FDOT DISTRICT 7

BICYCLE AND PEDESTRIAN FACILITY PLAN



2026 UPDATE

FDOT

CONTENTS

Report Structure 1
- Introduction
- Local Agency Plans
- Existing Conditions
- Planning & Design Guidance
- Next steps

Introduction 2
- Purpose & Need
- Intended Outcomes
- Plan Development

Local Agency Plans 5
- Local Plans

Existing Conditions 18
- Demographics
- Roadway Characteristics
- Crash Analysis
- Existing Infrastructure

Planning & Design Guidance 71
- Pedestrian Facilities
- Pedestrian Gap Assessment
- Bicycle Facilities
- Intersection Geometry
- Next Steps

Appendix A: Roadway Characteristics by County 126
- Access Classification on State Roads by County
- County Lanes and Traffic Volumes
- Posted Speed Limits on State Roads by County
- Existing Crossing Spacing on State Roads by County

Appendix B: Level of Traffic Stress Flowcharts 152
- Level of Traffic Stress Flowcharts

Appendix C: Reference Guide to Bicycle Facility Selection 155
- Reference Guide to Bicycle Facility Selection

REPORT STRUCTURE



INTRODUCTION

This section sets out the purpose and need of the 2026 update to the Bicycle and Pedestrian Facility Plan (referred to as the Plan).



LOCAL AGENCY PLANS

This section summarizes the local agency engagement, including the outreach conducted as part of this Plan update. This involved a review of local walking and bicycling plans to incorporate identified needs and priorities. By mapping out these local networks, District 7 can proactively plan to create a holistic bicycle and pedestrian network.



EXISTING CONDITIONS

Existing conditions were assessed to understand existing facilities for people walking and bicycling. This created a baseline to understand the available infrastructure and related land uses, demographics, and crash history.



PLANNING & DESIGN GUIDANCE

The latest technical guidance was reviewed to identify best practices for District 7 to incorporate during planning, design, and implementation of bicycle and pedestrian projects.



NEXT STEPS

This section outlines the next steps and actions for District 7 to continue to create a connected and safe network for people walking and bicycling. Local agencies are able to build upon this Plan and assist in bicycle and pedestrian implementation by prioritizing projects.



Source: Kittelson

INTRODUCTION

The Florida Department of Transportation (FDOT) District 7's Bicycle and Pedestrian Facility Plan was initially completed in 2019. Since then, District 7 has continued to improve and expand the multimodal transportation network throughout the five-county region, which is comprised of Citrus, Hernando, Hillsborough, Pasco, and Pinellas counties and includes the cities of Tampa, St. Petersburg, and Clearwater. District 7 spans a variety of contexts, including downtown urban centers, suburban neighborhoods, coastal communities, rural towns, and wildlife preserves. As such, the multimodal infrastructure throughout the District must reflect these changing contexts and serve the needs of the various communities. This updated Plan reflects the incremental steps completed and facilities constructed since 2019, as well as incorporates the latest local agency planning efforts, design standards, and guidance. This document will guide FDOT staff and local agency partners in support of the planning and implementation of bicycle and pedestrian projects throughout District 7.

PURPOSE & NEED

The state roadway network plays a critical role in non-motorized travel. Improving bicycle and pedestrian service on the state road network promotes a variety of positive outcomes, such as access to essential jobs, destinations, and social opportunities.

> FDOT's vision is to provide a transportation network that is well-planned and supports economic growth with a goal of being congestion and fatality-free.

INCREASE ACCESS

This Plan is intended to identify bicycle and pedestrian infrastructure solutions that align with the function of the roadway and its surrounding land use context. It also distinguishes facilities that support regional mobility from those that provide localized circulation and access. When combined with thoughtful land development, multimodal infrastructure can improve vehicular travel conditions by supporting trips that can be made by walking, biking, and using transit.

IMPROVE SAFETY

Designing and operating roadways to emphasize safe bicycle and pedestrian access and mobility will help FDOT achieve its vision of Target Zero with a fatality-free transportation network.

SPUR ECONOMIC DEVELOPMENT

A network of streets designed for all modes enhances community connectedness, access to services, and recreational opportunities. Transportation investments can spur corresponding development investments that support a variety of uses and development types.

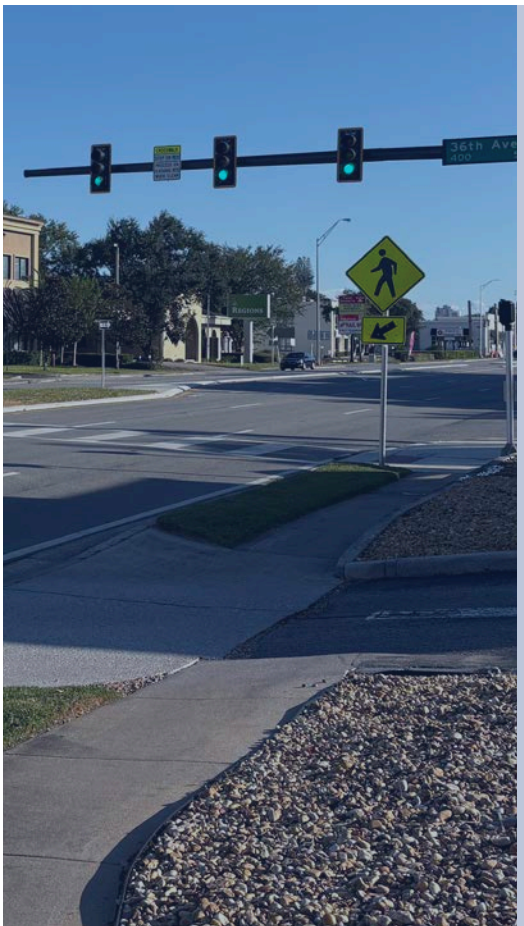
SEAMLESS EXPERIENCE

A well-planned network allows for a continuous experience for people walking and bicycling in District 7. This Plan included collaboration with all four MPO/TPOs to understand regional and local priorities and support seamless integration of travel modes across the region.

INTENDED OUTCOMES

This Plan is intended to be used in the following three ways:

- Proactively identify critical needs.
- Identify appropriate bicycle and pedestrian facilities for state roadway network.
- Serve as a guide to implementation as future opportunities arise.



Source: Kittelson

PLAN DEVELOPMENT

This Plan considers the range of users, needs, and contexts that exist throughout District 7. Local agency plans and interviews with stakeholders provide information on local planned bicycle facility types and their interaction with the state roadway network. An inventory of existing facilities provides an overview of conditions for bicyclists and pedestrians on state roads throughout the District. Next, programmed or committed projects are incorporated into the network recognizing ongoing improvements in design or construction.

Guidance is then provided on how and where to apply the bicycle and pedestrian treatments based on criteria in the FDOT *Design Manual* (FDM) and the *Traffic Engineering Manual* (TEM), identifying preferred facilities and crossing frequencies in each context. Building off the existing conditions and preferred facilities, an assessment identifies gaps in the current bicycle and pedestrian network, including locations with no facilities and locations with less desirable facilities. This overall process is summarized in Figure 1.

FDOT DESIGN MANUAL



FDOT TRAFFIC ENGINEERING MANUAL

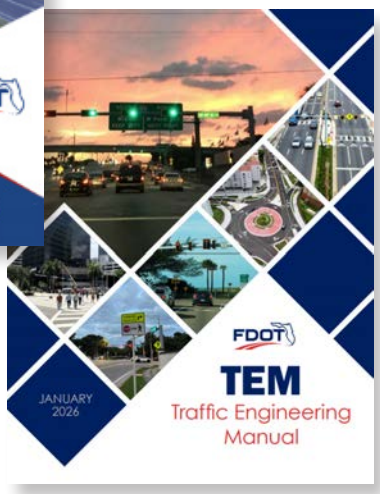
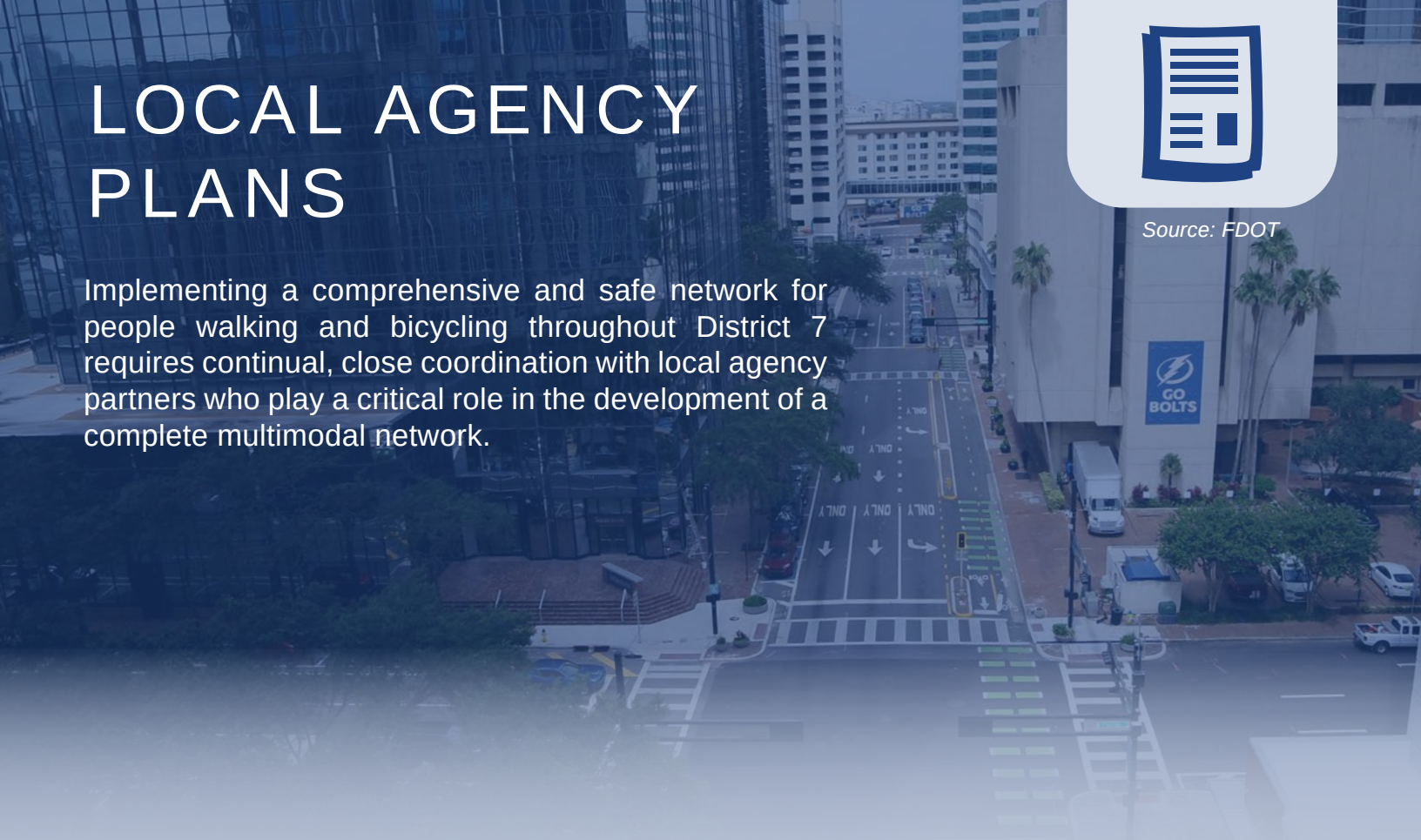


FIGURE 1. PLAN DEVELOPMENT PROCESS

1. **GATHER LOCAL AGENCY PARTNER VISION NETWORKS**
2. **IDENTIFY EXISTING FACILITIES ON STATE ROADS**
3. **IDENTIFY PROGRAMMED FACILITIES THAT FILL GAPS ON STATE ROADS**
4. **CREATE FACILITY SELECTION RECOMMENDATIONS**
5. **IDENTIFY GAPS OR SUBSTANDARD FACILITIES ON STATE ROADS**

LOCAL AGENCY PLANS

Implementing a comprehensive and safe network for people walking and bicycling throughout District 7 requires continual, close coordination with local agency partners who play a critical role in the development of a complete multimodal network.



Source: FDOT

STAKEHOLDER INTERVIEWS

During the development of this Plan, the following stakeholders were interviewed:

- Forward Pinellas
- Pasco County MPO
- Hillsborough TPO
- Hernando/Citrus MPO

The goal of the interviews was to outline the goals of the Plan update and gather regional and local data.

FORWARD PINELLAS

Hillsborough TPO
Transportation
Planning Organization

PASCO COUNTY MPO FLORIDA

MPO
METROPOLITAN PLANNING ORGANIZATION
HERNANDO / CITRUS

LOCAL PLANS

A review of pedestrian and bicycle plans and planned projects provided an understanding of the type of bicycle and pedestrian network communities desire and are working to implement. A summary of the plans reviewed is organized by agency.

PINELLAS COUNTY

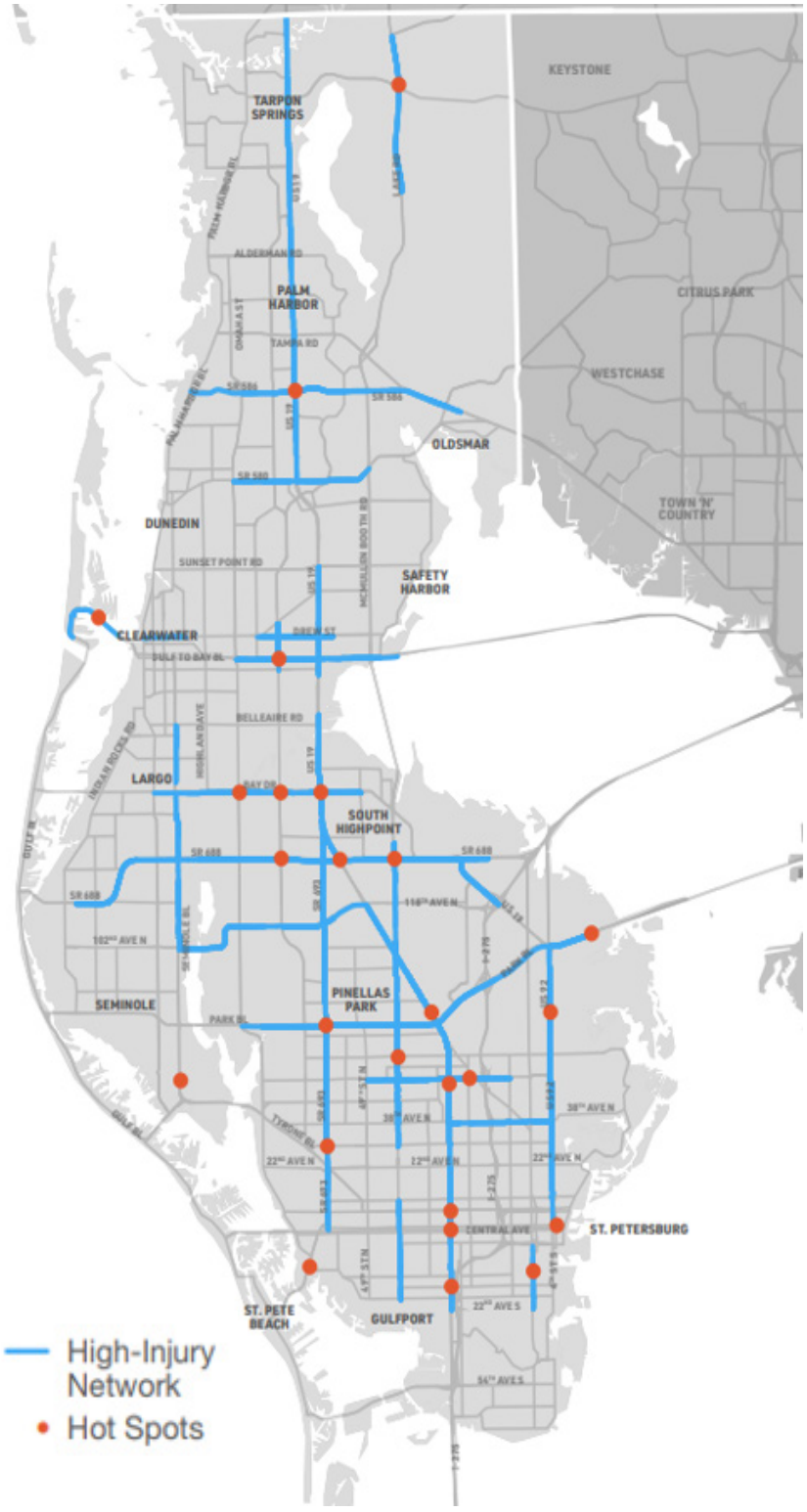
Forward Pinellas

Safe Streets Pinellas Action Plan (2023)

The *Safe Streets Pinellas Action Plan* (2023) sets a goal of eliminating serious injuries and fatalities on Pinellas County roadways by 2045. Developed by Forward Pinellas and partner agencies, the plan emphasizes periodic updates to track progress, integrate proven safety strategies, and adjust measures that are not effective.

The plan includes an analysis of local collision trends, development of a High Injury Network (HIN) that highlights the 3% of roadways where 40% of severe and fatal crashes occur, as shown in Figure 2. Most of the roads on the HIN have a speed limit greater than 40 mph, and 75% are under FDOT jurisdiction. Figure 2 includes segments of state roads within Pinellas County, underscoring their significance in countywide safety efforts. It also introduces a toolbox of countermeasures, ranging from engineering improvements to education and policy strategies, with an emphasis on protecting vulnerable road users. Roads with a speed limit of 40 mph or higher account for almost 60% of both pedestrian and bicycle fatal and serious injury crashes.

FIGURE 2. PINELLAS HIGH-INJURY NETWORK



Source: Forward Pinellas

Advantage Pinellas 2050 Long Range Transportation Plan (2024)

Forward Pinellas created the *Advantage Pinellas 2050 Plan* by incorporating input from the public, the latest demographic insights from the U.S. Census, and updated project cost estimates reflecting current inflation trends. The plan also accounts for changes in travel behavior and employment patterns following the pandemic. It received official approval from the Forward Pinellas Board in November 2024.

The *Advantage Pinellas 2050 Plan* identifies priorities for funding including active transportation projects such as Pinellas Trail (Phase 3), Salt Creek Trail Extension, and 4th St N trail.

FIGURE 3. ADVANTAGE PINELLAS EXISTING TRAILS AND BICYCLE LANES MAP



Source: Advantage Pinellas Active Transportation Plan

Advantage Pinellas: Active Transportation Plan (2024)

The *Advantage Pinellas Active Transportation Plan*, adopted in 2024 as part of long-range planning efforts, sets out strategies to expand and improve the county's bicycle and pedestrian network. The plan's purpose is to create a safe, connected, and accessible system that supports health, mobility, and economic opportunity. Goals include closing gaps in existing infrastructure, addressing high-stress corridors, and prioritizing investments in key countywide connections.

The plan examines best practices regarding active transportation policies, identifies high crash corridors and intersections for bicyclists and pedestrians, and highlights gaps in pedestrian and bicycle infrastructure. Existing infrastructure is mapped in Figure 3. The plan also includes concepts with proposed bicycle and pedestrian facilities for 10 unique locations.

City of Clearwater

Complete Streets Implementation Plan (2019)

The *City of Clearwater Complete Streets Implementation Plan*, adopted in 2019, promotes a network of streets designed to match the surrounding land uses and context, providing safe and comfortable travel for people of all ages and abilities. A major focus is improving crossings at intersections. It includes a toolkit of design details organized by street type, existing infrastructure, and land use context. The plan also offers direction on preferred sidewalk widths, bicycle and transit accommodations, desired operating speeds, and other street characteristics, such as lane widths and the frequency of crossings, each adapted to the appropriate land use context and street type.

Connecting Clearwater: Active Transportation Plan (2025–2026)

The *Connecting Clearwater: Active Transportation Plan* promotes walking, bicycling, and other human-powered travel as part of a comprehensive citywide network. The plan notes the importance of identifying feasible projects across city, county, and state roads. *Connecting Clearwater* includes potential facilities, such as recreational trails, urban trails/shared use paths, bike lanes and protected bike lanes, neighborhood greenways, and crossing improvements, along with strategies to close sidewalk gaps.

City of St. Petersburg

Complete Streets Implementation Plan (2019)

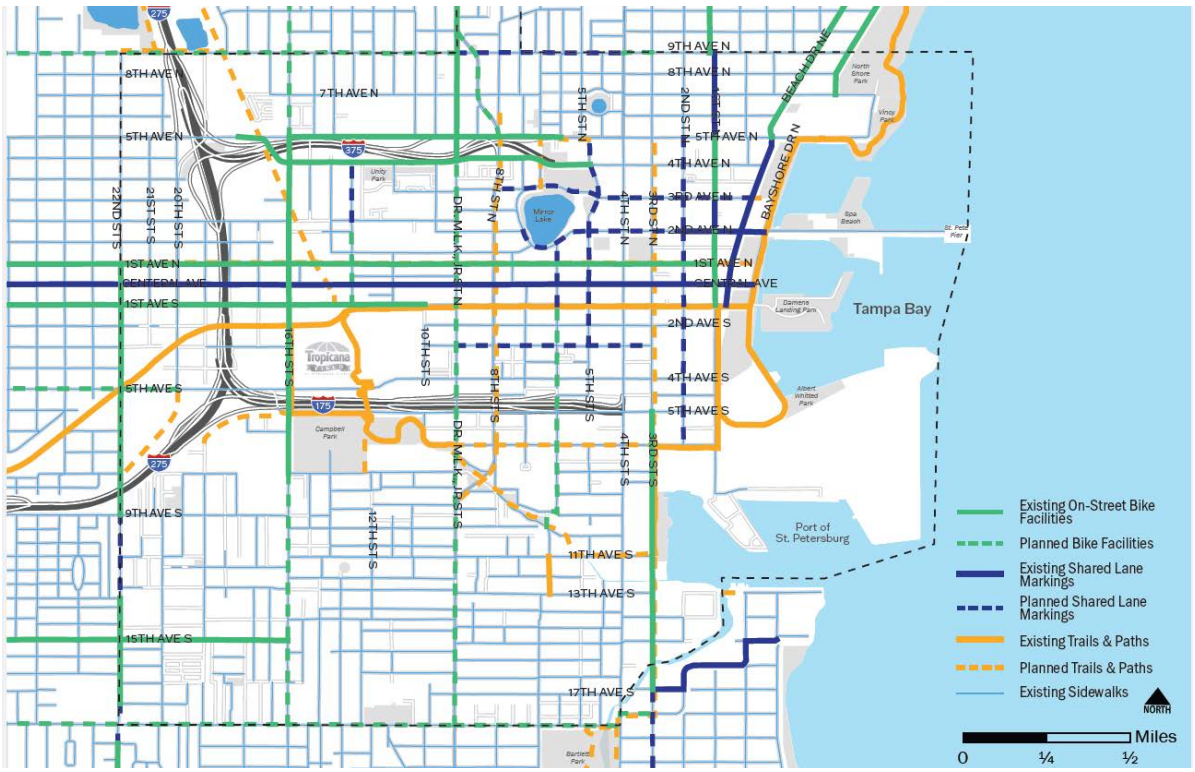
The *St. Petersburg Complete Streets Implementation Plan*, adopted in 2019, aims to create streets that are safe, comfortable, and responsive to surrounding land use, supporting healthy and sustainable growth. The plan includes an inventory of existing conditions and defines land use contexts that align with FDOT's context classifications, modal priorities for major roadways, and desired operating speeds across the city. The plan identifies recommendations for bicycle facilities across St. Petersburg for future trails, separated bicycle lanes, bicycle lanes, neighborhood greenways, and shared lane markings as well as locations for pedestrian crossings.

Downtown St. Petersburg Mobility Study (2022)

The Downtown St. Petersburg Mobility Study (2022) addresses growing demand for housing, jobs, services, and cultural destinations. It explores how the transportation network can support inclusive economic growth and improved mobility.

A major focus of the study is conceptual planning and prioritization of short- and long-term projects within focus areas and corridors, as illustrated in Figure 4. The study recommends bicycle or pedestrian facilities on several state roads within the downtown area, including SR 687/3rd St S, SR 687/4th St S, and US Alt. 19/5th Ave N.

FIGURE 4. DOWNTOWN ST. PETERSBURG MOBILITY STUDY



Source: Downtown St. Petersburg Mobility Study

Neighborhood Greenways Toolbox (2024)

The *Neighborhood Greenways Toolbox* (2024) provides guidance for implementing low-speed, low-traffic streets that serve as connected bicycle routes without the need for dedicated bike lanes. Building on the *St. Petersburg's Complete Streets Implementation Plan*, the toolbox emphasizes traffic calming, enhanced crossings, and wayfinding as the core elements of neighborhood greenways.

The document compiles design tools drawn from national best practices, including pavement markings, signage, vertical speed devices, mini traffic circles, curb extensions, and crossing treatments such as rectangular rapid flashing beacons (RRFBs), pedestrian hybrid beacons (PHBs), and protected intersections. It also introduces typologies to match design options with neighborhood contexts. Although the Toolbox focuses on neighborhood active transportation needs, these guidelines on enhanced crossings and the interaction with the state road network were considered in this Plan.

City of Dunedin

Citywide Multimodal Transportation Master Plan (2021)

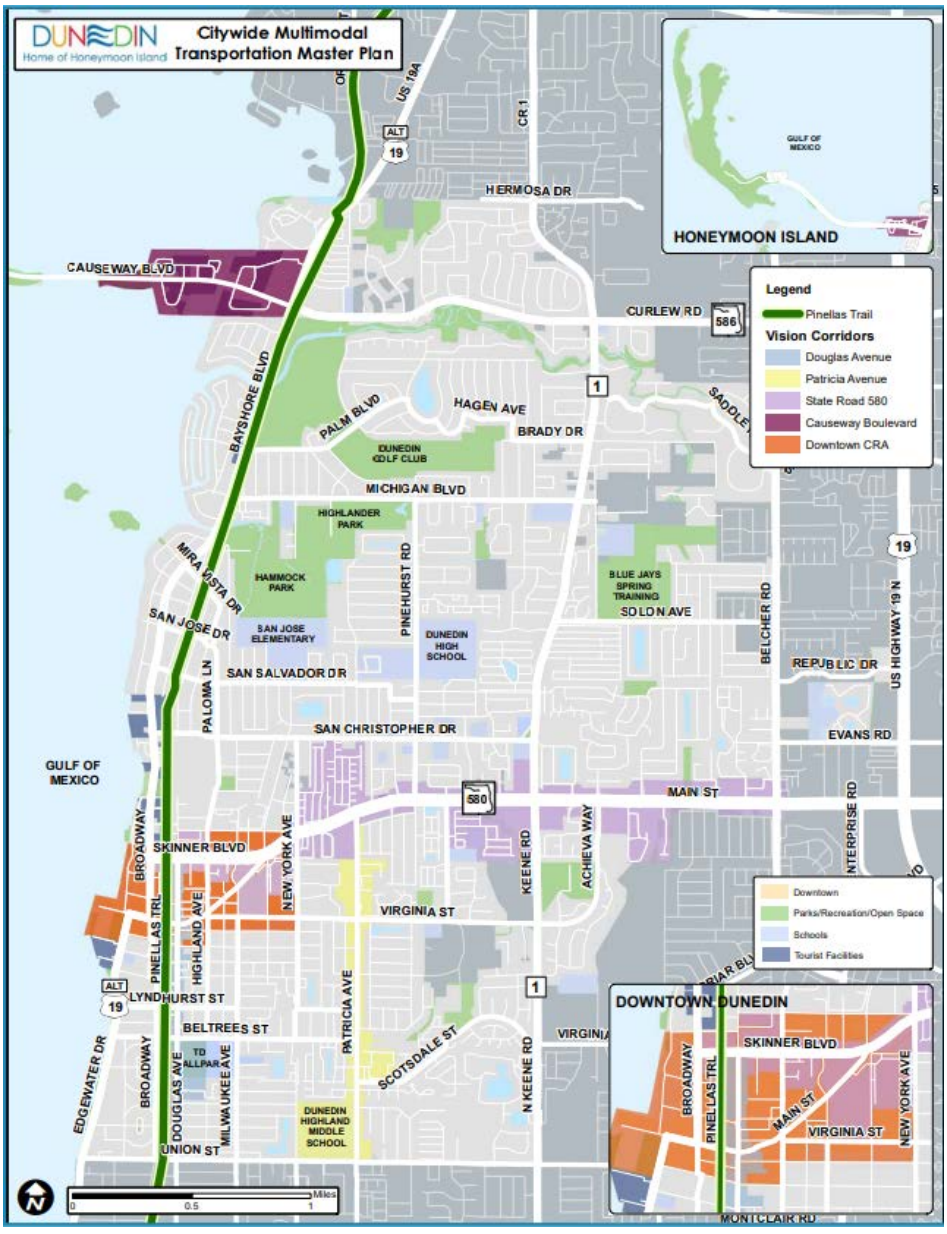
The City of Dunedin developed a *Citywide Multimodal Transportation Master Plan* in 2021 aimed at improving safety, connectivity, and accessibility across all modes of transportation throughout the city. The proposed multimodal network, including the City's "vision corridors," is shown in Figure 5. The plan establishes a framework for prioritizing projects, programs, and policies to support pedestrian, bicycle, transit, and roadway travel while integrating regional transportation goals. Key objectives include implementing new design standards, enhancing bicycle and pedestrian facilities, coordinating with transit amenities, and planning for emerging transportation modes, such as micromobility and golf carts.

