	Sidewalk width	-2
	High ambient stress among bicyclists and pedestrians due to narrow lanes	-2
	Aesthetic appeal given lack of construction impacts	0
	Aesthetic appeal is not compromised over an extended period of time	0
	Large buffer set-back from roadway to sidewalk, that provides increased sense of safety for pedestrians	2
	Rates of heart disease, cancers, dementia, diabetes, and stroke	-2
		Composite Score: -0.86
Mixed Traffic with Limited Bus Stops	Minimal increase in the number of individuals meeting daily exercise requirements related to public transit use	-1
	Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build)	2
	Aesthetic appeal given lack of construction impacts	0
	Aesthetic appeal is not compromised over an extended period of time required to implement the transportation alternative	0
	Minimal reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke	0

	Ambient stress for bicyclists that have wider lanes, but no physical barrier	-1
	Some reduction in perceived safety for pedestrians due to smaller buffer set-back from roadway to sidewalk	-1
		Composite Score: -0.14
BAT Curbside Lane	Minimal increase in the number of individuals meeting daily exercise requirements related to public transit use	-1
	Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build)	2
	Aesthetic appeal is maintained given limited construction required to implement a BAT curbside lane	0
	Aesthetic appeal is not compromised over an extended period of time required to implement the transportation alternative	0
	Minimal reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke	0
	Ambient stress for bicyclists that have wider lanes, but no physical barrier	-1
	Moderate reduction in perceived safety for pedestrians due to small buffer set-back from roadway to sidewalk	-1
		Composite Score: -0.14
Curbside Dedicated Lane BRT	Moderate increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (BRT)	0
	Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build)	2
	Aesthetic appeal is maintained given limited construction required to implement a BRT curbside lane	0
	Aesthetic appeal is not compromised over an extended period of time required to implement the transportation alternative	0
	Moderate reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke	1
	Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier	2
	Small buffer setback in combination with a dedicated bus lane provides minimal reduction in perceived safety	0
		Composite Score: 0.71
Center Platform Dedicated BRT	Moderate increase in the number of individuals meeting daily exercise requirements associated with increased public transit use	1

	& ridership (BRT) (>Curbside Dedicated BRT)	
	Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build)	2
	Aesthetic appeal is compromised due to significant construction efforts required to build a center platform dedicated lane	-2
	Negative aesthetic impacts experienced over a longer period given the extensiveness of the project	-2
	Moderate reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke	1
	Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier	2
	Minimal increase in perceived safety among pedestrians due to small buffer setback from roadway to sidewalk as compared to no build, yet pedestrian dedicated onboarding area in the center platform promotes slower traffic speeds	1
		Composite Score: 0.43
Center Platform Dedicated LRT	Maximum increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (LRT has a high ridership)	2
	Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build)	2
	Aesthetic appeal is compromised due to significant construction efforts required to build a center platform dedicated lane	-2
	Negative aesthetic impacts experienced over a longer period given the extensiveness of the project	-2
	Significant reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke	2
	Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier	2
	Minimal increase in perceived safety among pedestrians due to small buffer setback from roadway to sidewalk as compared to no build, yet pedestrian dedicated onboarding area in the center platform promotes slower traffic speeds	1
		Composite Score: 0.71
Elevated Grade Separated LRT	Maximum increase in the number of individuals meeting daily exercise requirements associated with increased public transit use & ridership (Elevated LRT has the highest ridership)	2
	Wide sidewalks are considered more desirable and encourage pedestrian activity (= across all alternatives, except no-build)	2

	Aesthetic appeal is compromised due to significant construction efforts required to build an elevated platform dedicated lane	-2
	Negative aesthetic impacts experienced over a longer period given the extensiveness of the project	-2
	Significant reduction in mortality from heart disease, cancers, dementia, diabetes, and stroke	2
	Minimal amount ambient stress for bicyclists that have wider lanes, and a physical barrier	2
	Increase in perceived safety among pedestrians due to buffer setback from roadway to sidewalk as compared to no build, yet pedestrian dedicated onboarding area on the elevated platform and below the LRT space, promotes slower traffic speeds	2
		Composite Score: 0.86

Road Safety

Alternative	Potential Health Outcomes	Transportation-Alternative Health Score
No-Build	Narrow bicycle lane leads to maximum exposure to roadway traffic	-2
	Risk of injury without a designated or separated buffer	-2
	Large buffer set-back from roadway to sidewalk, that reduces pedestrian exposure to vehicular traffic	2
	Travel lane width of 12’ is linked with high travel speeds and risk of severe injury and/or fatality	-2
	Minimal risk of road traffic fatalities compared to other travel scenarios projected by ITHIM	2
	Maximum distance across travel lanes, increasing time and risk for pedestrians crossing the roadway	-2
	Number of travel lanes for non-transit vehicles to meet road capacity (decrease congestion and increase traffic speeds)	-2
	Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access)	2
		Composite Score: -0.5
Mixed Traffic with Limited Bus Stops	Wide bicycle lane reduces bicyclist exposures to roadway traffic	2
	Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present	2
	Pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk	-1
	Reduced travel lane widths promote slower traffic speed	1
	Minimal risk of road traffic fatalities projected by ITHIM (= BAT Curbside Lane	2
	Minimal reduction in roadway width compared to no-build, similar time and exposure for pedestrians to cross the roadway	0

	Number of travel lanes for non-transit vehicles to meet road capacity (decrease congestion and increase traffic speeds)	-2
	Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access)	2
		Composite Score: 0.75
BAT Curbside Lane	Wide bicycle lane reduces bicyclist exposures to roadway traffic	2
	Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present	2
	Pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk	-1
	Maximum reduction in vehicle speeds due to travel lane width	2
	Minimal risk of road traffic fatalities projected by ITHIM	2
	Moderate reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway	1
	Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds) and dedicated bus lane provides an additional safety buffer for pedestrians and bicyclists	2
	Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access)	2
		Composite Score: 1.50
Curbside Dedicated Lane BRT	Wide bicycle lane reduces bicyclist exposures to roadway traffic	2
	Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present	2
	Maximum pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk	-2
	Travel lane widths of 12’ are associated with increased travel speeds and increased risk of injury	-2
	Moderate risk of road traffic fatalities projected by ITHIM	-1
	Maximum reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway	2
	Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds) and dedicated bus lane provides an additional safety buffer for pedestrians and bicyclists	2
	Minimal risk of road crashes among transit users with availability of curbside service (not necessary to cross the roadway for transit-access)	2
		Composite Score: 0.63
Center Platform Dedicated BRT	Wide bicycle lane reduces bicyclist exposures to roadway traffic	2
	Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present	2
	Pedestrian exposure to vehicular traffic is somewhat increased due to the buffer size from roadway to sidewalk	1
	Travel lane widths of 12’ are associated with increased travel speeds and increased risk of injury	-2
	Moderate risk of road traffic fatalities projected by ITHIM	-1
	Maximum reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway	2

	Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds)	1
	Maximum risk of road crashes for BRT users crossing the roadway from the center platform to the sidewalk	-2
		Composite Score: 0.38
Center Platform Dedicated LRT	Wide bicycle lane reduces bicyclist exposures to roadway traffic	2
	Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present	2
	Pedestrian exposure to vehicular traffic is increased due to the buffer size from roadway to sidewalk (= Mixed Traffic alternative & BAT Curbside Lane)	-1
	Travel lane widths of 12' are associated with increased travel speeds and increased risk of injury	-2
	Significant risk of road traffic fatalities projected by ITHIM (= Elevated LRT)	-2
	Maximum reduction in roadway width compared to no-build, less time and exposure for pedestrians to cross the roadway	2
	Reduced number of travel lanes for non-transit vehicles to meet road capacity (increase congestion and reduce traffic speeds)	1
	Maximum risk of road crashes among LRT users crossing the roadway from the center platform to the sidewalk	-2
		Composite Score: 0
Elevated Grade Separated LRT	Wide bicycle lane reduces bicyclist exposures to roadway traffic	2
	Risk of injury is reduced for bicyclists regardless of the type of buffer, so long as a buffer is present	2
	Maximum pedestrian exposure to vehicular traffic due to the buffer size from roadway to sidewalk	-2
	Travel lane widths of 12' are associated with increased travel speeds and increased risk of injury	-2
	Significant risk of road traffic fatalities projected by ITHIM (= Center Platform LRT)	-2
	Greatest distance across travel lanes, increasing time and risk for pedestrians crossing the roadway	-2
	Number of travel lanes for non-transit vehicles to meet road capacity (decrease congestion and increase traffic speeds)	-2
	Maximum risk of road crashes among LRT users crossing the roadway from the elevated platform to the sidewalk	-2
		Composite Score: -1

E: Land Use & Economic Development Report

OKEECHOBEE BLVD & SR 7
MULTIMODAL CORRIDOR STUDY

LAND USE AND ECONOMIC DEVELOPMENT REPORT

PALM BEACH Transportation Planning Agency

NOVEMBER 2022

Introduction

DEFINITIONS AND ACRONYMS

Ad Valorem - Assessed taxable value of a property

Market Score - The areas future development scoring standard

Park-and-Ride - Station location with ample parking to allow for users to park and utilize transit

Potential New Residential - Concept identified residential building footprint square footages divided by standard unit size of 1,300 square feet

Potential New Commercial - Concept identified mixed use(first floor) or commercial building footprints based on suggested uses

Potential New Employment - Commercial square footage by industry standard of 225 square feet

Potential Total Parking - Proposed and existing parking for concepts

Preferred Alternative - Locally preferred alignment and transit form

Proposed Buildings - Potential footprints identified currently in the station areas

Proposed Intersection - Concept emphasis on safer and more walkable intersection

Proposed Streetscape - Concept emphasis on walkable and bikeable improvements

Underutilized - Building value is below industry standard of 40% of total value of a property

AMI – Area Median Income

BIPOC – Black, Indigenous, and people of color

CIP – Capital Improvement Program

CBD - Central Business District

ESL – English as a Second Language

ETOD – Equitable Transit-Oriented Development

FAA – Federal Aviation Administration

HTF – Housing Trust Fund

NOAH – Naturally-Occurring Affordable Housing

QAP – Qualified Allocation Plan

TOD – Transit-Oriented Development

TPA - Transportation Planning Agency

UDO – Unified Development Ordinance

LAND USE & ECONOMIC DEVELOPMENT

Introduction

As a catalyst to conducting the transit and roadway alternatives analysis, the Palm Beach Transportation Planning Agency (TPA) is evaluating land use characteristics and market demand to determine a feasible level of economic development along the study corridor. To do that, The land use and economic development station area summaries focuses on developing conceptual station area plans to forecast and analyze the economic and land use impacts of redevelopment within the half mile station areas. The following pages summarizes the existing conditions, analysis and proposed 17 station areas on the Okeechobee & SR-7 study corridor. A station typology was applied based on a vision for each station area as identified by stakeholders during public planning efforts. The visions describe future areas of change, access and connectivity improvements, and the future urban form of the station area, the also include future economic impact of the proposed stations.

This Land Use and Economic Development Report includes the deliverables and analysis performed during the Land Use and Economic Development Analysis that include:

- Station Typologies
- A Quantitative Station Area Analysis
- A Qualitative Station Area Analysis
    - Station Area Plans
    - Station Economic and Residential Projections
- Appendix A - Station Area Economic Evaluations
- Appendix B - Station Area Evaluation Matrix
- Appendix C - Land Use and Economic Development Workshop Materials
- Appendix D - Land Use and Economic Development Presentation

Military Trail Station Area

Transit Supportive Neighborhood Elements

The neighborhood is safe, connected, and supports walking and bicycling.

- People feel like getting around by foot or bicycle is convenient, safe, and comfortable.
- Public spaces are active and vibrant
- Bicycle parking and storage is ample and secure.

There is a complete network of streets and paths.

- Walking and bicycling routes are short, direct, and varied.
- Motor vehicles can utilize a network rather than relying on major arterials

There is nearby, high-quality public transportation.

- High-quality transit is accessible by foot or by bike.
- Reliability of frequent transit vehicles.

Opportunities for people of different backgrounds and incomes.

- Access to goods in services are within a short walking or bicycling distance
- Public space is active for much of the day.
- Transit routes are seen as a reliable means of movement.

The community is accessible by a short transit ride.

- The development is in or near an existing urban area.
- Traveling through the area or city is convenient.

Transportation Demand Management.

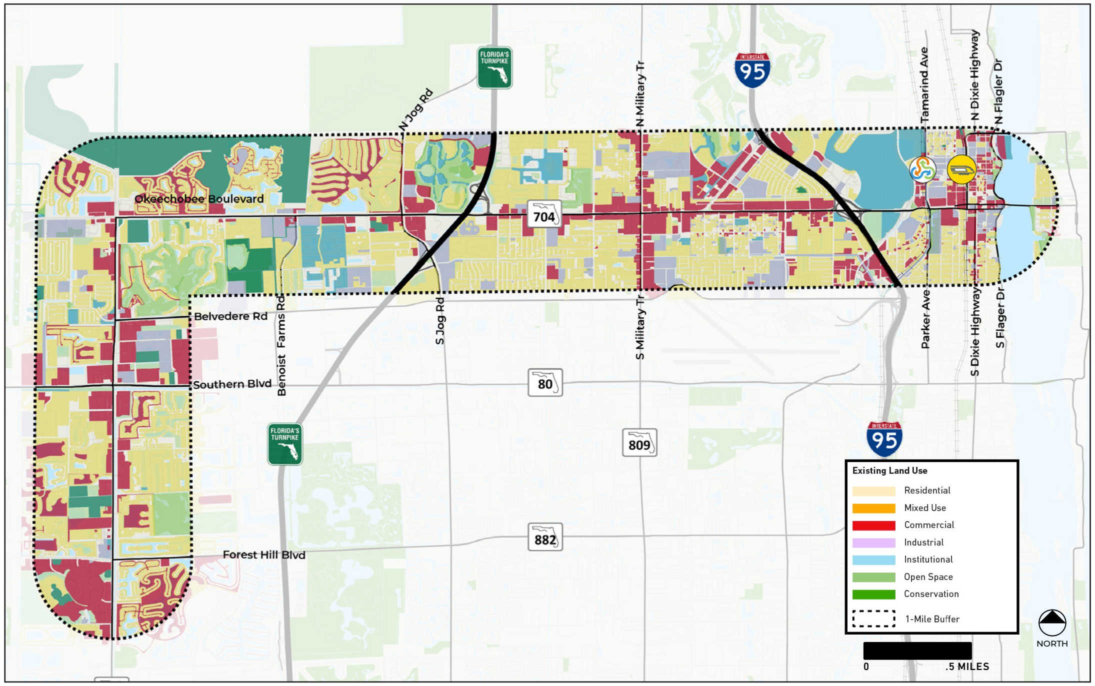
- Use of the land is not tied to standardized parking requirements and is separate from leases.
- Property developers and managers are required to provide transportation demand management solutions.

Land Use

Today, most people travel the corridor by single-occupant vehicles and many people felt there are too many cars on the road already. The existing land uses along the study corridor are primarily suburban neighborhoods and strip development commercial areas. Further, many of these people feel they have no option but to drive due to the community design around the roadways. Without a more efficient mode of transportation along the corridor such as transit and transit supportive investments in walking and bicycling, future redevelopment and growth will only add to the number of vehicles driving every day.

The corridor has many opportunities for both development and re-development to support transit investments. For example, the southeast corner of Okeechobee Blvd. and SR 7 could include in its redevelopment a park-and-ride facility to encourage suburban commuters from the west to take transit instead of driving. Additionally, neighborhoods with more people living in them and with more jobs have the greatest potential to support enhanced multimodal transportation for people walking, bicycling and using transit. Typically, more mixed-use and medium to higher density residential developments is commonplace for using existing along the corridor. Likewise, underused parcels offer spaces to shift the region's built environment toward more walkable, bikeable and transit-friendly transportation.

Land Use



Station Area Plans

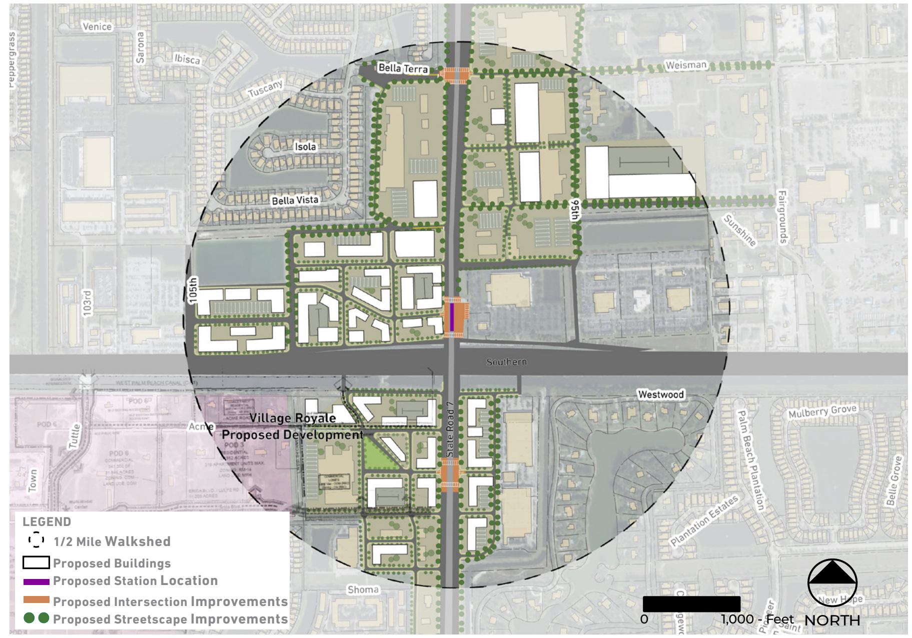
The redevelopment potential of station areas that would be served by LRT along Okeechobee Blvd and SR 7 was identified for stations along the proposed route. By concentrating intentional, transit-supportive development around transit stations, vibrant community spaces and neighborhoods could develop that people want to live in and visit around LRT stations. In these areas, walkable, mixed-use development patterns convert car-centric spaces into compact and engaging places that welcome pedestrians and cyclists.

To visualize how these stations might look, 17 station area conceptual plans were created along the study corridor. These plans use context-sensitive design to make sure the right amenities are in the right place for a particular station type. Land use scenarios for each station area reflect infrastructure and development necessary to support transit ridership and opportunities for economic development or redevelopment.

The proposed Okeechobee & SR-7 stations have different forms, functions, and characteristics within their respective communities and the larger region. The typologies and station area summaries reflect these differences. In addition, the station areas are in varying stages of “readiness” to become successful TODs. Some are more suburban in character, while others are more urban. Others serve to support major regional destinations and are as fully developed as they will ever be.

As the project moves from planning to design to construction and finally to operation, the creation of transit-supportive communities will also progress as described in the TOD Timeline. Taking the next step to move the TOD station area visions from planning to implementation can be enhanced by developing a cohesive, regional strategy to support local actions.

Station Area Summary Example:



Station Area Projections

Potential New Residential
1,256 Homes
190 Affordable

Potential New Commercial
2,026,085 SF

Estimated Ad Valorem Tax Revenue
$785,233,250

Potential New Employment
9,005 Jobs

Potential Total Parking
5,885 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

Station Typologies

STATION TYPOLOGIES

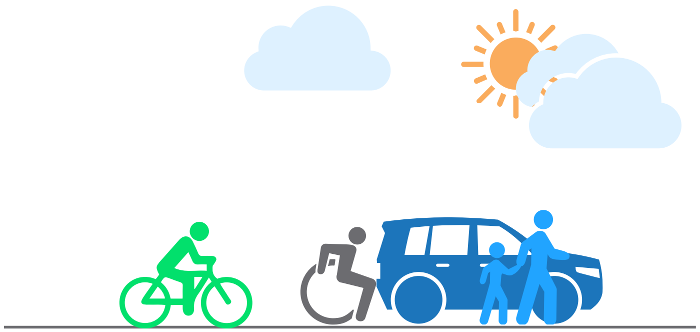
As a catalyst to conducting the transit and roadway alternatives analysis, the Palm Beach Transportation Planning Agency (TPA) is evaluating land use characteristics and market demand to determine a feasible level of economic development along the study corridor. To do that, transit-oriented development (TOD) typologies are a useful tool to classify and organize the land around stations into context-appropriate development patterns along the corridor.

"As part of an overall study examining roadway and transit alternatives analysis, Health Impact Assessment and Land Use and Economic Development Analysis, this study also engaged the public and key stakeholders for their input to guide the development of these station typologies."

Station Typologies

Station typologies examine development patterns around a station area typically within ¼ to ½-mile (a five- to ten-minute walk) of a transit stop and are categorized by the existing and future land use around each station. The identified typology allows for the creation and grouping of projects into TOD districts to create active and interesting spaces where all users can live, work and play.

Proposed typologies along the Okeechobee Blvd & SR 7 corridor were developed using guidelines for each station typology to reflect planning principles established in local and county future land use planning approaches and the Palm Beach County Comprehensive Plan.



Okeechobee & SR7 Typologies

The Okeechobee Blvd & SR 7 corridor proposed transit stations were evaluated and categorized into five unique typologies based on existing land use patterns, housing demand, commercial development and station access.

- Central Business District
- District/Town Center
- Commercial Center
- Neighborhood Commuter
- Regional Employment District

The size and function of five different station areas can help balance market demand and allow for unique spaces to develop along the transit corridor. All station typologies propose pedestrian and bicycling improvements as part of their development patterns.