City of Safety Harbor

Moving Safety Harbor Forward (2022)

The City of Safety Harbor developed the *Moving Safety Harbor Forward Sidewalk and Bicycle Facility Master Plan* to identify projects for improving multimodal connectivity throughout Safety Harbor. A prioritization process was conducted to categorize pedestrian and bicycle recommendations into three tiers: Tier 1 (Initial Priorities), Tier 2 (Other Priorities), and Tier 3 (Visionary).

FIGURE 5. CITY OF DUNEDIN MULTIMODAL TRANSPORTATION CORRIDORS



Source: Dunedin Citywide Multimodal Transportation Master Plan

PASCO COUNTY

Pasco County MPO

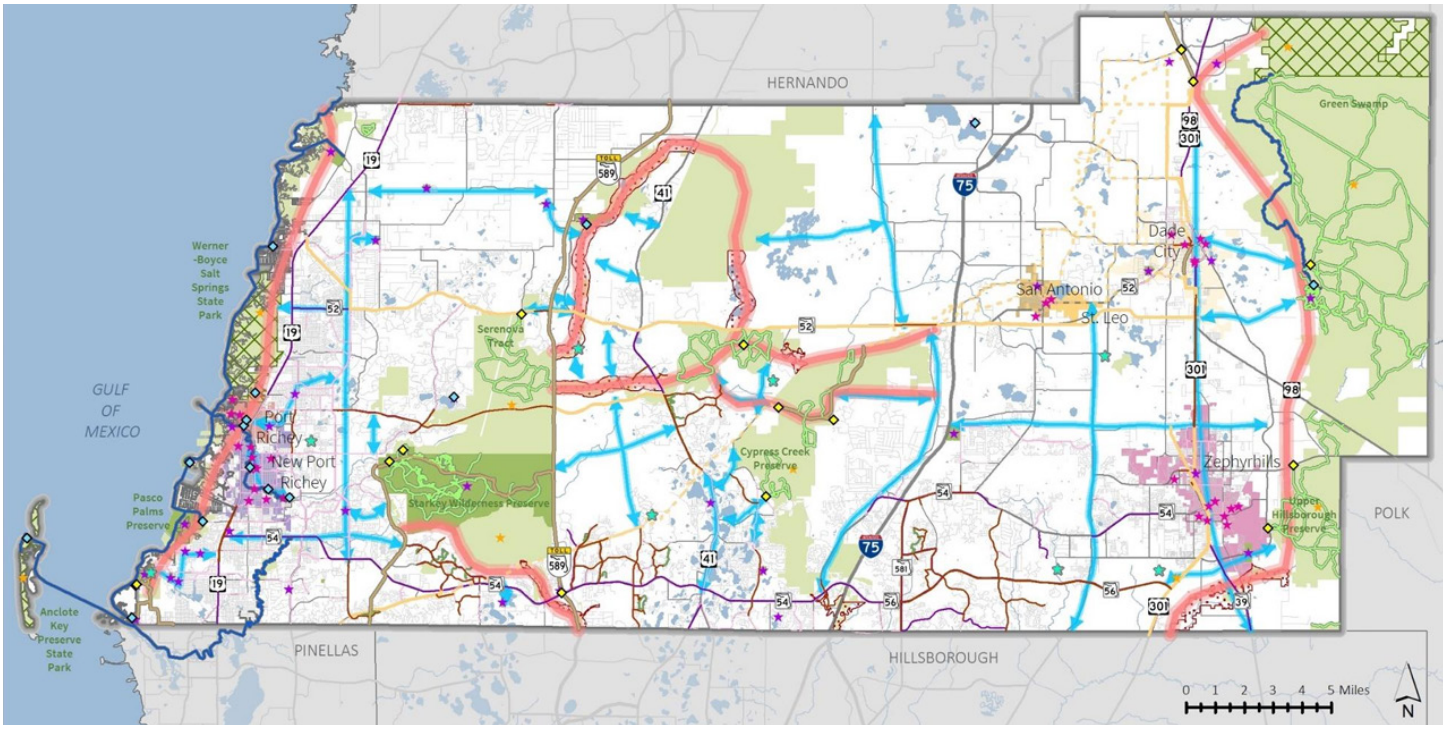
Innovate Pasco 2050 (2024)

Innovate Pasco 2050, developed in 2024 by the Pasco County MPO, is the organization's long-range transportation strategy designed to address both present and future mobility needs in the County over the next two decades. It considers all applicable forms of transportation—cars, public transit, cycling, walking, freight logistics, and air travel. The plan evaluates the County's transportation infrastructure needs and aligns them with priority projects for funding, ultimately serving as Pasco County's guide for transportation planning and investment.

Pasco County Greenways, Trails, and Blueways Master Plan (2023)

The *Pasco County Greenways, Trails, and Blueways (GTB) Master Plan*, adopted in 2023, provides a countywide framework for enhancing and expanding Pasco County's recreational trail and waterway network. The plan addresses existing resources, including nearly 300 miles of paved and unpaved trails and 80 miles of designated blueways, while identifying future opportunities for connectivity, mobility, and safe, comfortable recreation for all residents and visitors. Figure 6 includes several trail segments that run along or intersect state roads, highlighting opportunities for coordination between the GTB system and the state roadway network. The plan aims to guide the development of new greenways, trails, and blueways, improve network connections, and promote community engagement through increased awareness of the GTB system (see proposed network in Figure 6).

FIGURE 6. PASCO COUNTY GREENWAYS, TRAILS, AND BLUEWAYS



Source: Pasco County Greenways, Trails, and Blueways Master Plan

Orange Belt Trail Project Development & Environment (PD&E) Study (2022)

The *Orange Belt Trail PD&E Study*, initiated in 2022, focuses on the proposed Bi-County Trail, a 37-mile multi-use trail across central Pasco County from Trinity to Trilby. The trail is designed as a 12- to 15-foot paved facility for bicyclists and pedestrians and will connect the Starkey Trail Connector, the Suncoast Trail, and the Withlacoochee State Trail.

Tampa Bay Regional Planning Council

Visualizing Development Strategies for Highway US-19 in Pasco County (2021)

The Tampa Bay Regional Planning Council prepared this study to explore conceptual redevelopment strategies along the 19.5-mile Highway U.S. 19 corridor in Pasco County, building on the 2013 West Market Redevelopment/Infill Plan.

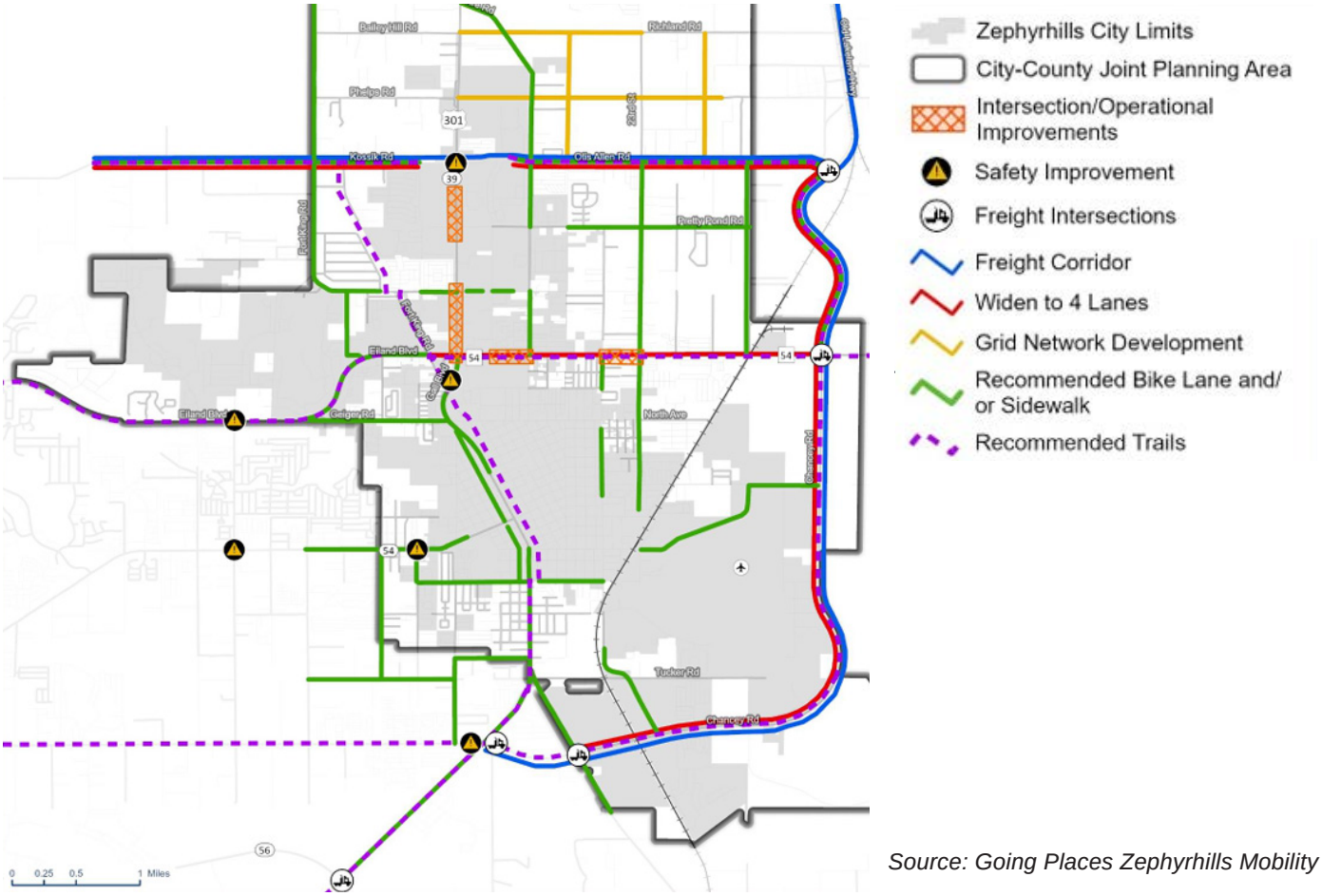
The study developed planning and design concepts for two focus areas, Gulf View Square Mall and Universal Plaza that include opportunities to transform the corridor from underutilized commercial strips into compact, walkable, mixed-use districts, with an emphasis on workforce housing and economic development.

City of Zephyrhills

Going Places Zephyrhills Mobility Plan (2024)

The *Going Places Zephyrhills Mobility Plan*, adopted in 2024, provides a strategic framework to improve multimodal transportation within the city. The plan identifies strategies, actions, and projects to enhance mobility, safety, and quality of life for residents and visitors. Key goals include improving bicycle and pedestrian access, supporting smooth traffic flow, increasing access to public transportation, and enhancing freight and regional connectivity. The plan emphasizes integration of emerging micro-mobility and micro-transit options and connections between land uses. Figure 7 illustrates the recommendations from the *Mobility Plan*, including segments needing bicycle lanes or sidewalks.

FIGURE 7. ZEPHYRHILLS MOBILITY PLAN RECOMMENDATIONS



Source: Going Places Zephyrhills Mobility Plan

HILLSBOROUGH COUNTY

Hillsborough County

Hillsborough County Bicycle Network Plan (2023)

The *Hillsborough County Bicycle Network Plan*, adopted in 2023, was developed to identify, prioritize, and recommend safety improvements for high-risk bicycle corridors. Building on the County's 2022 *Complete Streets Guide*, the plan uses a data-driven methodology that combines crash risk, bicyclist exposure, and network connectivity to create a Bicycle Risk Score and prioritize segments for investment. Four County-owned corridors were selected for detailed recommendations, with improvements drawn from the County's Bicycle Corridor Safety Retrofit Toolbox, three of which intersect a state road:

- W Waters Ave from Sheldon Rd to SR 589/ Veterans Expressway
- Causeway Blvd/W Lumsden Rd from S Falkenburg Rd to SR 628/Brandon Pkwy
- Shell Point Rd from US Highway 41/SR 45/ Tamiami Trail to 24th St NE

The plan emphasizes system-wide change to improve conditions for vulnerable road users, focusing on safer design standards, complete network connectivity, and targeted corridor retrofits to reduce crashes and support safer bicycle travel.

Greenways and Trails Master Plan (2024)

The Hillsborough County *Greenways and Trails Master Plan*, updated in 2024 from its original 1995 version, establishes a renewed vision for a countywide network of paved and unpaved trails, blueways, and natural corridors. Developed through extensive community engagement in 2022, the plan outlines a Vision Plan with objectives and a map of future connections, including 289 new miles of paved trails, 121 miles of unpaved trails, and 37 miles of new blueways.

Hillsborough TPO

Access 2050 Long Range Transportation Plan (2025)

Access 2050, developed by Hillsborough TPO in 2025, outlines a vision for a well-connected, multimodal transportation system that enhances prosperity, quality of life, and regional connectivity across the Tampa Bay Area. Transportation investments are shaped by public input, emphasizing the importance of linking people to employment, services, experiences, and opportunities. The Hillsborough TPO focused on preserving and maintaining existing infrastructure, much of which requires overdue repairs to extend its lifespan. Tackling this maintenance backlog is the plan's highest priority. Two main goals for addressing mobility needs include:

- Creating viable rapid transit
- Investing in safer and more reliable roadways

Access 2050 emphasizes maintaining existing transportation assets, improving safety, expanding travel choices beyond driving, and investing in major projects that support economic growth.

Managing Speed on Hillsborough's High Injury Network (2020)

Adopted in 2020, *Managing Speed on Hillsborough's High Injury Network* was developed by the Hillsborough TPO as part of the Vision Zero initiative to address Hillsborough County's high rates of roadway fatalities and severe injuries, many of which occur on corridors with posted speeds above 40 mph. It emphasizes that speed is the most critical factor influencing crash severity and focuses on systemic, proactive strategies rather than reactive measures at crash hot spots.

The plan emphasizes key actions such as adopting the Safe System Approach, setting appropriate speed limits, incorporating traffic calming principles, enhancing enforcement and education, and institutionalizing good design and policy practices across jurisdictions. Stakeholder engagement with local governments, law enforcement, FDOT, Hillsborough Area Regional Transit Authority (HART), health agencies, and schools shaped the recommendations for the county's Top 20 and Next 30 High Injury Network corridors.

FIGURE 8. HILLSBOROUGH VISION ZERO ACTION PLAN TOP 20 CORRIDORS



Source: Hillsborough Vision Zero Action Plan

Vision Zero Action Plan (2017)

The Hillsborough TPO *Vision Zero Action Plan*, adopted in 2017, outlines key goals and performance measures through four Action Tracks to achieve zero deaths and serious injuries on the county's roads. These Action Tracks are supported by detailed crash statistics, a broad programmatic framework, and the work of the Vision Zero coalition. The plan also identifies preferred design treatments and highlights the top corridors with the most severe crashes. Many of the top 20 corridors with serious pedestrian and bicycle crashes, shown in Figure 8, are located on state roads.

City of Plant City

Plant City Walk-Bike Plan (2018)

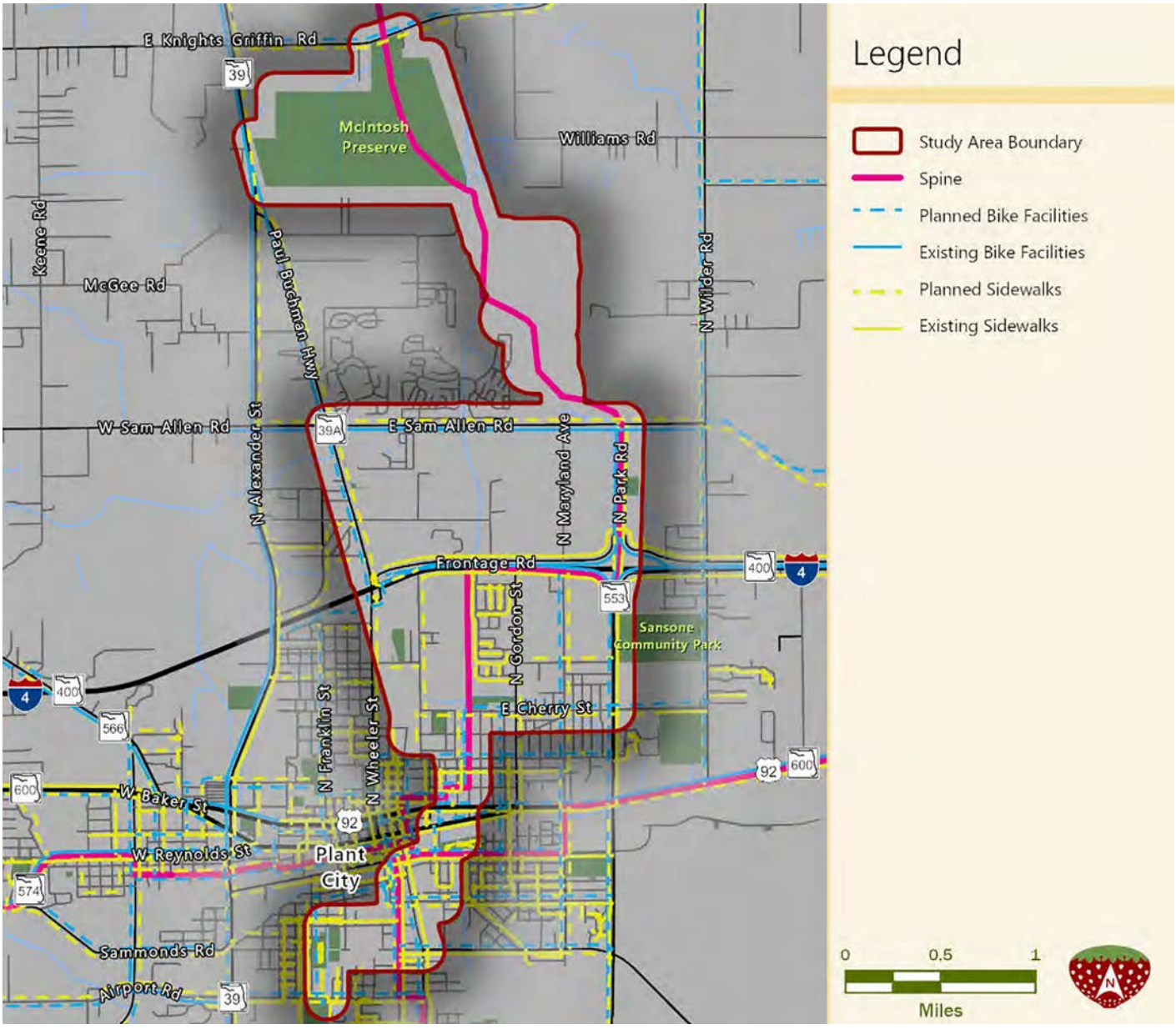
The City of Plant City, in conjunction with the Hillsborough MPO developed the *Plant City Walk-Bike Plan* in 2018. The purpose of the plan was to develop an initial bicycle and pedestrian network. The bikeway network leverages a proposed regional trail, the "Canal Connector Trail," whereas the pedestrian network focuses on filling gaps around the city center and improving connections to places of interest. Figure 9 illustrates the existing and planned bicycle facilities and sidewalks.

City of Temple Terrace

Temple Terrace Multimodal Connections Study (2026)

The *Temple Terrace Multimodal Connections Study*, completed in 2026, is a citywide initiative to create a comprehensive network of low-stress multimodal facilities that connect neighborhoods, schools, parks, and key destinations. The study seeks to enhance mobility, improve quality of life, and celebrate Temple Terrace's history and character while encouraging walking, biking, and other active modes. Key elements include assessing existing facilities, identifying opportunities for expansion, improving safety and accessibility, and prioritizing trail projects based on community input, feasibility, and benefits.

FIGURE 9. PLANT CITY WALK BIKE PLAN



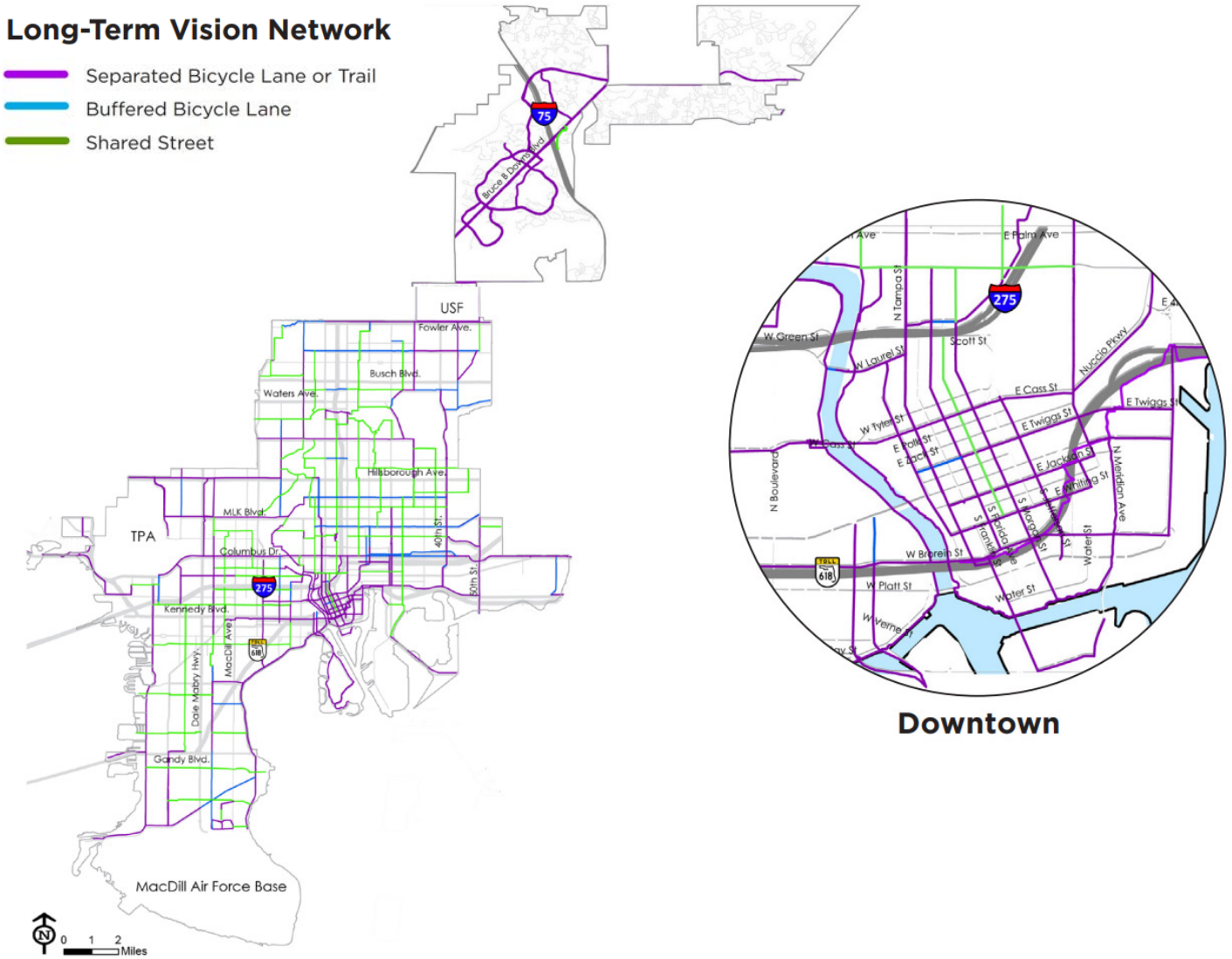
Source: Plant City Walk Bike Plan

City of Tampa

City of Tampa MOVES Plan (2023)

The City of Tampa *MOVES Plan*, adopted in 2023, was developed following the Transforming Tampa's Tomorrow initiative to set a long-term vision. MOVES outlines strategies to invest in existing infrastructure, complete a citywide multimodal network, design streets as places, advance safety improvements, expand transit, and manage congestion with technology and data-driven approaches. MOVES includes a vision network of bicycle and pedestrian facilities including on state roadways, shown in Figure 10.