CORRIDOR STATION LOCATIONS & TYPOLOGIES

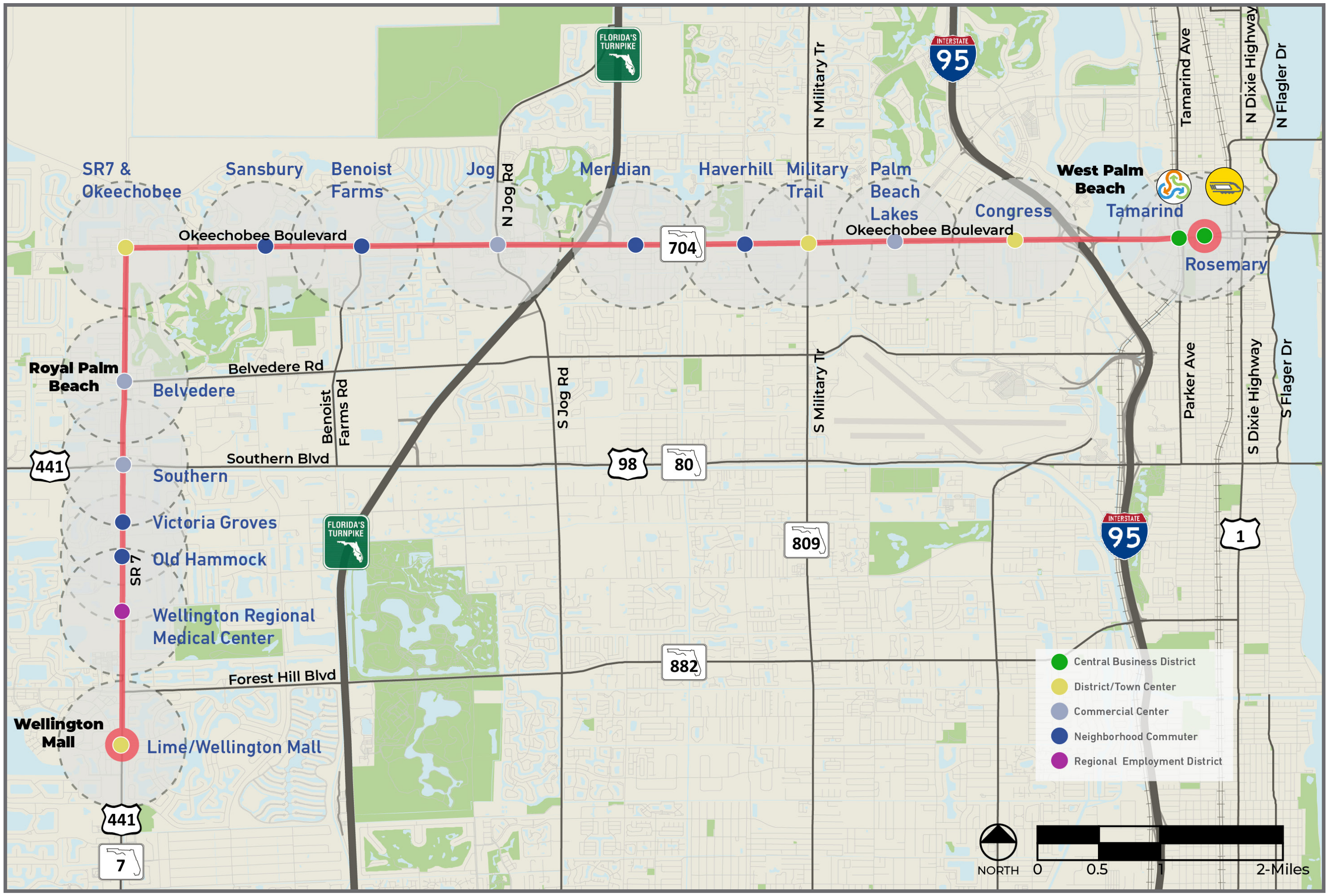
Central Business District
- Rosemary Square
- Tamarind Ave

District/Town Center
- Congress Ave
- Military Trail
- Okeechobee Blvd & SR 7
- Lime Dr / Wellington Mall

Commercial Center
- Palm Beach Lakes Dr
- Jog Rd
- Belvedere Rd
- Southern Blvd

Neighborhood Commuter
- Haverhill Rd
- Meridian Rd
- Benoist Farms Rd
- Sansbury Way
- Victoria Groves Blvd
- Old Hammock Way

Regional Employment District
- Wellington Regional Medical Center



TOD STATION TYPOLOGIES

TYPOLOGY	DESCRIPTION	MIX OF LAND USE	STATION TYPE
CENTRAL BUSINESS DISTRICT	Dense Core Areas with High-Rise Buildings and Active Public Open Space. Stations are Primarily Based near Transit Access, such as Transfers or Multimodal hubs	Civic, Entertainment, Institutional, Office, Retail and Residential	Walk-Up Station, Park & Ride (with Structured Parking)
DISTRICT/TOWN CENTER	Walkable Area of Multiple Blocks Serving as Cultural + Commercial Hubs for various Neighborhoods. Stations are Primarily Based near Transit Access, such as Transfers or Multimodal hubs	Civic, Entertainment, Institutional, Office, Retail and Residential	Walk-Up, Ride-Up, Park & Ride, Public Private Partnership Parking Structures
COMMERCIAL CENTER	Walkable Commercial Areas of Multiple Blocks with a Range of Commercial Types - Aging to New Strip Commercial, Office, Shopping Malls, Big Box etc.	Entertainment, Office, Retail, and Residential	Park & Ride, Public Private Partnership Parking Structures
NEIGHBORHOOD COMMUTER	Walkable Areas of Residential with Small Commercial Nodes of 1 - 2 Blocks	Commercial nodes, Retail and Stabilized Residential	Walk-Up, Ride-Up
REGIONAL EMPLOYMENT DISTRICT	Walkable Areas of Multiple Blocks with offices, light industry, institutional, or medical campuses	Office Park, Institutional, Light Industry and Medical Campuses	Ride-Up, Park & Ride (with Structured Parking)

TOD STATION TYPOLOGIES

TYPOLOGY	HOUSING TYPES		COMMERCIAL/ EMPLOYMENT TYPES	
CENTRAL BUSINESS DISTRICT	High-Density Mixed Use and Multi-Family	25+ du/ac	Civic, Institutional, Prime Office, and Retail	MAX. 10 FAR
DISTRICT/TOWN CENTER	Low-Moderate Mixed-Use, Multi-Family with Single Family Attached and Detached	15-25 du/ac	Limited Office (less than 250K), Concentrated Retail (greater than 50K)	1-6 FAR
COMMERCIAL CENTER	Multi-Family, Single Family Attached (Appropriate on the fringe)	8-15 du/ac	Limited Office (less than 250K), Concentrated Retail (greater than 50K)	1-6 FAR
NEIGHBORHOOD COMMUTER	Single Family Attached/Detached with Mixed-Use Multi-Family	4-8 du/ac	Neighborhood Retail (less than 50K sqft)	N/A
REGIONAL EMPLOYMENT DISTRICT	Clusters of Moderate to High Density Multi-Family with Single-Family Attached at fringe	8-25 du/ac	High-Density Office or Institutional with Mixed-Use Retail	Varies

SCALE/DENSITY			PEDESTRIAN FACILITY	BICYCLE FACILITY TYPE	VEHICULAR ACCESS	INTERSECTING MOBILITY
Max Building Height	Block Size	Block Network	Sidewalk Widths			
10+ Stories	Less than 1 AC	Largely existing	12+ Feet	Shared Lanes, Traditional Bike Lanes, Buffered Bike Lanes, Separated Bike Lanes	Major Local Roads and Minor Arterials	Major destinations accessible with circulators, micromobility, walking, & bicycling
3-10 Stories	1/2 - 2 AC	Some existing, may require some new streets	8+ Feet	Buffered Bike Lanes, Separated Bike Lanes, Shared-Use Paths and Regional Trail	Urban Collector and Minor Arterial	Accessible connections to local bus service, micromobility, walking, & bicycling
2-6 Stories	2-6 AC	Will require new street connections	6+ Feet; Fill in sidewalk gaps	Buffered Bike Lanes, Separated Bike Lanes, Regional Trail	Major Arterials	Regional destinations accessible with express local bus, circulators and ride-sharing
2-4 Stories	1/2 - 1 AC	Largely existing, may require minor connections	6+ Feet; Fill in sidewalk gaps	Buffered Bike Lanes, Separated Bike Lanes, Regional Trail	Local Road, Urban Collector	Accessible local bus connections, walking and bicycling
Varies	Varies	Some existing, may require some new streets	6+ Feet; Fill in sidewalk gaps	Buffered Bike Lanes, Separated Bike Lanes, Regional Trail	Major and Minor Arterials	Regional destinations accessible with express local bus, circulators and ride-sharing

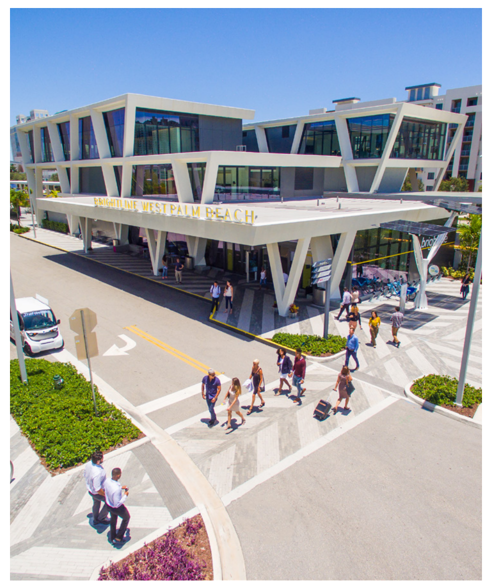
TOD Station Typologies

CENTRAL BUSINESS DISTRICT

The Central Business District typology has the highest density with a mixture of land uses including office, retail and multi-family residential. This typology is generally located in downtown and are seen as regional destinations.

Key Characteristics

- Built Environment - Taller buildings with compact high-quality development near stations with landmarks that add to the city skyline, and mixed-uses that include commercial, institutional, retail, and multifamily residential types with continuous facades that align to the build-to-line.
- Economic Potential - High infill opportunities and surrounding uses will be served by multimodal transit modes.
- Pedestrian Environment - Highly active pedestrian-oriented environment supporting multimodal connections with defined street infrastructure, active ground floor frontages and amenities with clear wayfinding.
- Parking - Parking structures and opportunities for dense parking structures to support multimodal uses.
- Parks and Open Space - Designed urban plazas and a hierarchy of open spaces for large and small public gatherings intended to encourage interaction.



DISTRICT/TOWN CENTER

The District/Town Center typology has medium density with mixed land-uses, including retail, small offices, single family and multi-family residential. This typology is generally located in urban areas and create vital nodes for interaction and development.

Key Characteristics

- Built Environment - Moderately tall buildings developed near stations with a mix of uses that include commercial, office and multifamily residential with mixture of heights and intensities.
- Economic Potential - Infill opportunities and surrounding uses will be served by multimodal connections.
- Pedestrian Environment - Multimodal connections with defined street infrastructure, active ground floor frontages and amenities with clear wayfinding.
- Parking - Surface parking and low height parking structures internal to blocks and on-street parking. Public private partnerships include low height parking structures.
- Parks and Open Spaces - Open spaces for large and small public gatherings intended to encourage interaction with a network of open spaces and/or a centralized open space.

COMMERCIAL CENTER

The Commercial Center Typology is situated near major arterials and serve as park and ride facilities for adjacent commercial and residential development. They have a suburban commercial mix of uses and include a mix of single family and multi-family housing types.

Key Characteristics

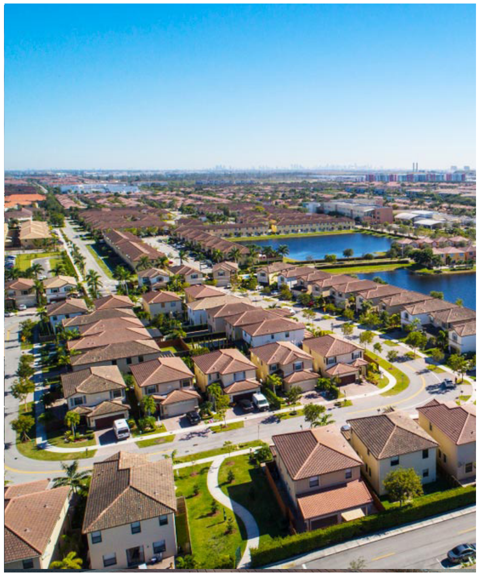
- Built Environment- Compact, high-quality, pedestrian-oriented environment to create a place that aligns with existing development in the community and one that is not dominated by vehicles.
- Economic Potential - Commercial and retail businesses, with improved access that promote regional destinations.
- Pedestrian Environment - Well-defined zones for commercial and residential typologies with connectivity to micromobility services. The street infrastructure will facilitate medium to low footfalls in the neighborhood.
- Parking - Surface lot parking accessible from an adjacent roadway and connecting arterial network. Parking structures and opportunities for parking structures with public private partnerships.
- Parks and Open Spaces - Programmed open spaces for active uses such as paved plazas, seating areas and neighborhood parks.

NEIGHBORHOOD COMMUTER

The Neighborhood Commuter typology may include compact multimodal focused nodes with land uses such as suburban commercial and single family. This typology facilitates connectivity between the neighborhoods to destinations, employment hubs and urban centers by providing walkable stations closer to existing communities.

Key Characteristics

- Built Environment - Neighborhood oriented environment to create a place that aligns with existing neighborhoods in the community and one that is not dominated by vehicles.
- Economic Potential - Infill opportunities for out parcel commercial and retail businesses.
- Pedestrian Environment - Well-defined zones for commercial and residential typologies with connectivity to micromobility services.
- Parking - Surface parking and adjacent to blocks and existing neighborhood structure. Walking or ride up connection to stations, stops and surrounding development.
- Parks and Open Spaces - Programmed open spaces for active community uses with seating areas and neighborhood parks.



REGIONAL EMPLOYMENT DISTRICT

Regional Employment District are situated adjacent to multimodal facilities and serve moderately dense commercial, retail and employment hubs. These areas have attracting uses or destinations that serve as entertainment, areas of community and regional congregation.

Key Characteristics

- Built Environment - Commercial based developments with high activity and access that create a place that aligns with existing development in the community.
- Economic Potential - Commercial and retail businesses, with improved access that promotes regional trips and destinations.
- Pedestrian Environment - Well-defined zones for commercial typologies with connectivity to multimodal services. The street infrastructure will facilitate employment hubs, infill and multi-family residential development.
- Parking - Designated surface parking and multi-level parking integrated into the station area. Surface lot parking accessible from an adjacent roadway and connecting arterial network.
- Park and Open Spaces - Regional green space and parks for environmental and health purposes. Public plazas and paved open spaces for programmed events.

List of Reference Images and Sources

1. Central Business District

Top - Rosemary Square, West Palm Beach FL

Source: www.eaglerockventures.com/rosemarysquare

Bottom Left - Brightline Station, West Palm Beach, FL

Source: www.gobrightline.com

Bottom Right - Broward County Mass Transit, Ft Lauderdale, FL

Source: www.sunny.org

2. District/Town Center

Top - Town Center at the Preserve, Chino, CA

Source: www.ktgy.com

Bottom Left - Worth Avenue, Palm Beach, FL

Source: www.luxurytravelmagazine.com/news-articles/worth-avenue-palm-beach-the-ultimate-guide

Bottom Right - Elmwood Center, New Orleans, LA

Source: www.lauricella.com

3. Commercial Center

Top - Village Shoppes, Royal Palm Beach, FL

Source: www.bizjournals.com/southflorida/news/2018/12/05/village-shoppes-in-royal-palm-beach-sold.html

Bottom Left - Cobblestone Village, Royal Palm Beach, FL

Source: www.artech.pro/projects-all/cobblestone-village

Bottom Right - The Shoppes at University Town Center, University Park, FL

Source: www.loopnet.com/Listing/8101-8485-Cooper-Creek-Blvd-University-Park-FL/20556699/

4. Neighborhood Commuter

Top - Azola West Palm Beach, West Palm Beach, FL

Source: www.azolawestpalmbeach.com

Bottom Left - The Park at Broken Sound Shuttles, Boca Raton, FL

Source: www.myboca.us

Bottom Right - Suburban Miami, Miami, FL

Source: www.neighborhoods.com/blog/urban-vs-suburban-miami-fl

5. Regional Employment District

Top - Wellington Regional Medical Center, Wellington, FL

Source: www.wellingtonregional.com

Bottom Left - Downtown Dadeland, Miami, FL

Source: www.dienerproperties.com

Bottom Right - University of Jacksonville, FL

Source: www.logsdonandassociates.com

Qualitative Station Analysis

QUALITATIVE STATION ANALYSIS

As a catalyst to conducting the transit and roadway alternatives analysis, the Palm Beach Transportation Planning Agency (TPA) is evaluating land use characteristics and market demand to determine a feasible level of economic development along the study corridor. To do that, The qualitative station analysis focuses on evaluating existing development patterns at each of the station locations by providing information developed in the existing conditions.

Methodology

The Palm Beach Transportation Planning Agency (TPA) is evaluating multimodal transportation alternatives and transit supportive land uses along the Okeechobee Blvd/ SR-704 and SR-7 corridor to provide continuous, safe facilities for all modes of travel. This includes existing demographics, future/planned developments, aerial photographs of the stations, existing station photographs and future typology designations for each proposed station areas.

Each station location was analyzed based on its existing land use and development patterns. Strengths, opportunities, barriers and weaknesses were assessed and highlighted for each station area to develop the plans that will demonstrate the viability and economic potential of each station.

Content

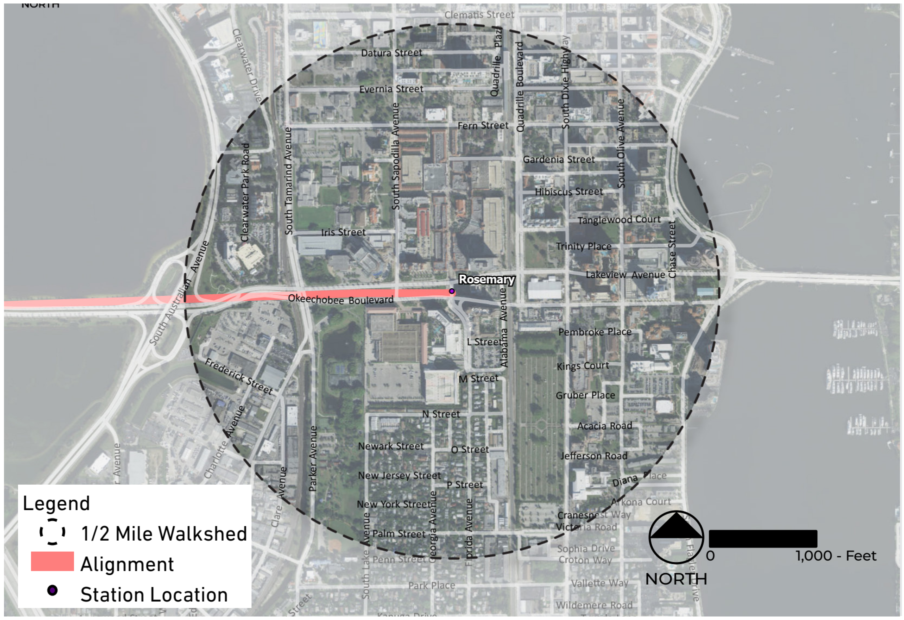
THIS REPORT SUMMARIZES THE QUALITATIVE STATION ANALYSIS FOR THE CORRIDOR STUDY. THE DOCUMENT INCLUDES ELEMENTS FROM PREVIOUS EXISTING CONDITIONS REPORTS AND HAS BEEN COMPOSED TO SPECIFICALLY DISCUSS EACH STATION AREA. THE ANALYSIS IS STRUCTURED AS SINGLE PAGE SUMMARIES FOR EACH STATION. EACH PAGE INCLUDES THE FOLLOWING COMPONENTS:

Components of each sheet include:

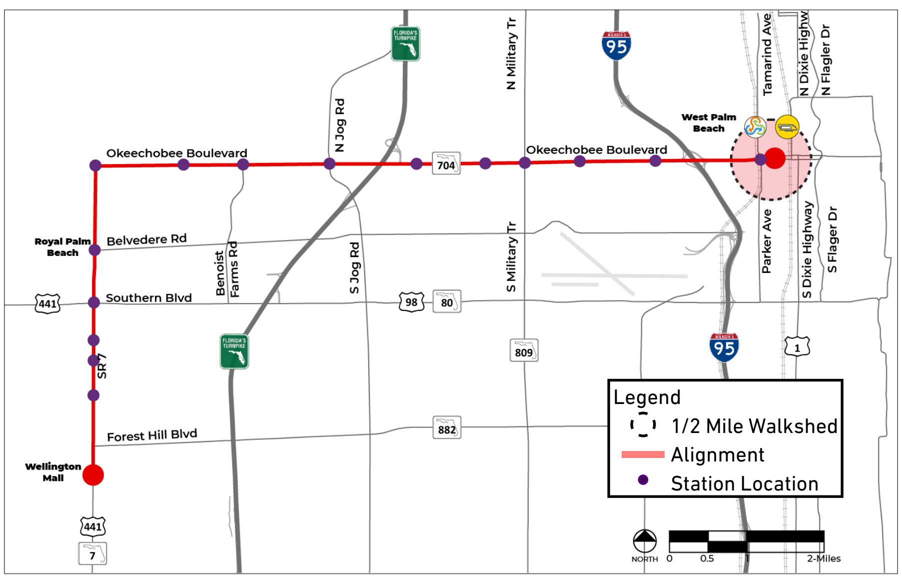
- Aerial Photograph with 1.5 -mile Walking Distance
- Birds-Eye Photography of Station Area
- Ground Level Photography of Existing Station Area
- Station Location along the Okeechobee Blvd & SR 7 Corridor
- Existing Conditions Description
- Current Station Ridership (if applicable)
- Demographics Information
- Existing Station Area Strengths and Weaknesses
- Existing Station Area Opportunities and Barriers
- Land Use and Property Control Description
- Future Typology Designation
- Existing Station Area Key Developments

STATION: ROSEMARY SQUARE

Typology: Central Business District



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: City Place, Palm Beach County Convention Center, Intermodal Transit Center

POPULATION 7,000 Residents

RIDERSHIP Over 10,000 average daily boarding + alightings

EMPLOYMENT 12,100 Workers

PROPOSED DEVELOPMENTS: West Palm Point, Tent Site, University of Florida

AVERAGE HOUSEHOLD INCOME: $107,200/year

AVERAGE BLOCK SIZE: 400' x 600'

STRENGTHS

- Proximity to major roadways
- Walkable environment
- Proximity to transit hubs
- Proximity to major employment and entertainment generators

WEAKNESSES

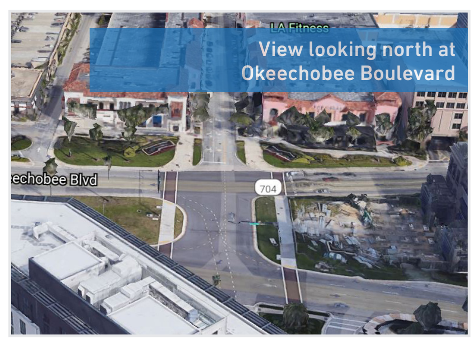
- High land prices
- Caters to mostly wealthy patrons
- Limited multimodal facilities
- Limited land to redevelop

OPPORTUNITIES

- Infill development opportunities
- Potential to connect beach tourism
- Proximity to Downtown West Palm Beach
- Increased emphasis on redevelopment

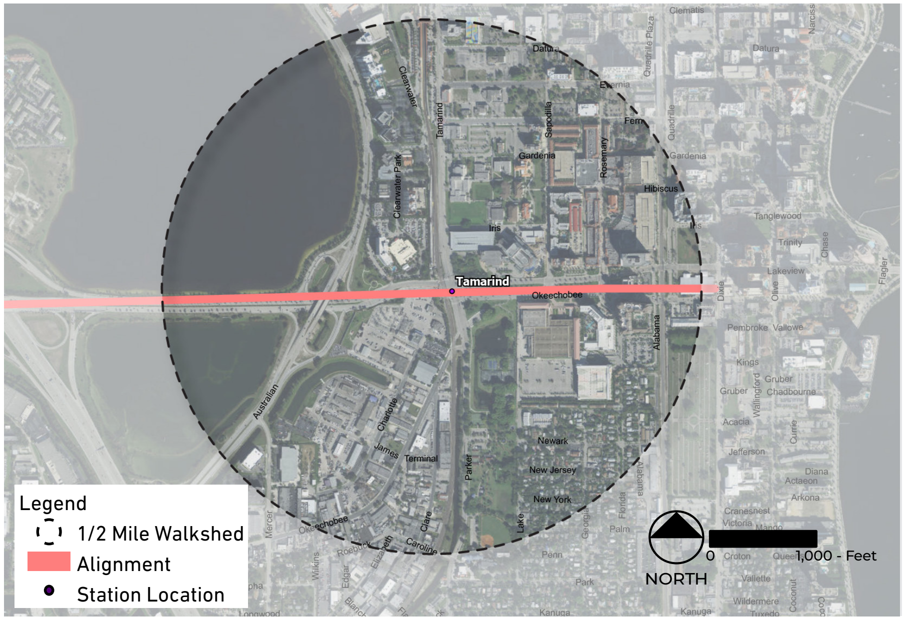
BARRIERS

- Large and fast roadways
- Station location access
- Railroad crossings
- Okeechobee Blvd one way pairs

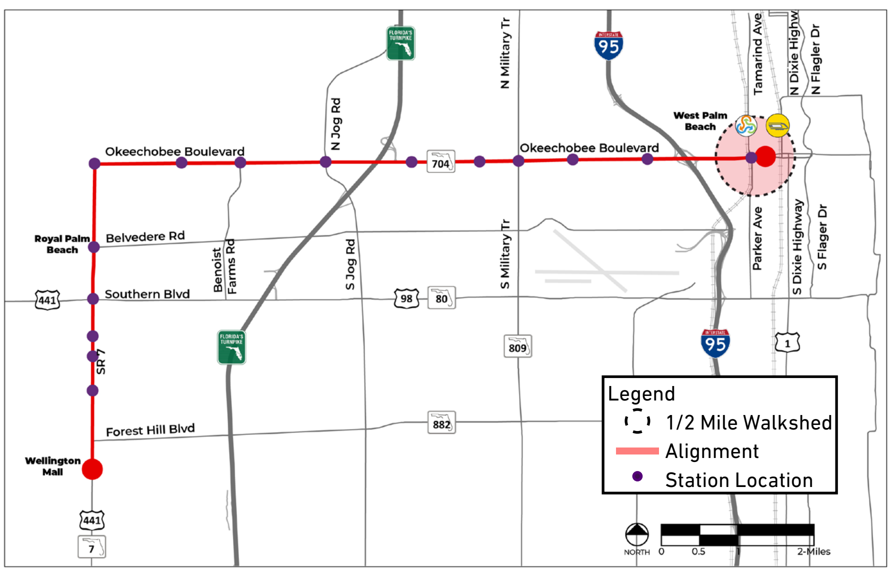


STATION: TAMARIND AVENUE

Typology: Central Business District



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: City Place, Palm Beach County Convention Center, Intermodal Transit Center

PROPOSED DEVELOPMENTS: Tamarind Avenue Streetscape, Tamarind Mixed-Use Area, University of Florida, Jefferson Terminal District, Clear Lake Trail

POPULATION 7,500 Residents

EMPLOYMENT 11,000 Workers

AVERAGE HOUSEHOLD INCOME: $107,200/year

RIDERSHIP Over 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 400’ x 600’

STRENGTHS

- Proximity to entertainment and amenities
- Proximity to transit hubs
- Access to green space
- Proximity to high density housing

WEAKNESSES

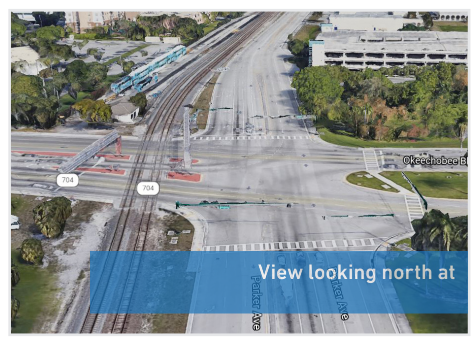
- Limited walkability and bicycle facilities
- Limited connectivity
- High land prices
- Limited land available for redevelopment

OPPORTUNITIES

- Infill development opportunities
- Regional connections
- Increased emphasis on infill development
- Proximity to Downtown West Palm Beach

BARRIERS

- Large and fast roadways
- Station location access
- Limited crossing opportunities
- Limited shade

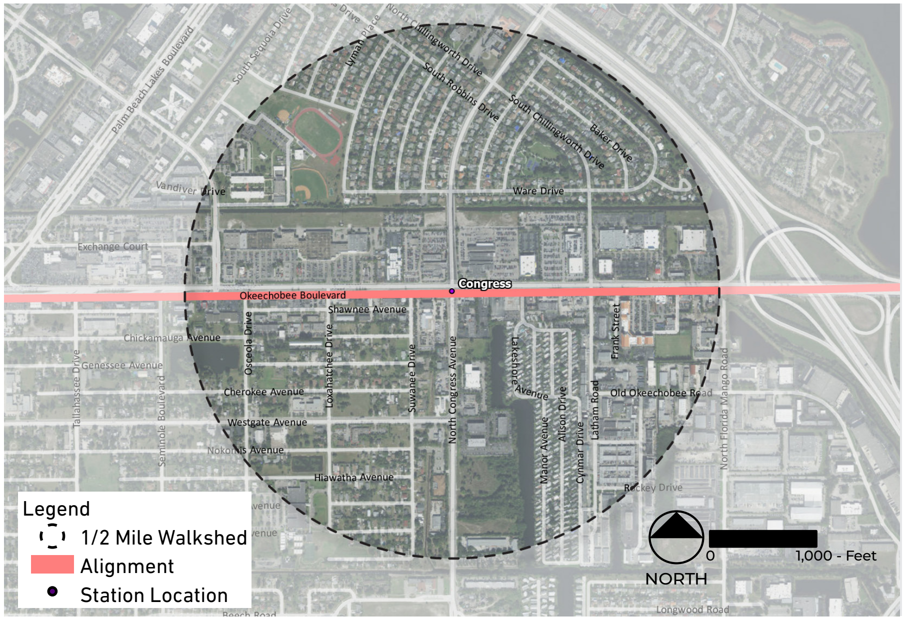


View looking north at

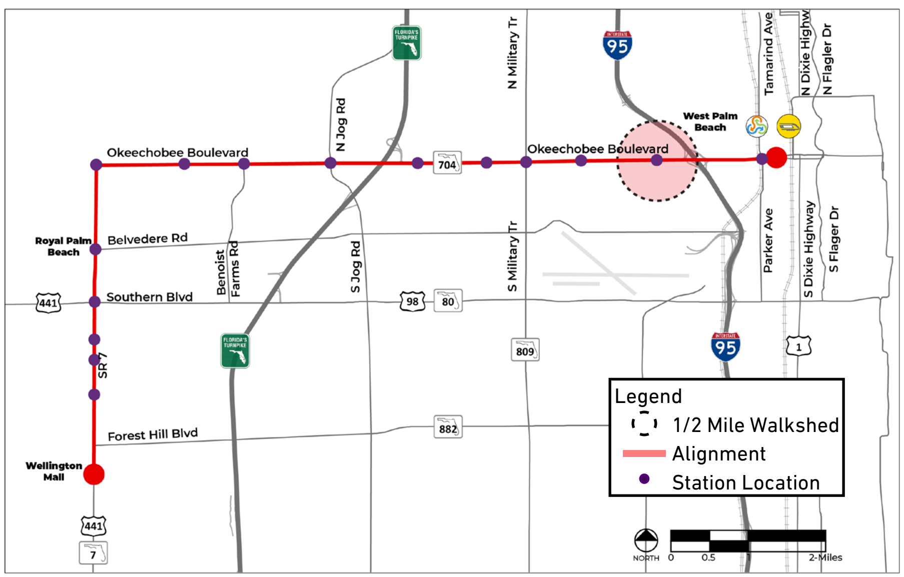

Streetview looking north at Tamarind Avenue

STATION: CONGRESS AVENUE

Typology: District/Town Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Chillingworth Park, Access to Airport, Cardinal Newman High school, Westgate CRA

POPULATION 3,500 Residents

RIDERSHIP Over 10,000 average daily boarding + alightings

EMPLOYMENT 2,200 Workers

PROPOSED DEVELOPMENTS: Affordable Infill Housing Redevelopment Project, Westgate Avenue Streetscape, Westgate Seminole Mixed-Use Project

AVERAGE HOUSEHOLD INCOME: $43,300/year

AVERAGE BLOCK SIZE: 1200' x 600'

STRENGTHS

- Proximity to I-95
- Large redevelopable parcels
- Proximity to high ridership stations
- Access to parking

WEAKNESSES

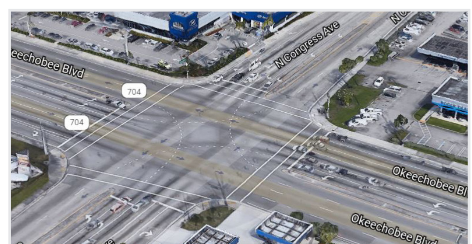
- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Drainage challenges

OPPORTUNITIES

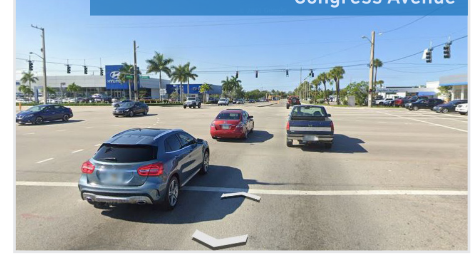
- Potential for multimodal/ transit oriented development
- Proximity to Downtown West Palm Beach
- Increased emphasis on redevelopment

BARRIERS

- Large and fast roadways
- Limited shade
- Limited multimodal network and connectivity
- Limited access to green space

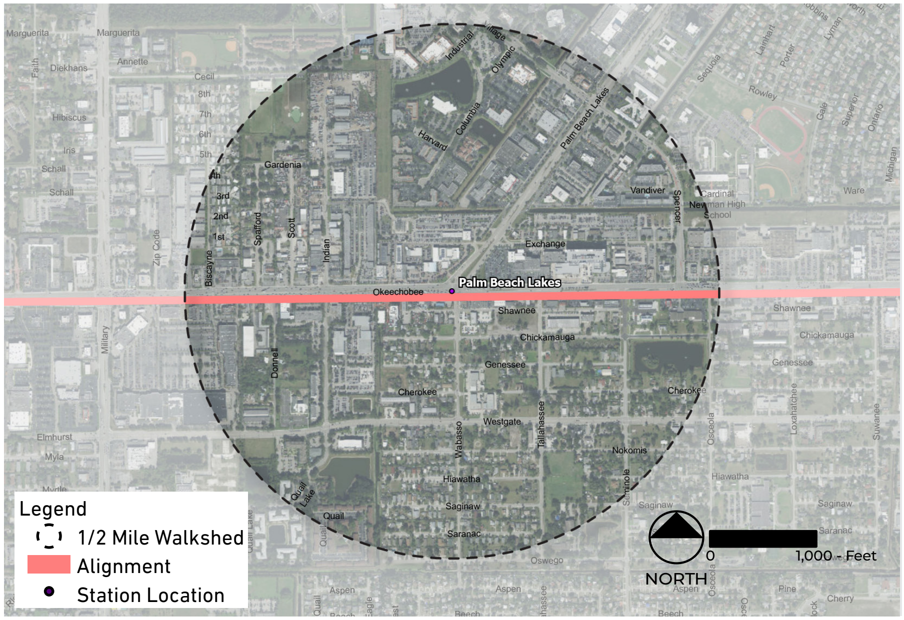


View looking northwest at

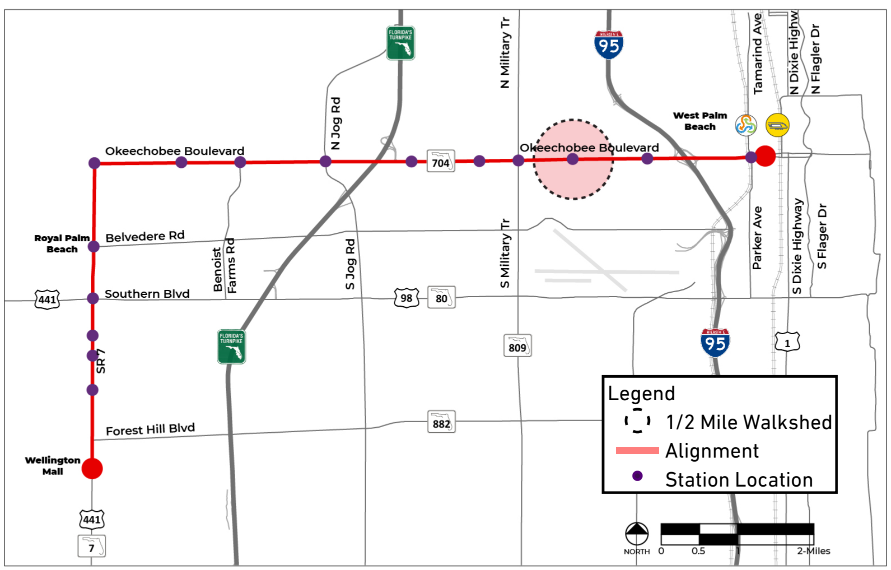

Streetview looking north at Congress Avenue

STATION: PALM BEACH LAKES BLVD

Typology: Commercial Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Access to Airport, Cardinal Newman High school, Westgate CRA, Keiser University

PROPOSED DEVELOPMENTS: Affordable Infill Housing Redevelopment Project, Westgate Avenue Streetscape, Westgate Seminole Mixed-Use Project

POPULATION 3,700 Residents

EMPLOYMENT 6,400 Workers

AVERAGE HOUSEHOLD INCOME: $50,400/year

RIDERSHIP Over 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 800' x 400'

STRENGTHS

- Proximity to commercial land uses
- Proximity to high ridership stations
- Large redevelopable parcels
- Proximity to housing

WEAKNESSES

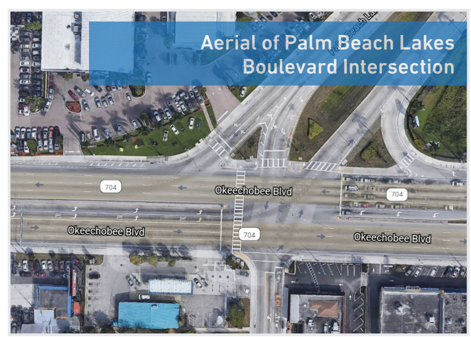
- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Low density of development

OPPORTUNITIES

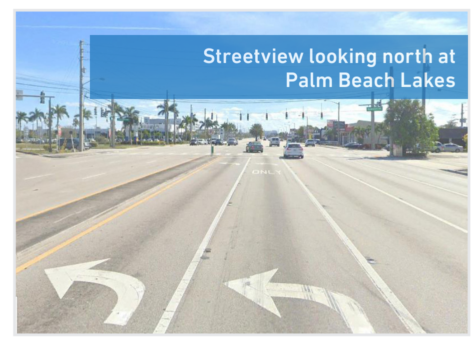
- Emphasis on development
- Potential for multimodal/ transit oriented development
- Proximity to Downtown West Palm Beach

BARRIERS

- Large and fast roadways
- Limited multimodal network and connectivity
- Limited crossing opportunities
- Limited access to green space

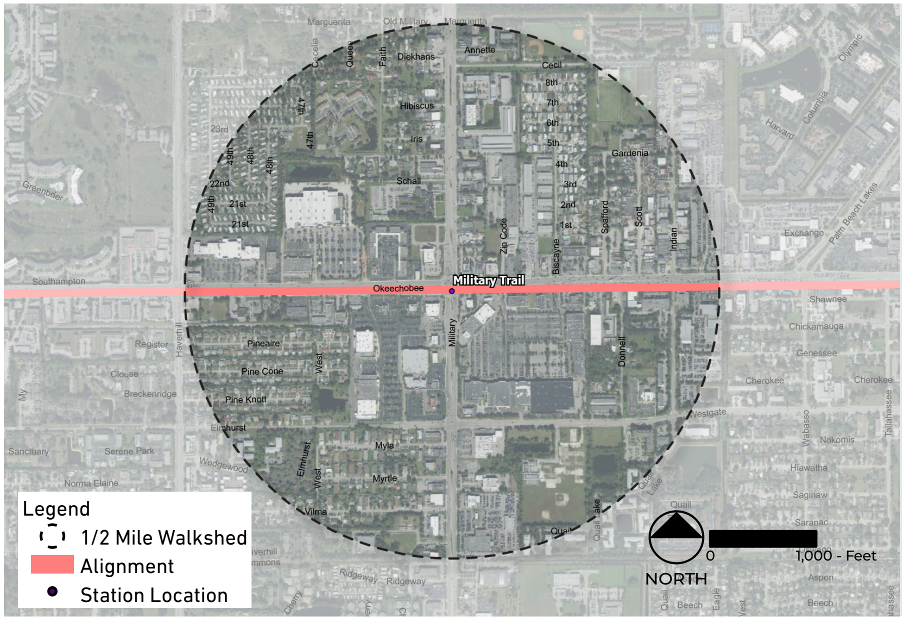


Aerial of Palm Beach Lakes Boulevard Intersection

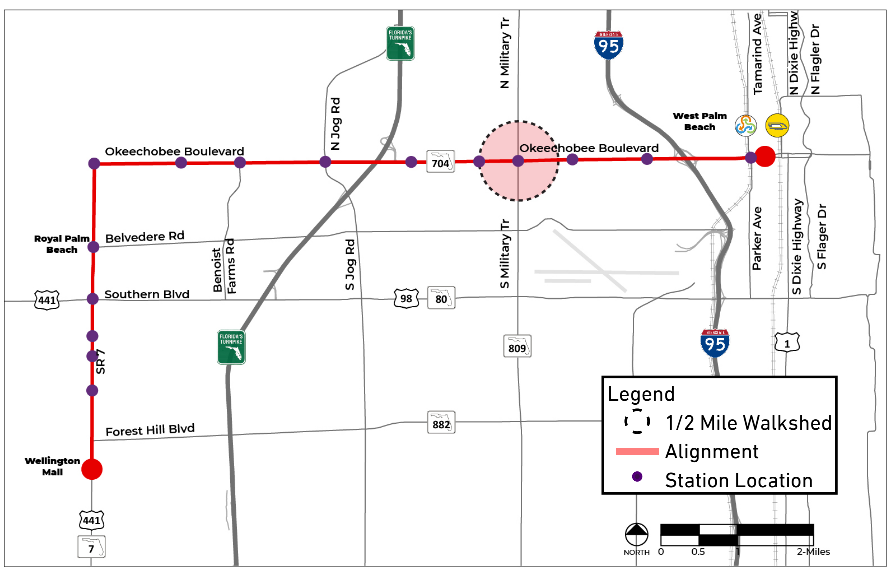

Streetview looking north at Palm Beach Lakes

STATION: MILITARY TRAIL

Typology: District/Town Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Mounts Botanical Gardens, Oxbridge Academy, Cross County Plaza, Century Village

PROPOSED DEVELOPMENTS: None at this timee

POPULATION 3,500 Residents

EMPLOYMENT 3,700 Workers

AVERAGE HOUSEHOLD INCOME: $44,650/year

RIDERSHIP Over 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 1200' x 1200'

STRENGTHS

- Proximity to the Turnpike
- Proximity to high ridership stations
- Large redevelopable parcels
- Proximity to commercial land uses

WEAKNESSES

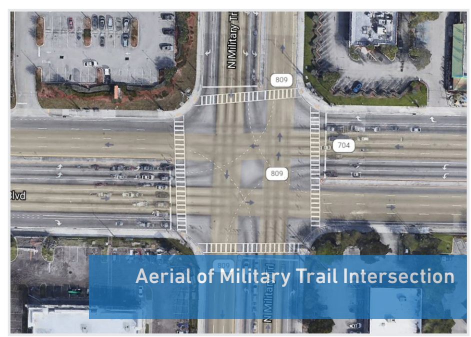
- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Low density of development

OPPORTUNITIES

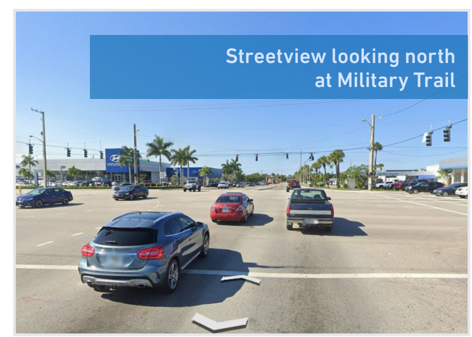
- Potential for multimodal/ transit oriented development
- Proximity to vacant properties
- Increased emphasis on development

BARRIERS

- Large and fast roadways
- Limited shade
- Limited multimodal network and connectivity
- Limited access to green space



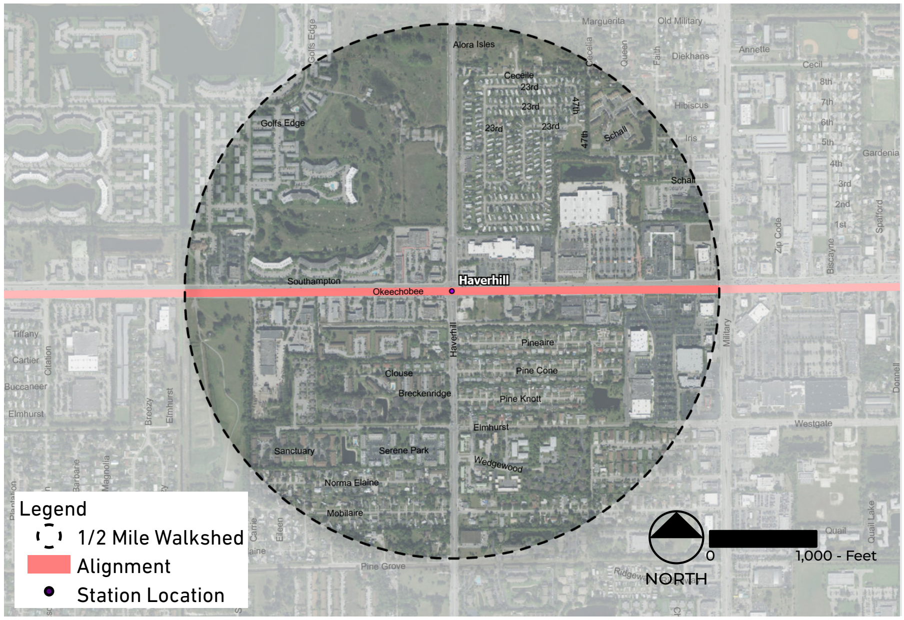
Aerial of Military Trail Intersection



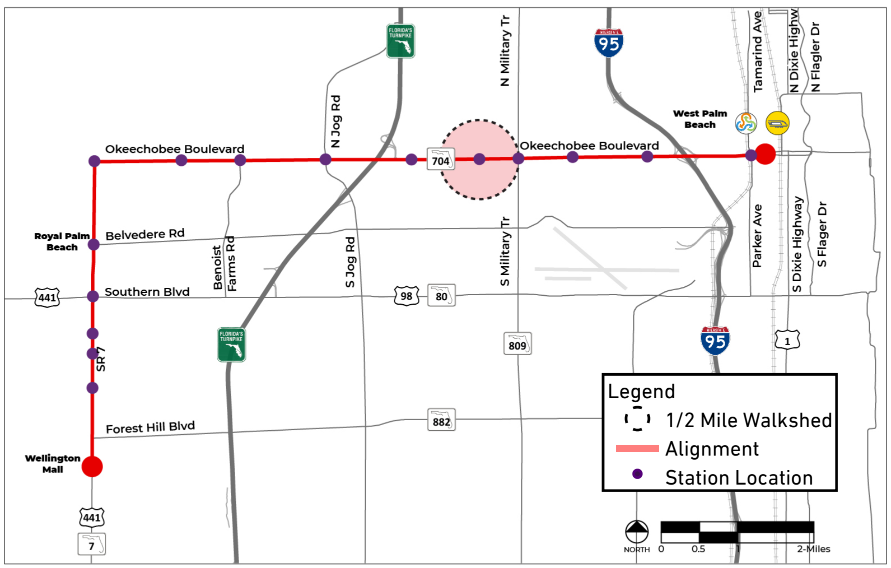
Streetview looking north at Military Trail

STATION: HAVERHILL ROAD

Typology: Neighborhood Commuter



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: West Palm Beach Emergency Center, Century Village

PROPOSED DEVELOPMENTS: Reflection Bay, Fount MUPD

POPULATION 5,000 Residents

EMPLOYMENT 1,300 Workers

AVERAGE HOUSEHOLD INCOME: $41,450/year

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 500' x 1000'

STRENGTHS

- North/ South connection
- Proximity to the Turnpike
- Proximity to neighborhoods
- Large redevelopable parcels
- Access to parking

WEAKNESSES

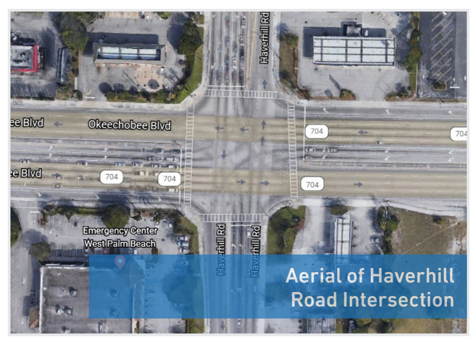
- Limited land uses
- Access to adjacent neighborhoods
- Limited active commercial developments
- Low density of development

OPPORTUNITIES

- Proximity to housing
- Emphasis on development
- Potential for multimodal/ transit oriented development
- Transit access to vulnerable communities

BARRIERS

- Limited activity centers
- Limited multimodal network and connectivity
- Limited crossing opportunities
- Limited access to green space