FIGURE 10. TAMPA MOVES LONG-TERM VISION NETWORK



Source: City of Tampa MOVES Plan

HERNANDO COUNTY AND CITRUS COUNTY

Hernando/Citrus MPO

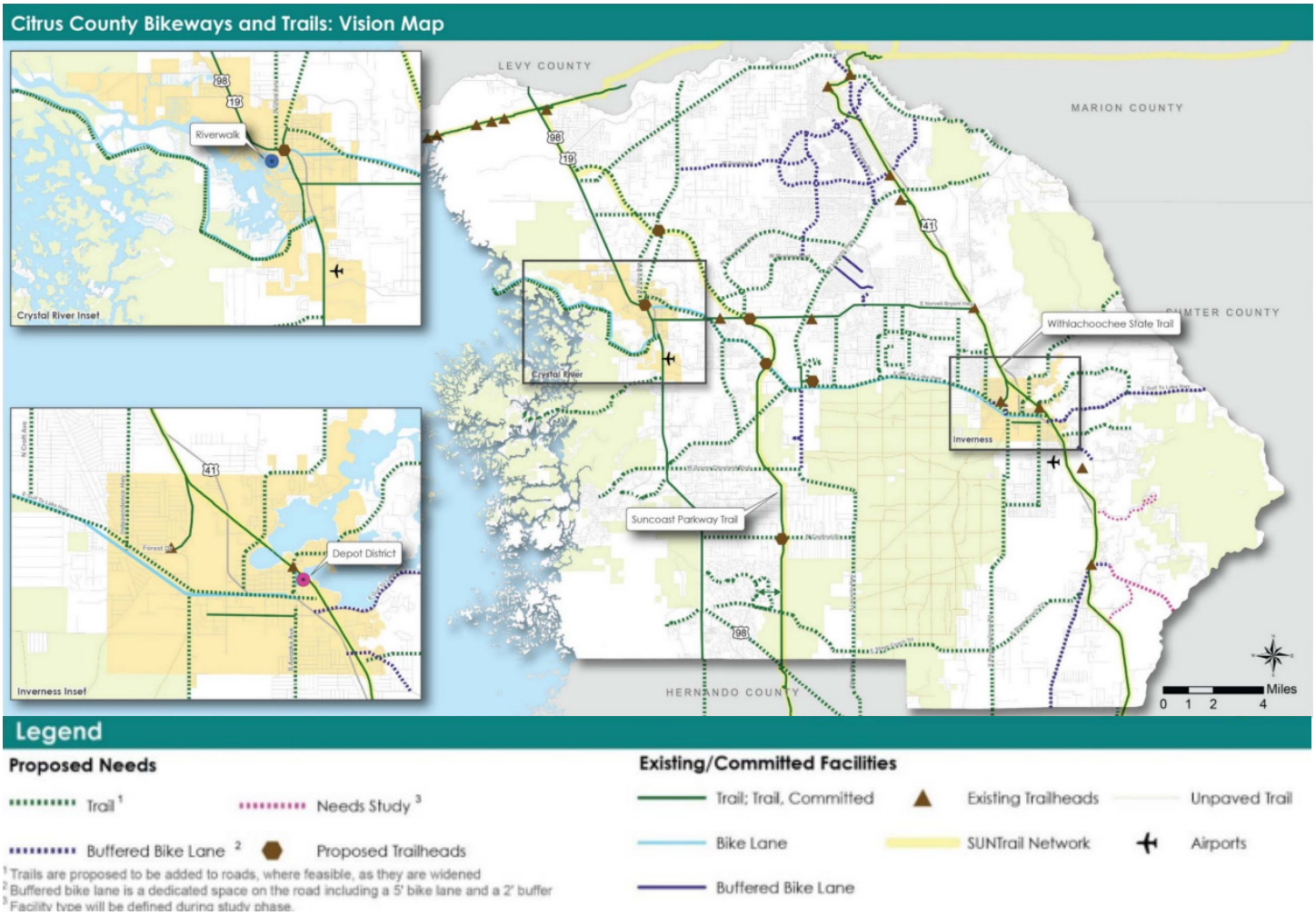
2050 Long Range Transportation Plan (2024)

The Hernando/Citrus MPO developed their *2050 Long Range Transportation Plan* in 2024. The plan addresses the transportation needs of both people and freight, covering roadway facilities, public transit assets, bicycle accommodations, and pedestrian facilities. It relies on input from the community, stakeholders and the public to create a comprehensive plan. The plan outlines the long-term mobility needs of Hernando and Citrus Counties and provides infrastructure recommendations for people walking and bicycling.

Bikeways and Trails Master Plan (2018)

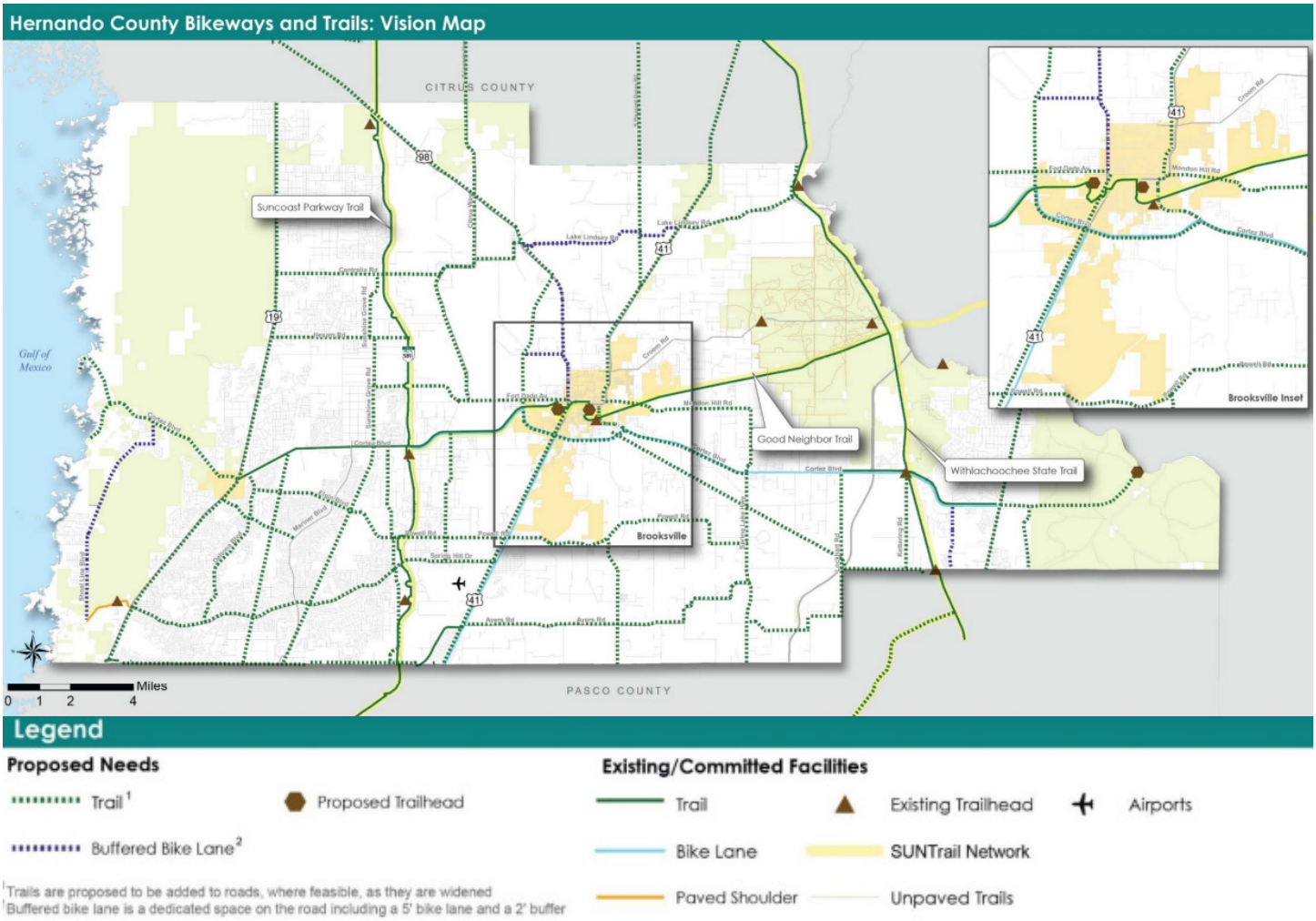
The *Bikeways and Trails Master Plan* envisions that Hernando and Citrus Counties will become communities where people can safely and easily bike and walk daily. The plan details committed bikeways and trails as well as long-term visionary projects. The plan provides a programmatic approach with a key focus on education and maintenance, as well as evaluation plans for active transportation facilities. The FDOT functional classification guidance was used for selection of bicycle facility types. Figure 11 and Figure 12 show the vision maps for Citrus County and Hernando County, respectively.

FIGURE 11. CITRUS COUNTY VISION MAP

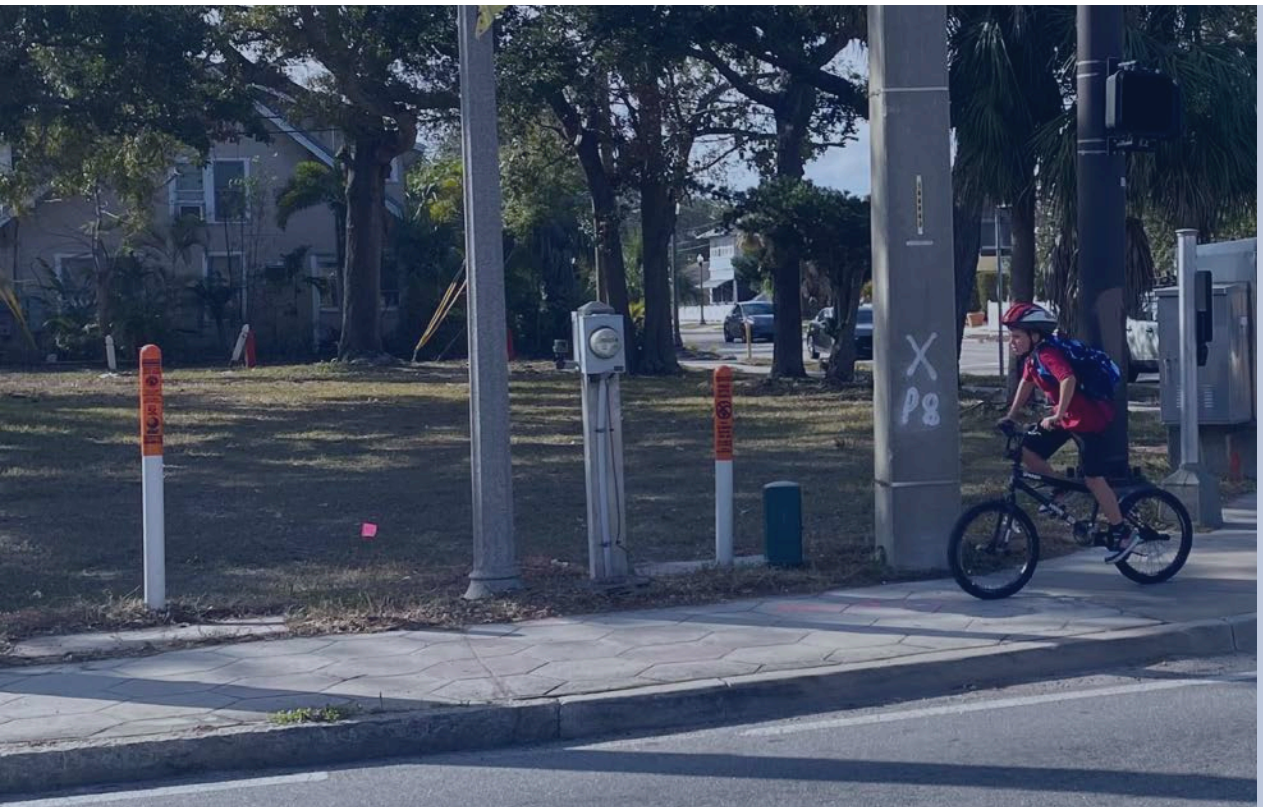


Source: Hernando Citrus MPO Bikeways and Trails Master Plan

FIGURE 12. HERNANDO COUNTY VISION MAP



Source: Hernando Citrus MPO Bikeways and Trails Master Plan



Source: Kittelson

EXISTING CONDITIONS

This section reviews existing conditions data related to road characteristics, safety, land use, and existing infrastructure. This analysis establishes the current baseline for pedestrian and bicycle infrastructure across the District.



Source: Kittelson

DEMOGRAPHICS

Demographics were analyzed to better understand needs and opportunities across the District. Census data was used to identify areas where there may be higher demands for walking and bicycling infrastructure.

ZERO VEHICLE HOUSEHOLDS

Residents without access to a vehicle rely heavily on walking, biking, and public transit, making them an important population to consider when planning and prioritizing active transportation infrastructure across the District. The data are displayed in quantiles, ranking census tracts by the percentage of zero-vehicle households, with each group representing an equal share of the distribution. While most tracts have relatively few zero-vehicle households, a limited number of areas reach as high as 51%.

As shown in Figure 13, census tracts with high percentages of zero-vehicle households are primarily concentrated in Tampa. Additional clusters are found along the US 19 corridor from Pasco to Pinellas Counties. Smaller concentrations also appear in Dade City (Pasco County) and Brooksville (Hernando County).

LOW-INCOME POPULATION

Lower-income households often geographically overlap with those that lack access to a vehicle, underscoring the importance of providing safe and reliable walking and bicycling infrastructure in areas where residents depend on these modes for essential trips and employment access.

The data is displayed in Figure 14 in quantiles. Low-income residents are distributed throughout the District but are more heavily concentrated in urbanized areas such as the City of Tampa and along the Interstate 4 corridor. Low-income populations also extend across broader areas in Hernando and Citrus Counties.

YOUTH POPULATION

Most youth under 18 are not of driving age and rely more on walking and bicycling infrastructure for both daily needs and recreational purposes. Proving safe infrastructure for youth walking and bicycling enables healthier and more active lifestyles starting from a young age and supports Safe Routes to School.

As shown in Figure 15, residents under 18 are distributed throughout the District, with higher concentrations observed across much of Hillsborough County, the central portion of Pasco County, the area east of the Chassahowitzka Wildlife Management Area in Hernando County, and the Citrus Springs area in Citrus County. The median share of the population under 18 is approximately 18%, with some tracts, particularly in the Tampa area, reaching as high as 40%. Lower concentrations, around 8%, are found primarily along western edges of Pasco County and in Pinellas County.

OLDER ADULT POPULATION

The needs of the older adult population (over 65) are important considerations when planning for walking and bicycling infrastructure, as this demographic group is generally more comfortable walking and bicycling in areas that offer higher levels of protection from vehicular traffic. Older adults may not be able to drive or may choose not to, making it especially important to provide adequate walking and bicycling infrastructure in areas with large numbers of senior residents.

As shown in Figure 16, areas with higher proportions of older adults, including retirement communities, are primarily located along the western coastline and in less densely populated areas. Tracts with lower percentages of older adults are found in and around the City of Tampa. Higher concentrations of older adults are observed in Citrus (median 37%), Hernando (median 24%), Pasco (median 22%), Pinellas (median 24%) and Lower Hillsborough County (median 14%).

The median percentage is 19%, indicating that most areas in District 7 have relatively low proportions of older adults. Most of the older adults population is concentrated in areas with dedicated senior living communities.

FIGURE 13. DISTRICT 7 ZERO CAR HOUSEHOLDS

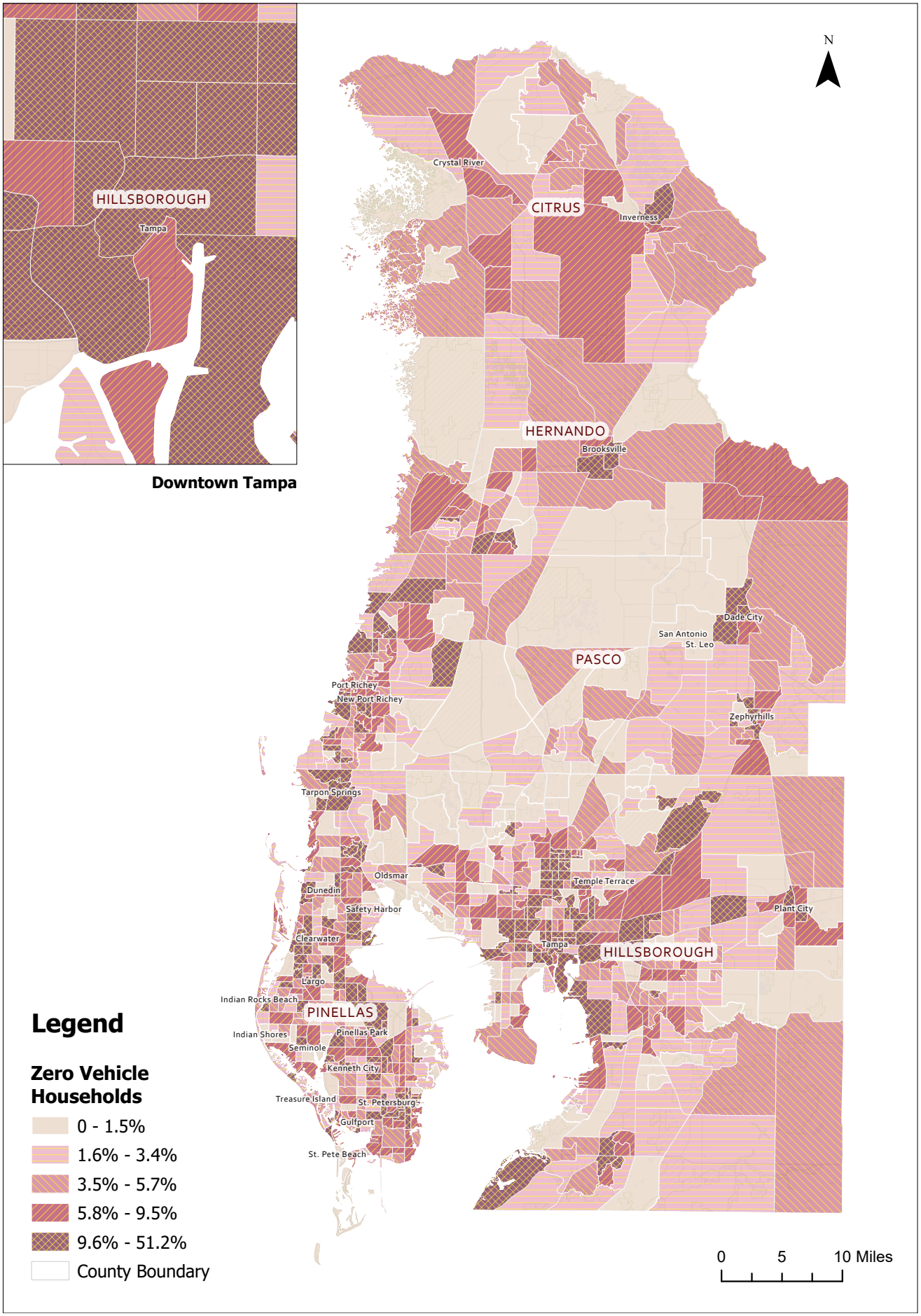


FIGURE 14. DISTRICT 7 LOW-INCOME POPULATION

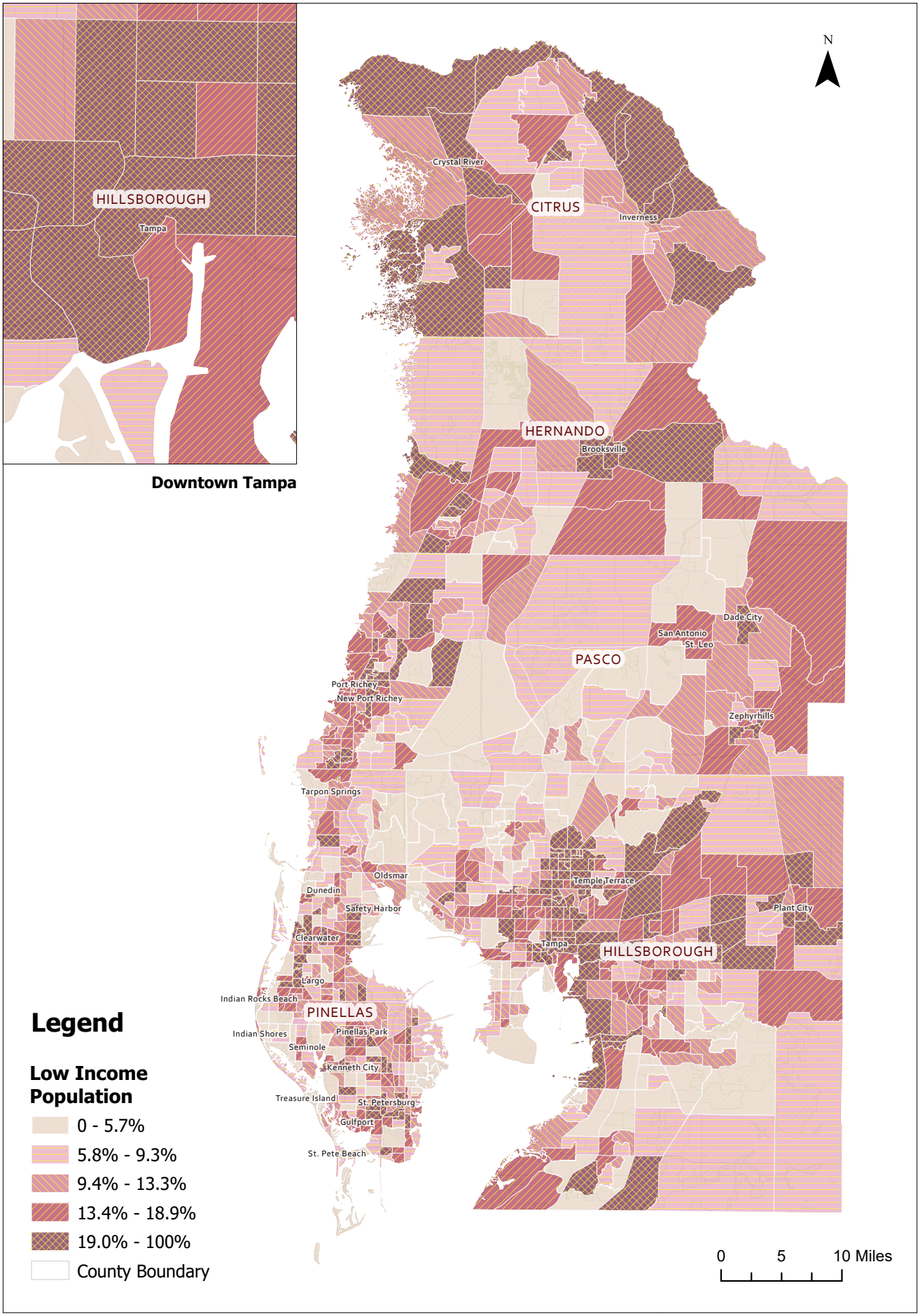


FIGURE 15. DISTRICT 7 YOUTH POPULATION

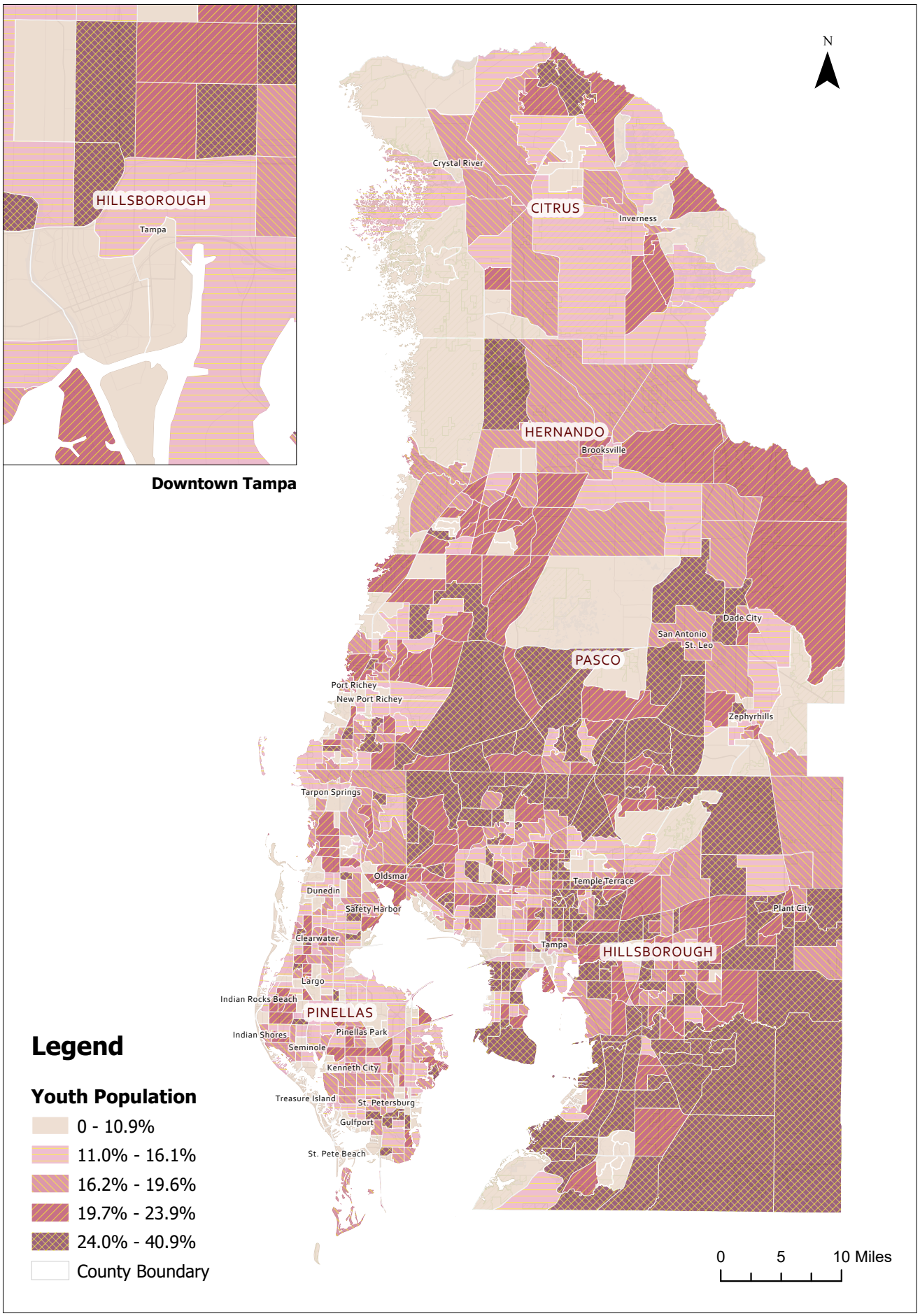
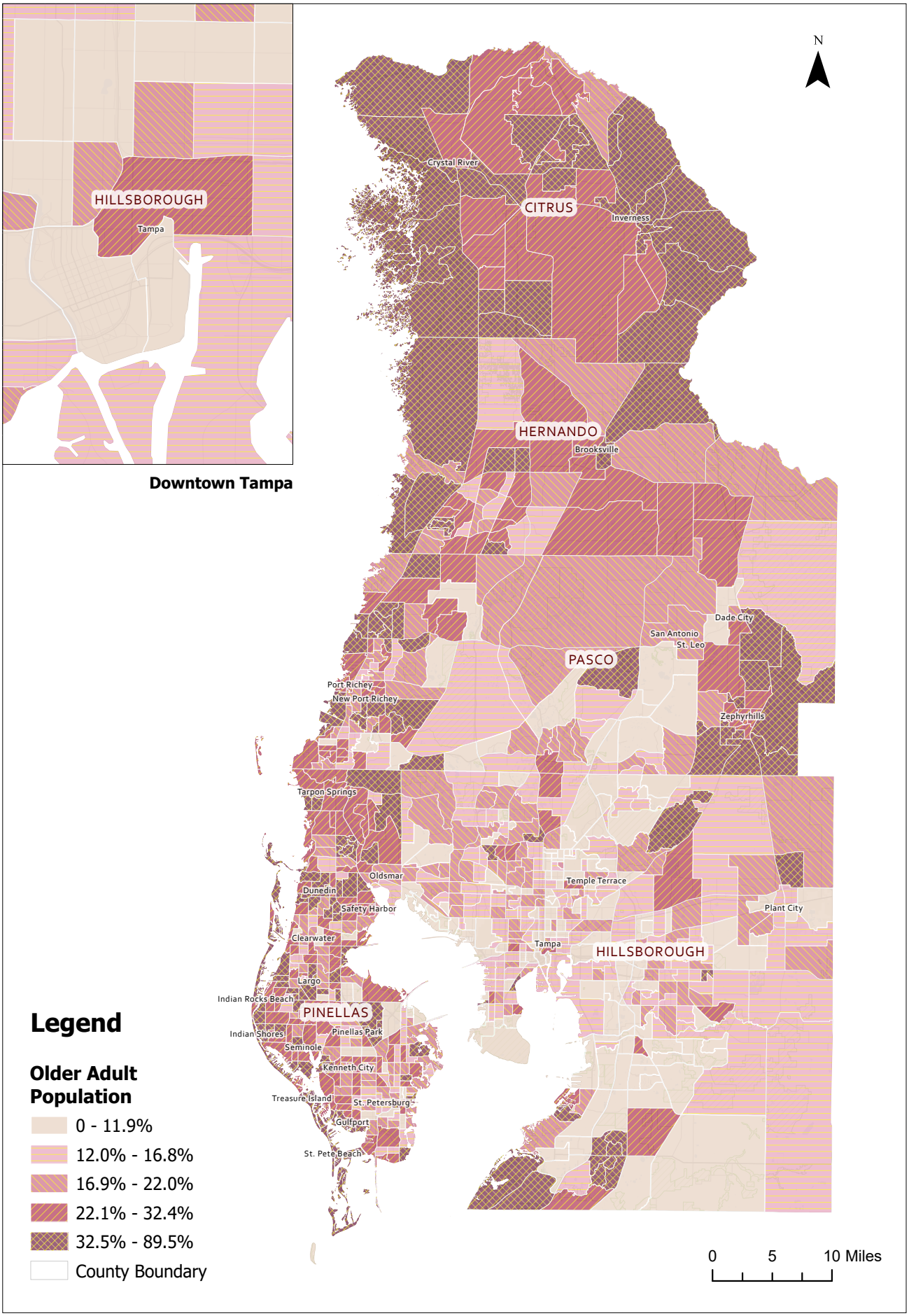


FIGURE 16. DISTRICT 7 OLDER ADULT POPULATION



ROADWAY CHARACTERISTICS

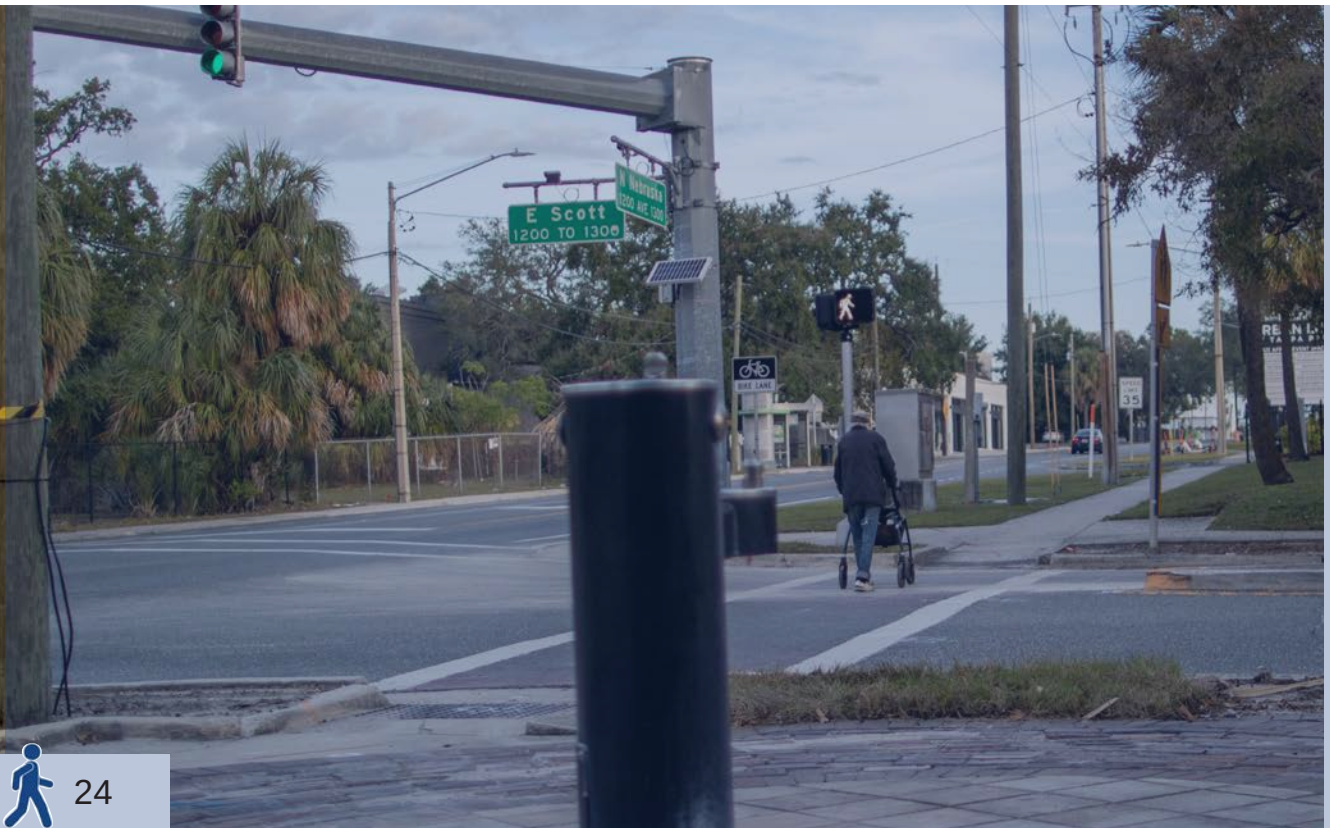
CONTEXT CLASSIFICATION

Roadway context plays a key role in determining how safe and comfortable walking and bicycling can be. Context classification evaluates roadway environments to better understand their relationship to surrounding land uses and travel patterns. This analysis helps identify where roadway design, land use, and multimodal needs align, or where adjustments may be needed to support safe and accessible walking and bicycling opportunities for all users.

Figure 17 illustrates the context classifications of major roadways throughout the preliminary District. C2T, C4, C5, and C6 contexts generally support higher levels of pedestrian and bicyclist activity, particularly in urban areas such as Tampa, St. Petersburg, and downtown Clearwater, as well as along coastal corridors on the west side of Pinellas County. In contrast, C1 and C2 contexts may be more auto-oriented, with less pedestrian and bicyclist activity, and may require different safety measures to better accommodate non-motorized users. C3C context often includes a mixture of all modes requiring consideration between the needs and interactions of motorists, transit users, bicyclists, and pedestrians. Maps showing the context classification by County are provided in Appendix A.

POSTED SPEED LIMIT

Posted speed limits play a vital role in shaping the safety and comfort of walking and bicycling environments. Lower speeds create safer, more accommodating conditions for pedestrians and bicyclists, while higher speeds are typically associated with auto-oriented corridors that are typically less supportive of active transportation. Within the District, posted speed limits vary widely depending on roadway context, surrounding land use, and functional classification, as shown in Figure 18. Areas such as Tampa and the western coasts of Citrus, Hernando, Pasco, and Pinellas Counties generally feature lower speeds between 20 and 30 mph, with certain dense or recreational areas operating at even lower limits. In contrast, major regional corridors such as U.S. 19, I-275, and I-75 serve interregional travel and have much higher posted speeds, reaching up to 70 mph.



Source: Kittelson

FIGURE 17. DISTRICT 7 CONTEXT CLASSIFICATION ON STATE ROADS

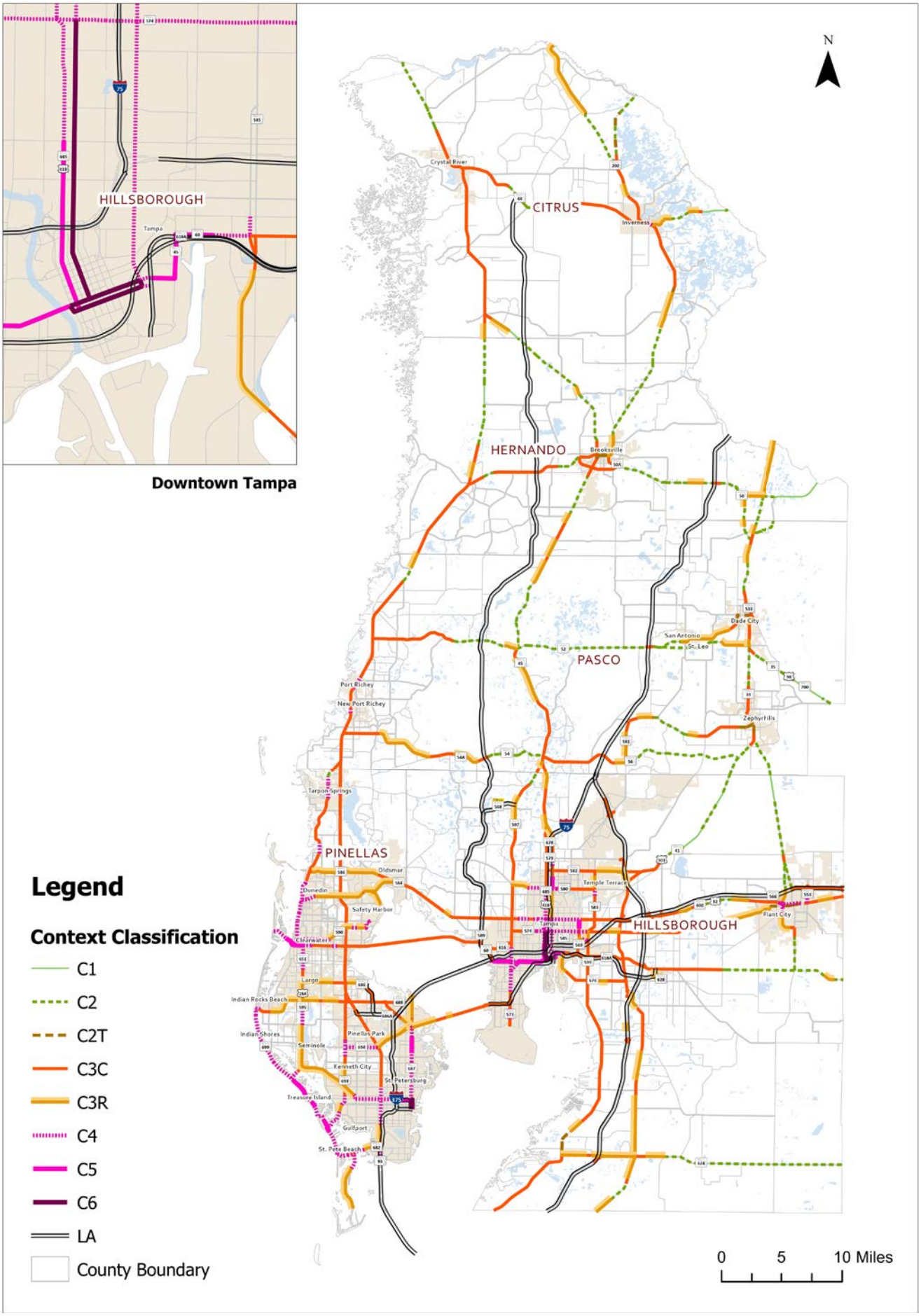
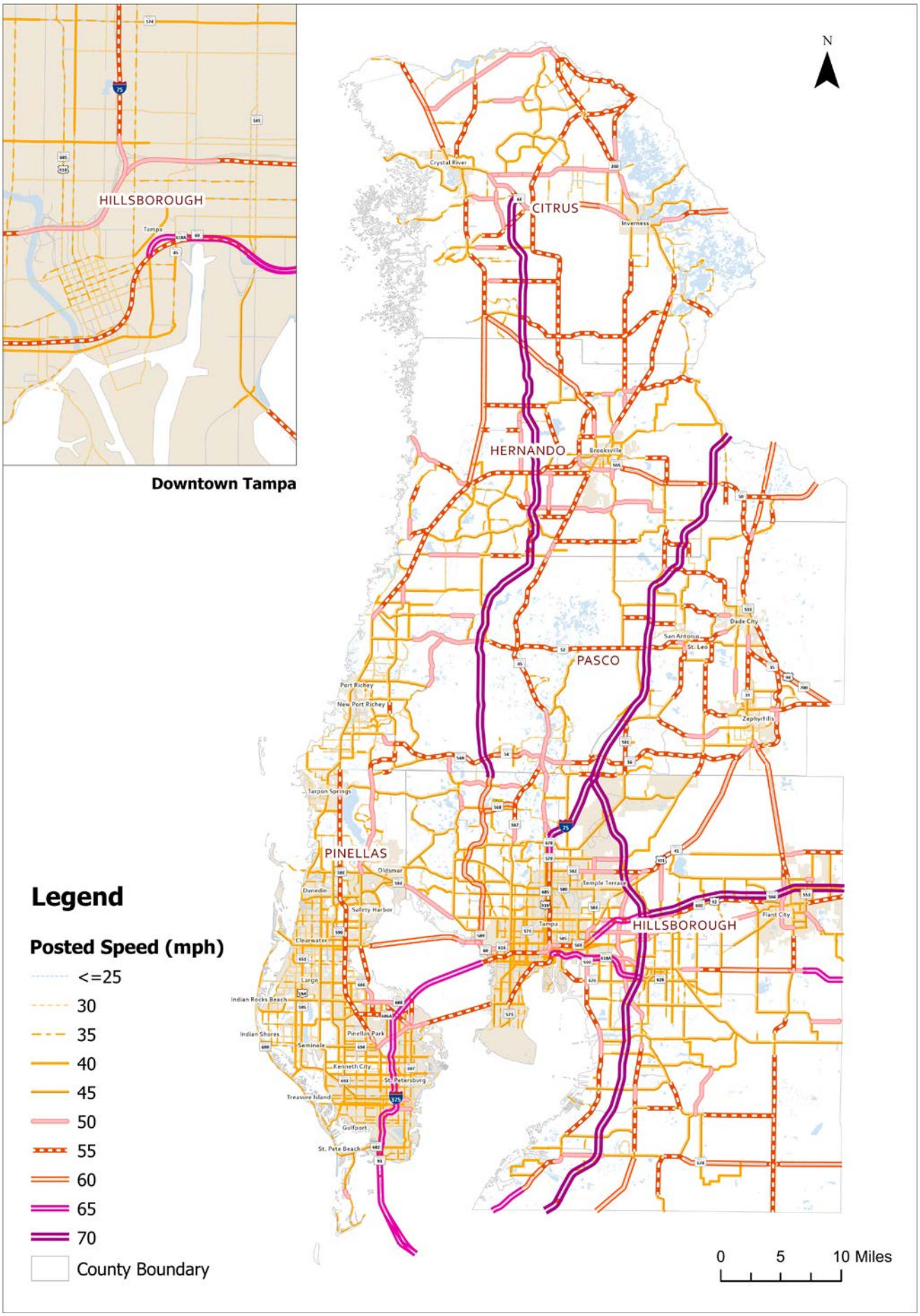


FIGURE 18. DISTRICT 7 POSTED SPEED ON MAJOR ROADS



NUMBER OF LANES AND VEHICULAR TRAFFIC VOLUMES

The level of risk for people walking and bicycling is directly related to their exposure, particularly to traffic volume and crossing distances. In general, higher traffic volumes create more exposure and potential conflicts for people bicycling or walking along or across a roadway. Each passing vehicle increases the likelihood of conflicts, and intersections present additional risks, as people walking or bicycling must navigate motor vehicle movements. A wider intersection footprint or a broader roadway increases the amount of space and time during which vulnerable users are exposed.

Figure 19 and Figure 20 illustrates the number of lanes and the annual average daily traffic (AADT) along major roads in District 7. AADT provides an overview of auto activity by representing the yearly average of daily traffic volumes. In general, roadways with higher AADT tend to have more lanes and greater vehicle activity. The relationship between traffic volume and lane count indicates whether a roadway is congested or has excess capacity. High traffic volumes can present barriers to walking and bicycling by increasing exposure to vehicles, noise, and emissions. They also elevate stress levels for non-motorized users, especially where pedestrian crossings or dedicated signals are lacking. Likewise, multiple lanes increase risk by extending crossing distances and creating more opportunities for conflicts. During uncongested travel times, traffic often operates at higher speeds, increasing the potential for severe injuries if a crash occurs with a person walking or biking.

ACCESS CLASSIFICATION

Access management balances property access with traffic throughput by planning the spacing and design of block lengths, street intersections, driveways, medians, traffic signals, and interchanges. Walking and bicycling trips are often the final legs of multimodal journeys and are generally more focused on accessing destinations rather than long-distance travel. Roads designed to maximize vehicle throughput through higher numbers of lanes, speeds, and volumes tend to have lower access classifications and may be less comfortable for people walking and bicycling.

Florida Statutes established seven access classifications for the State Highway System, defining access management standards for controlled access facilities (access classes 2 through 7). Figure 21 illustrates these access classes throughout District 7 on state roads.

Access classes 2, 3, and 5 typically have greater access restrictions, with quarter to half mile spacing between median openings and traffic signals. These standards improve traffic flow by allowing vehicles to move more efficiently, but they can also limit opportunities for crossing, turning, and property access—creating challenges for people walking and bicycling. They also tend to be associated with higher vehicular speeds, which can negatively affect pedestrian comfort and safety. In contrast, access classes 6 and 7 apply to areas with higher development intensity, such as downtowns and urban centers, and have fewer access restrictions. However, more frequent driveways and intersections can lead to greater potential conflicts between people walking, biking, and driving.



Source: Kittelson

FIGURE 19. DISTRICT 7 VEHICLE TRAFFIC VOLUMES ON MAJOR ROADS

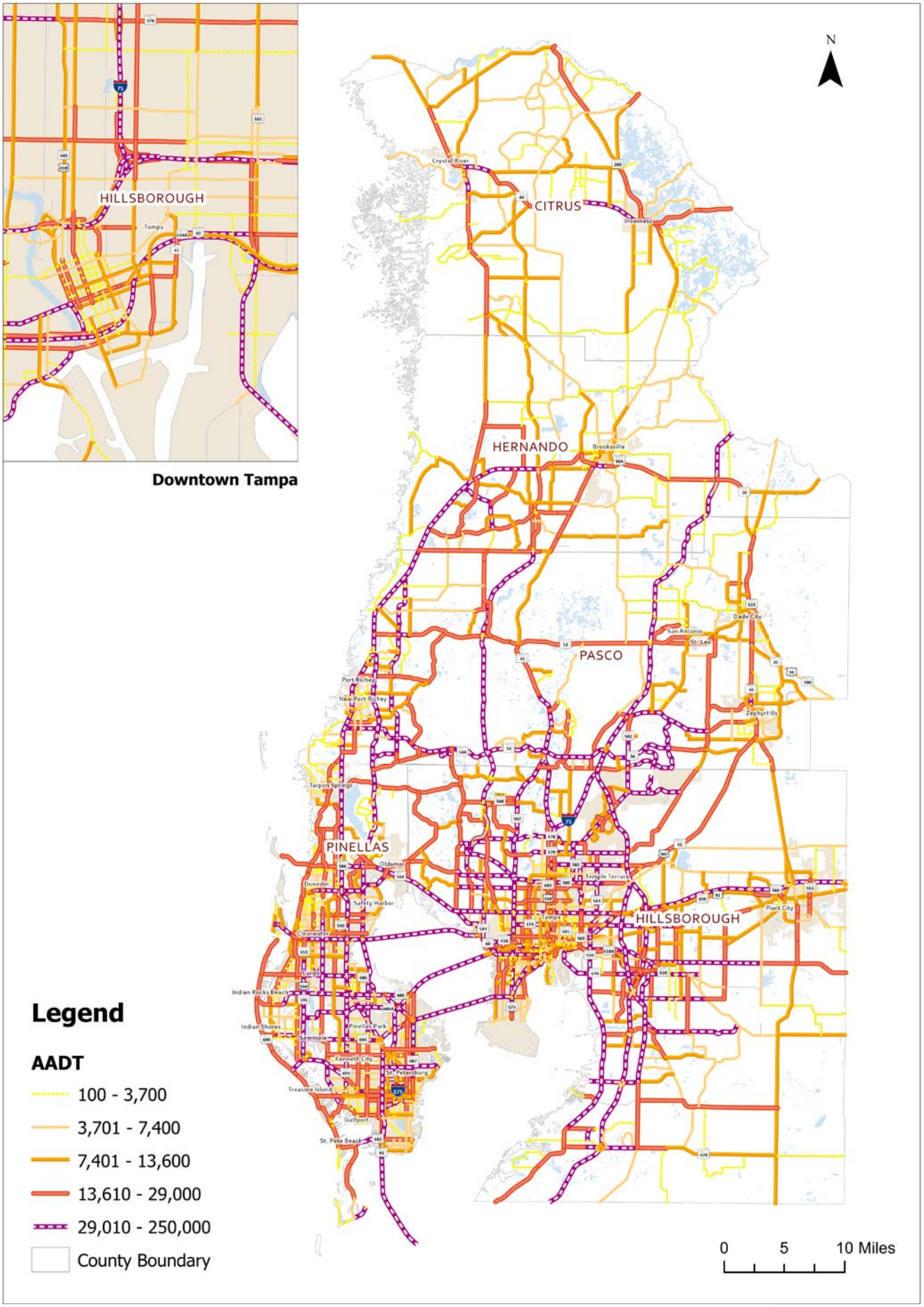


FIGURE 20. DISTRICT 7 NUMBER OF LANES ON MAJOR ROADS

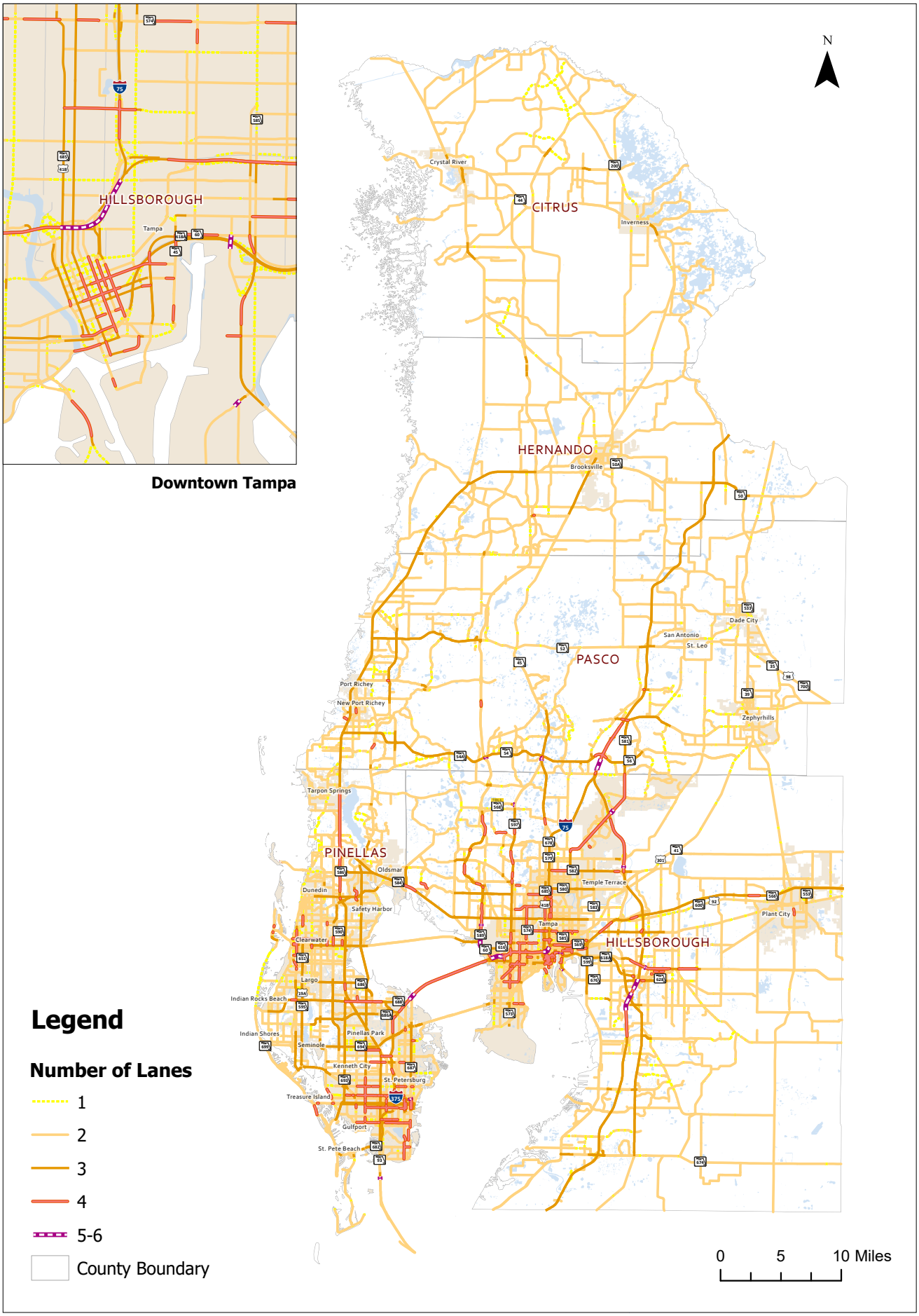
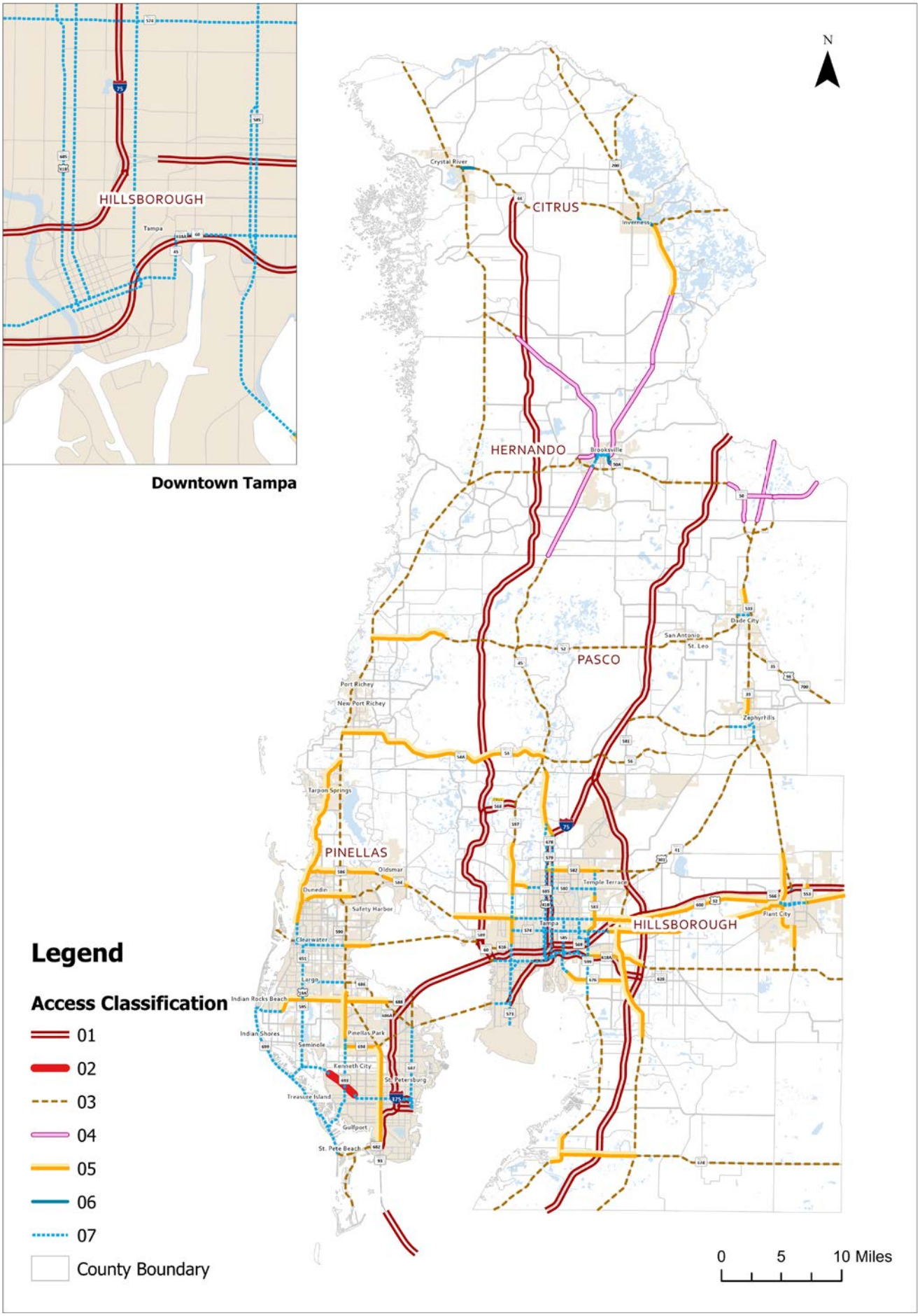


FIGURE 21. DISTRICT 7 ACCESS CLASSIFICATION ON STATE ROADS



PEDESTRIAN AND BICYCLIST CRASH TRENDS

In the five year period between 2020 and 2024, an average of 174 fatal and serious injury bicyclist-involved crashes and 322 fatal and serious injury pedestrian-involved crashes occurred annually in District 7. The fatal and serious injury pedestrian and bicyclist crashes are shown in Figure 22.