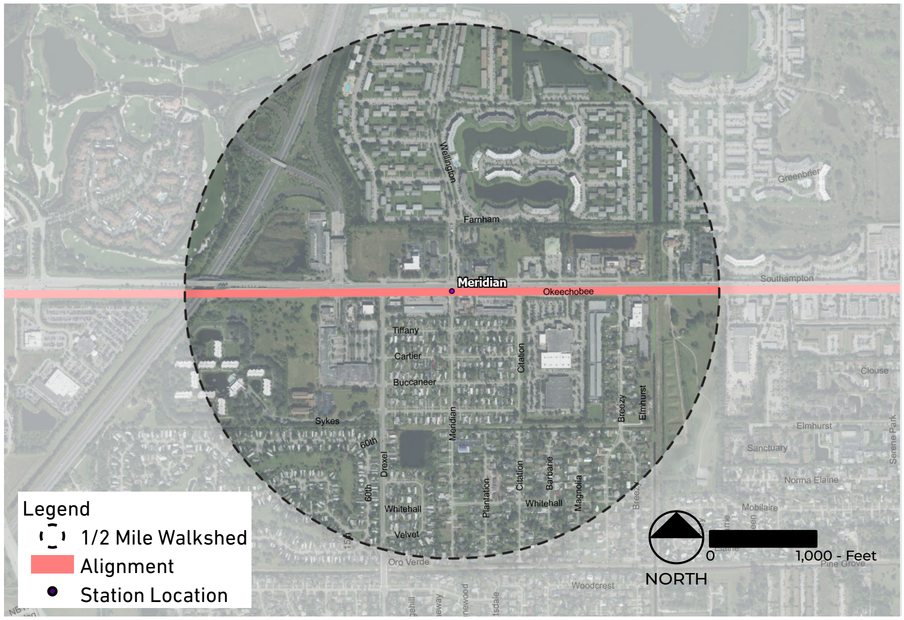


Aerial of Haverhill Road Intersection

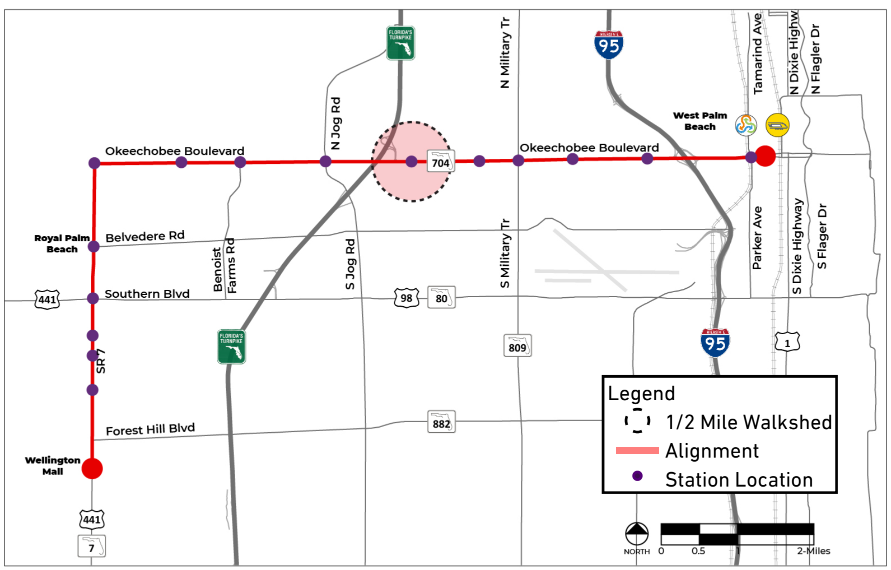

Streetview looking north at Haverhill Road

STATION: MERIDIAN ROAD

Typology: Neighborhood Commuter



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS:
Century Village, Florida's Turnpike, Library

PROPOSED DEVELOPMENTS:
Fount MUPD

POPULATION
6,700 Residents

EMPLOYMENT
1,200 Workers

AVERAGE HOUSEHOLD INCOME:
$41,560/year

RIDERSHIP
1,000 - 10,000
average daily boarding + alightings

AVERAGE BLOCK SIZE:
1000' x 500'

STRENGTHS

- Proximity to the Turnpike
- Proximity to neighborhoods
- Large redevelopable parcels
- Proximity to housing
- Access to parking

WEAKNESSES

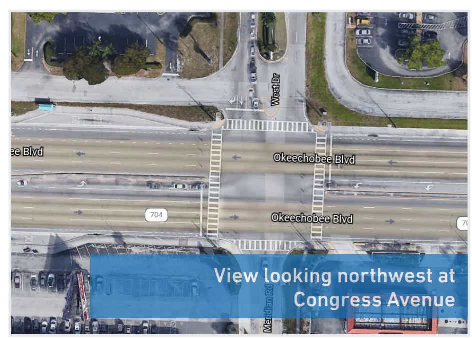
- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Low commercial elements

OPPORTUNITIES

- Potential for multimodal/ transit oriented development
- Proximity to vacant properties
- Increased emphasis on development

BARRIERS

- Large and fast roadways
- Limited crossing opportunities
- Limited multimodal network and roadway network
- Limited access to activity centers

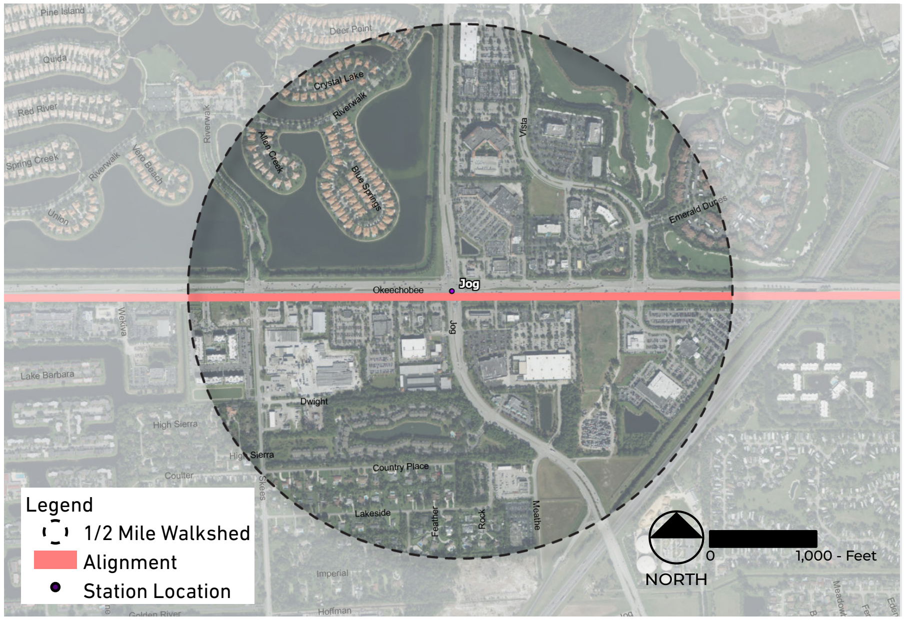


View looking northwest at Congress Avenue

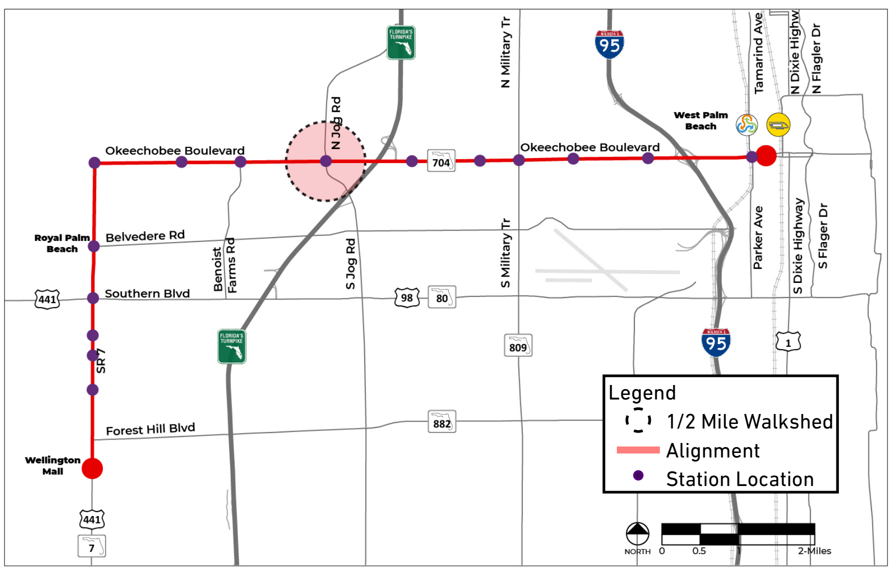

Streetview looking north at Meridian Road

STATION: JOG ROAD

Typology: Commercial Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Keiser University, Riverwalk, Palm Beach County Building Department

PROPOSED DEVELOPMENTS: Luma Apartments

POPULATION 2,000 Residents

EMPLOYMENT 3,535 Workers

AVERAGE HOUSEHOLD INCOME: $64,300/year

RIDERSHIP 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 1200' x 850'

STRENGTHS

- Commuter supportive land uses
- Proximity to activity center
- Proximity to high ridership stations
- Large redevelopable parcels

WEAKNESSES

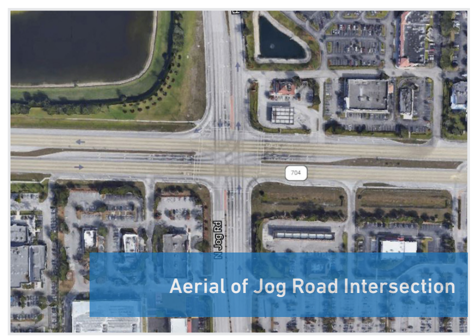
- Development challenges due to wetlands/drainage
- Auto focused environment
- Limited multimodal facilities
- Gated Communities

OPPORTUNITIES

- Proximity to the Turnpike
- Emphasis on development
- Potential for multimodal/ transit oriented development
- Proximity to commercial land uses

BARRIERS

- Large and fast roadways
- Limited multimodal network and roadway network
- Limited crossing opportunities
- Limited access to green space

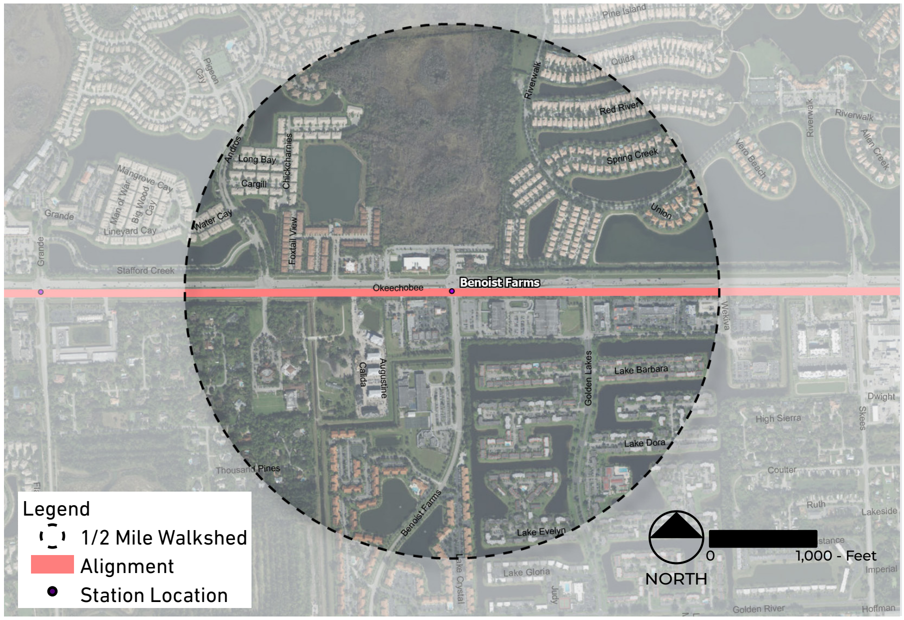


Aerial of Jog Road Intersection

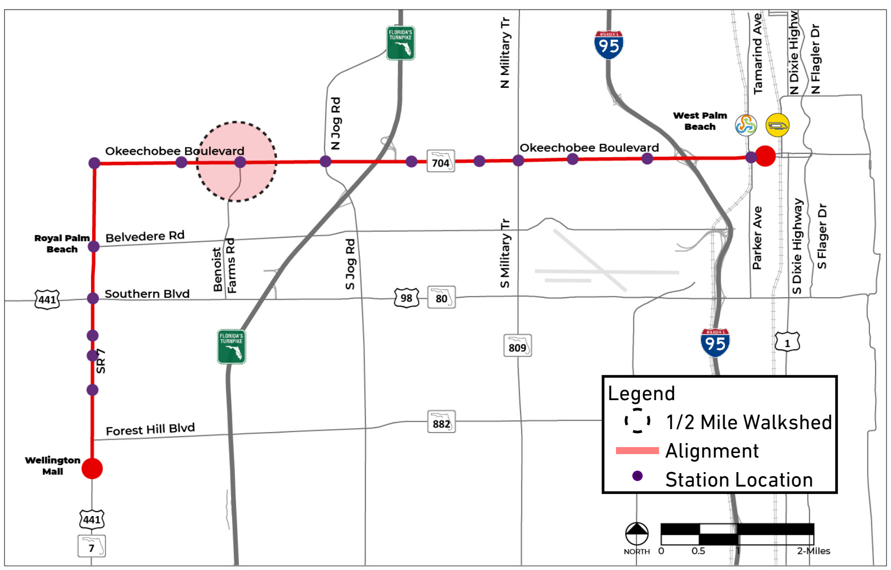
Streetview looking northwest at Jog Road

STATION: BENOIST FARMS ROAD

Typology: Neighborhood Commuter



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Renaissance Charter School, Turning Points Academy, Berean Christian School

PROPOSED DEVELOPMENTS: Azola Apartments, Grace Fellowship

POPULATION 3,131 Residents

EMPLOYMENT 530 Workers

AVERAGE HOUSEHOLD INCOME: $62,040/year

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 1200' x 400'

STRENGTHS

- Proximity to planned redevelopments
- Proximity to schools
- Large redevelopable parcels
- Proximity to existing park-and-ride

WEAKNESSES

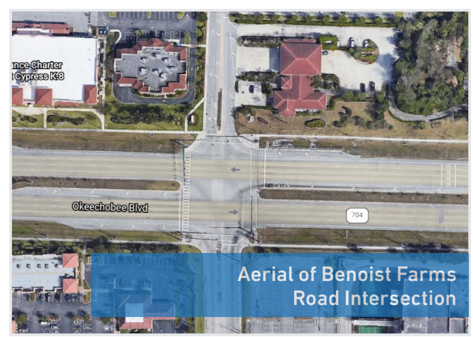
- Development challenges due to wetlands/drainage
- Auto focused environment
- Limited multimodal facilities
- Gated Communities

OPPORTUNITIES

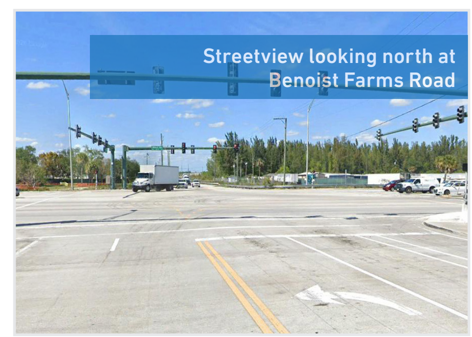
- Potential commuter elements
- Proximity to young riders
- Emphasis on development

BARRIERS

- Large and fast roadways
- Limited crossing opportunities
- Limited roadway network
- Complex intersection dynamics

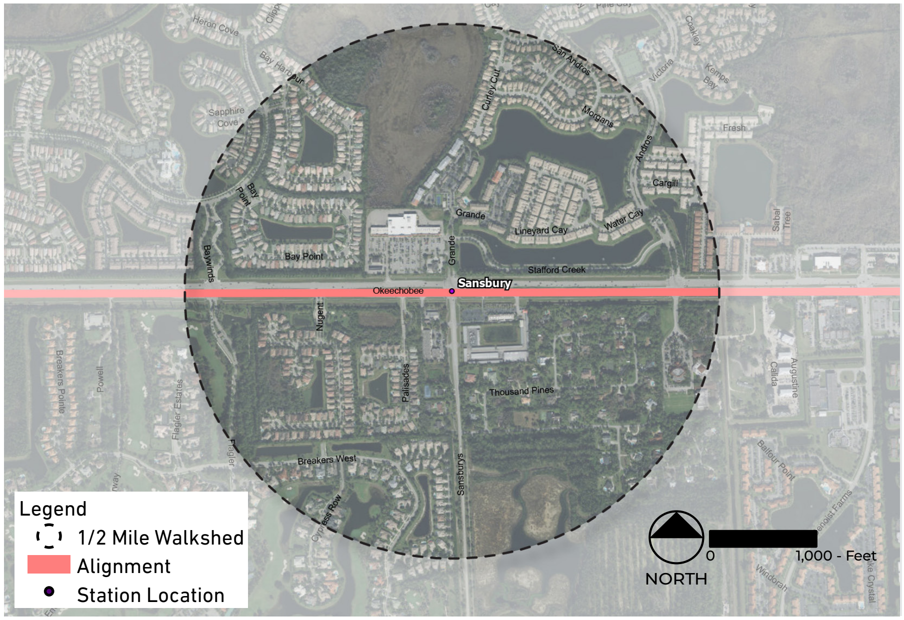


Aerial of Benoist Farms Road Intersection

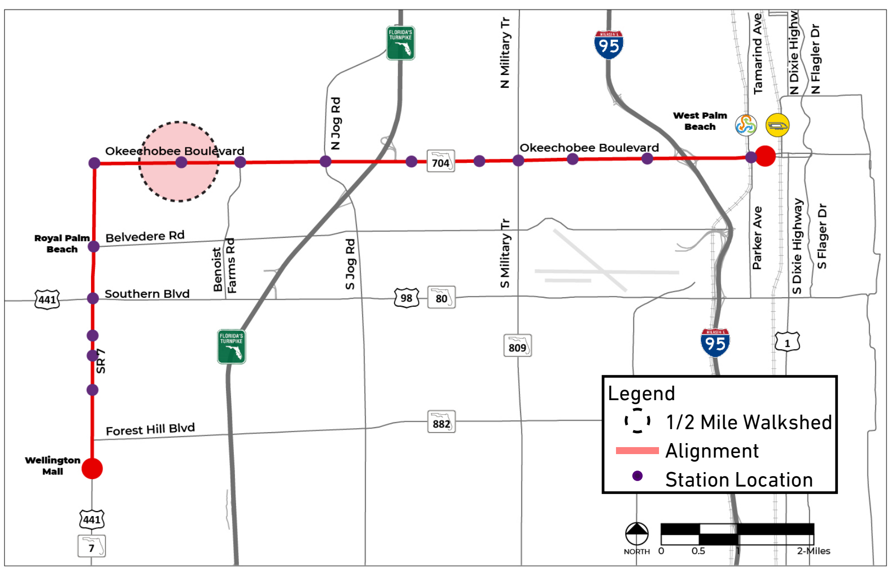

Streetview looking north at Benoist Farms Road

STATION: SANSBURY WAY

Typology: Neighborhood Commuter



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Cobblestone Village

PROPOSED DEVELOPMENTS: None at this time

POPULATION 2,600 Residents

EMPLOYMENT 312 Workers

AVERAGE HOUSEHOLD INCOME: $82,000/year

RIDERSHIP 1,000-10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 700' x 600'

STRENGTHS

- Commuter supported land uses
- Proximity to schools
- Large redevelopable parcels
- Proximity to regional routes

WEAKNESSES

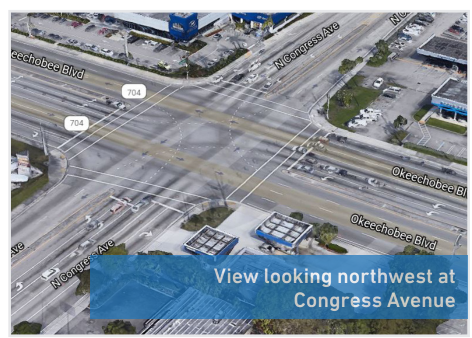
- Limited land uses
- Auto focused environment
- Limited commercial uses
- Low density of development

OPPORTUNITIES

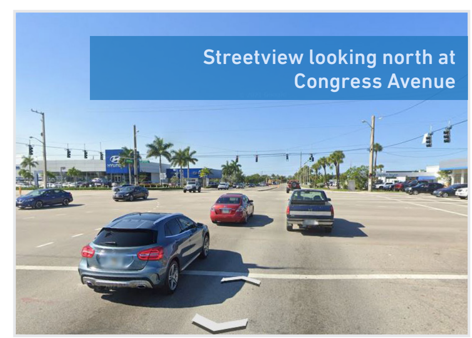
- Proximity to housing
- Emphasis on development
- Developable land
- Proximity to grocery store

BARRIERS

- Large and fast roadways
- Limited roadway network
- Limited crossing opportunities
- Limited multimodal network



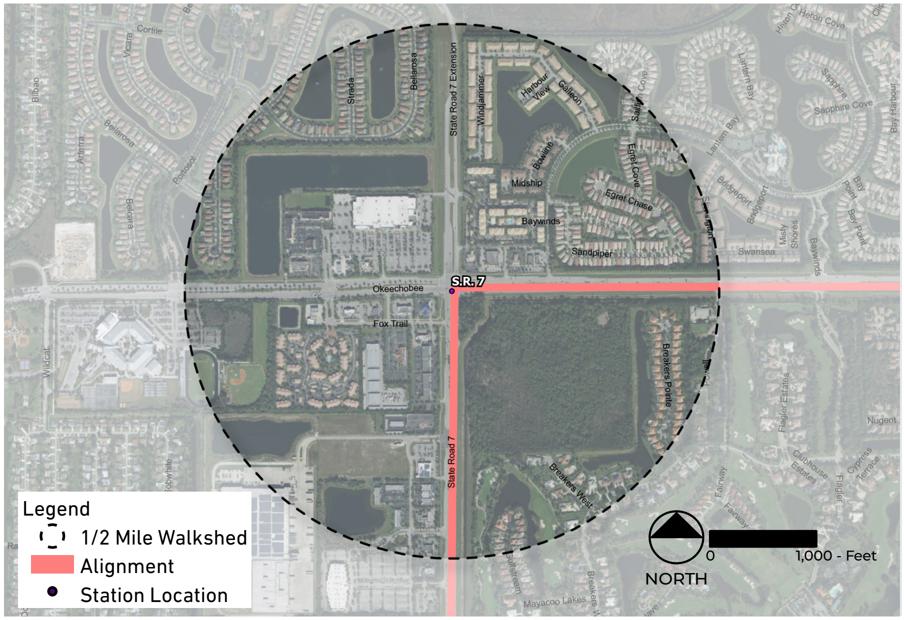
View looking northwest at Congress Avenue



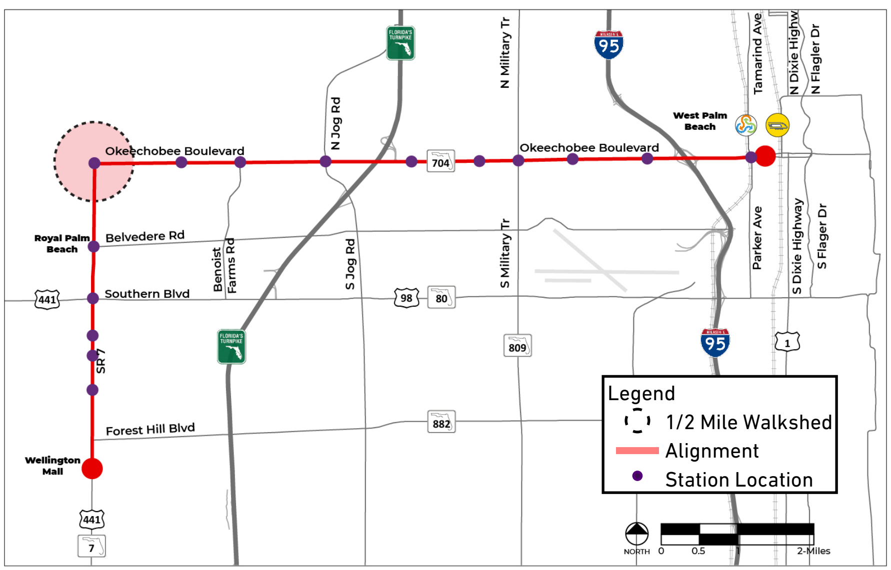
Streetview looking north at Congress Avenue

STATION: STATE ROAD 7

Typology: District/Town Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Cobblestone Village, Royal Palm Beach High School

PROPOSED DEVELOPMENTS: None at this time

POPULATION 2,400 Residents

EMPLOYMENT 1,030 Workers

AVERAGE HOUSEHOLD INCOME: $88,000/year

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 1500' x 850'

STRENGTHS

- Proximity to regional routes
- Proximity to high ridership stations
- Large redevelopable parcels
- Proximity to commercial land uses

WEAKNESSES

- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Limited access to surrounding neighborhoods

OPPORTUNITIES

- Potential for multimodal/ transit oriented development
- Proximity to vacant properties
- Emphasis on development

BARRIERS

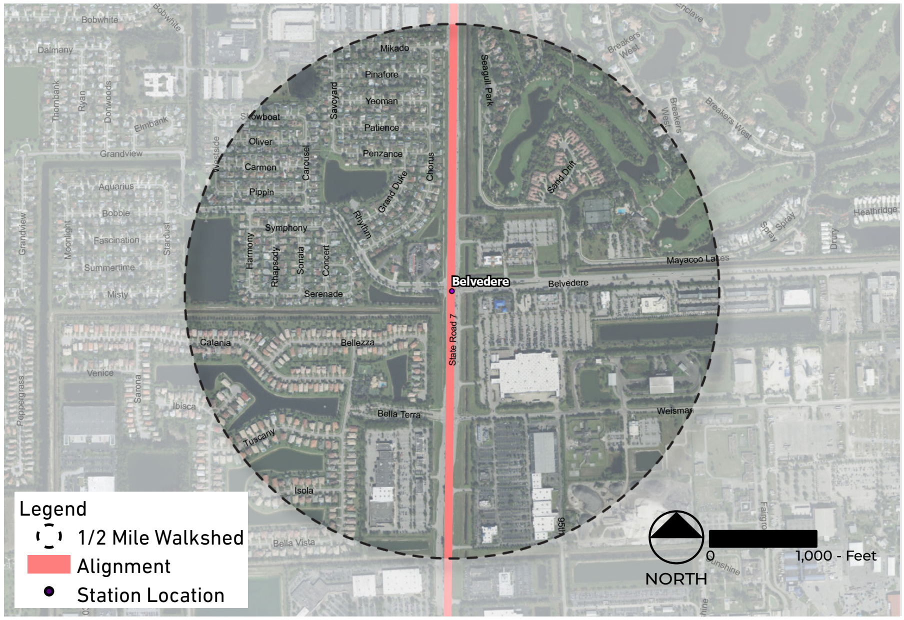
- Large and fast roadways
- Limited shade
- Limited multimodal network and connectivity
- Intersection complexities

Aerial of SR 7 Intersection

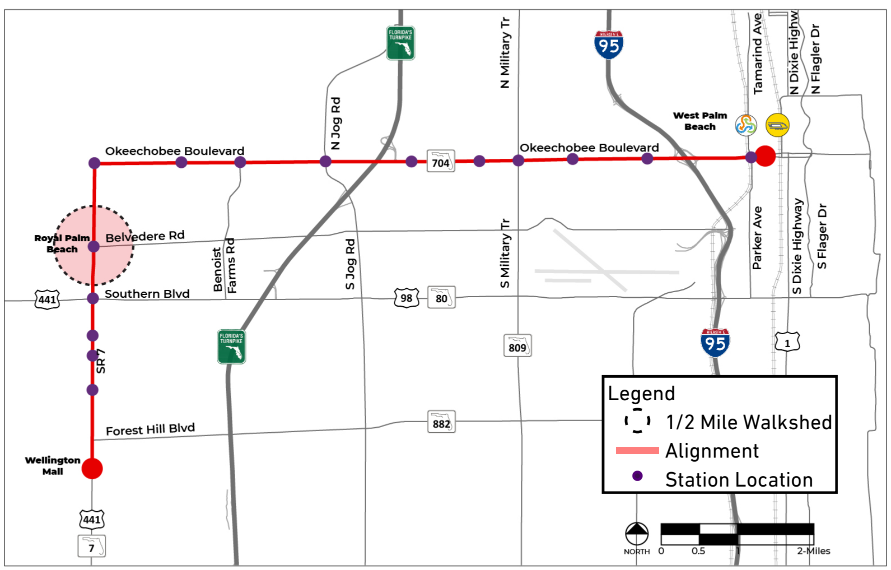
Streetview looking north at SR 7

STATION: BELVEDERE ROAD

Typology: Commercial Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS:
South University

PROPOSED DEVELOPMENTS:
None at this time

POPULATION
2,000 Residents

EMPLOYMENT
2,000 Workers

AVERAGE HOUSEHOLD INCOME:
$127,500/year

RIDERSHIP
Over 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE:
900' x 600'

STRENGTHS

- Proximity to commercial land uses
- Proximity to high ridership stations
- Large redevelopable parcels

WEAKNESSES

- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Low density of development

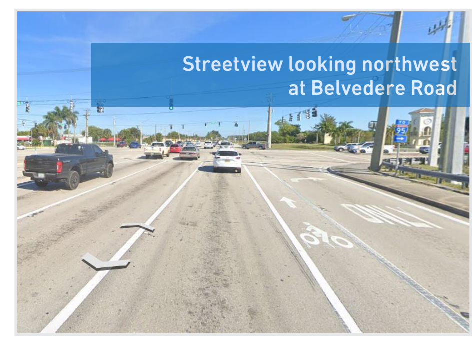
OPPORTUNITIES

- Proximity to housing
- Emphasis on development
- Potential for multimodal/ transit oriented development

BARRIERS

- Large and fast roadways
- Limited multimodal network and connectivity
- Limited crossing opportunities
- Limited access to green space

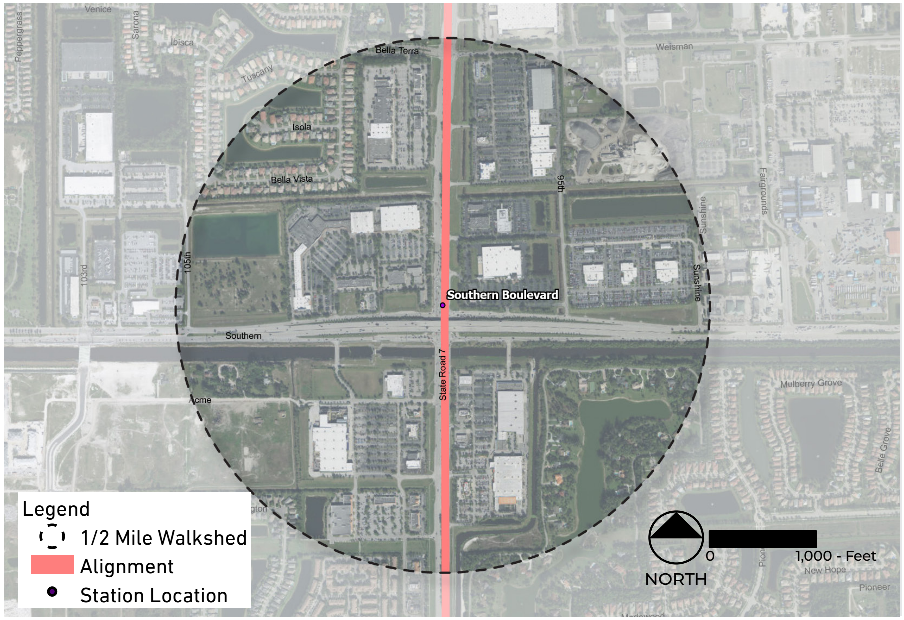
Aerial of Belvedere Road Intersection



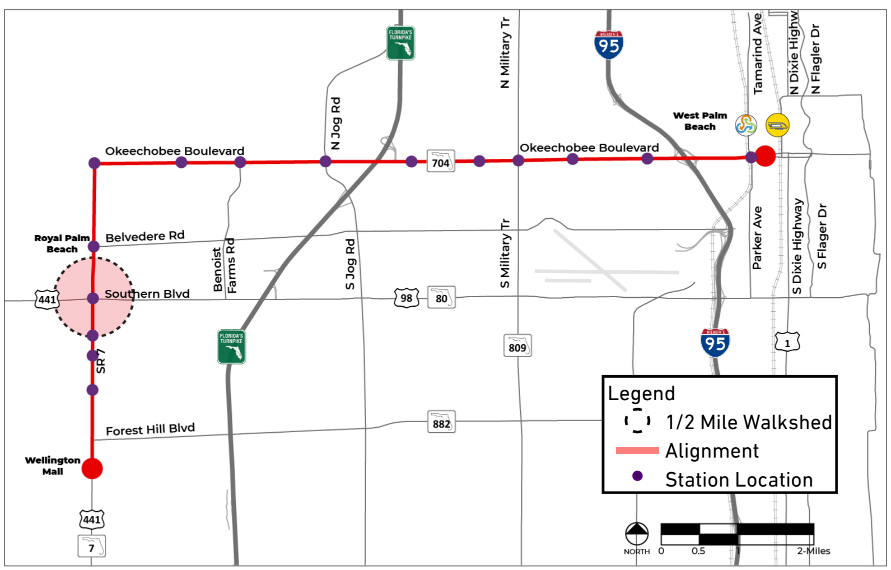
Streetview looking northwest at Belvedere Road

STATION: SOUTHERN BLVD

Typology: Commercial Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Westshore Shopping Plaza, Village Shoppes, Coral Sky Plaza Shoppes, Commons at Royal Palm Beach

POPULATION 813 Residents

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

EMPLOYMENT 2,500 Workers

PROPOSED DEVELOPMENTS: SR 80 Bridge Replacement, Tuttle Royal, The Point

AVERAGE HOUSEHOLD INCOME: $125,000/year

AVERAGE BLOCK SIZE: 1300' x 1000'

STRENGTHS

- Proximity to developing TOD
- Proximity to regional route
- Large redevelopable parcels
- Proximity to retail and commercial land uses
- Access to parking

WEAKNESSES

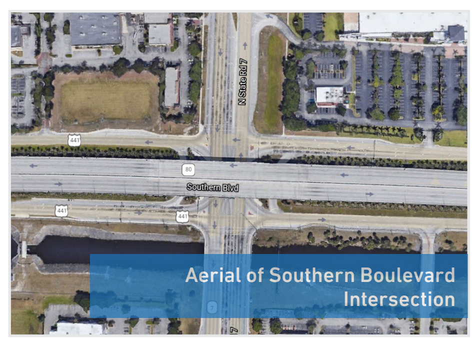
- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Limited access to residential developments

OPPORTUNITIES

- Potential for multimodal/ transit oriented development
- Proximity to developable properties
- Emphasis on development

BARRIERS

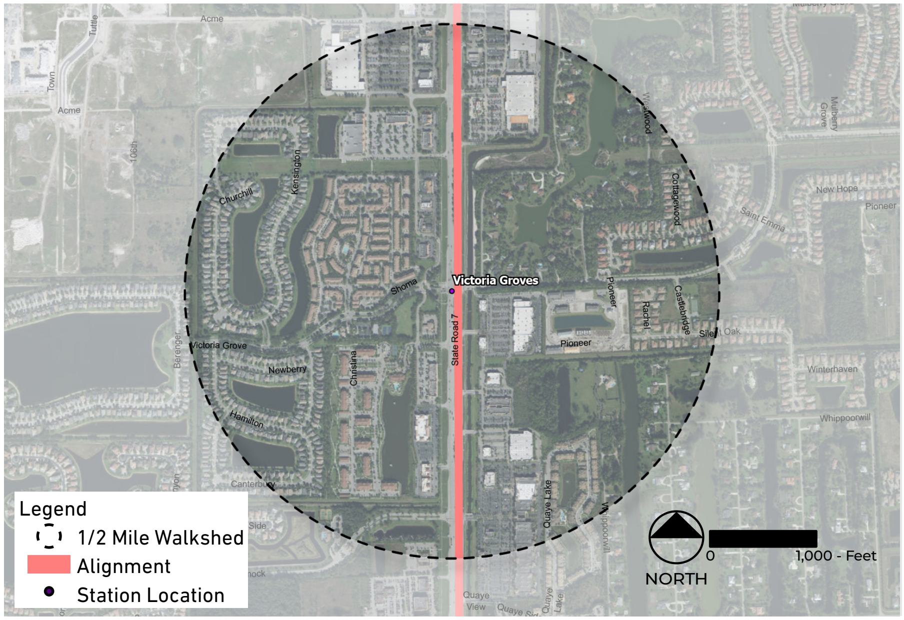
- Large and fast roadways
- Limited shade and green space access
- Limited multimodal network
- Limited roadway network
-


Aerial of Southern Boulevard Intersection

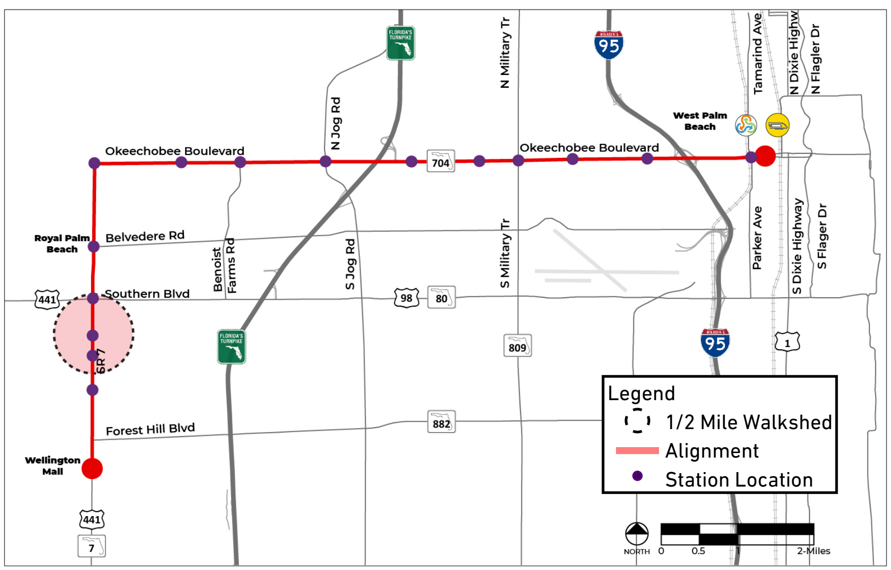

Streetview looking north at Southern Boulevard

STATION: VICTORIA GROVES BLVD

Typology: Neighborhood Commuter



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Westshore Shopping Plaza, Village Shoppes, Coral Sky Plaza Shoppes, Commons at Royal Palm Beach

PROPOSED DEVELOPMENTS: None at this time

POPULATION 2,800 Residents

EMPLOYMENT 1,200 Workers

AVERAGE HOUSEHOLD INCOME: $103,900/year

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 500' x 300'

STRENGTHS

- Proximity to residential developments
- Proximity retail and commercial land uses
- Redevelopable parcels

WEAKNESSES

- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Limited access to residential developments

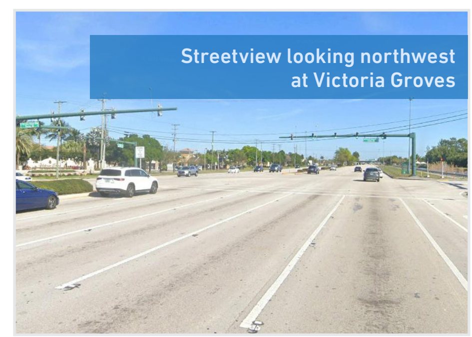
OPPORTUNITIES

- Proximity to housing
- Increased emphasis on development
- Potential for multimodal/ transit oriented development
- Proximity to commuters

BARRIERS

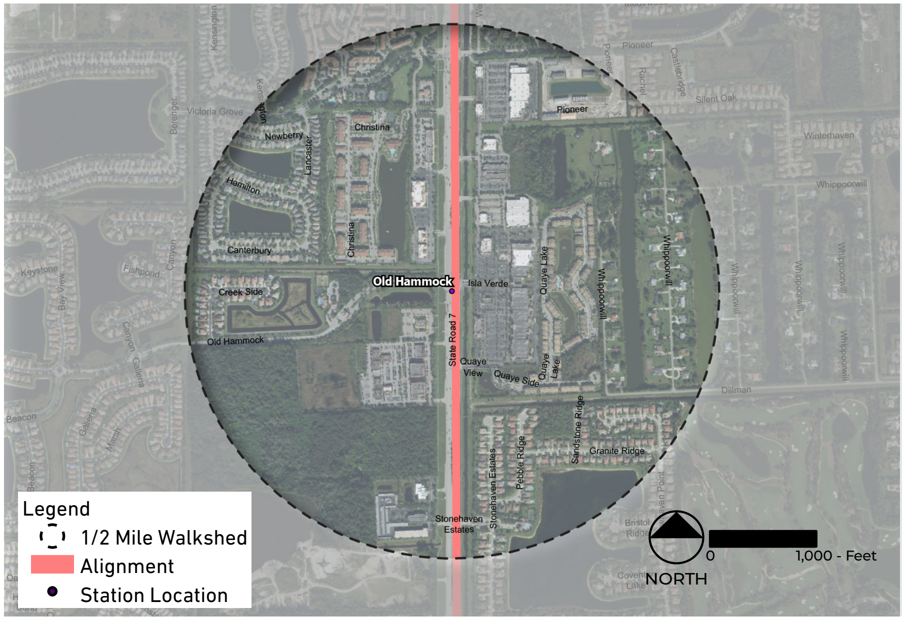
- Limited developable land
- Limited multimodal network and connectivity
- Limited crossing opportunities
- Limited access to green space

Aerial of Victoria Groves Intersection

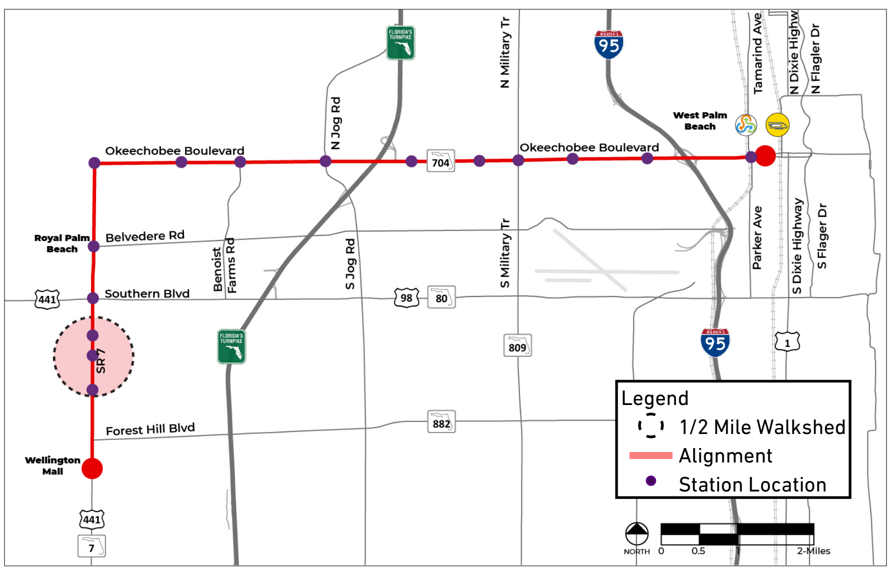

Streetview looking northwest at Victoria Groves

STATION: OLD HAMMOCK WAY

Typology: Neighborhood Commuter



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Westshore Shopping Plaza, Village Shoppes, Coral Sky Plaza Shoppes, Commons at Royal Palm Beach, The Shoppes at Isla Verde

POPULATION 1,900 Residents

EMPLOYMENT 1,400 Workers

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

PROPOSED DEVELOPMENTS: Lotis

AVERAGE HOUSEHOLD INCOME: $125,500/year

AVERAGE BLOCK SIZE: 1200' x 600'

STRENGTHS

- Proximity to residential developments
- Proximity to existing transit stations
- Large redevelopable parcels
- Proximity to commercial land uses

WEAKNESSES

- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Limited access to residential developments

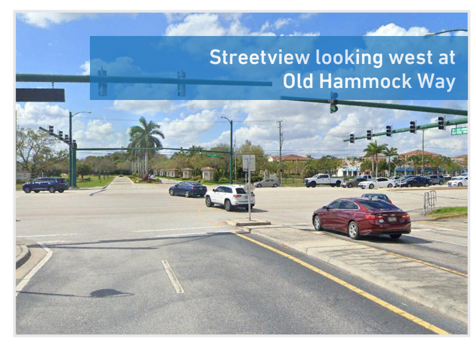
OPPORTUNITIES

- Access to commercial land uses
- Potential for multimodal/ transit oriented development
- Proximity to redevelopable properties
- Emphasis on development

BARRIERS

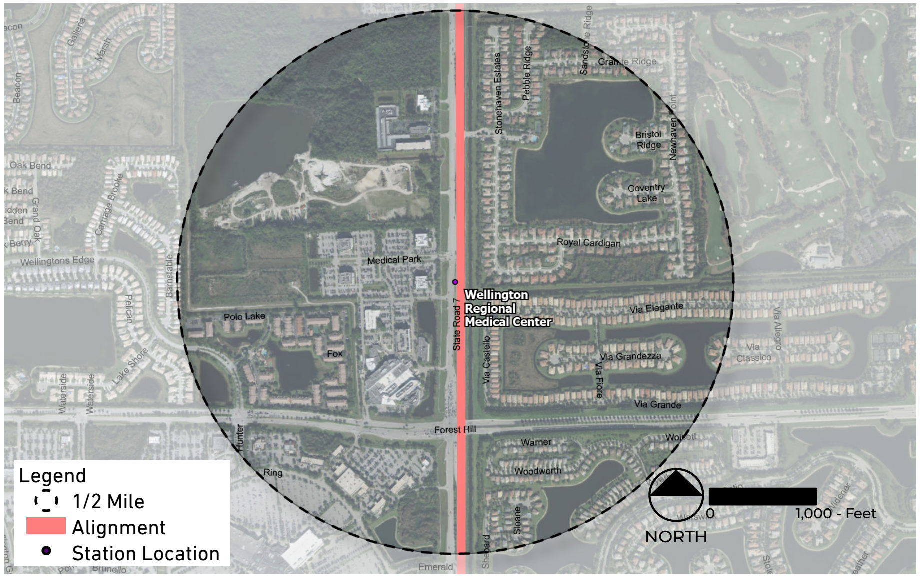
- Large and fast roadways
- Limited shade
- Limited multimodal network and connectivity
- Limited access and connections east-to-west

Aerial of Old Hammock Way Intersection

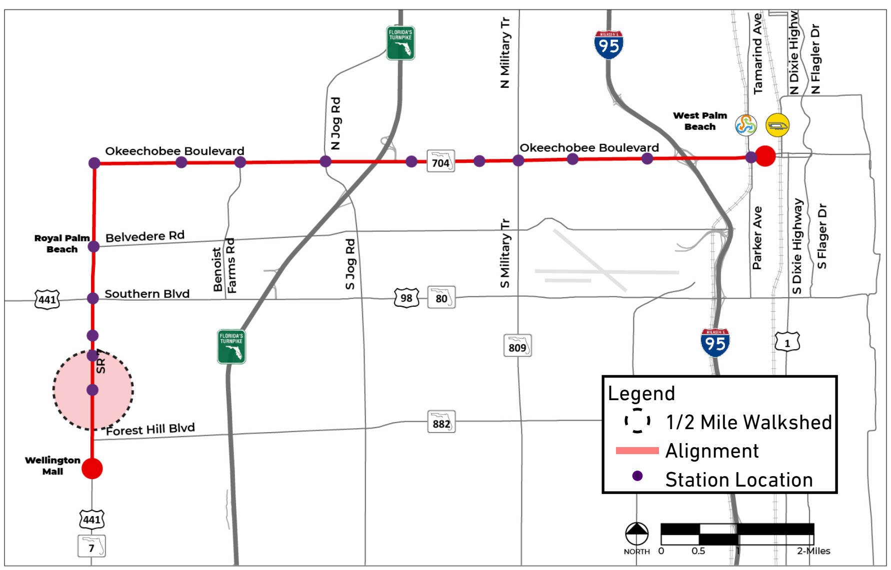

Streetview looking west at Old Hammock Way

STATION: WELLINGTON REGIONAL MEDICAL CENTER

Typology: Regional Employment Generator



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: The Shoppes at Isla Verde, Wellington Regional Medical Center

PROPOSED DEVELOPMENTS: Lotis

POPULATION 2,000 Residents

EMPLOYMENT 3,800 Workers

AVERAGE HOUSEHOLD INCOME: $136,000/year

RIDERSHIP 1,000 - 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 1600' x 600'

STRENGTHS

- Proximity to commercial and medical land uses
- Proximity to regional routes
- Large redevelopable parcels
- Access to parking

WEAKNESSES

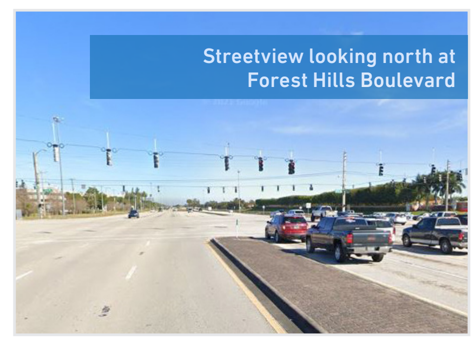
- Limited land uses
- Auto focused environment
- Limited multimodal facilities and access to existing facilities
- Eastern residential developments

OPPORTUNITIES

- Proximity to redeveloping parcels
- Emphasis on development
- Potential for multimodal/ transit oriented development
- Access to commuters and workers