During this period, 27% of pedestrian crashes and 12% of bicyclist crashes in District 7 resulted in fatalities or incapacitating injuries. Approximately 32% of pedestrian and bicyclist crashes occurred at intersections. Hillsborough County had the highest number of crashes, accounting for 46% of the total bicycle and pedestrian crashes, followed by Pinellas (34%), Pasco (13%), Hernando (4%), and Citrus (3%). Crashes by county are shown in Figure 23 to Figure 27.

HIGH CRASH CORRIDORS

The District identified the top 12 crash corridors based on the frequency and severity of pedestrian and bicyclist crashes, measured by total crashes and fatal or serious injury rates per mile. These corridors, detailed in Table 1, represent locations with the greatest concentration of severe crashes and therefore the highest priority for safety improvements.

Figure 28 shows the top crash corridors, including major roadways such as U.S. Highway 19, Hillsborough Avenue, 34th Street, and Seminole Boulevard/Missouri Avenue, which have experienced a higher number of pedestrian and bicyclist crashes over recent years.



Source: Kittelson

FIGURE 22. DISTRICT 7 PEDESTRIAN AND BICYCLIST CRASHES ON STATE ROADS

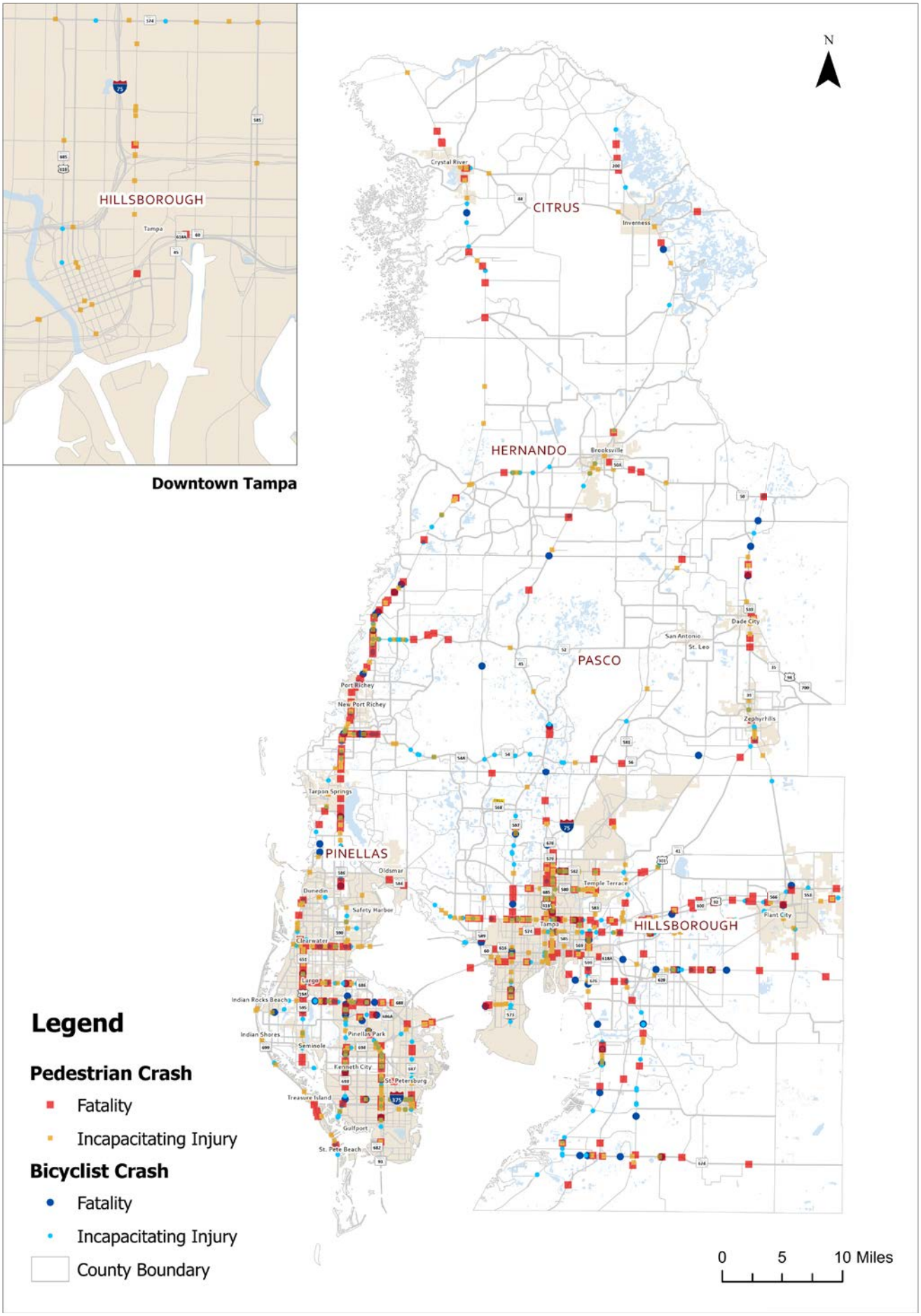


FIGURE 23. CITRUS COUNTY PEDESTRIAN AND BICYCLIST CRASHES ON STATE ROADS

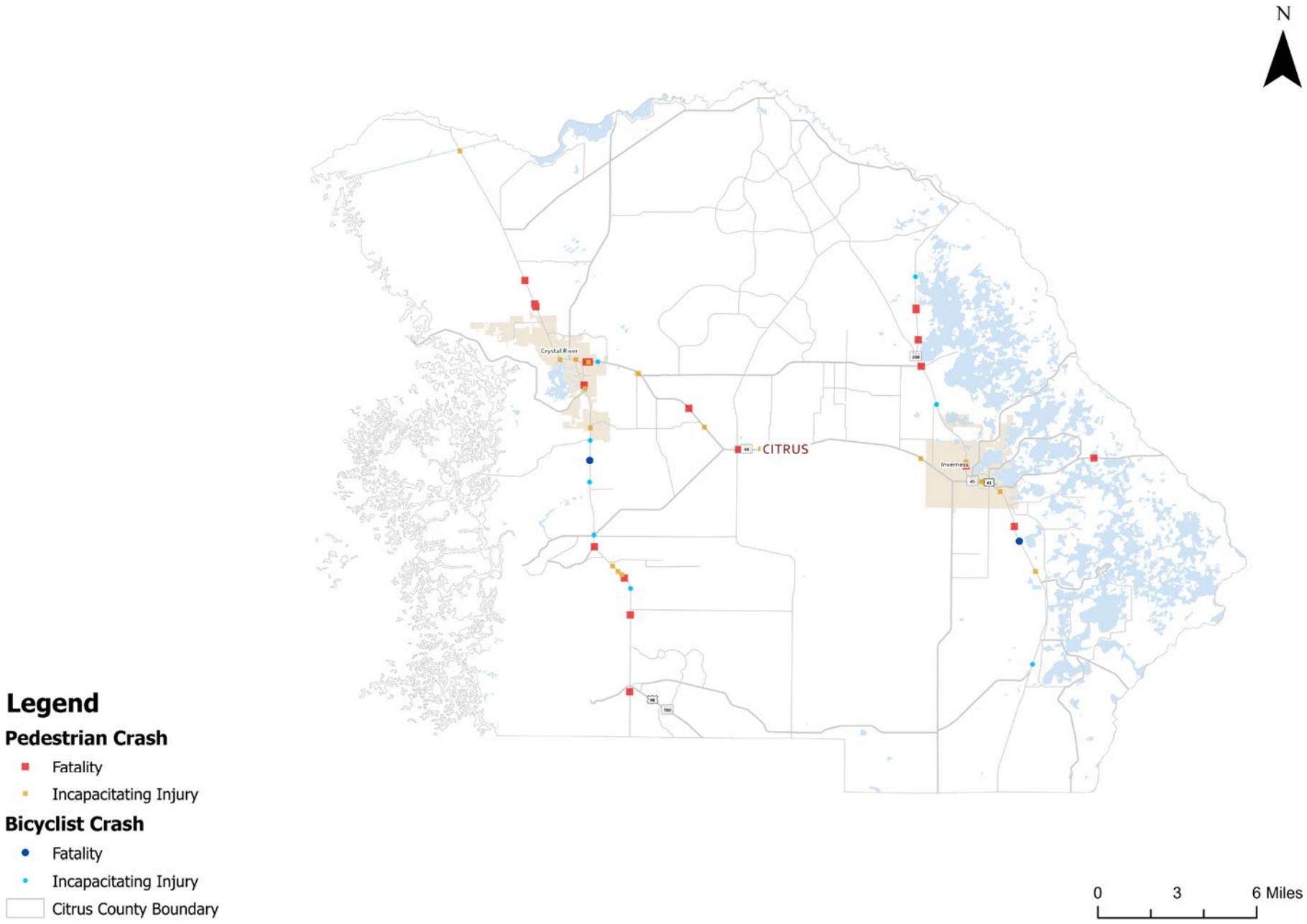


FIGURE 24. HERNANDO COUNTY PEDESTRIAN AND BICYCLIST CRASHES ON STATE ROADS

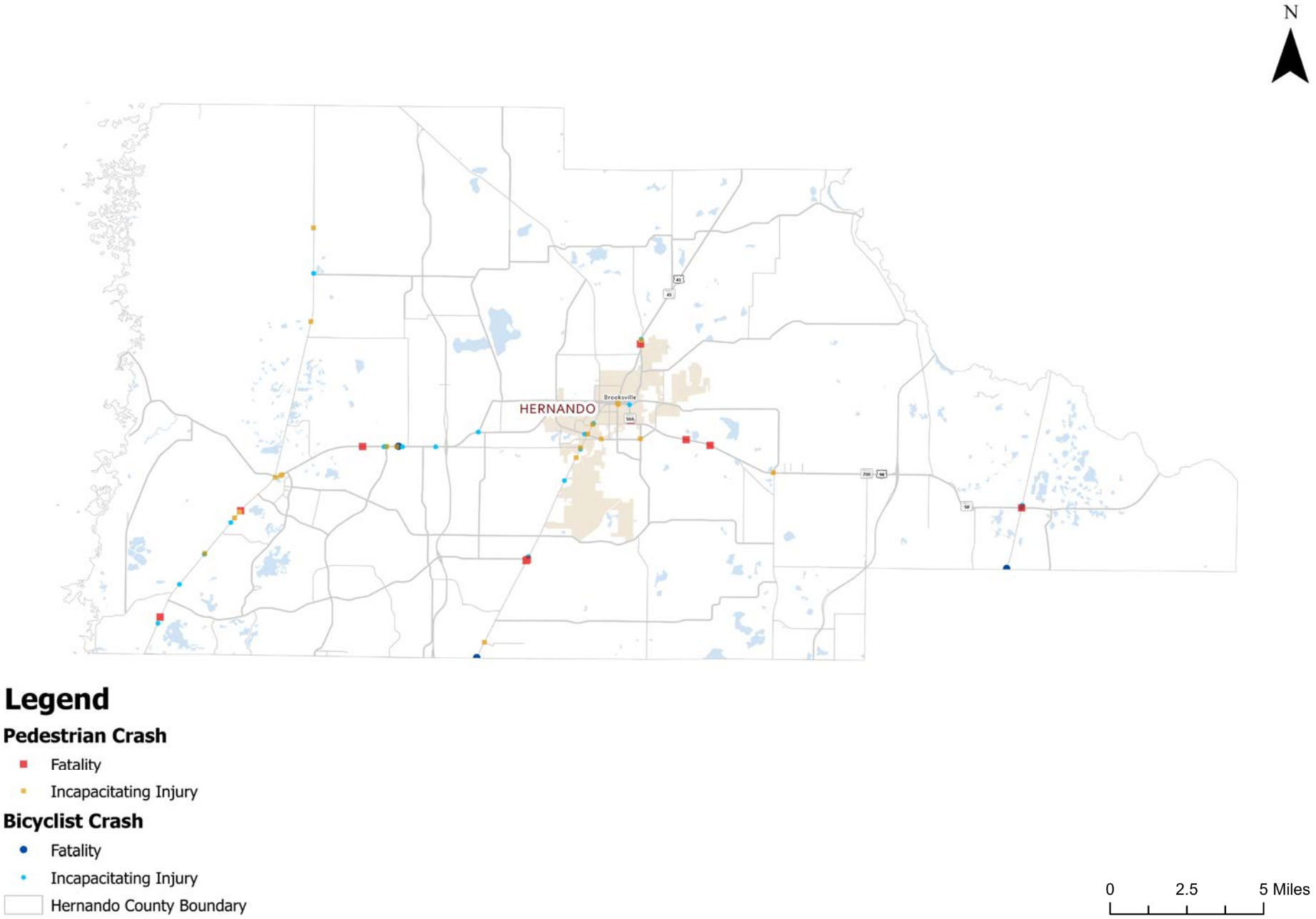


FIGURE 25. PASCO COUNTY PEDESTRIAN AND BICYCLIST CRASHES ON STATE ROADS

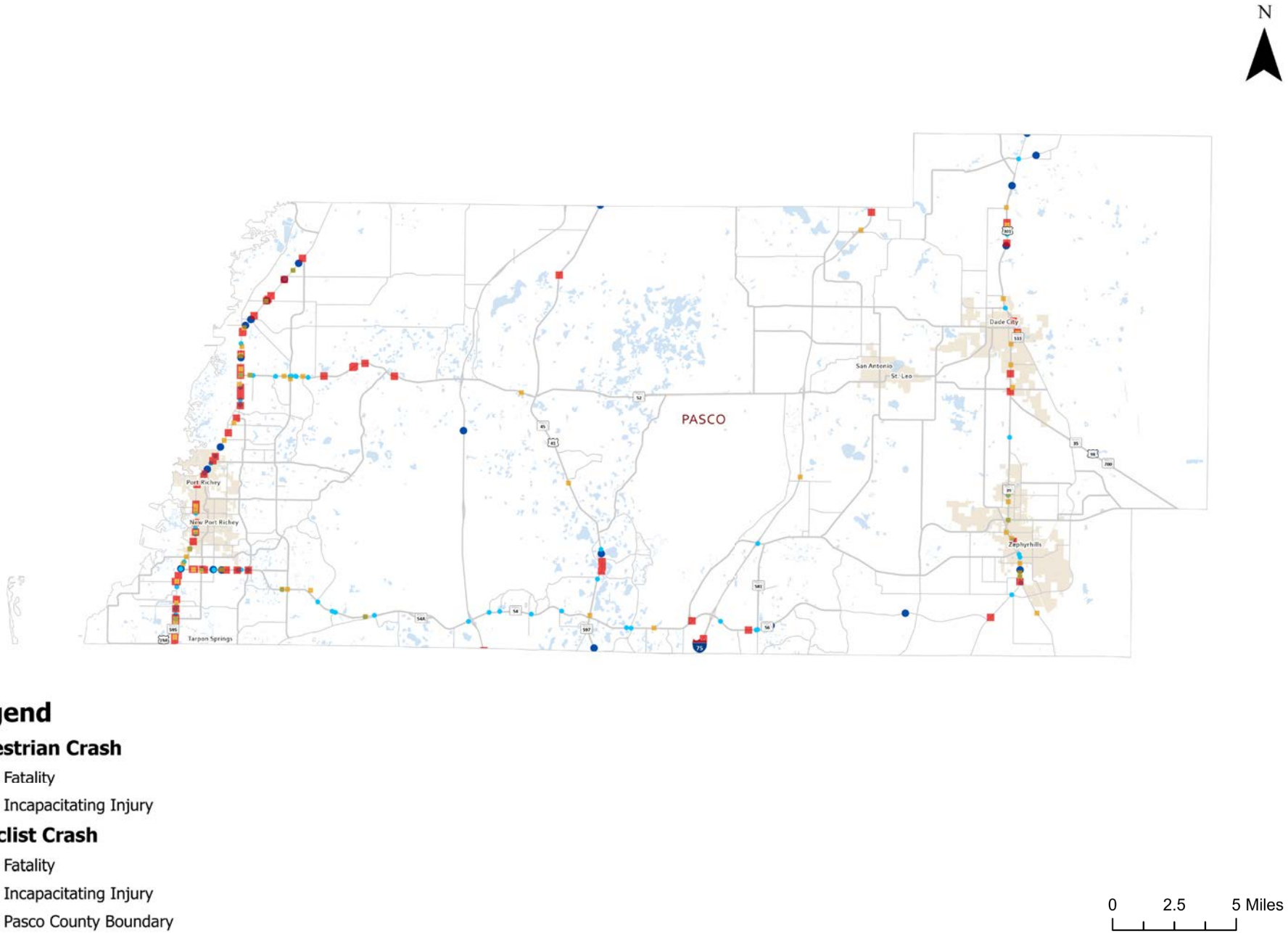


FIGURE 26. PINELLAS COUNTY PEDESTRIAN AND BICYCLIST CRASHES ON STATE ROADS

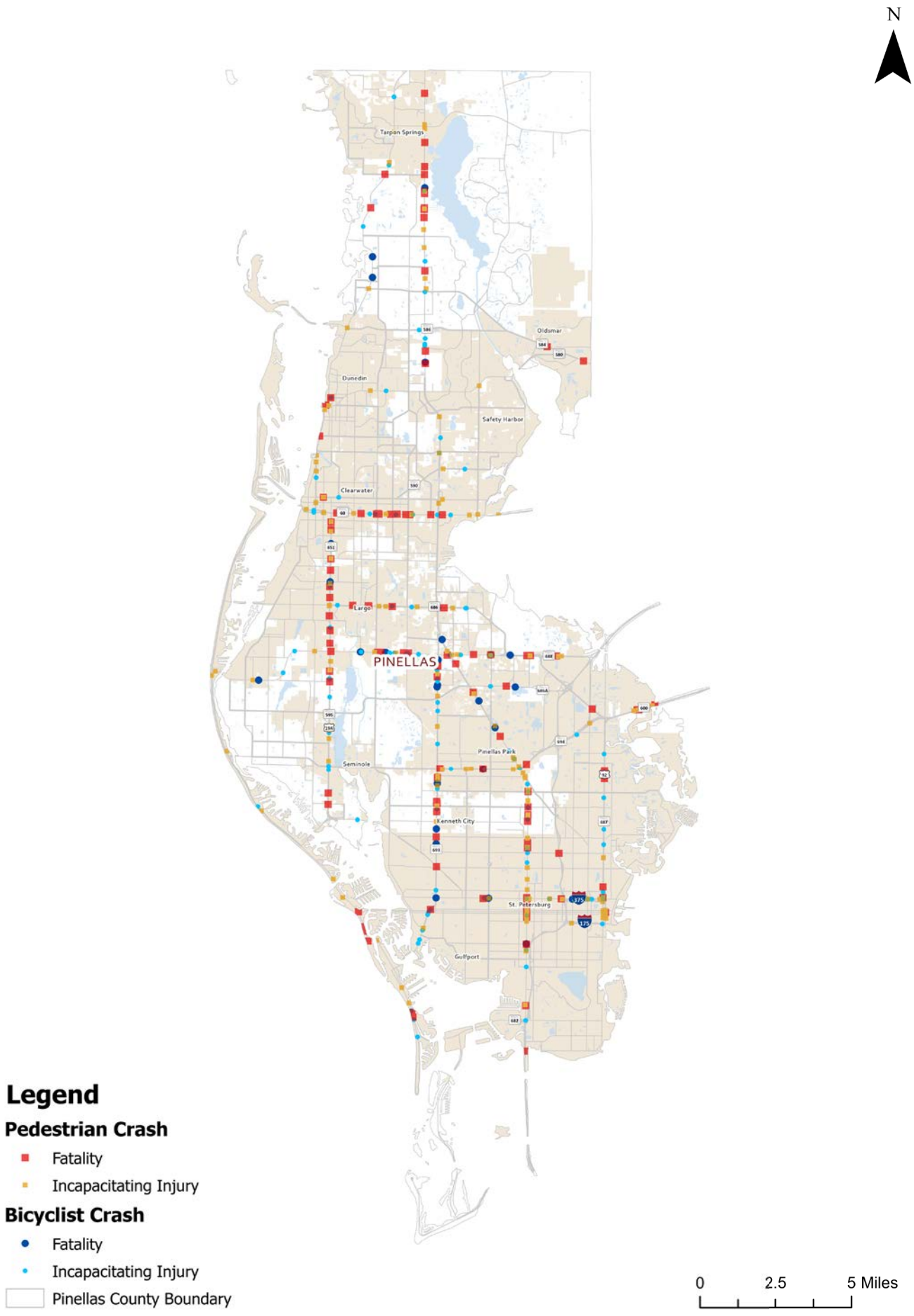


FIGURE 27. HILLSBOROUGH COUNTY PEDESTRIAN AND BICYCLIST CRASHES ON STATE ROADS

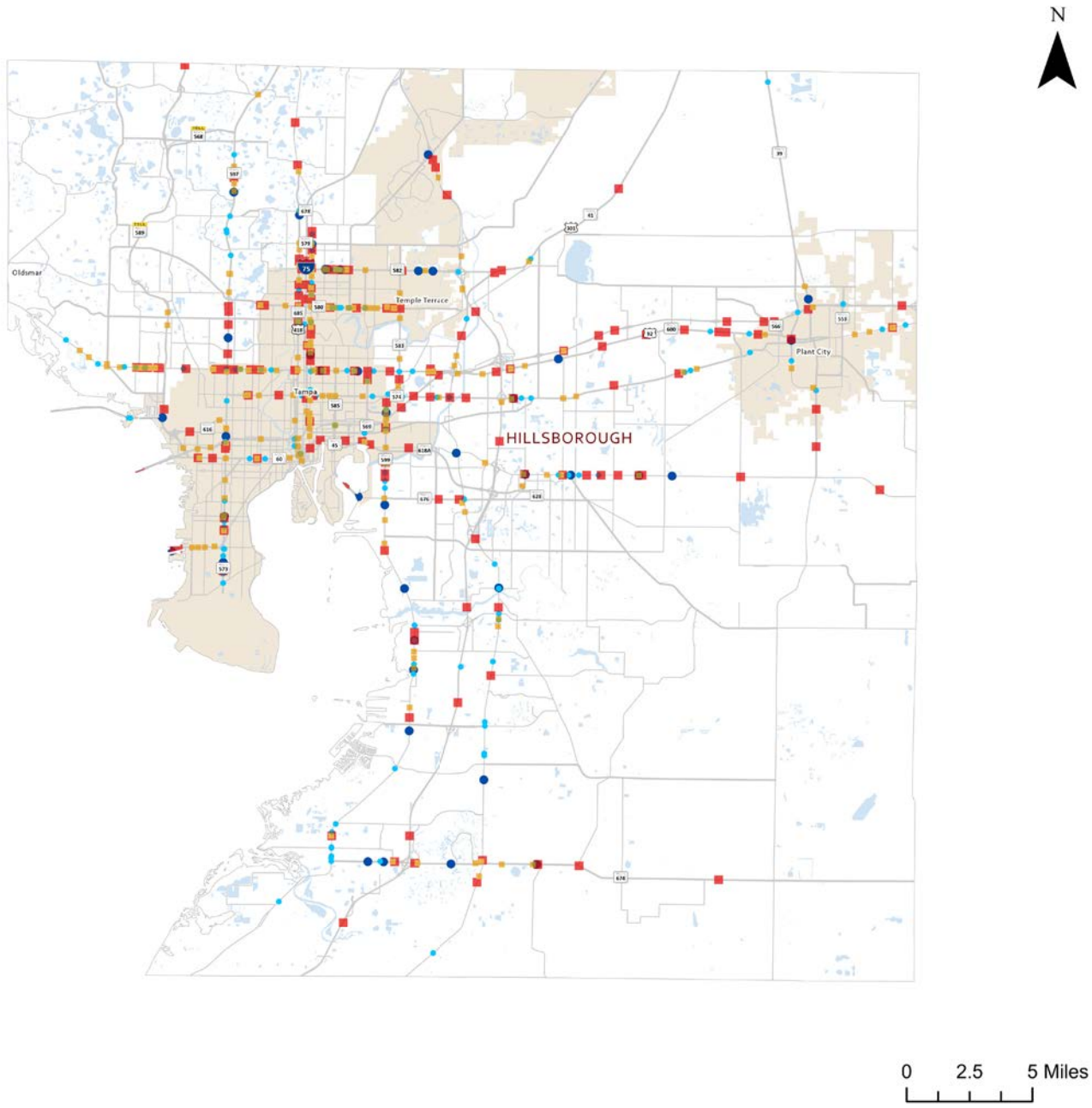


FIGURE 28. DISTRICT 7 HIGH CRASH CORRIDORS ON STATE ROADS

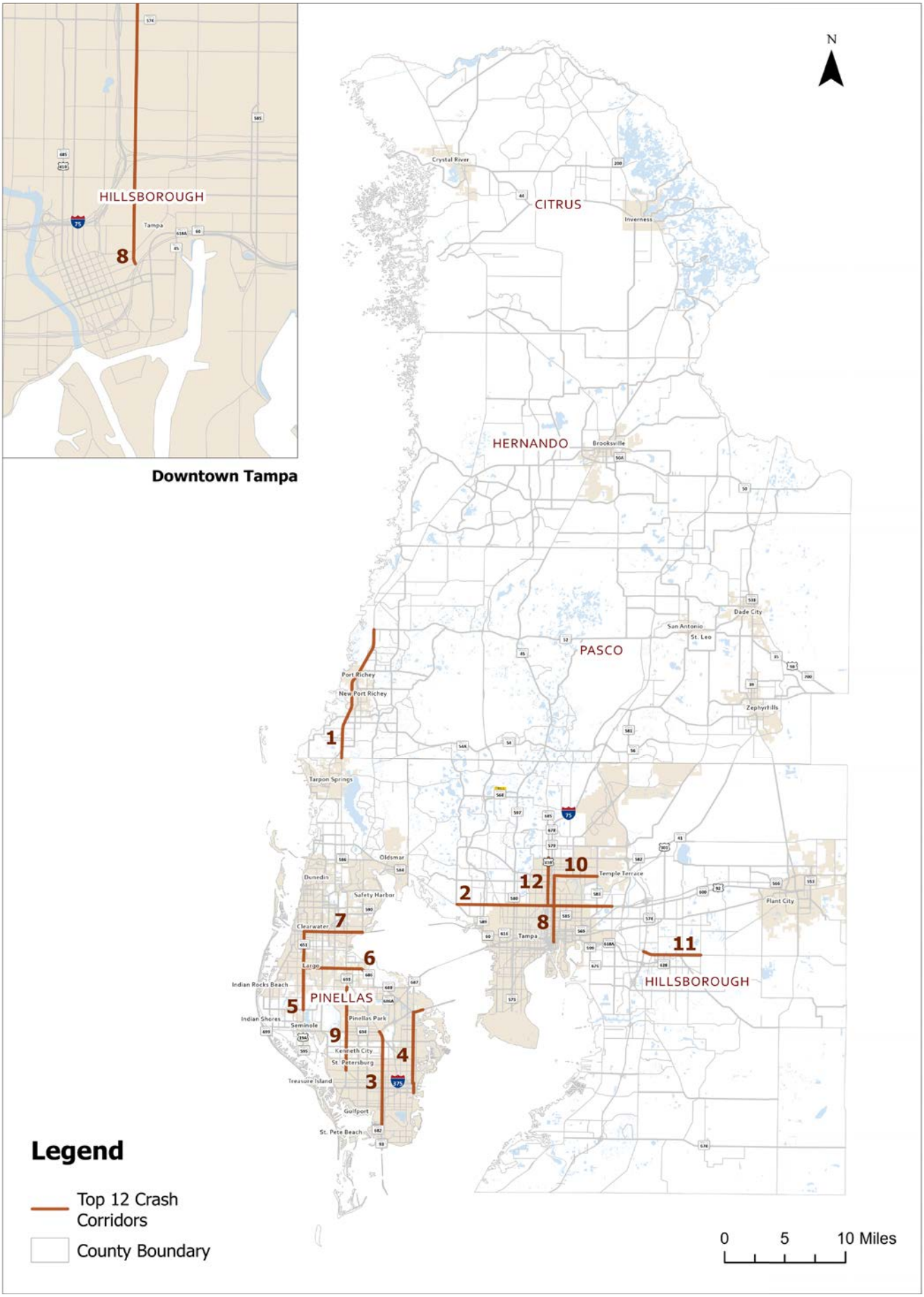


TABLE 1. TOP 12 CRASH CORRIDORS

Rank	Roadway	From	To	Total Bicycle/ Pedestrian Crashes per Year	Fatal & Serious Injury Crashes per Year[1]	Fatal & Serious Injury Crashes/mi per Year	Bicycle/ Pedestrian Crashes/mi per Year
1	U.S. Highway 19	Pinellas/ Pasco County Line	State Road 52	50.4	13.6	1.19	4.4
2	Hillsborough Avenue	Memorial Highway	Orient Road	53.8	12.2	0.96	4.21
3	34th Street	54th Avenue South	Gandy Boulevard	10	2.6	0.31	1.2
4	4th Street	5th Avenue South	Gandy Boulevard	17.8	3.4	0.57	2.99
5	Seminole Blvd/ Missouri Ave	102nd Avenue	Court Street	30.8	5.6	0.84	4.67
6	East Bay Drive	Alt-19	49th Street	7.8	2.4	0.44	1.44
7	SR-60	Alt-19	McMullen Booth Road	7	2.6	0.54	1.46
8	Nebraska Avenue	Twiggs Street	Busch Boulevard	0.8	0.4	0.07	0.14
9	66th Street	Tyrone Boulevard	Ulmerton Road	8.8	3.6	0.52	1.26
10	Busch Boulevard	Nebraska Avenue	56th Street	2	0.6	0.16	0.531
11	Adamo Drive	I-75 Interchange	Valrico Road	3.8	0.8	0.19	0.8
12	Florida Avenue	Hillsborough Avenue	Fowler Avenue	0.6	0.2	0.05	0.15