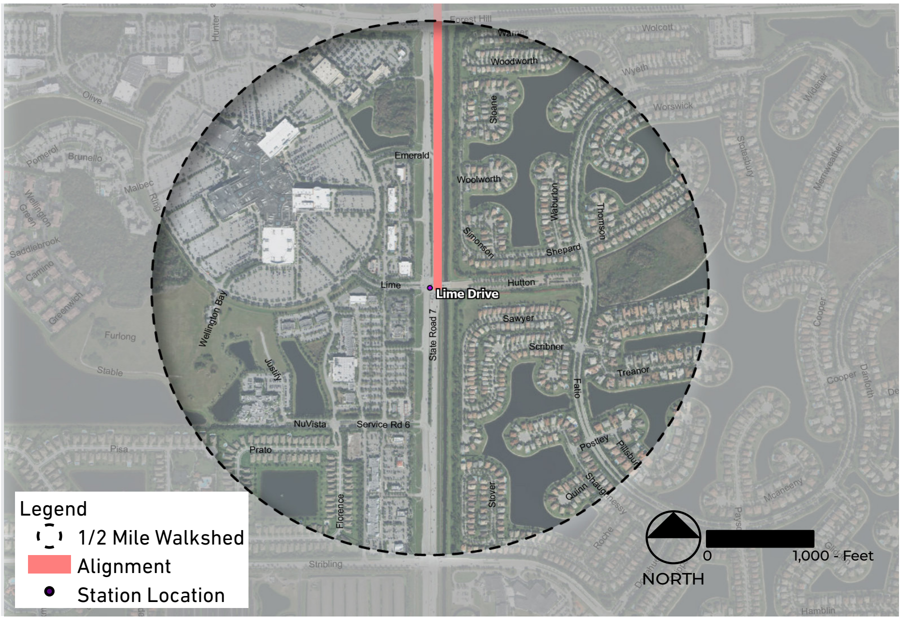
BARRIERS

- Large and fast roadways
- Limited multimodal network and connectivity
- Limited crossing opportunities
- Proximity to major intersection

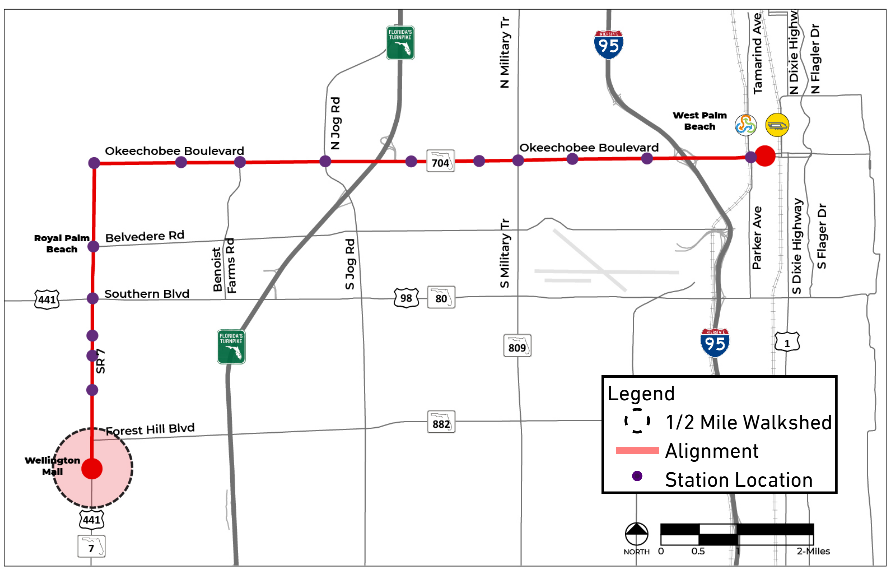


STATION: LIME DRIVE

Typology: District/Town Center



Station Location within Overall Study Corridor



Existing Station Area Summary

KEY LANDMARKS: Wellington Regional Medical Center, Wellington Green Mall

PROPOSED DEVELOPMENTS: Mall at Wellington Green Redevelopment

POPULATION 1,900 Residents

EMPLOYMENT 4,000 Workers

AVERAGE HOUSEHOLD INCOME: $136,500/year

RIDERSHIP Over 10,000 average daily boarding + alightings

AVERAGE BLOCK SIZE: 1200' x 500'

STRENGTHS

- Proximity to the Transit Hub
- Proximity to high ridership stations
- Large redevelopable parcels
- Proximity to commercial land uses

WEAKNESSES

- Limited land uses
- Auto focused environment
- Limited multimodal facilities
- Limited right-of-way opportunities

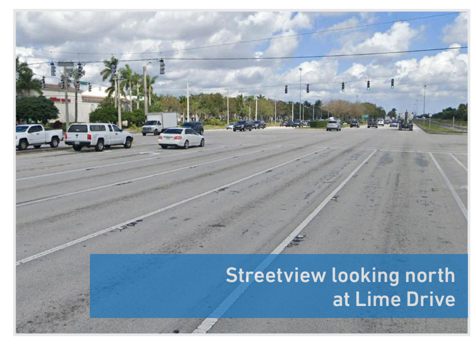
OPPORTUNITIES

- Potential for multimodal/ transit oriented development
- Proximity to vacant properties
- Increased emphasis on development

BARRIERS

- Large and fast roadways
- Limited shade
- Limited multimodal network and roadway connectivity
- Limited access and connections east-to-west

Aerial of Lime Drive Intersection



Streetview looking north at Lime Drive

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Station Area Summaries Methodology

STATION AREA SUMMARIES

As a catalyst to conducting the transit and roadway alternatives analysis, the Palm Beach Transportation Planning Agency (TPA) is evaluating land use characteristics and market demand to determine a feasible level of economic development along the Okeechobee Blvd. & SR-7. To do that, The land use and economic development station area summaries focuses on developing conceptual station area plans to forecast and analyze the economic and land use impacts of redevelopment within the half mile station areas.

Methodology

The Palm Beach Transportation Planning Agency (TPA) is evaluating multimodal transportation alternatives and transit supportive land uses along the Okeechobee Blvd./ SR-704 and SR-7 corridor to provide continuous, safe facilities for all modes of travel. This includes existing demographics, future/planned developments, aerial photographs of the stations, existing station photographs and future typology designations for each proposed station areas.

The seventeen station location were developed based on the information and analysis found in Tasks 4.1 Typologies and Task 4.2 Qualitative Station Area Assessment. Station area concepts were developed to blend and enhance the current vacant or underutilized parcels within the half mile walksheds to forecast the potential improvements within the station areas. Based on the conceptual development a 10% increase and deduction were applied to create a range of development scenarios to show potential development yields.

Content

THIS DOCUMENT INCLUDES ELEMENTS FROM THE EXISTING CONDITIONS REPORT AND QUALITATIVE ANALYSIS REPORT. THE LAND USE AND ECONOMIC DEVELOPMENT ANALYSIS IS ORGANIZED AS A SINGLE PAGE SUMMARY AND INCLUDES THE FOLLOWING COMPONENTS:

- Illustrative Urban Design Vision
- Example Photos of Potential Illustrative Visions
- Land Use Implications and Suggestions
- Key Housing Projections
- Key Commercial Projections
- Key Employment Projections
- Key Revenue Projections
- Key Parking Projections

STATION AREA PLANNING

What is Transit-Oriented Development?

Transit-oriented development (TOD) is pedestrian oriented, compact, mixed-use development that is centered on quality public transit. It typically includes a mix of housing, office, retail, neighborhood amenities, and other uses within walking distance of a transit station.

Station Area Plans

Station area plans for the proposed transit alternative were developed based on existing and future characteristics identified along the Okeechobee and SR 7 corridor. An existing conditions analysis were compiled to highlight key consideration for the select station areas. These station area plans outline the goals and strategies for future development around the proposed light rail stations. Additionally, station area plans examined current vacant and underutilized parcels within the half-mile walksheds as a foundation for the potential improvements within the station areas.

As part of this study, 17 station area plans were developed. Station areas were defined based on a half-mile walkshed representing the approximate area that may be accessed within a ten-minute walk of each station. Site specific station area plans illustrate the potential of future TOD outcomes, outlining a new street network and opportunities for developments and open spaces. The station area plans also recommend/suggest how enhanced multimodal features such as dedicated bicycle lanes and shared use paths may be developed to facilitate connectivity to the proposed light rail facility.

Furthermore, station area plans include specific station typologies* that were formulated based on existing and future land use. This ensures preservation of existing neighborhood characteristics as well as helps balance market demand to allow for appropriate development within station areas. The five station typologies include a Central Business District/Town Center, Commercial Center, Neighborhood Center, and Regional Employment District. All in all, the principles and guidelines within these station area plans have been developed to align with the community's vision and to enhance the way residents access multiple destinations throughout the corridor.

* Task 4.1 Station Typologies outlines and identifies current and proposed conditions at each station area

Priorities of TOD

WALK

DEVELOPING NEIGHBORHOODS THAT PROMOTE WALKING

OBJECTIVE A. The pedestrian realm is safe, complete, and accesslble to all.

OBJECTIVE B. The pedestrian realm is active and vibrant.

OBJECTIVE C. The pedestrian realm is temperate and comfortable.

BICYCLE

PRIORITIZE NONMOTORIZED TRANSPORT NETWORKS

OBJECTIVE A. The cycling network is safe and complete.

OBJECTIVE B. Cycle parking and storage is ample and secure.

CONNECT

CREATE DENSE NETWORKS OF STREETS & PATHS

OBJECTIVE A. Walking and cycling routes are short, direct, and varied.

OBJECTIVE B. Walking and cyclinig routes are shorter than motor vehicle routes.

TRANSIT

DEVELOP NEARBY HIGH-QUALITY PUBLIC TRANSPORT

OBJECTIVE A. High quality transit is accesslble by foot

MIX

PLAN FOR MIXED USES, INCOME, & DEMOGRAPH[CS

OBJECTIVE A. Opportunities and services are within a short walking distance of where people live and work, and the public space is active over extended hours.

OBJECTIVE B. Diverse demographics and income ranges are Included among local residents.

DENSIFY

OPTIMIZE DENSITY & MATCH TRANSIT CAPACITY

OBJECTIVE A. High residential and job densities support high-quality transit, local services, and public space activity.

COMPACT

CREATE REGIONS WITH SHORT TRANSIT COMMUTES

OBJECTIVE A. The development is in, or next to, an existing urban area.

OBJECTIVE B. Traveling through the city is convenient.

SHIFT

INCREASE MOBILITY BY REGULATING PARKING & ROAD USE

OBJECTIVE A. The land occupied by motor vehicles is minimized.

ECONOMIC DEVELOPMENT, AFFORDABLE HOUSING AND LAND USE

Economic Parameters

An economic analysis was conducted within the overall study area to understand the unique market conditions within each station walkshed. Utilizing the parameters defined in the Qualitative Station Area Assessment, the potential revenues were estimated for commercial, residential, and mixed use typologies throughout the corridor based on average unit prices in the current market (2021).

Affordable housing parameters were calculated using 80% of Area Mean Income (AMI) in order to identify the affordable rate for low income households. The unique characteristics of each station walkshed were also considered in order to define affordability for each community.

The analysis included an assessment of current market conditions to estimate the average market price of various typologies within each station walkshed. These values were converted to price per square foot and then applied to the parameters of each new construction outlined in the Qualitative Station Area Assessment. The final result consisted of the forecasted taxable revenue, as well as the distinct residential and commercial values for each building.

Affordable Housing

In order to assess affordable housing possibilities, an “Affordable Housing Rate” was developed for each station. This rate was calculated using 80% of AMI within each station and reflects the economic impact of affordable housing increases at 1% intervals. Each rate is unique to each station and the market conditions within each walkshed. The models primarily utilize a rate of 7% affordable units, but 15% and 50% models are also included to demonstrate the range of Affordable Housing possibilities.

Based on detailed and location-specific household data of the corridor, the study developed an understanding of neighborhood propensities for new housing. The potential market for new housing in the demonstration areas, and specifically affordable housing, was determined by the correlation of a number of factors—including, but not limited to: household mobility rates, income, lifestyle characteristics and housing preferences, the location of the study area, and the current housing market context. From the station area plans, a set of economic development scenarios were developed based on projected market for TOD.

Land Use Impacts

The station typologies (on the following page) were based on a review of current and future land use data for all relevant jurisdictions within the study area. Based on those typologies and the economic development parameters, high level urban design plans were generated to show how redevelopment could occur over time at each station area. Major elements of each plan include:

- Future building footprints (including appropriate orientation to the street)
- Parking density (garage parked vs. surface parked)
- Parking location (integrated with a building or behind the proposed building)
- New streets and street connections
- Intersection improvements to facilitate walking and biking within each station area
- Potential locations for stormwater/green/open space

Station Area Summaries

STATION: ROSEMARY SQUARE

Typology: Central Business District

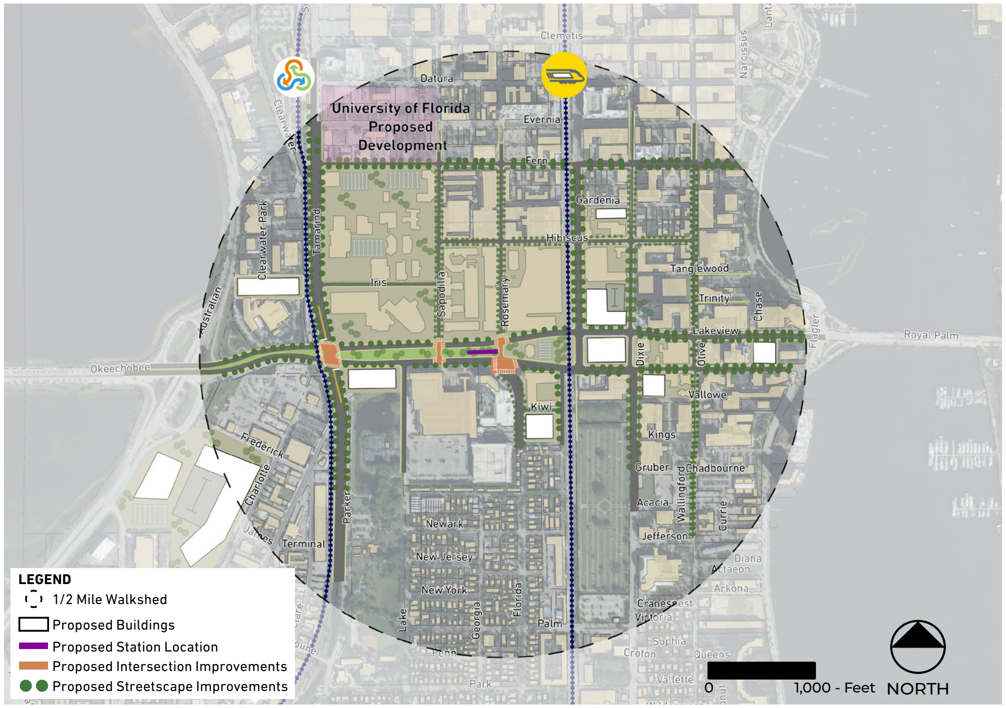


Figure 1: 4.

Station Area Projections

Potential New Residential
1,086 Homes
163 Affordable Units*

Potential New Commercial
2,960,453 SF

Estimated Ad Valorem Tax Revenue
$1,873,539,964

Potential New Employment
3,158 Jobs

Potential Total Parking
4,090 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

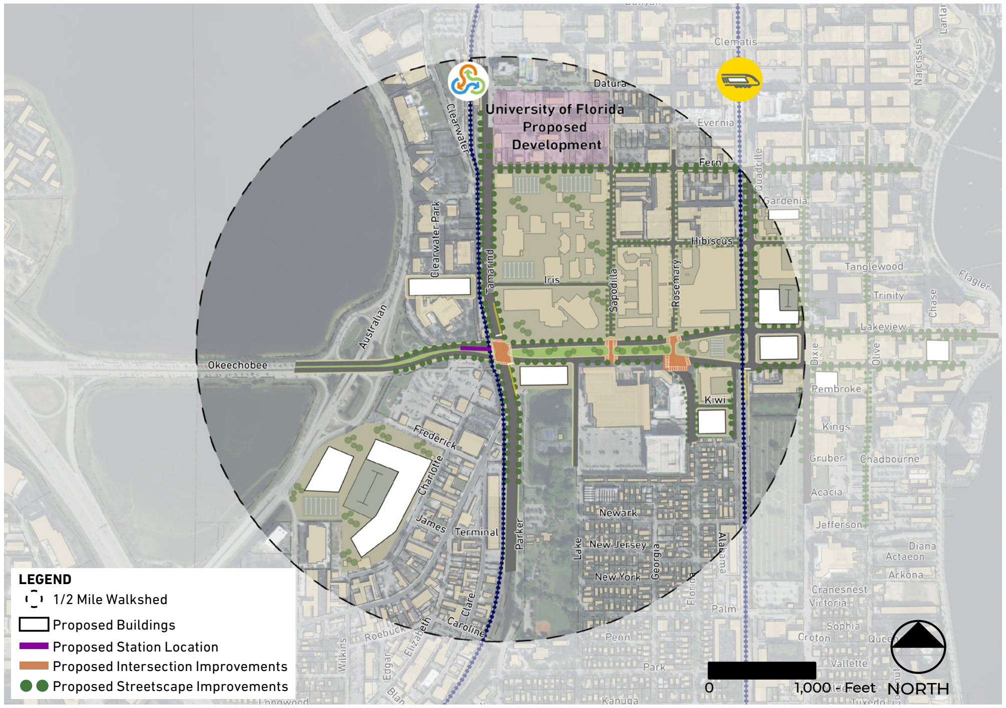
Key Considerations & Future TOD Vision

- Support opportunities for urban infill redevelopment within existing narrow blocks
- Establish multimodal connections to Downtown West Palm Beach, Palm Beach Atlantic University, Palm Beach County Convention Center, and future UF Campus
- Capitalize on location and access to Downtown West Palm Beach, Transit Oriented Village, Tri-Rail/Amtrak and Brightline
- Infill and capitalize on downtown West Palm Beach's capital investments and current land development practices
- Already developed in a transit-oriented fabric, this station area provides a fairly "TOD-ready" location with existing densities and access to existing forms of rail

Conceptual Vision
(Okeechobee Blvd near Quadrille Blvd)

STATION: TAMARIND AVENUE

Typology: Central Business District



Key Considerations & Future TOD Vision

- Support opportunities for urban infill redevelopment within existing narrow blocks
- Establish multimodal connections to Downtown West Palm Beach, Palm Beach Atlantic University, Palm Beach County Convention Center, and future UF Campus
- Capitalize on location and access to Downtown West Palm Beach, Transit Oriented Village, Tri-Rail/Amtrak and Brightline
- Infill and capitalize on downtown West Palm Beach's capital investments and current land development practices
- Already developed in a transit-oriented fabric, this station area provides a fairly "TOD-ready" location with existing densities and access to existing forms of rail

Station Area Projections

Potential New Residential
389 Homes
58 Affordable Units*

Potential New Commercial
101,178 SF

Estimated Ad Valorem Tax Revenue
$214,778,300

Potential New Employment
450 Jobs

Potential Total Parking
1,836 Spaces

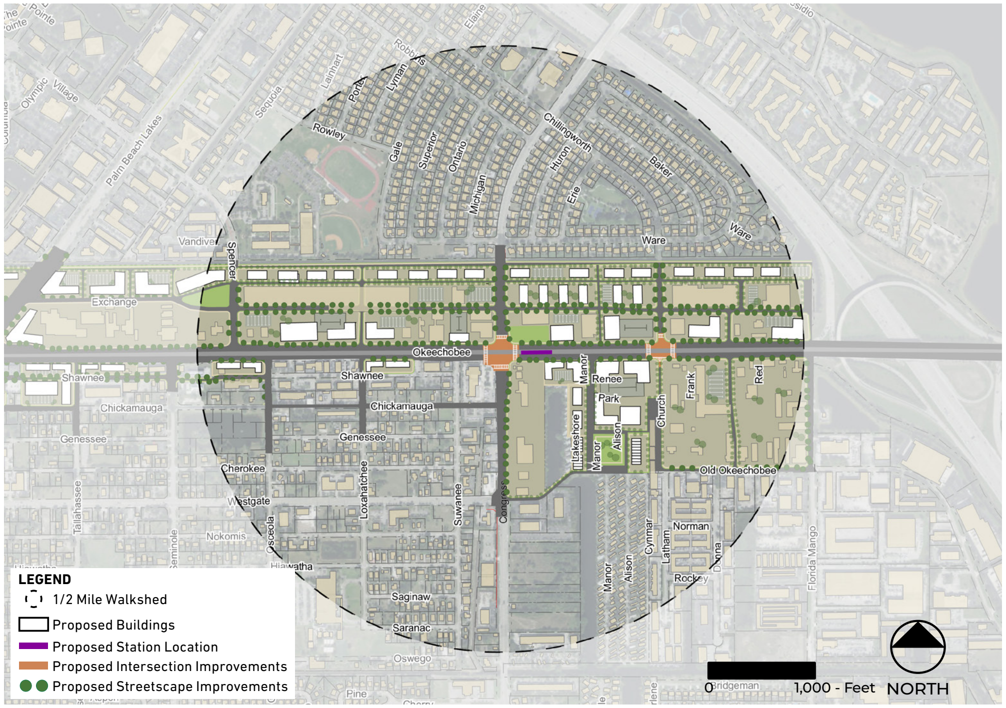
Development Market Score
HIGH

*Assumes 15% of the overall new residential

Conceptual Vision
(Okeechobee Blvd near Tamarind Ave)

STATION: CONGRESS AVENUE

Typology: District/Town Center



Key Considerations & Future TOD Vision

- Support opportunities for infill development and redevelopment of existing big box retail
- Connect development and station to the surrounding neighborhoods and amenities such as West Gate, Palm Beach Lakes and Cardinal Newman High School
- Develop secondary connections to Palm Beach International
- Airport
- Create multimodal connections to major regional access routes
- Create park and ride developments to support regional travelers utilizing I-95

Conceptual Vision
(Okeechobee Blvd near Congress Ave)

Station Area Projections

Potential New Residential
858 Homes
130 Affordable Units*

Potential New Commercial
608,384 SF

Estimated Ad Valorem Tax Revenue
$430,302,500

Potential New Employment
2,704Jobs

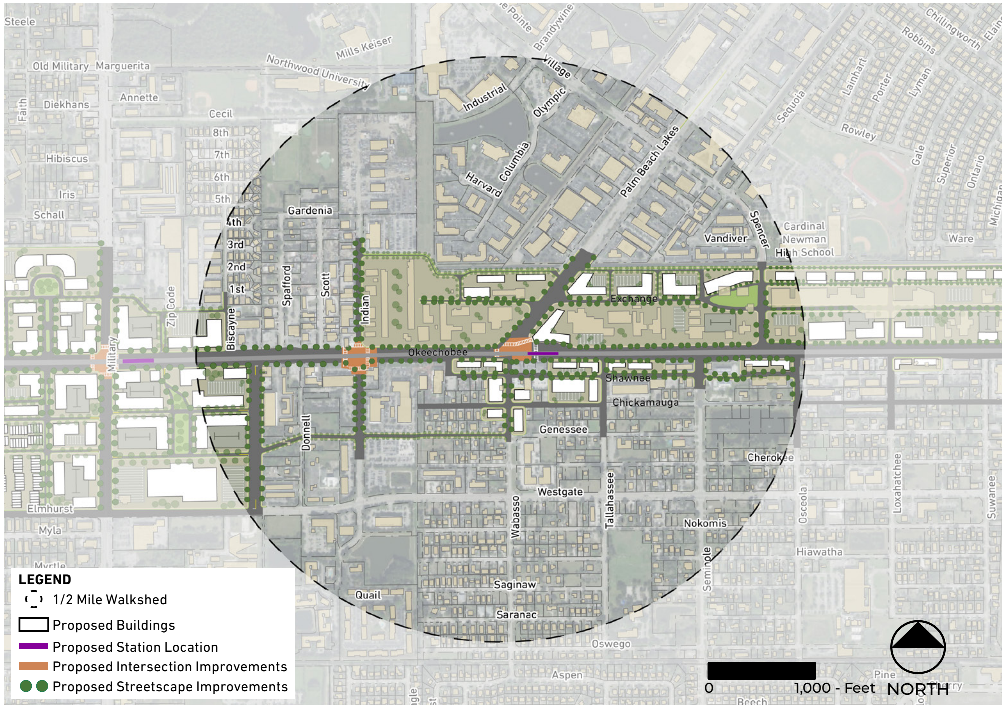
Potential Total Parking
2,949 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

STATION: PALM BEACH LAKES BLVD

Typology: Commercial Center



Key Considerations & Future TOD Vision

- Activate Palm Beach Lakes Boulevard intersection with new commercial uses.
- Redevelop and realign the Palm Beach Lakes Boulevard intersection to be more walkable and safe for users.
- Support redevelopment and infill developments of existing big box retail and car dealerships
- Create connections to the West Gate community and new access points for the community to access the station area and surrounding TOD
- Connect regional amenities such as Cardinal Newman High School, West Gate Community, Palm Beach Lakes and Palm Beach International Airport

Station Area Projections

Potential New Residential
230 Homes
35 Affordable Units*

Potential New Commercial
797,224 SF

Estimated Ad Valorem Tax Revenue
$261,075,400

Potential New Employment
3,453 Jobs

Potential Total Parking
3,317 Spaces

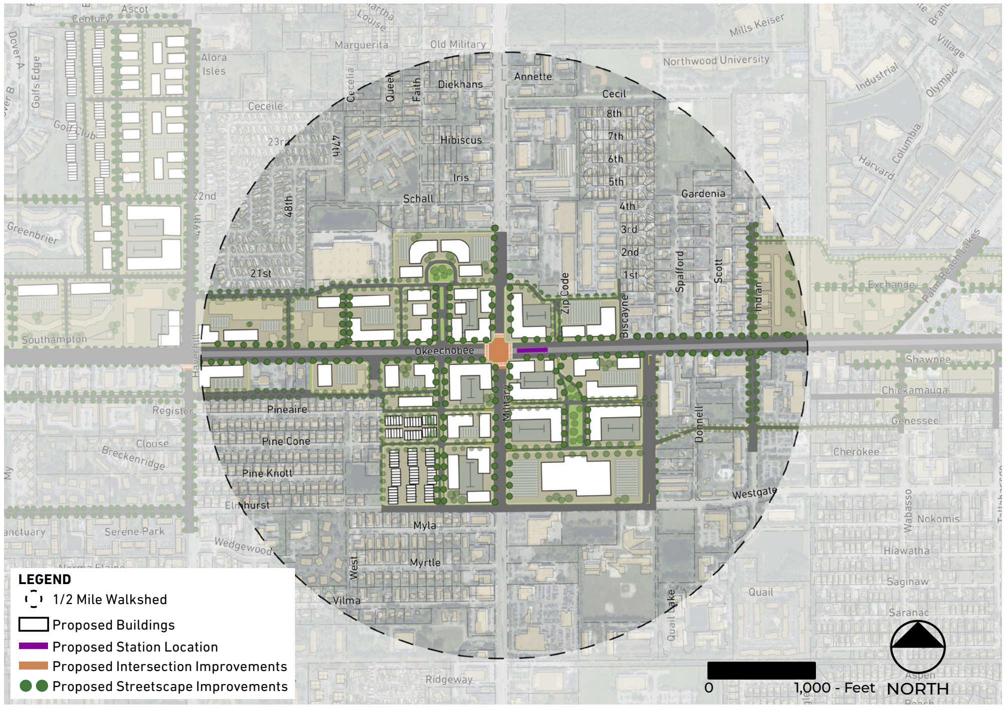
Development Market Score
MEDIUM

*Assumes 15% of the overall new residential

Conceptual Vision
(Okeechobee Blvd near Palm Beach Lakes Blvd)

STATION: MILITARY TRAIL

Typology: District/Town Center



Key Considerations & Future TOD Vision

- Support opportunities for infill redevelopment and redevelopment of big box retailers within the stations area
- Capitalize on the high ridership routes and transfers along Military Trail
- Connect and enhance regional routes and connections
- Develop TOD based around new commercial and mixed use opportunities along Military Trail and Okeechobee Boulevard, with an emphasis on stepping down and matching the local development patterns
- Enhance and create secondary connections along Westgate
- Avenue and new network developed along the north and south sides of the station area

Conceptual Vision
(Okeechobee Blvd at Military Trail)

Station Area Projections

Potential New Residential
1,086 Homes
163 Affordable Units*

Potential New Commercial
2,960,453 SF

Estimated Ad Valorem Tax Revenue
$621,270,750

Potential New Employment
13,158 Jobs

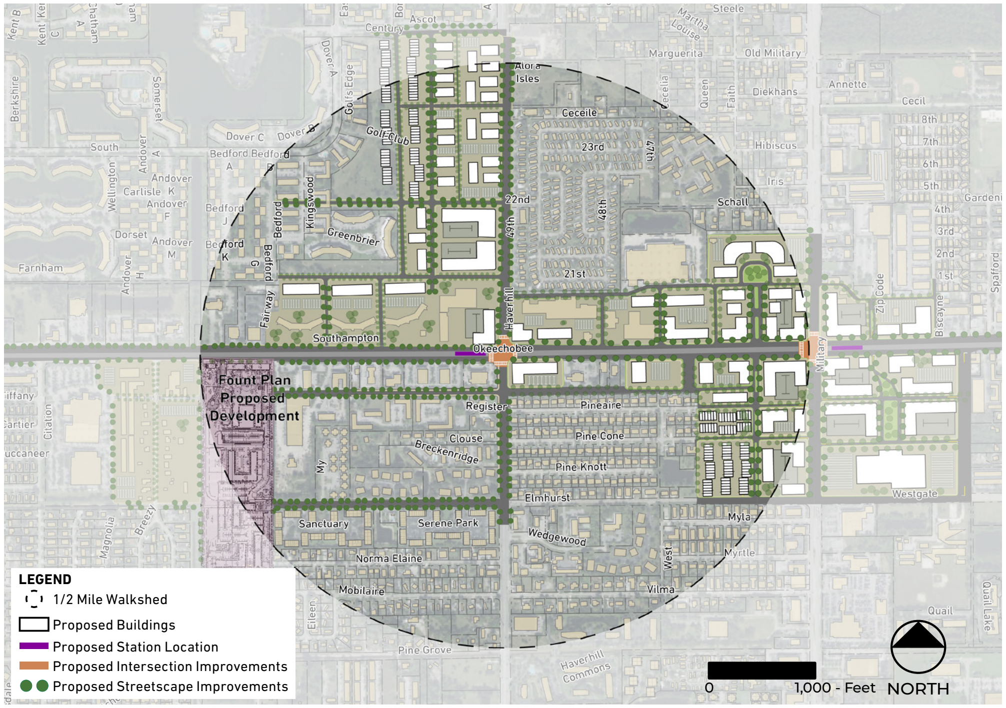
Potential Total Parking
9,531 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

STATION: HAVERHILL ROAD

Typology: Neighborhood Commuter



Key Considerations & Future TOD Vision

- Continue and capitalize on denser TOD development at the Military Trail Station
- Support and develop residential infill development to match existing developments to the north
- Capitalize on infill development opportunities within and at the big box retail sites along the north side
- Match and support infill development to the local community to the south of the proposed station area
- Connect secondary network to the Military Trail station to create a more connected network off of Okeechobee Boulevard along Westgate Avenue and Elmhurst Road

Station Area Projections

Potential New Residential
1,257 Homes
88 Affordable Units*

Potential New Commercial
587,276 SF

Estimated Ad Valorem Tax Revenue
$522,569,900

Potential New Employment
2,610 Jobs

Potential Total Parking
3,300 Spaces

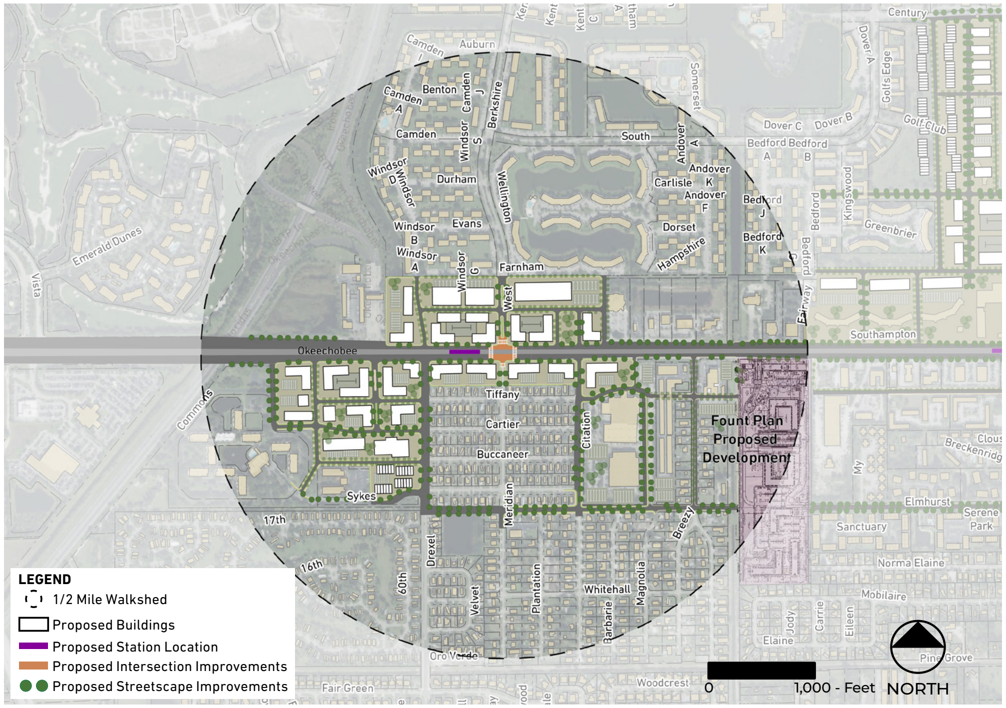
Development Market Score
MEDIUM

*Assumes 15% of the overall new residential

Conceptual Vision
(Okeechobee Blvd near Haverhill Rd)

STATION: MERIDIAN ROAD

Typology: Neighborhood Commuter



Key Considerations & Future TOD Vision

- Connect and enhance regional connections via the Florida Turnpike. With easy access to and from the Florida Turnpike, park-and-ride at this station will increase passenger activity for this location
- Develop vacant area southwest of the station will present a strong opportunity for large scale mixed-use development.
- Enhance secondary connections adjacent to Okeechobee to create a more complete network using Sykes Road to Elmhurst Road
- Support commercial and mixed use infill development adjacent to the proposed station area
- Encourage and match development to local scale to the south of the proposed station area

Station Area Projections

Potential New Residential
808 Homes
121 Affordable Units*

Potential New Commercial
807,446 SF

Estimated Ad Valorem Tax Revenue
$342,656,341

Potential New Employment
3,589 Jobs

Potential Total Parking
3,331 Spaces

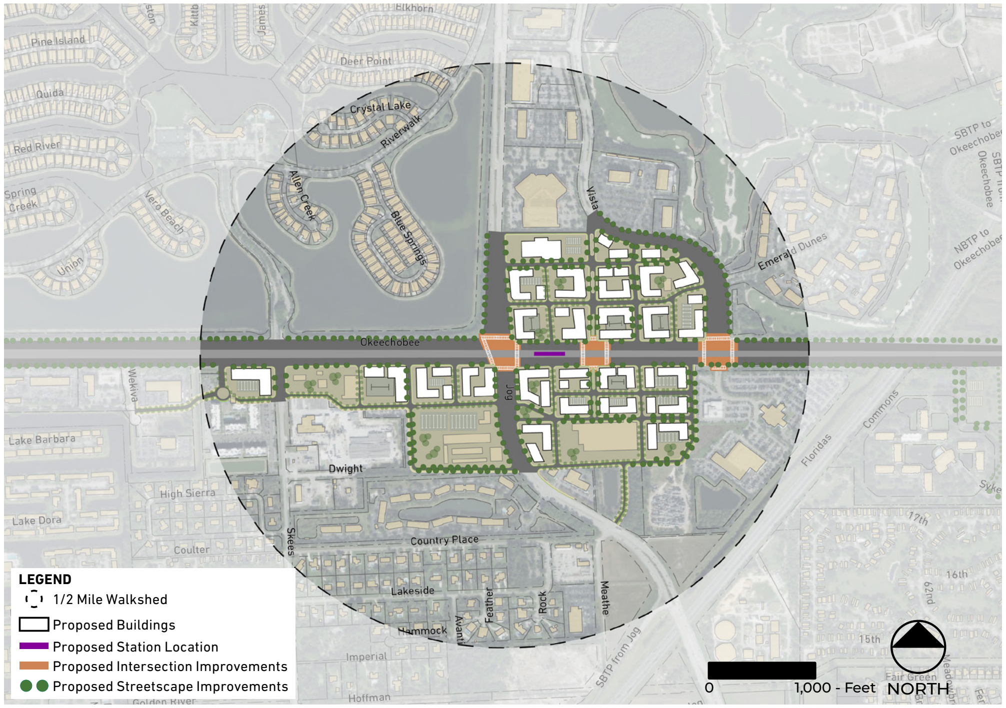
Development Market Score
HIGH

*Assumes 15% of the overall new residential

Conceptual Vision
(Okeechobee Blvd at Meridian Rd)

STATION: JOG ROAD

Typology: Commercial Center



Key Considerations & Future TOD Vision

- Connect and enhance regional connections via the Florida Turnpike. With easy access to and from the Florida Turnpike, park-and-ride at this station will increase passenger activity for this location
- Support commercial and mixed use infill development adjacent to the proposed station area
- Enhance regional connections to local destinations and amenities along Jog Road
- Match and support ongoing mixed use developments along the south side of Okeechobee Boulevard
- Develop a dense multimodal network and development to the northwest in underutilized properties

Station Area Projections

Potential New Residential
1,505 Homes
226 Affordable Units*

Potential New Commercial
1,398,861 SF

Estimated Ad Valorem Tax Revenue
$740,795,850

Potential New Employment
6,217 Jobs

Potential Total Parking
3,640 Spaces

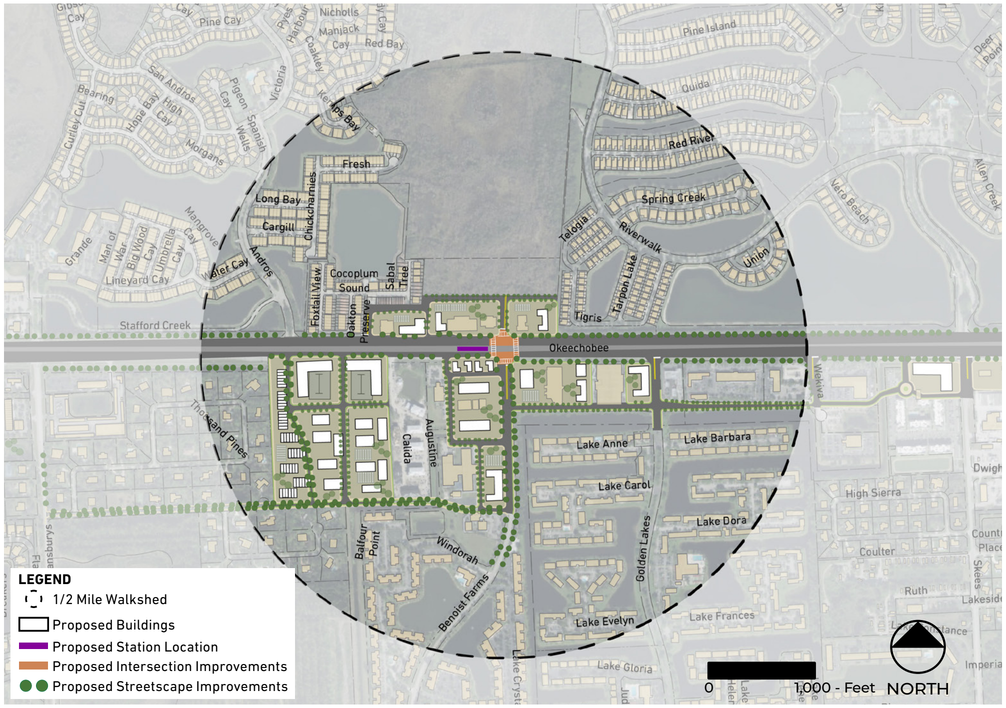
Development Market Score
HIGH

*Assumes 15% of the overall new residential

Conceptual Vision
(Okeechobee Blvd near Jog Rd)

STATION: BENOIST FARMS ROAD

Typology: Neighborhood Commuter



Key Considerations & Future TOD Vision

- Support opportunities for rural infill redevelopment within the existing rural development patterns
- Enhance the current park-and-ride locations to capitalize on high commuter ridership opportunity
- Develop commercial and mixed use opportunities around the proposed station to meet the needs of the local community and riders
- Match community development patterns with new residential developments to the southwest of the proposed station.
- Create secondary network opportunities to enhance and complete the station area along Thousand Pines Drive

Station Area Projections

Potential New Residential
422 Homes
63 Affordable Units*

Potential New Commercial
561,667 SF

Estimated Ad Valorem Tax Revenue
$255,222,350

Potential New Employment
2,496 Jobs

Potential Total Parking
1,553 Spaces

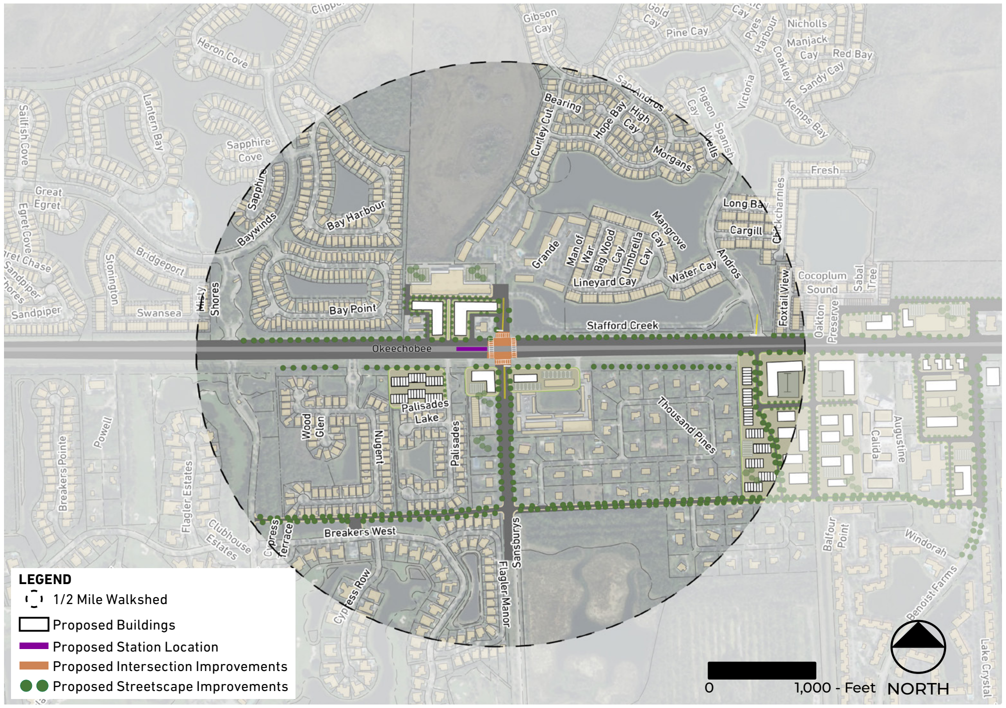
Development Market Score
LOW

*Assumes 15% of the overall new residential

Conceptual Vision
(Okeechobee Blvd near Benoist Farms Rd)

STATION: SANSBURY WAY

Typology: Neighborhood Commuter



Key Considerations & Future TOD Vision

- Support and create infill development surrounding the Publix, with mixed use active street frontage developments
- Develop park-and-ride locations to capitalize on high commuter ridership opportunity
- Develop commercial and mixed use opportunities around the proposed station to meet the needs of the local community and riders
- Match community development patterns with new residential developments to the southeast of the proposed station
- Create secondary network opportunities to enhance and complete the station area along Thousand Pines Drive

Conceptual Vision
(Okeechobee Blvd near Sansbury Way)

Station Area Projections

Potential New Residential
217 Homes
33 Affordable Units*

Potential New Commercial
199,325 SF

Estimated Ad Valorem Tax Revenue
$80,719,250

Potential New Employment
886 Jobs

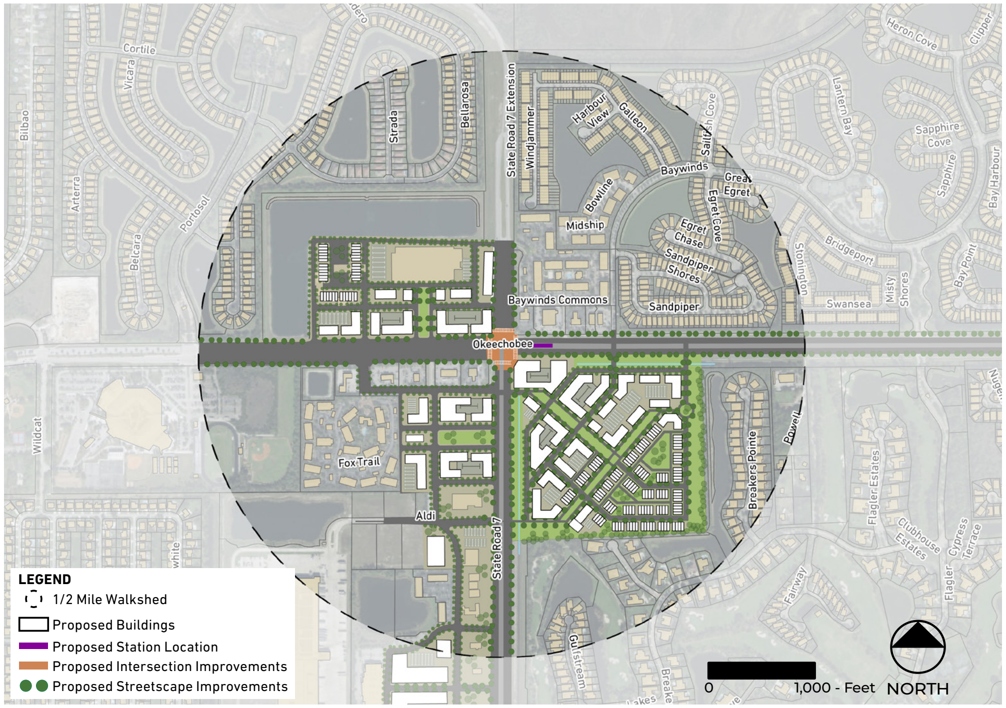
Potential Total Parking
641 Spaces

Development Market Score
LOW

*Assumes 15% of the overall new residential

STATION: STATE ROAD 7

Typology: District/Town Center



Station Area Projections

Potential New Residential
1,291 Homes
194 Affordable Units*

Potential New Commercial
1,027,694 SF

Estimated Ad Valorem Tax Revenue
$632,017,500

Potential New Employment
5,568 Jobs

Potential Total Parking
4,152 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

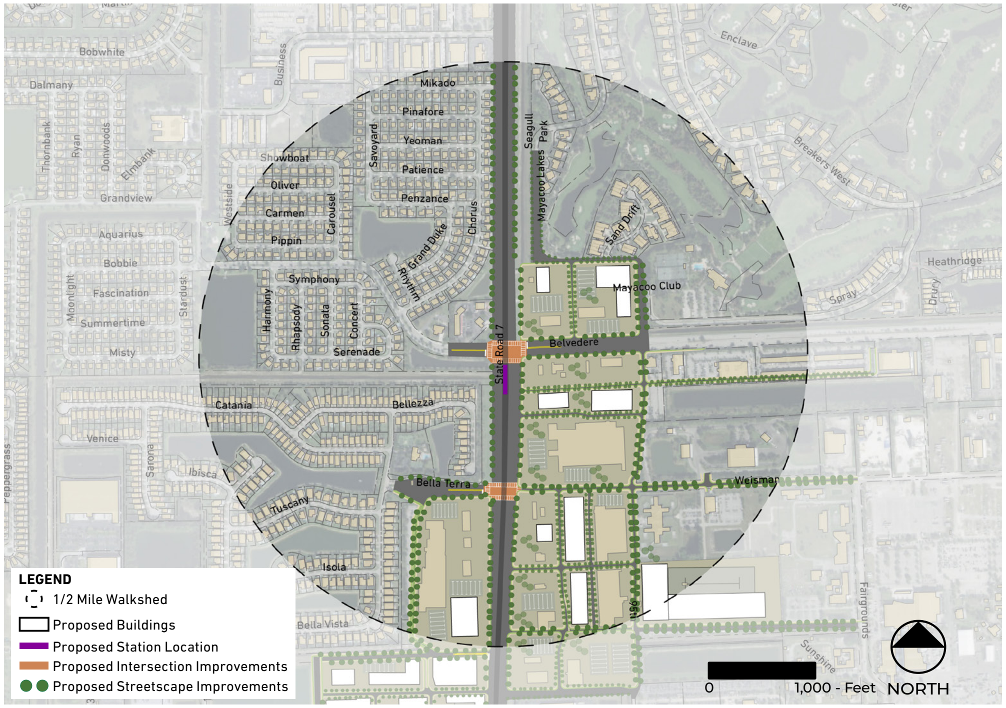
Key Considerations & Future TOD Vision

- Develop new mixed use walkable development southeast of the station area, with multimodal connections and direct access to the proposed station area
- Support infill development and development of underutilized areas northwest of the station area
- Develop destinations and amenities such as parks, green ways, active store frontages to enhance and support ridership
- Create park-and-ride locations to support commuter ridership from the western communities
- Enhance regional connections along State Road 7
- Create secondary networks adjacent to Okeechobee Boulevard and State Road 7