[1] *Data is from 2020 to 2024.*



Source: Kittelson

EXISTING INFRASTRUCTURE

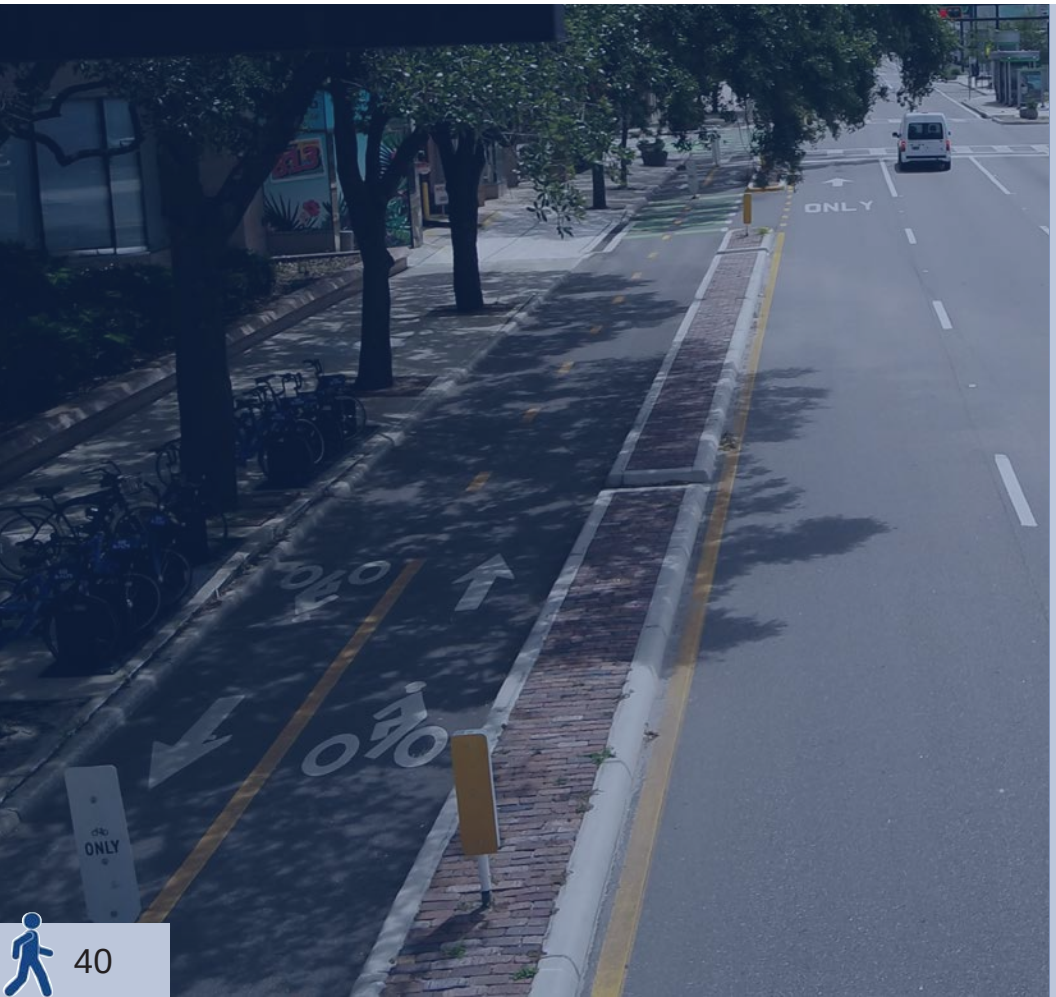
PEDESTRIAN AND BICYCLE FACILITIES

Existing sidewalk and shared use facilities were identified using available data and then reviewed based on aerial data. Gaps are shown where there is no sidewalk along the state road system.

High-comfort walking and bicycling facilities in District 7 include a network of shared use paths and trails across the district. Additionally, District 7 built the first two-way separated bike lane on a state road in Florida on Jackson Street (SR 60) and built a two-way cycle track on the Pinellas Bayway (SR 679). There are also two-way separated bike lanes on local roads in downtown Tampa and St. Petersburg, and several more separated bike lanes are planned for downtown St. Petersburg.

Existing bike facilities differ across District 7 from paved shoulders, sharrows, designated bike lanes, separated bike lanes and shared-use paths. Shared streets or bicycle boulevards—lower-volume, lower-speed streets where an exclusive bike facility is not necessary—are planned throughout District 7, including in downtown St. Petersburg. These facilities serve critical connections to separated bicycle facilities or trails. In many cases, shared streets or bicycle boulevards provide a comfortable parallel route to state roadways.

District 7's bicycle and pedestrian network, shown in Figure 29 to Figure 40, is supported by the Coast-to-Coast Connector, a multi-jurisdictional cross-state shared use path that includes the Pinellas Trail, Starkey Trail, Suncoast Trail, and the Good Neighbor Trail in Pinellas, Pasco, and Hernando counties.



Source: Kittelson

FIGURE 29. DISTRICT 7 PEDESTRIAN FACILITIES AND GAPS ON STATE ROADS

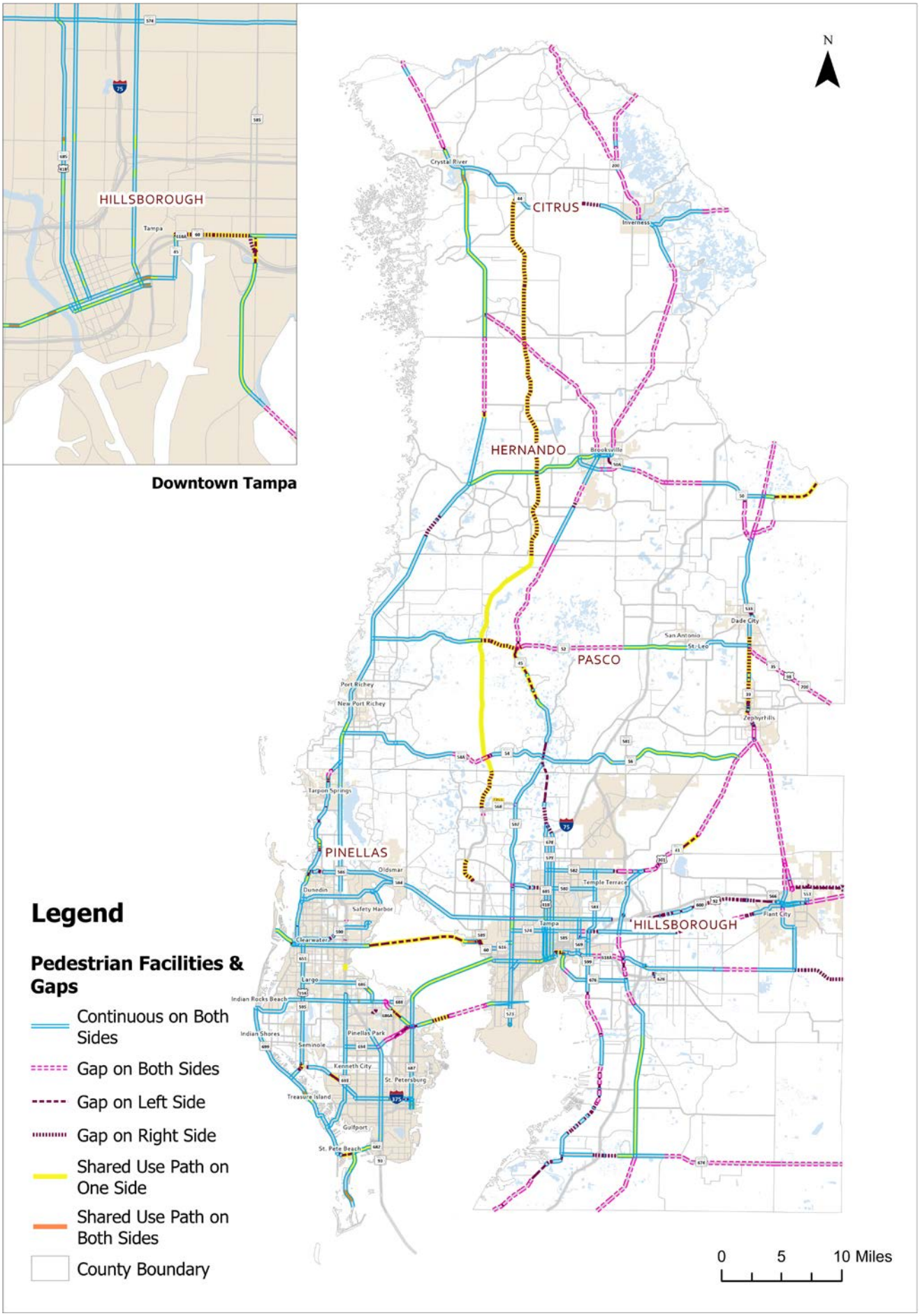


FIGURE 30. DISTRICT 7 BICYCLE FACILITIES AND GAPS ON STATE ROADS

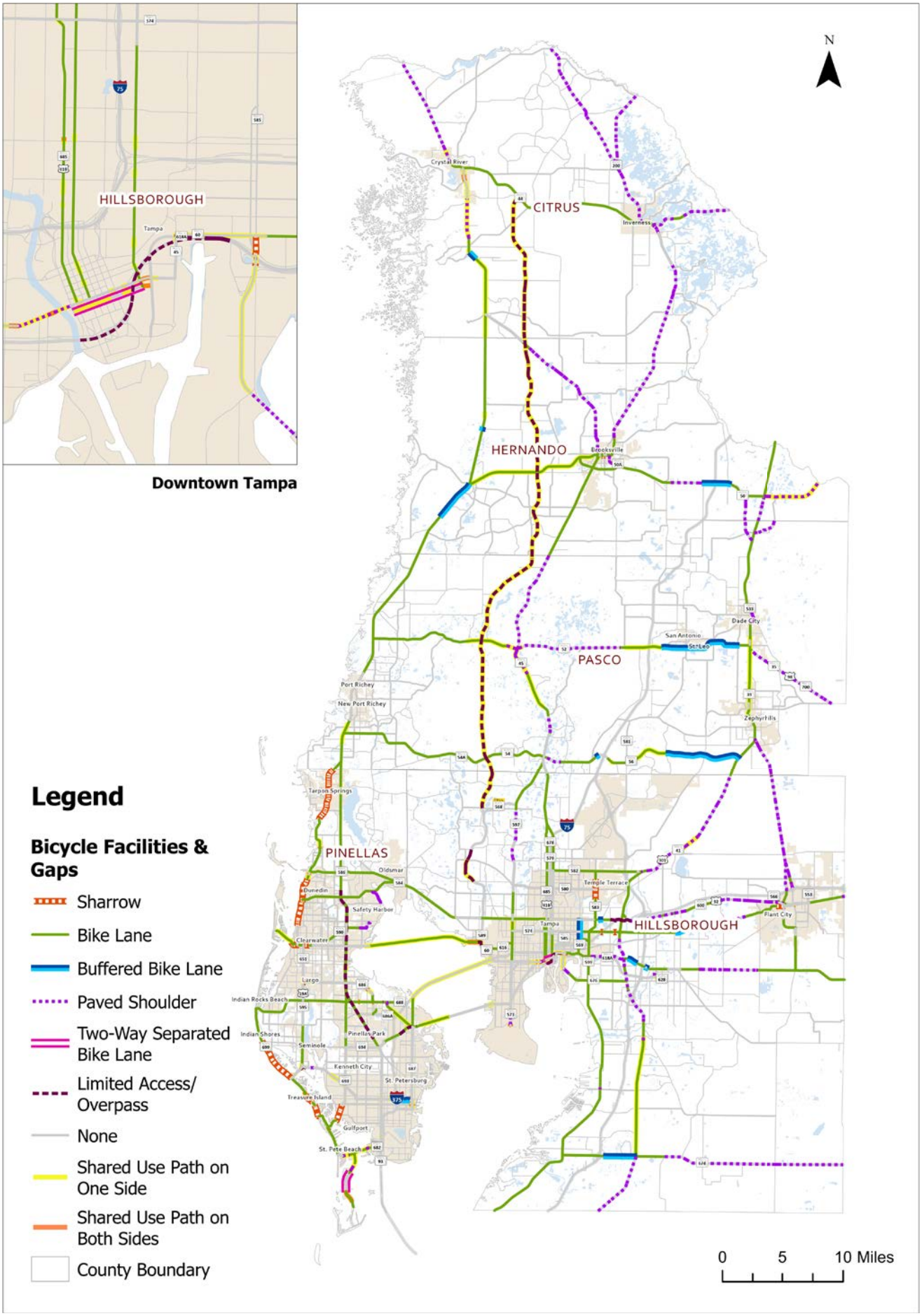


FIGURE 31. CITRUS COUNTY PEDESTRIAN FACILITIES AND GAPS ON STATE ROADS

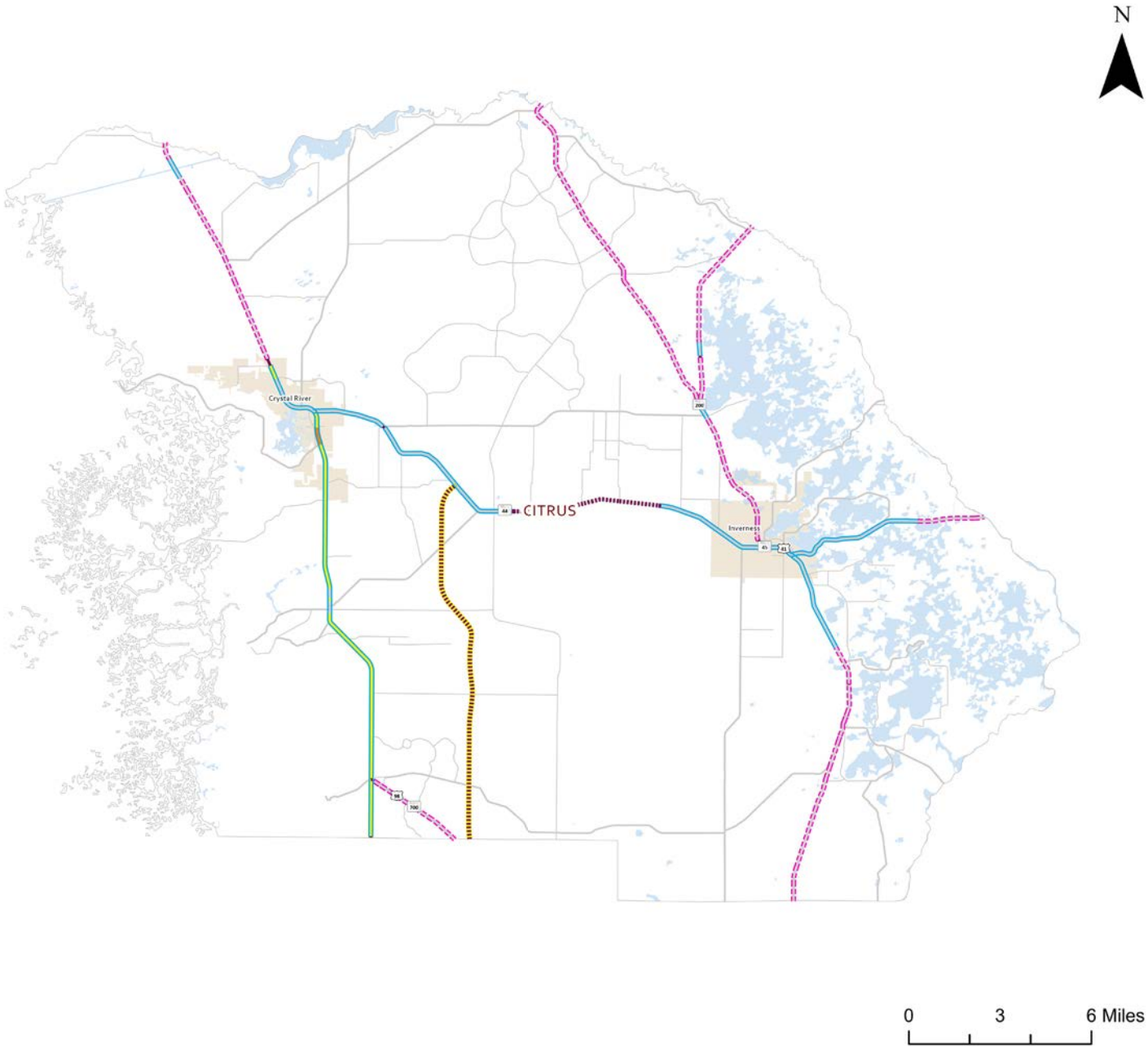


FIGURE 32. CITRUS COUNTY BICYCLE FACILITIES AND GAPS ON STATE ROADS

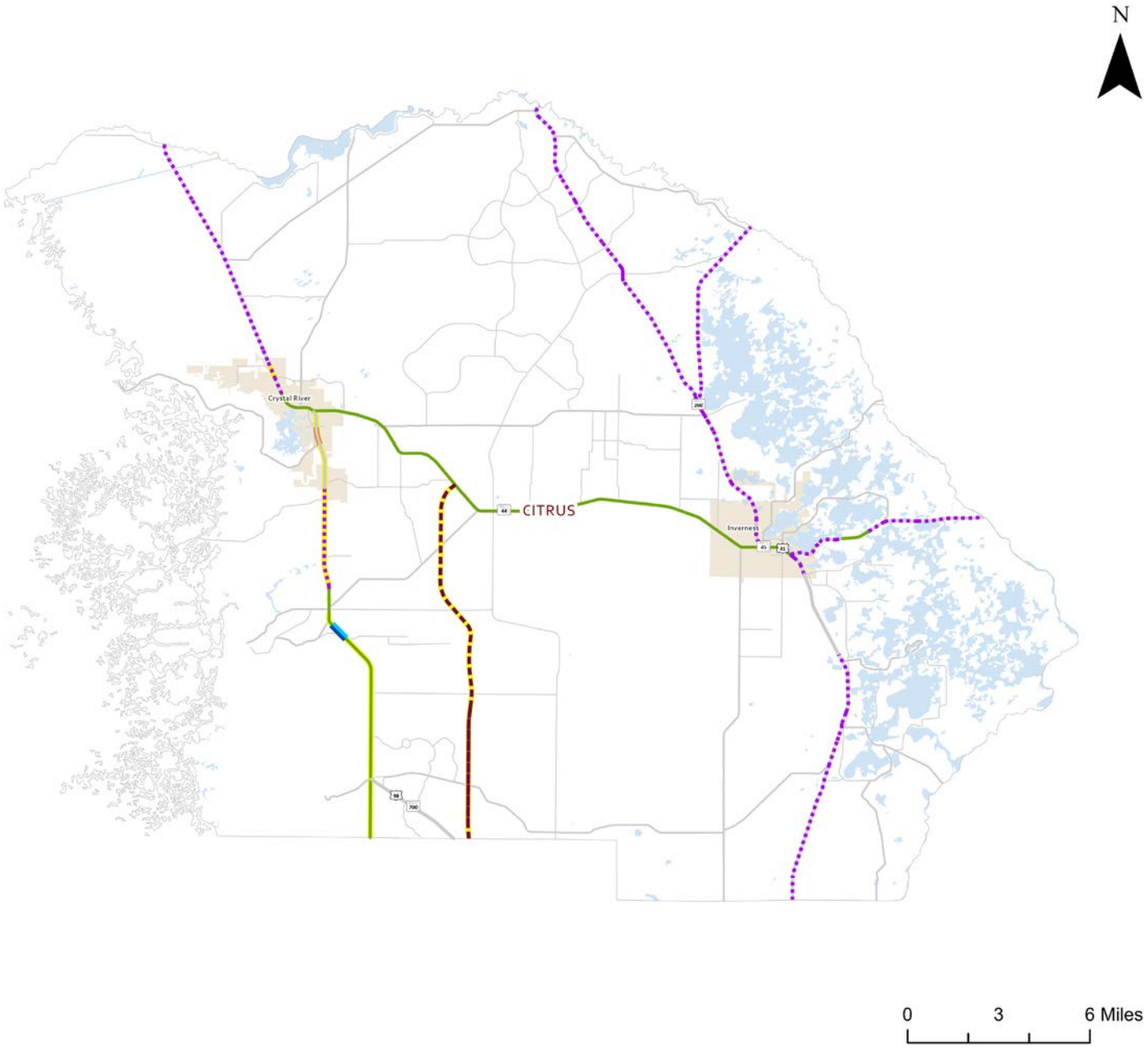


FIGURE 33. HERNANDO COUNTY PEDESTRIAN FACILITIES AND GAPS ON STATE ROADS

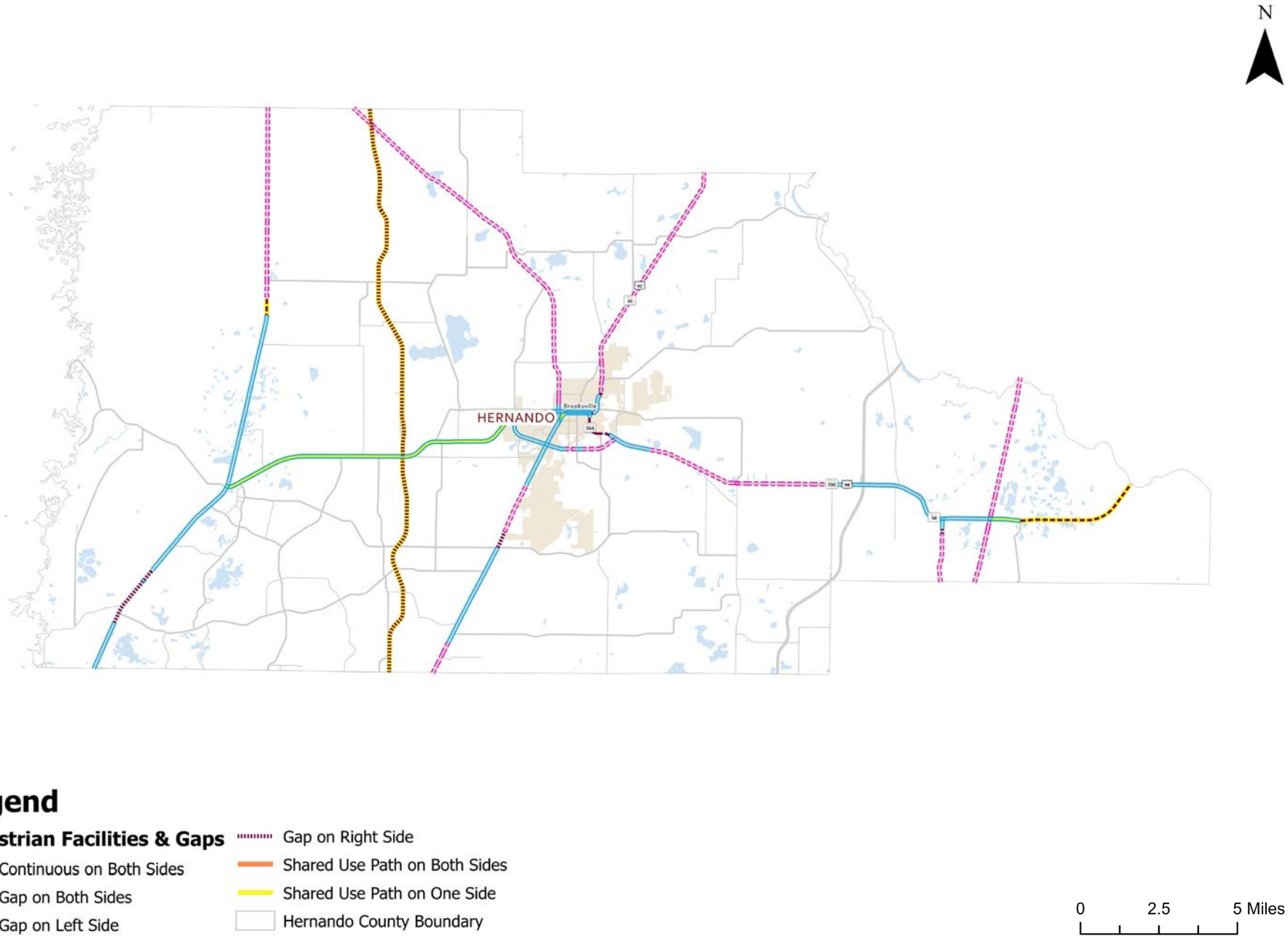


FIGURE 34. HERNANDO COUNTY BICYCLE FACILITIES AND GAPS ON STATE ROADS

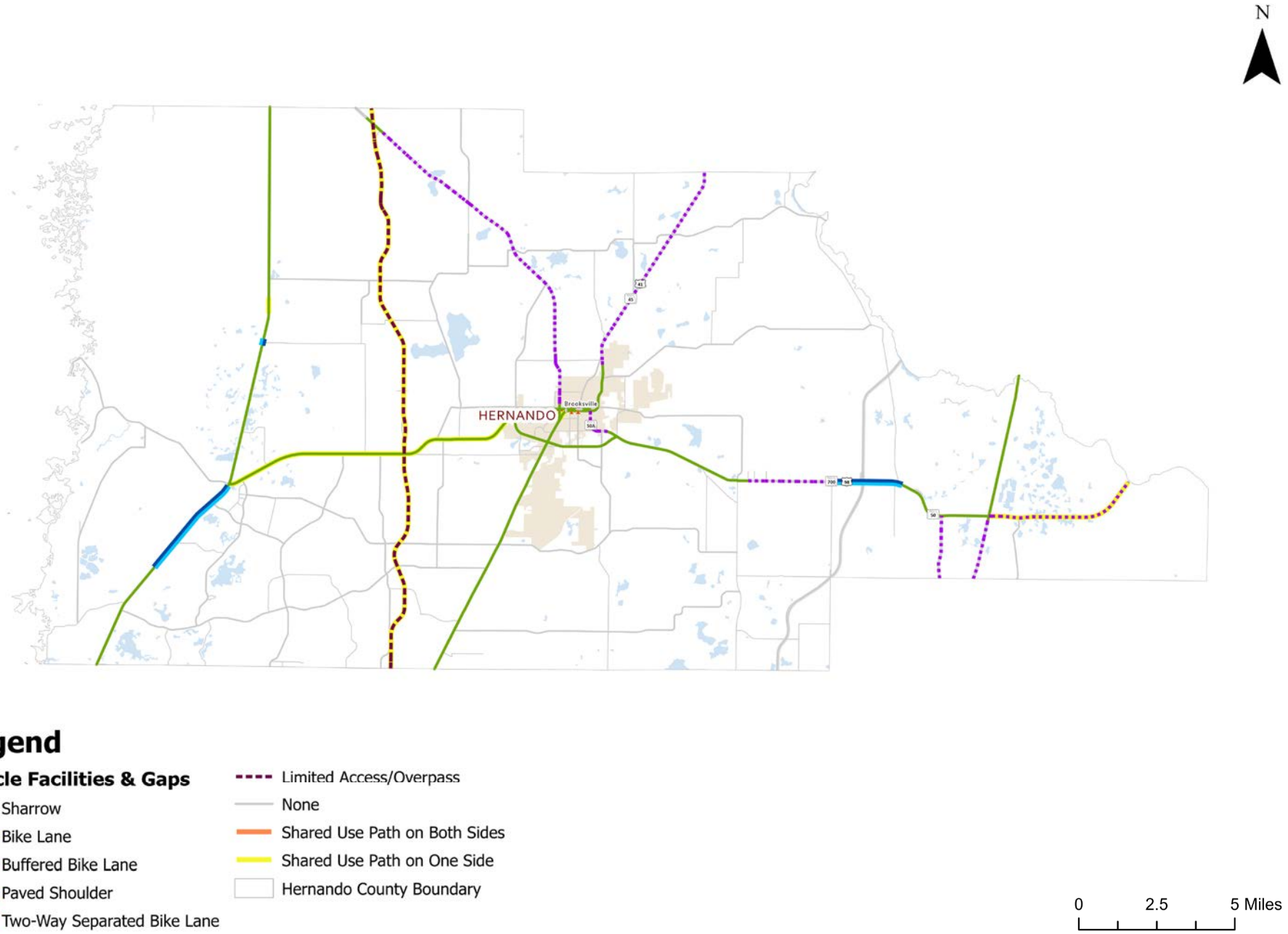


FIGURE 35. PASCO COUNTY PEDESTRIAN FACILITIES AND GAPS ON STATE ROADS

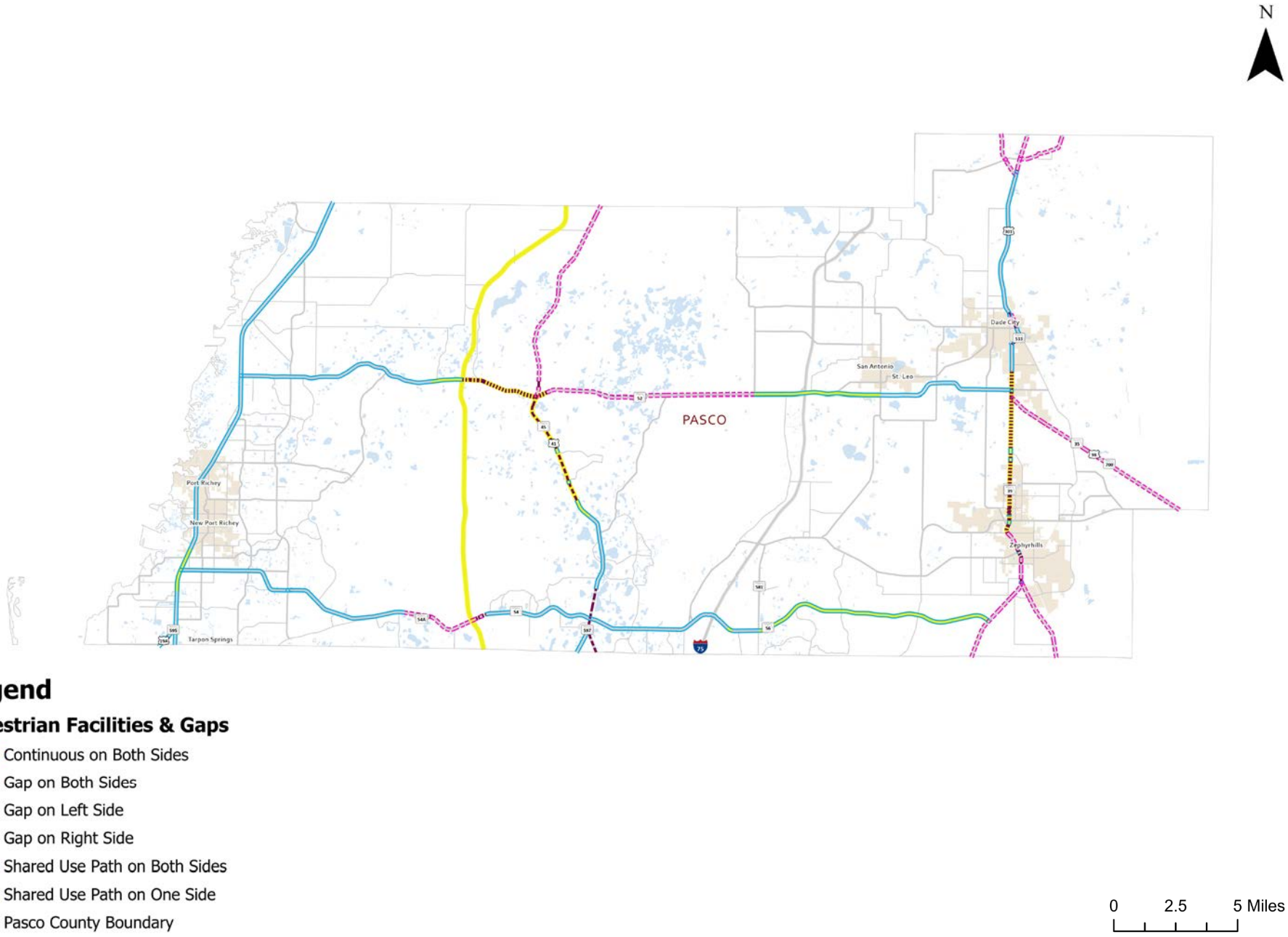


FIGURE 36. PASCO COUNTY BICYCLE FACILITIES AND GAPS ON STATE ROADS

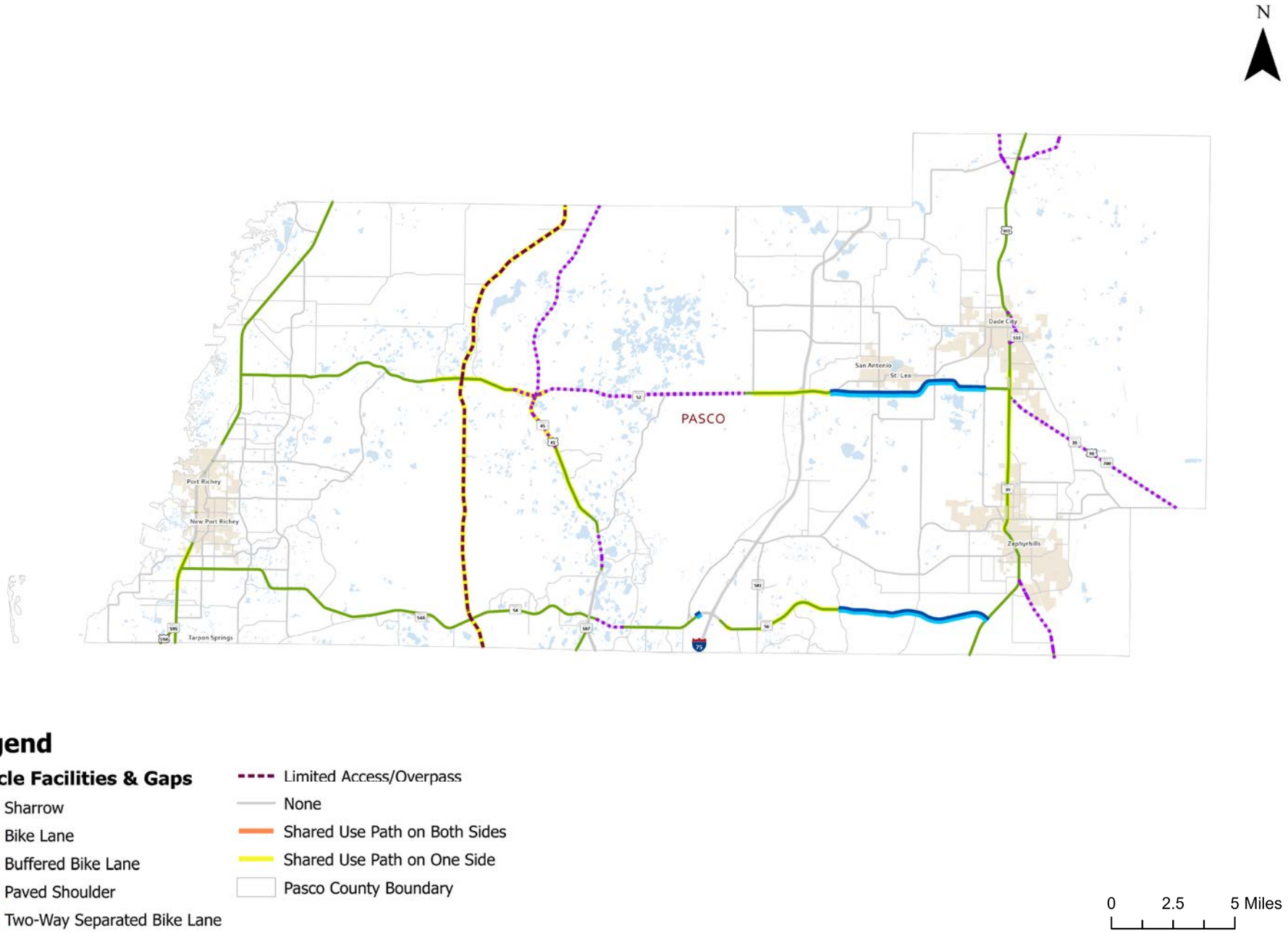


FIGURE 37. PINELLAS COUNTY PEDESTRIAN FACILITIES AND GAPS ON STATE ROADS

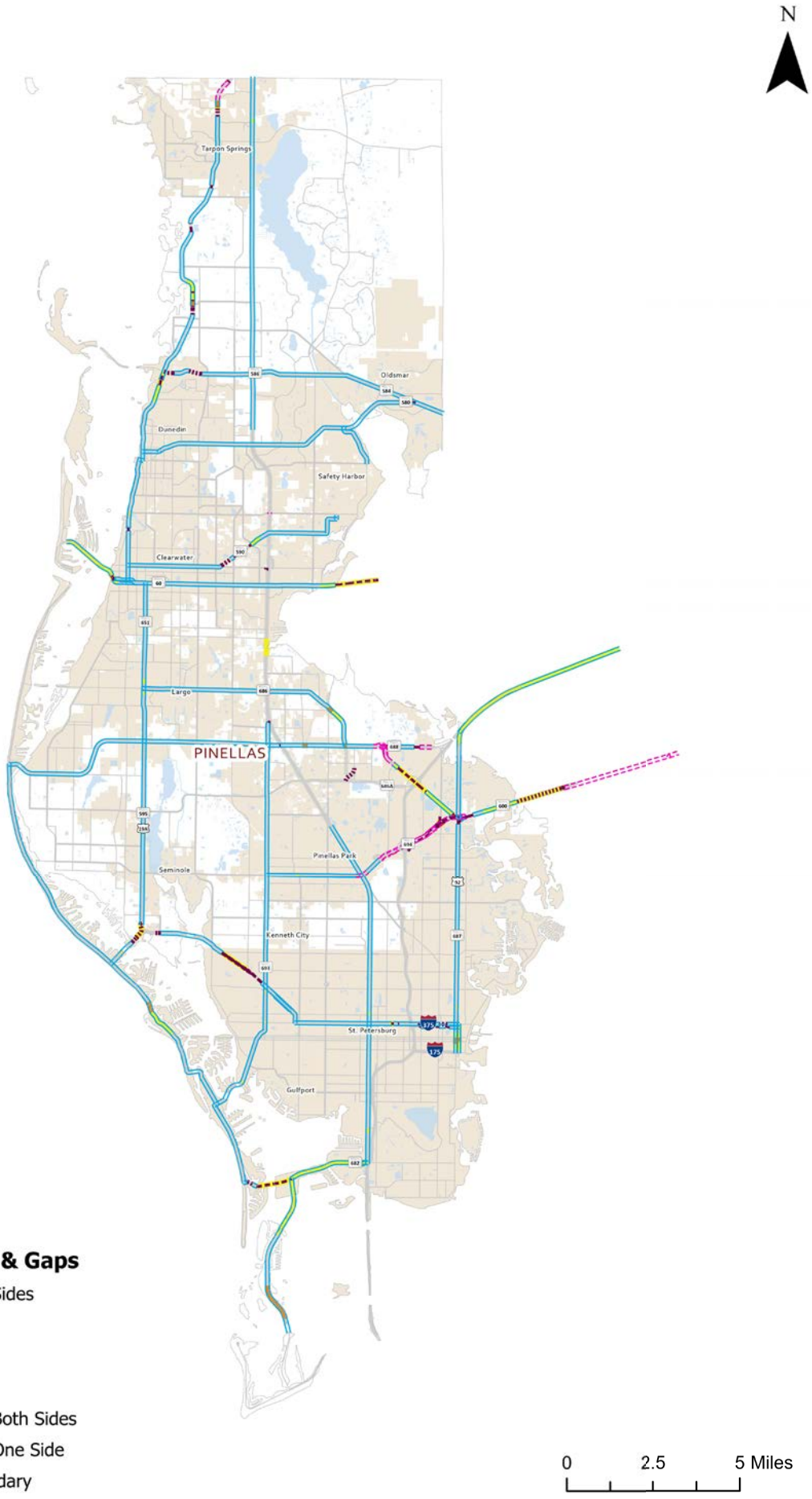


FIGURE 38. PINELLAS COUNTY BICYCLE FACILITIES AND GAPS ON STATE ROADS

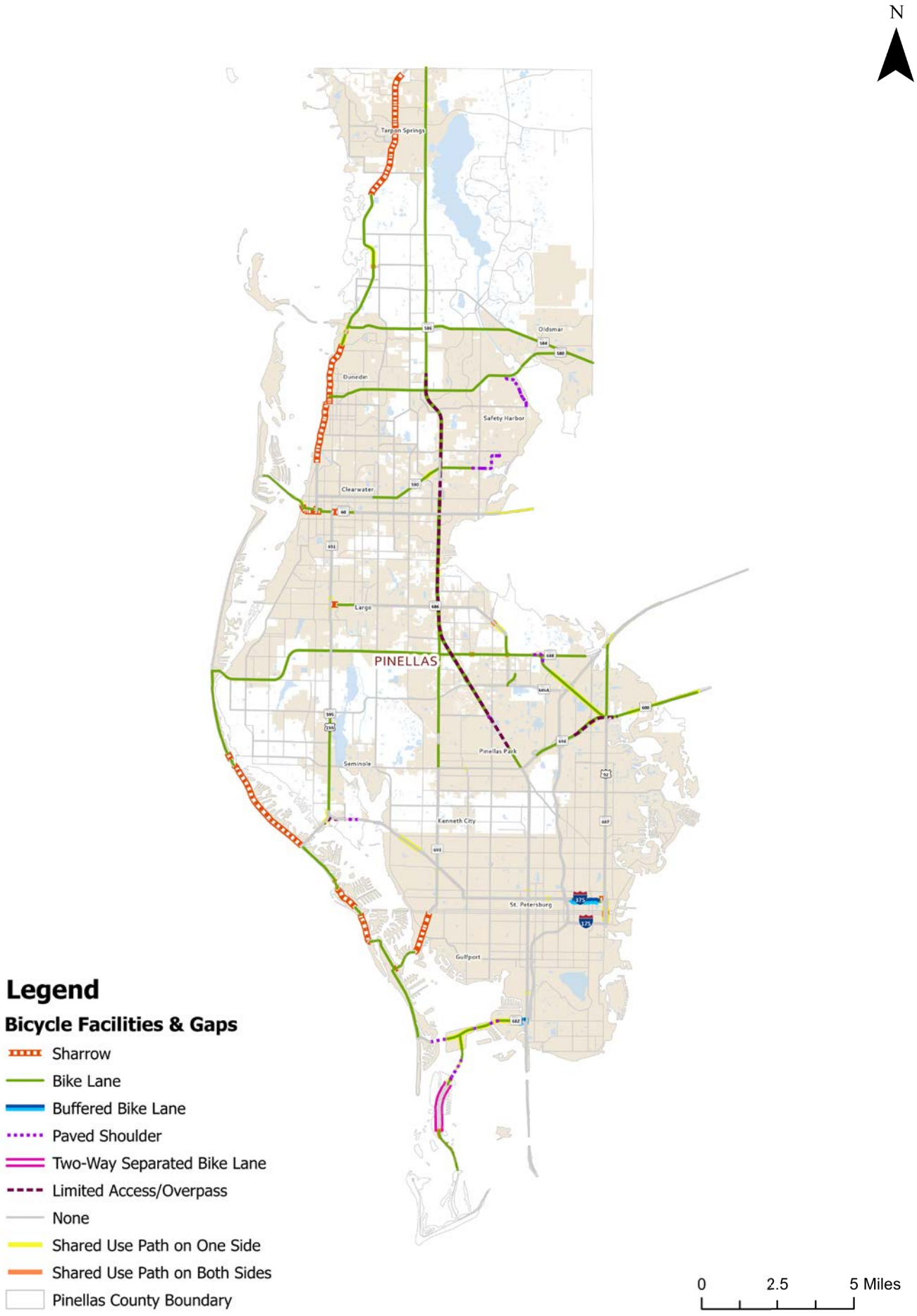


FIGURE 39. HILLSBOROUGH COUNTY PEDESTRIAN FACILITIES AND GAPS ON STATE ROADS

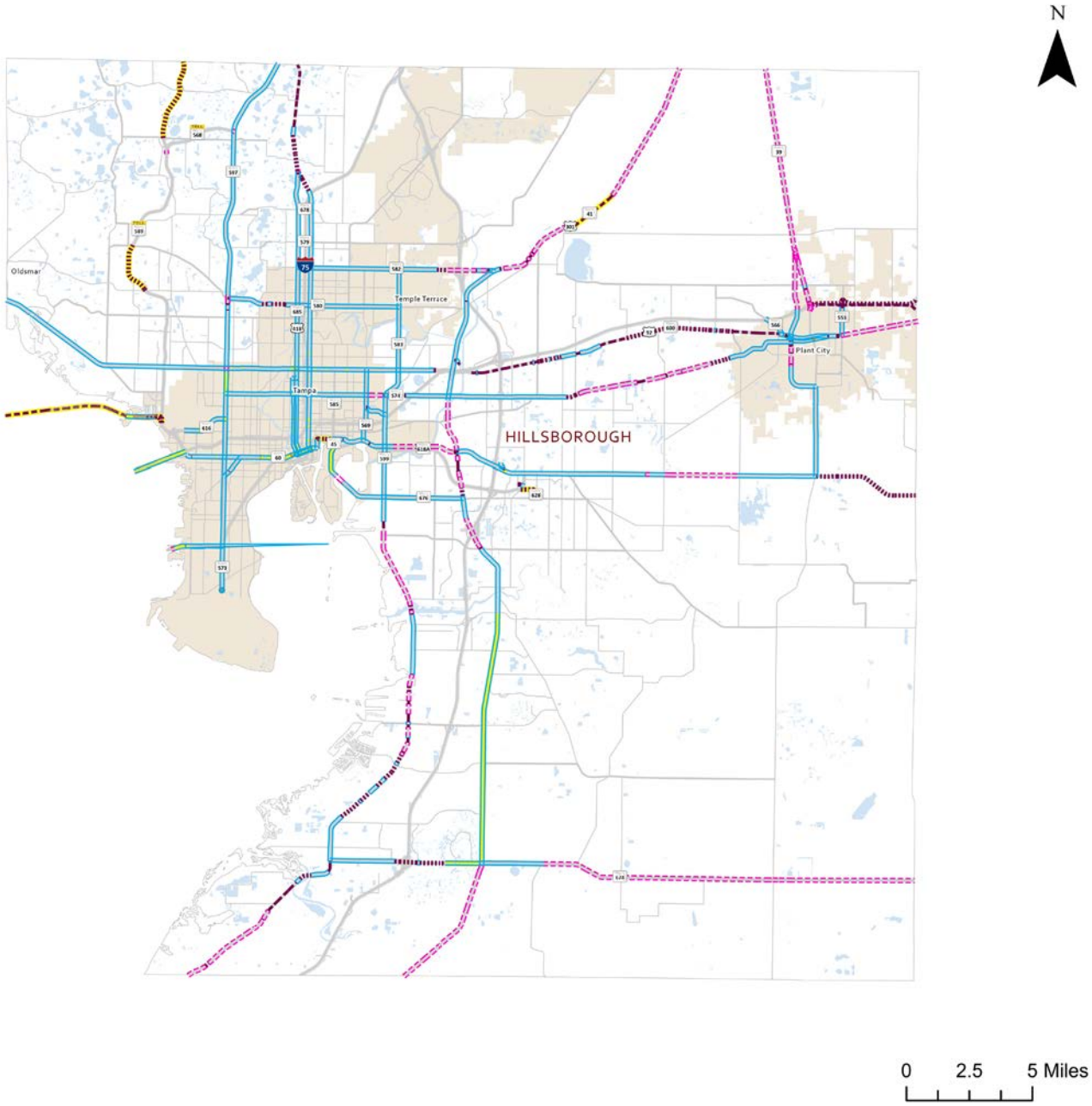
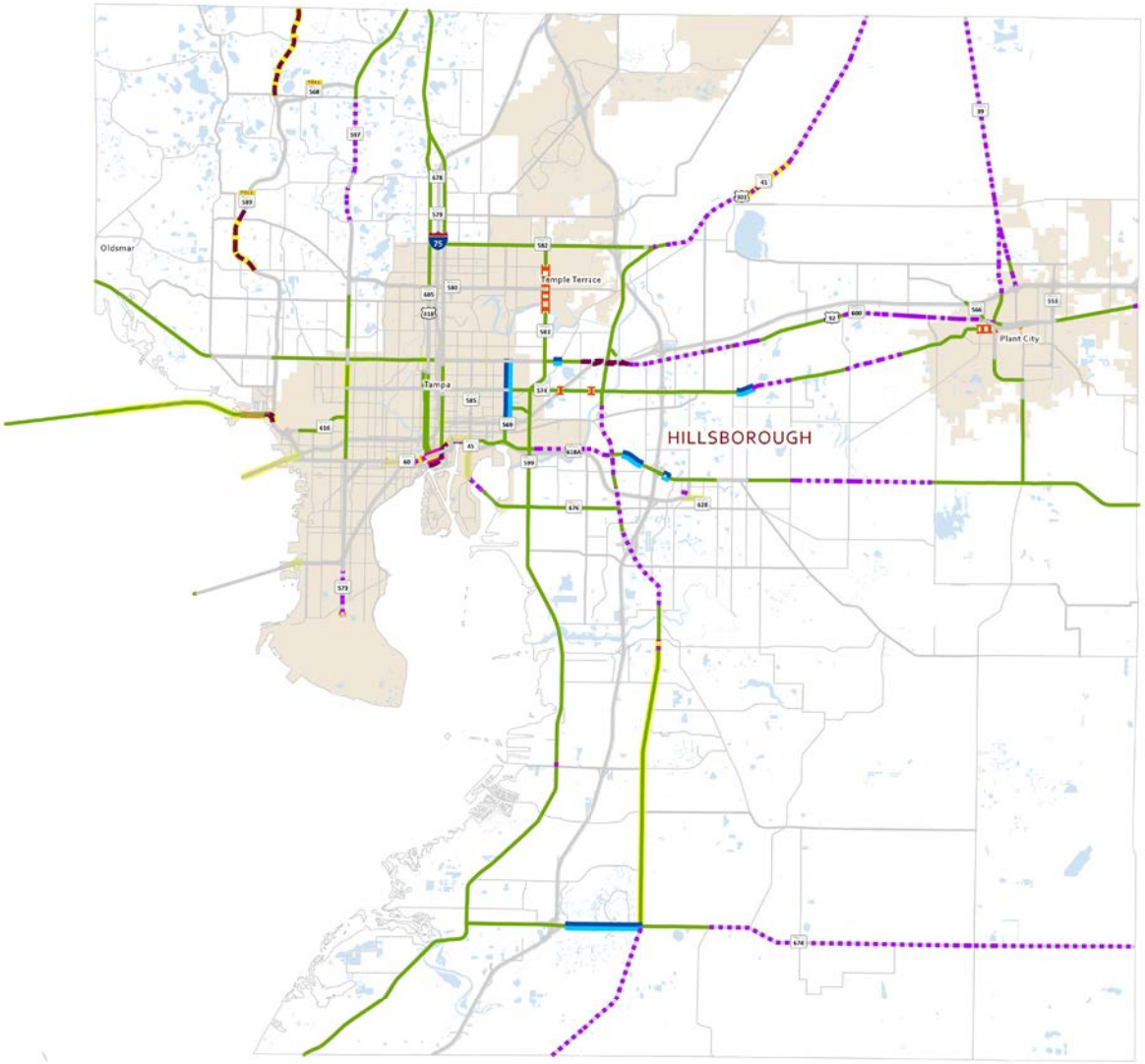


FIGURE 40. HILLSBOROUGH COUNTY BICYCLE FACILITIES AND GAPS ON STATE ROADS



Legend

Bicycle Facilities & Gaps

- Sharrow
- Bike Lane
- Buffered Bike Lane
- Paved Shoulder
- Two-Way Separated Bike Lane
- Limited Access/Overpass
- None
- Shared Use Path on Both Sides
- Shared Use Path on One Side
- Hillsborough County Boundary

LEVEL OF TRAFFIC STRESS

Level of traffic stress (LTS) was determined based on FDOT's Pedestrian and Bicycle Level of Traffic Flow Charts, where an LTS of 1 refers to low stress tolerance and an LTS of 4 corresponds to high stress tolerance.

Pedestrian level of traffic stress (PLTS) quantifies the amount of comfort or discomfort that people feel when they walk along a road. According to the FDOT 2023 *Multimodal Quality/Level of Service Handbook,* PLTS is broken down into the following four categories, as shown in Figure 41:

- PLTS 1: The level suitable for all users, including teenagers traveling alone, the elderly, and people using a wheeled mobility device. People feel safe and comfortable on the pedestrian facility and all users are willing to use the pedestrian facility.
- PLTS 2: The level where all users are able to use the facility and most users are willing to use the facility.
- PLTS 3: The level where some users are willing to use this facility, but others may only use the facility when there are limited route and mode choices available.
- PLTS 4: The level where the facility is difficult or impassible by a wheeled mobility device or users with other limitations in their movement and most likely used by users with limited route and mode choice.