Conceptual Vision
(Okeechobee Blvd at State Road 7)

STATION: BELVEDERE RD

Typology: Commercial Center



Key Considerations & Future TOD Vision

- Create opportunities for infill development of currently underutilized spaces within the proposed study area
- Develop new local commercial and mixed use developments to support the surrounding neighborhoods
- Create new multimodal connections from the proposed station to connect the surrounding neighborhoods
- Develop connections and enhancements to the current amenities= and destinations such as South University, West Palm Beach and ITHINK Financial Amphitheater
- Enhance local and regional connections along Belvedere Road and the recommended new secondary roadway network at 95th Avenue and the newly created network to the west

Station Area Projections

Potential New Residential
459 Homes
69 Affordable Units*

Potential New Commercial
1,140,630 SF

Estimated Ad Valorem Tax Revenue
$407,626,950

Potential New Employment
5,063 Jobs

Potential Total Parking
3,057 Spaces

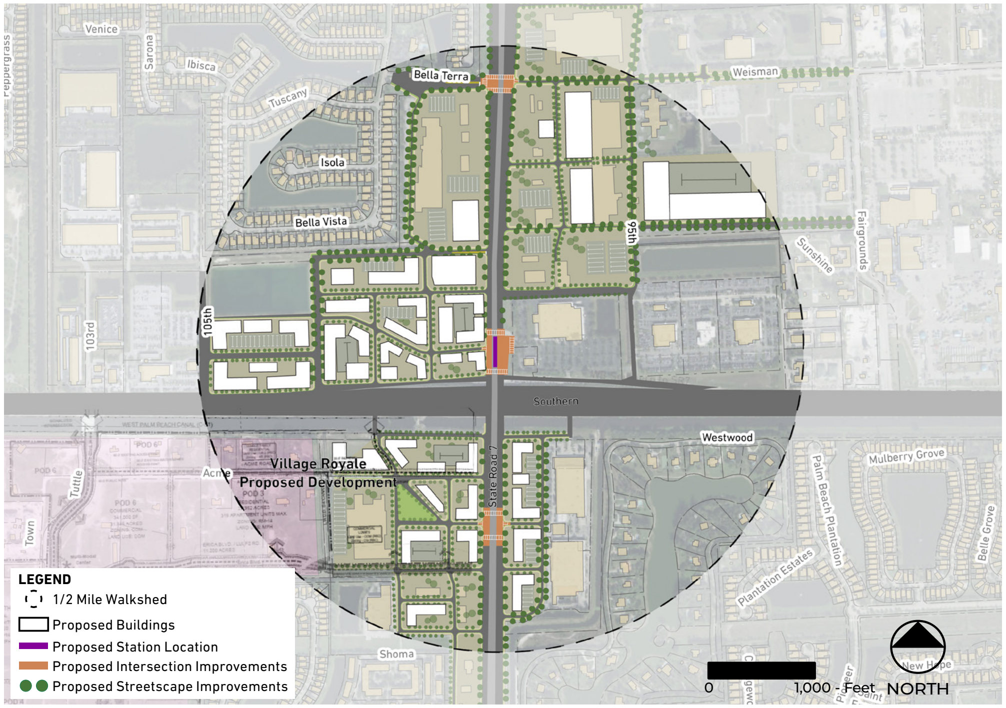
Development Market Score
MEDIUM

*Assumes 15% of the overall new residential

Conceptual Vision
(State Road 7 near Belvedere Rd)

STATION: SOUTHERN BLVD

Typology: Commercial Center



Station Area Projections

Potential New Residential
1,256 Homes
190 Affordable Units*

Potential New Commercial
2,026,085 SF

Estimated Ad Valorem Tax Revenue
$785,233,250

Potential New Employment
9,005 Jobs

Potential Total Parking
5,885 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

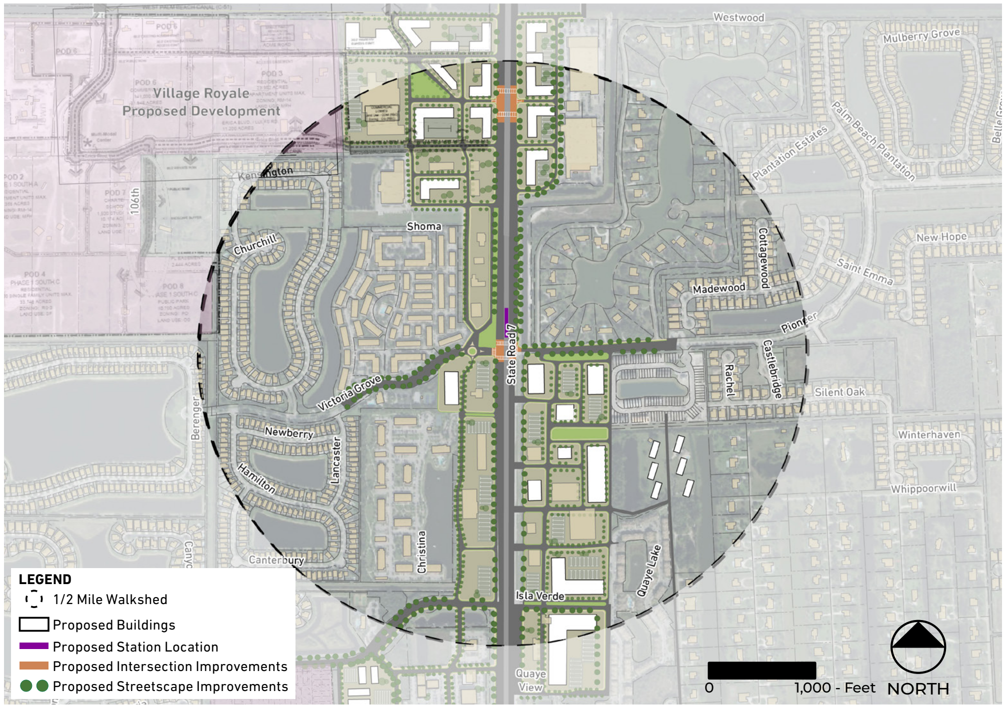
Key Considerations & Future TOD Vision

- Capitalize on current TOD development under active construction to the west and connect it to proposed station area developments
- Support infill development and development of underutilized areas adjacent to the station area
- Develop destinations and amenities such as parks, green ways, active store frontages to enhance and support ridership
- Create park-and-ride locations to support commuter ridership from regional routes such as Southern Boulevard
- Develop connections and enhancements to the current amenities and destinations such as Expo Center at the South Florida Fairgrounds and ITHINK Financial Amphitheater


Conceptual Vision
(State Road 7 near Quadrille Blvd)

STATION: VICTORIA GROVES BLVD

Typology: Neighborhood Commuter



Key Considerations & Future TOD Vision

- Continue and support opportunities for rural TOD development directly adjacent to the station
- Connect and enhance the secondary network adjacent to SR7 by developing connections along the western and eastern developments
- Support infill development of underutilized areas adjacent to the station area
- Develop park-and-ride locations to capitalize on high commuter ridership opportunity
- Develop commercial and mixed use opportunities around the proposed station to meet the needs of the local community and riders

Station Area Projections

Potential New Residential
102 Homes
15 Affordable Units*

Potential New Commercial
124,762 SF

Estimated Ad Valorem Tax Revenue
$55,619,500

Potential New Employment
554 Jobs

Potential Total Parking
386 Spaces

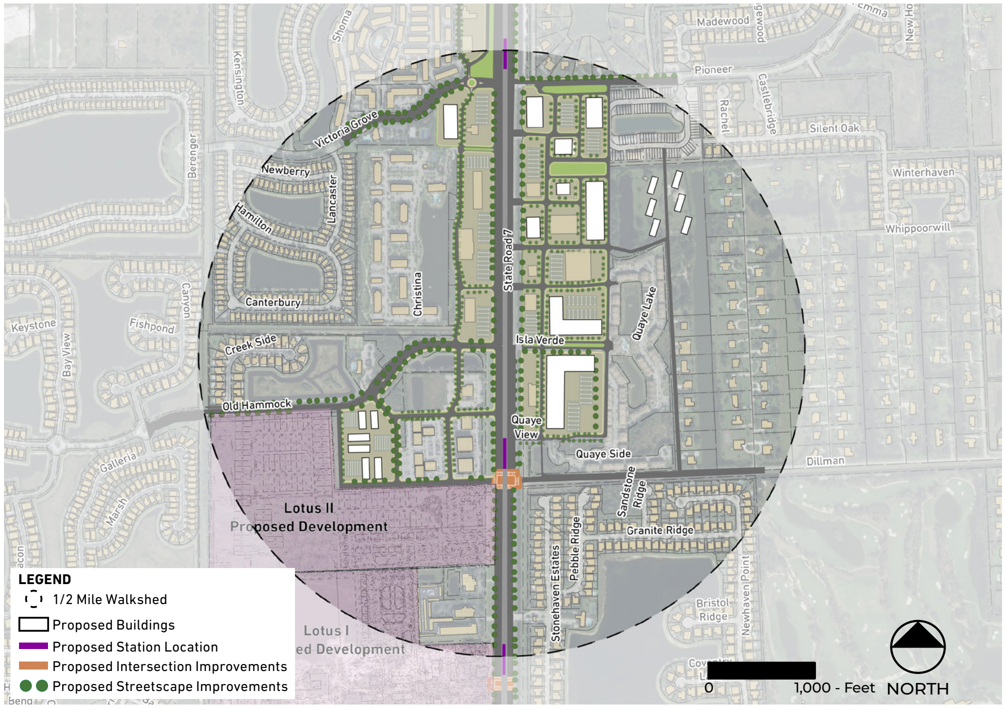
Development Market Score
LOW

*Assumes 15% of the overall new residential

Conceptual Vision
(State Road 7 near Victoria Groves Blvd)

STATION: OLD HAMMOCK WAY

Typology: Neighborhood Commuter



Key Considerations & Future TOD Vision

- Create connection to the active developments at the Wellington Regional Medical Center station area
- Connect and enhance the secondary network adjacent to SR7 by developing connections along the western and eastern developments
- Support infill development of underutilized areas adjacent to the station area
- Develop park-and-ride locations to capitalize on high commuter ridership opportunity
- Develop commercial and mixed use opportunities around the proposed station to meet the needs of the local community and riders

Conceptual Vision
(State Road 7 near Old Hammock Way)

Station Area Projections

Potential New Residential
178 Homes
12 Affordable Units*

Potential New Commercial
340,880 SF

Estimated Ad Valorem Tax Revenue
$208,323,000

Potential New Employment
1,515 Jobs

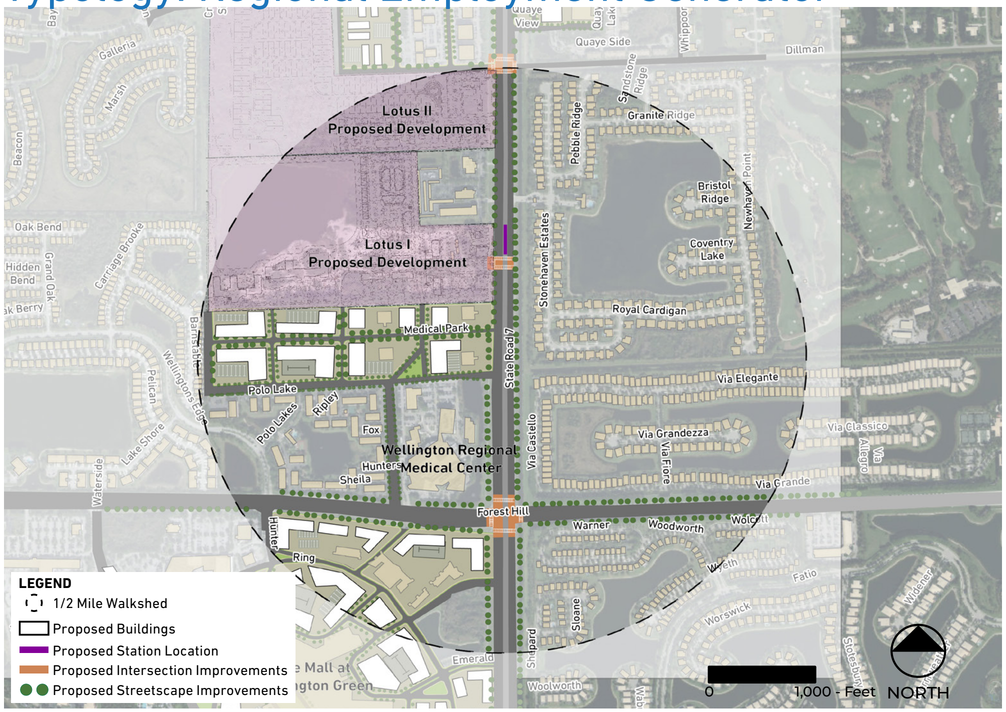
Potential Total Parking
1,366 Spaces

Development Market Score
LOW

*Assumes 15% of the overall new residential

STATION: WELLINGTON REGIONAL MEDICAL CENTER

Typology: Regional Employment Generator



Key Considerations & Future TOD Vision

- Provide multimodal connectivity to the regional medical center and offices
- Capitalize on active developments and compliment current designs with further TOD development
- Emphasize crossing connections from the wellington mall to the medical center
- Concentrate retail and mixed-use development near major employment centers
- Create new crossing opportunities to surrounding neighborhoods
- Support infill development of underutilized areas adjacent to the station area

Conceptual Vision

(State Road 7 at near Quaye Side)

Station Area Projections

Potential New Residential
1,444 Homes
101 Affordable Units*

Potential New Commercial
938,651 SF

Estimated Ad Valorem Tax Revenue
$1,306,767,750

Potential New Employment
4,172 Jobs

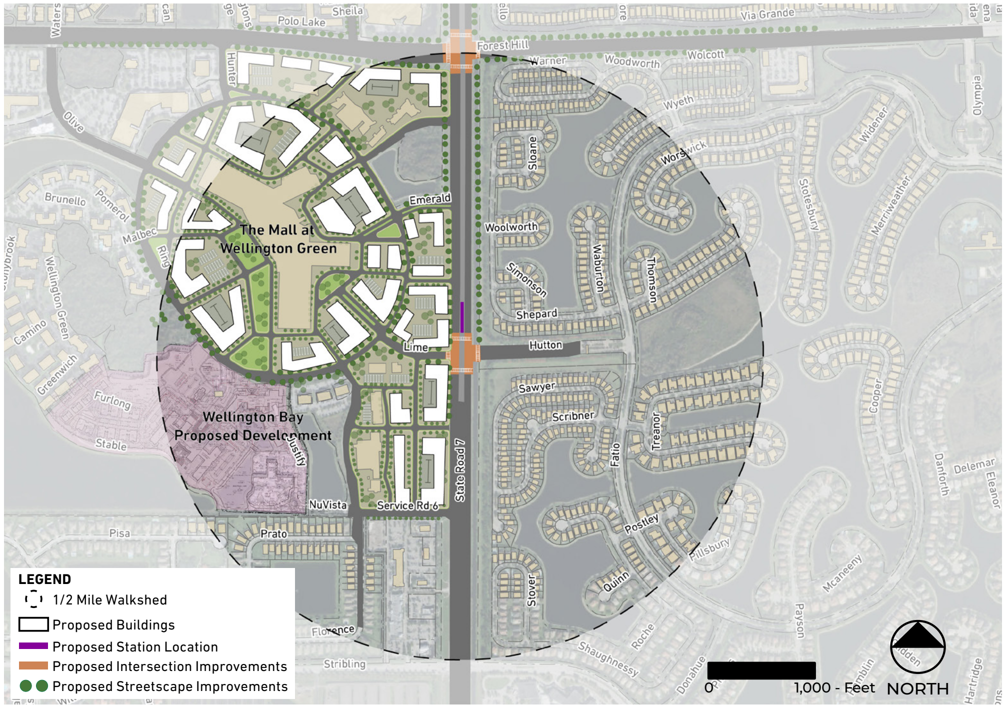
Potential Total Parking
7,625 Spaces

Development Market Score
MEDIUM

*Assumes 15% of the overall new residential

STATION: LIME DRIVE

Typology: District/Town Center



Key Considerations & Future TOD Vision

- Support opportunities for urban infill redevelopment within the Wellington Green Mall Site
- Concentrate mixed-use and multi-family development along the SR 7 corridor
- Support new infill development through new roadway connections adjacent to the corridor
- Create additional multimodal connections to existing residential areas
- Create connections to the current multimodal transfer center to the west of the proposed station
- Develop park-and-ride sites to allow for end of line users to utilize the proposed station

Station Area Projections

Potential New Residential
2,527 Homes
177 Affordable Units*

Potential New Commercial
1,885,245 SF

Estimated Ad Valorem Tax Revenue
$1,459,112,250

Potential New Employment
8,379 Jobs

Potential Total Parking
6,487 Spaces

Development Market Score
HIGH

*Assumes 15% of the overall new residential

Conceptual Vision
(State Road 7 at Lime Drive)

Intentionally Blank

Next Steps

WHERE DO WE GO FROM HERE?

Establishing a desired concept is only a small step towards implementing any enhancements towards a much larger series of steps in the transit development process. Many different stakeholders are currently engaged but their attention must be retained throughout a series of projects, analysis, and key questions are answered between now and implementation. The goal before establishing a desired date for launch is to work collaboratively to enhance existing service for current riders, which will generate greater ridership and demand for enhanced transit service.

Different alternatives could be realized as the community works towards accomplishing the desired concept. As service and operational enhancements generate additional ridership. There are three key steps to accomplishing the first major step towards an enhanced, dedicated service in the study area.

Implement Projects

- Transit Signal Priority
- Enhanced Transit Shelters
- Service Enhancements consistent with the Palm Tran Transit Development Plan

Land Use & Economic Development

- Share Recommendations with Local Stakeholders
- Re-orient land use and zoning configurations to align with TOD station areas

Further Analyze & Refine

- FDOT to conduct detailed analysis of transit vision and alternatives
- Options to increase safe, convenient and connected walking, bicycling, and transit improvements along the corridor.

SUCCESSFUL TOD NEXT STEPS

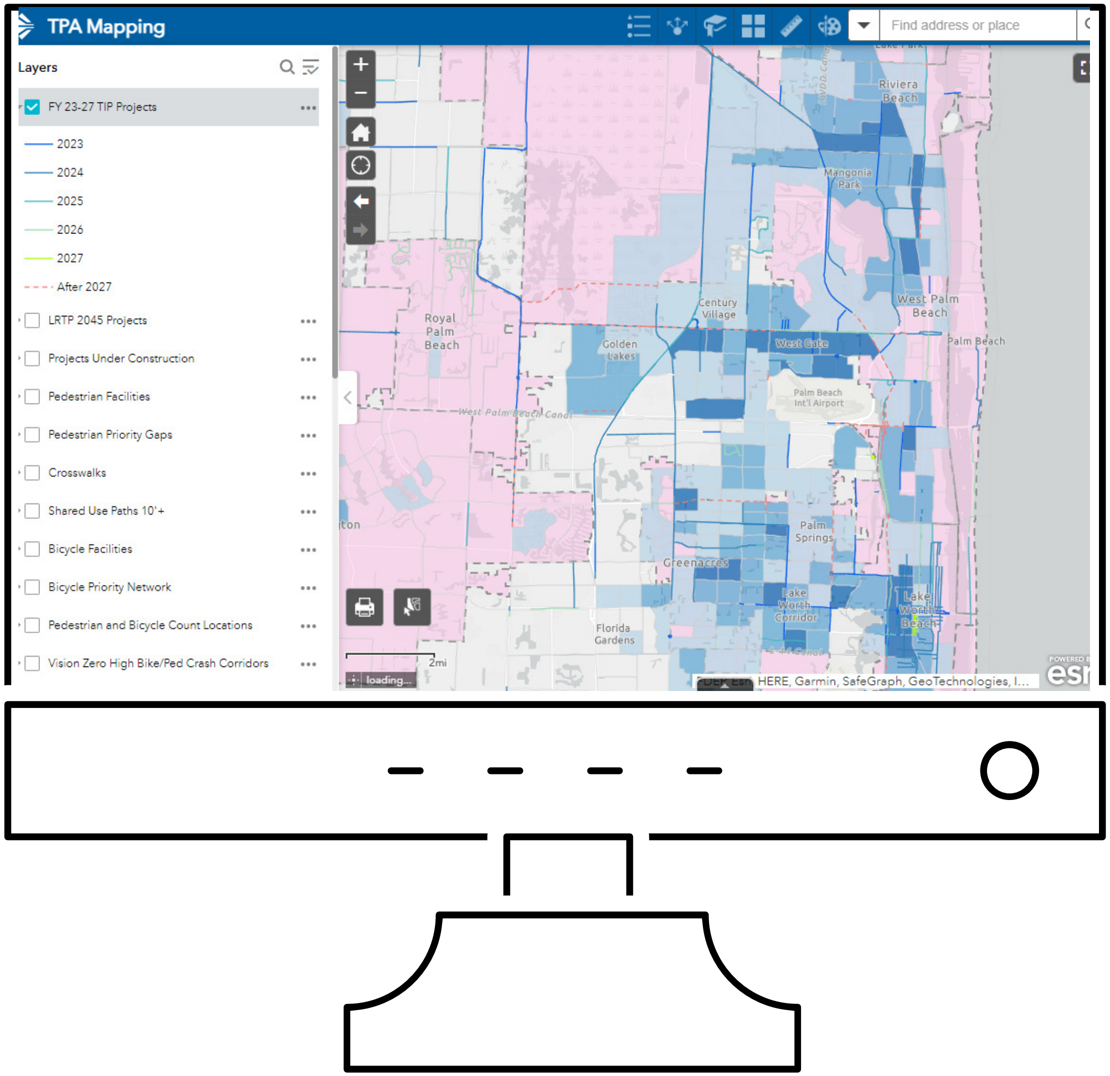
Two critical components of any transit-oriented development implementation strategy are

1) Supportive infrastructure investment and;

2) TOD zoning and development regulations.

These are essential tools to implement compact, walkable and bikeable development with high-quality public spaces and a vibrant mix of uses that engage transit users and community members.

The proposed station area plans are not prioritized in any way with regards to infrastructure but are intended to begin the conversations around TOD, The plans illustrate the important infrastructure ideas to support future TOD. Local municipal partners, FDOT, and Palm Tran are the most likely implementing agencies for future infrastructure improvements and should reference these station area plans as they develop their future capital investment plans or as they partner with private development and redevelopment projects.



Funding the Vision

Funding is necessary for the vision to ultimately become a reality. Several different funding sources will be explored moving forward, to include a variety of federal, state, and local options for transit capital investments.

Federal Resources

- Federal Transit Administration (FTA) Capital Investment Grants (CIG) Program, which provides funding for transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and BRT. Federal transit law requires transit agencies seeking CIG funding to complete a series of steps over several years. For New Starts and Core Capacity projects, the law requires completion of two phases in advance of receipt of a construction grant agreement – Project Development and Engineering. For Small Starts projects, the law requires completion of one phase in advance of receipt of a construction grant agreement – Project Development. The law also requires projects to be rated by FTA at various points in the process according to statutory criteria evaluating project justification and local financial commitment (For more on the requirements for this program, see Appendix C.)
- Discretionary Grants Program: There are several discretionary grants that are applicable for funding transit investments to include:
- Rebuilding America Infrastructure with Sustainability and Equity (RAISE).The eligibility requirements of RAISE allow project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. RAISE can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional Federal programs which provide funding to very specific groups of applicants (mostly State DOTs and transit agencies).This flexibility allows USDOT and partners at the State and local levels to work directly with a host of entities that own, operate, and maintain transportation infrastructure, but otherwise cannot turn to the Federal government for support.
- Strengthening Mobility and Revolutionizing Transportation (SMART).The SMART program was established to provide grants to eligible public sector agencies to conduct demonstration projects focused on advanced smart community technologies and systems in order to improve transportation efficiency and safety.

State Resources

- State New Starts Funding: Provides up to 50% of the non-federal match for projects that successfully obtain FTA CIG funding
- STTF
- DDR Funding for Transit Operations
- Other Capital Sources
- Legislative Earmarks

Local Revenues

- Bonds
- Surtaxes
- Other