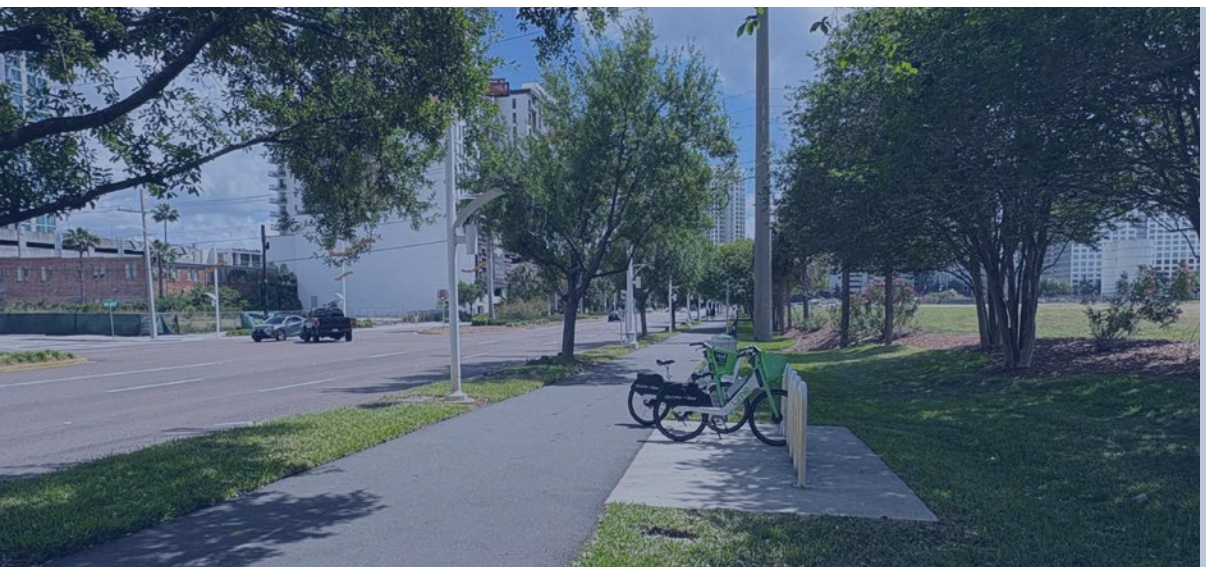
According to the FDOT 2023 *Multimodal Quality/ Level of Service Handbook* the bicyclist level of traffic stress (BLTS) is broken down into the following four categories, as shown in Figure 42:

- BLTS 1: The level that most children can use confidently.
- BLTS 2: The level that will be tolerated by most adults.
- BLTS 3: The level tolerated by confident bicyclists who still prefer having their own dedicated space for riding.
- BLTS 4: The level tolerated only by those with limited route or mode choice or cycling enthusiasts that choose to ride under stressful conditions.

These categories have been defined by FDOT in the 2023 *Multimodal Quality/Level of Service Handbook* using the following characteristics to assess bicyclists' perceptions of the roadway environment:

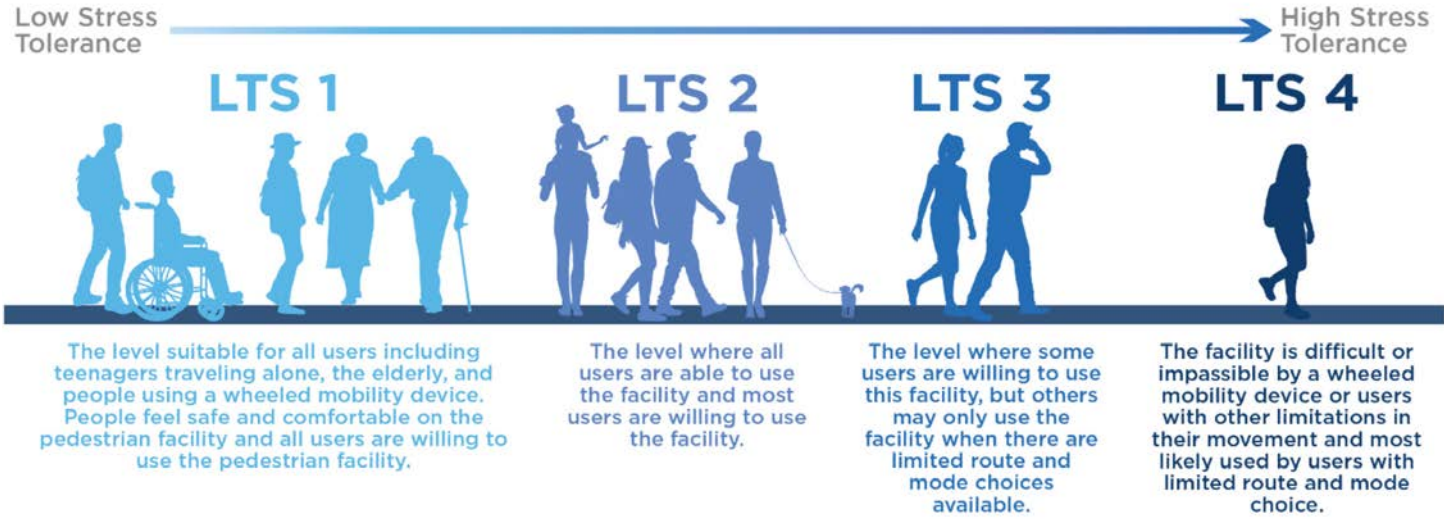
- Bicycle facility type
- Bicycle facility width
- Posted speed
- Separation from traffic
- AADT

Figure 43 to Figure 54 show pedestrian and bicycle levels of traffic stress districtwide and by county.



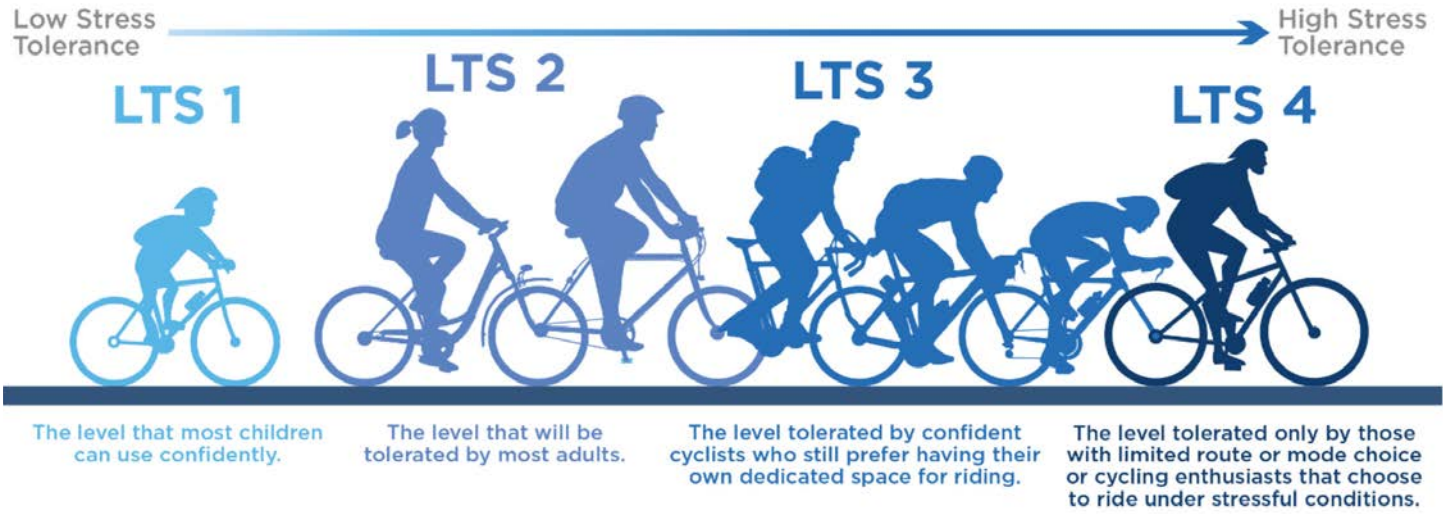
Source: Kittelson

FIGURE 41. PEDESTRIAN LEVEL OF TRAFFIC STRESS



Source: FDOT's Multimodal Quality Level of Service Handbook

FIGURE 42. BICYCLIST LEVEL OF TRAFFIC STRESS



Source: FDOT's Multimodal Quality Level of Service Handbook

FIGURE 43. DISTRICT 7 PEDESTRIAN LEVEL OF TRAFFIC STRESS ON STATE ROADS

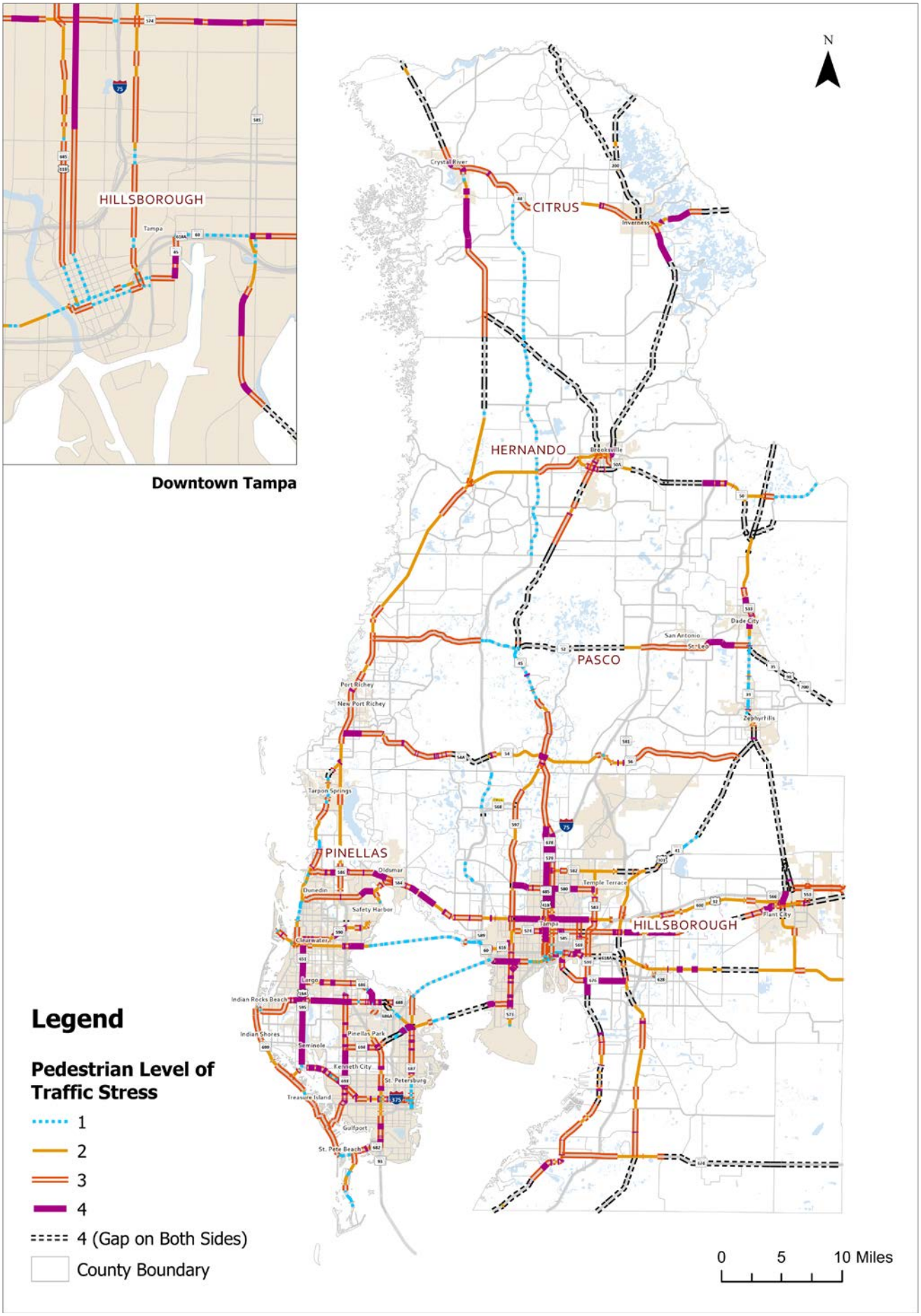


FIGURE 44. DISTRICT 7 BICYCLE LEVEL OF TRAFFIC STRESS ON STATE ROADS

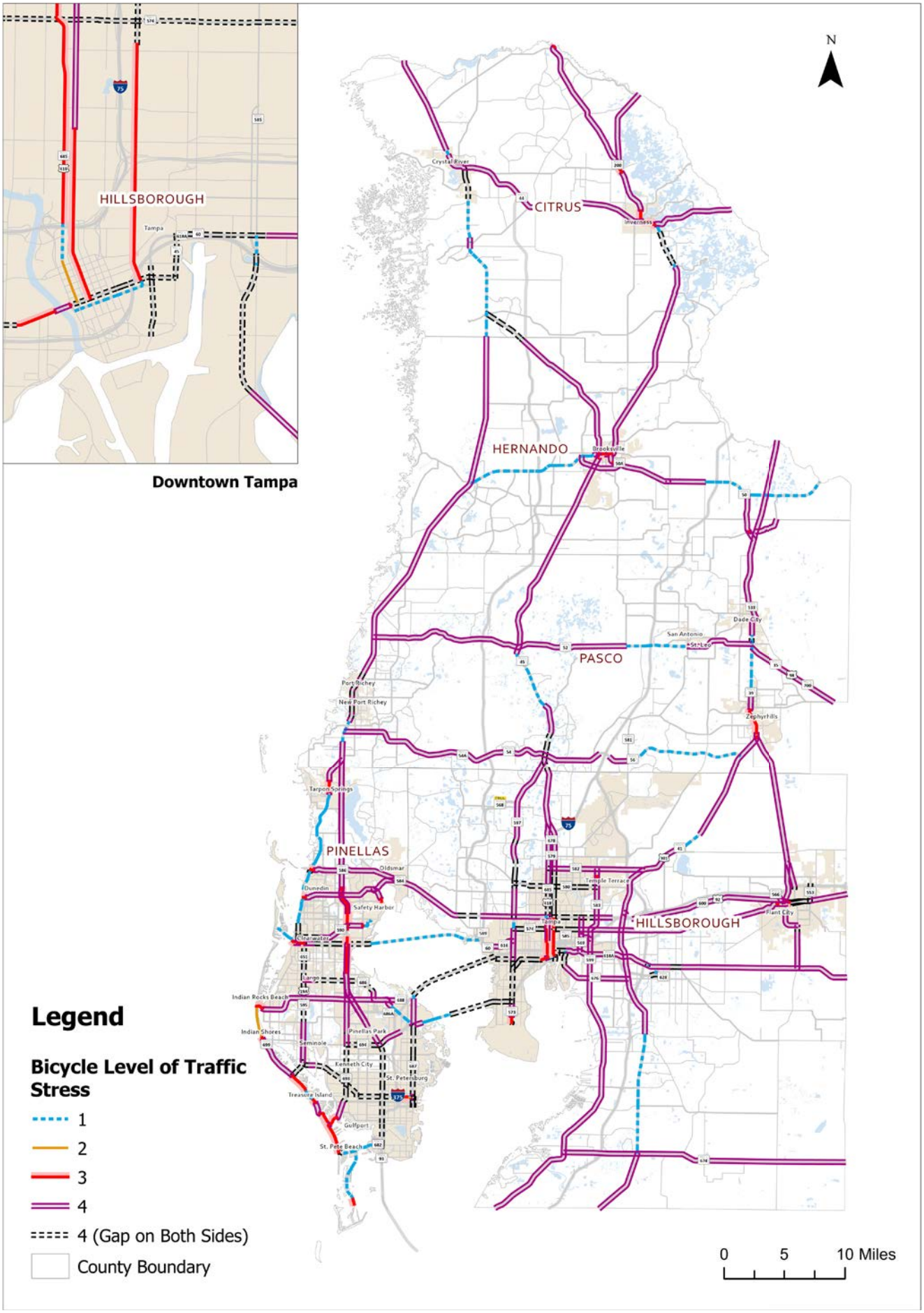


FIGURE 45. CITRUS COUNTY PEDESTRIAN LEVEL OF TRAFFIC STRESS ON STATE ROADS

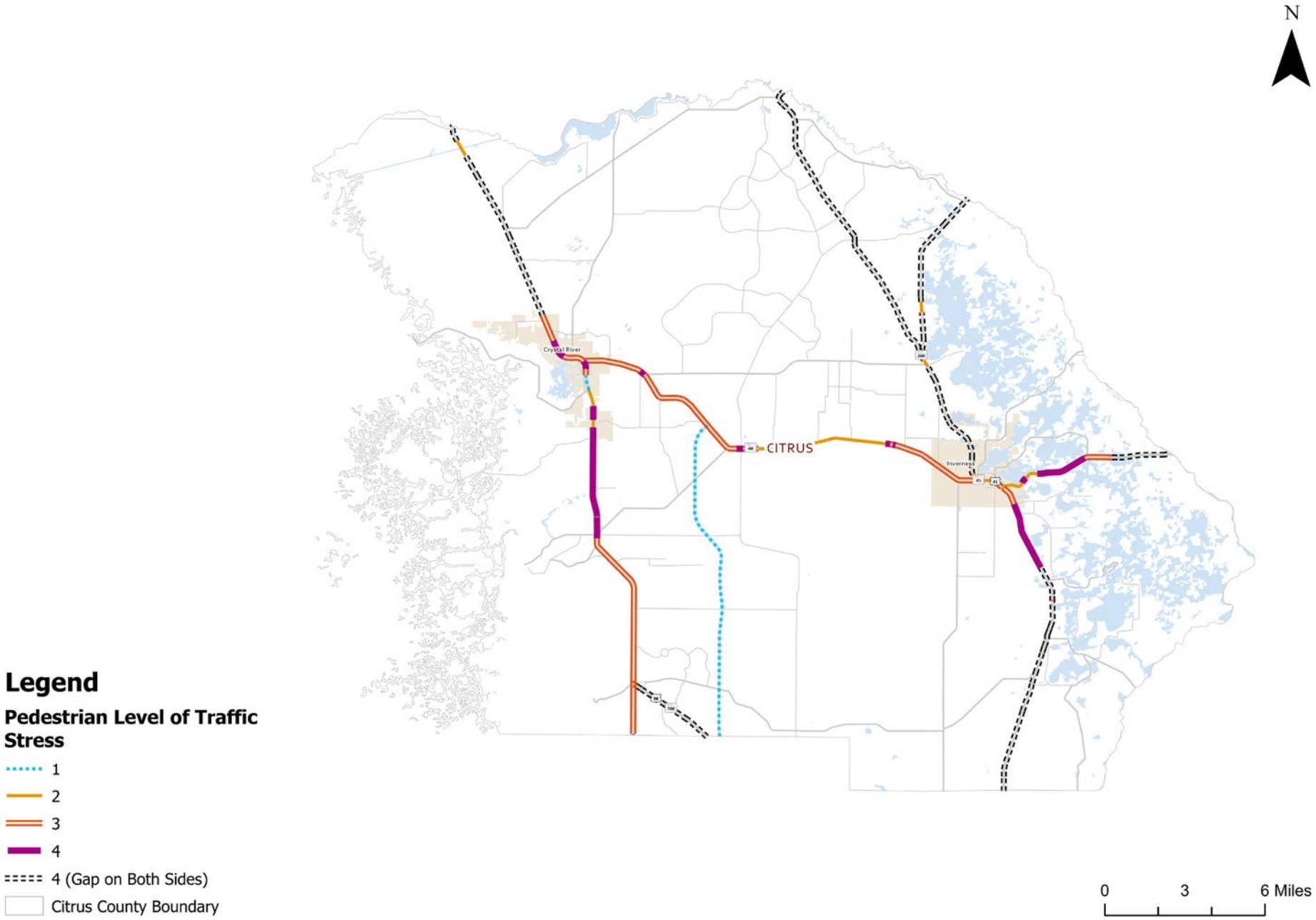


FIGURE 46. CITRUS COUNTY BICYCLE LEVEL OF TRAFFIC STRESS ON STATE ROADS

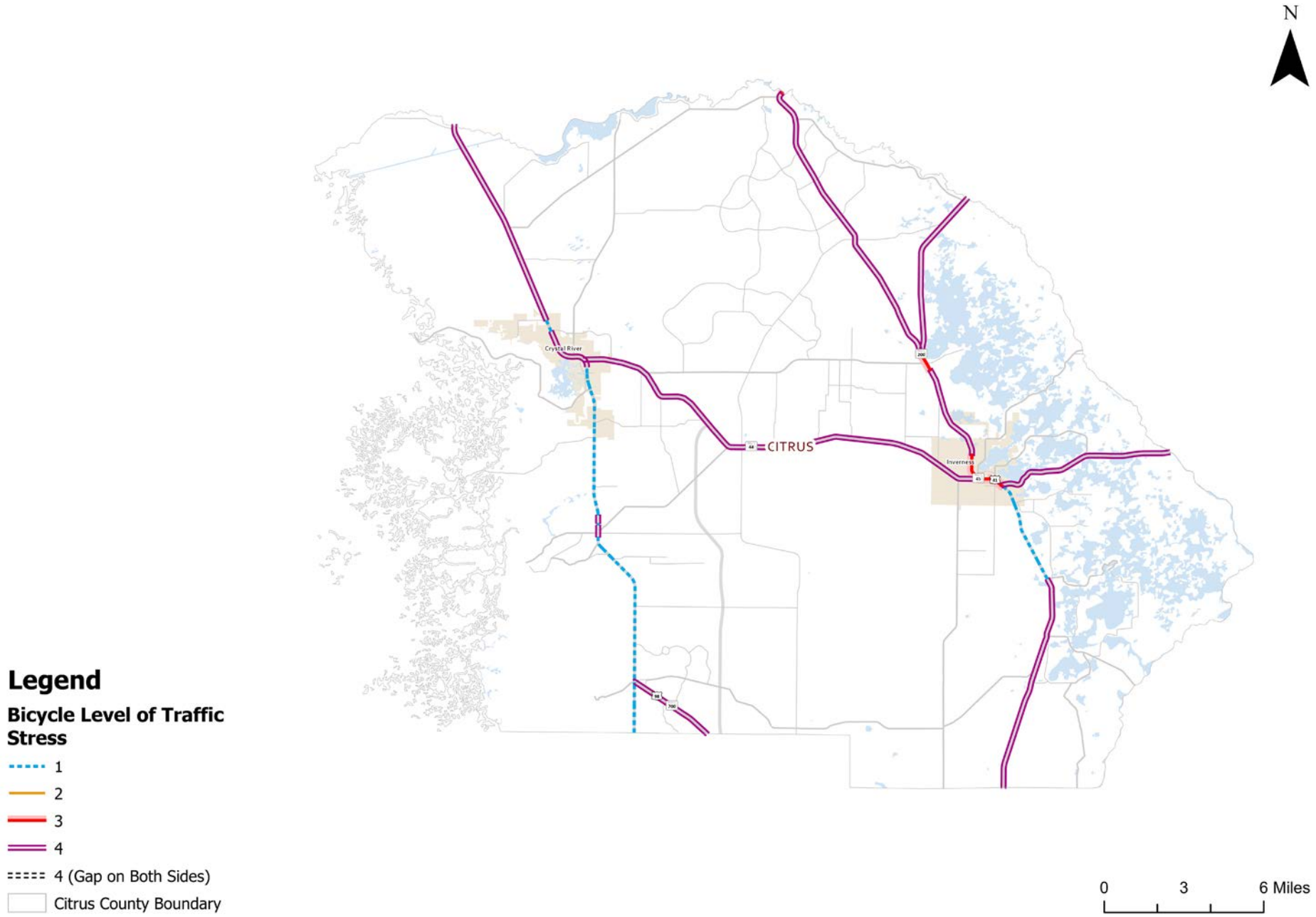


FIGURE 47. HERNANDO COUNTY PEDESTRIAN LEVEL OF TRAFFIC STRESS ON STATE ROADS

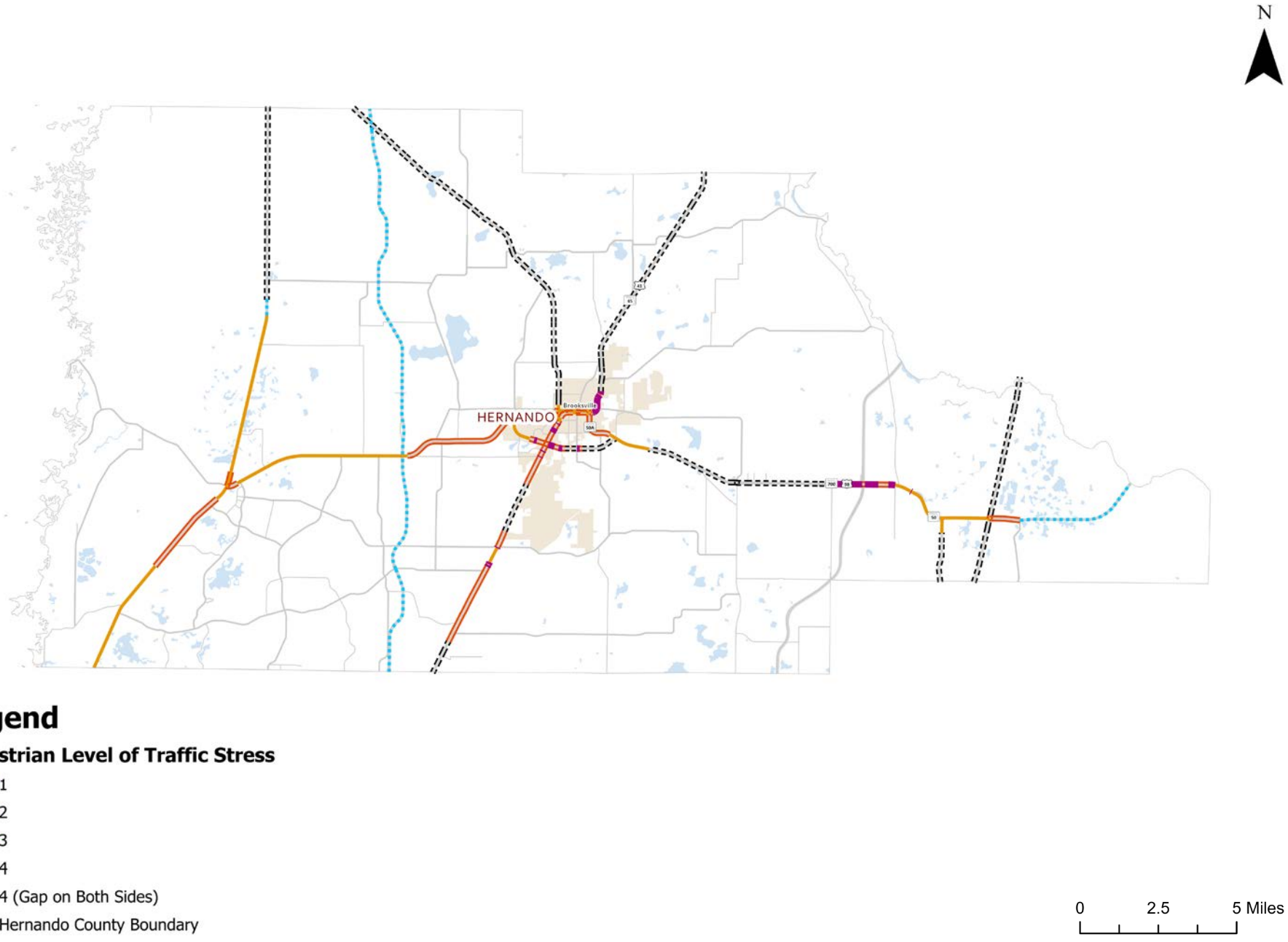


FIGURE 48. HERNANDO COUNTY BICYCLE LEVEL OF TRAFFIC STRESS ON STATE ROADS

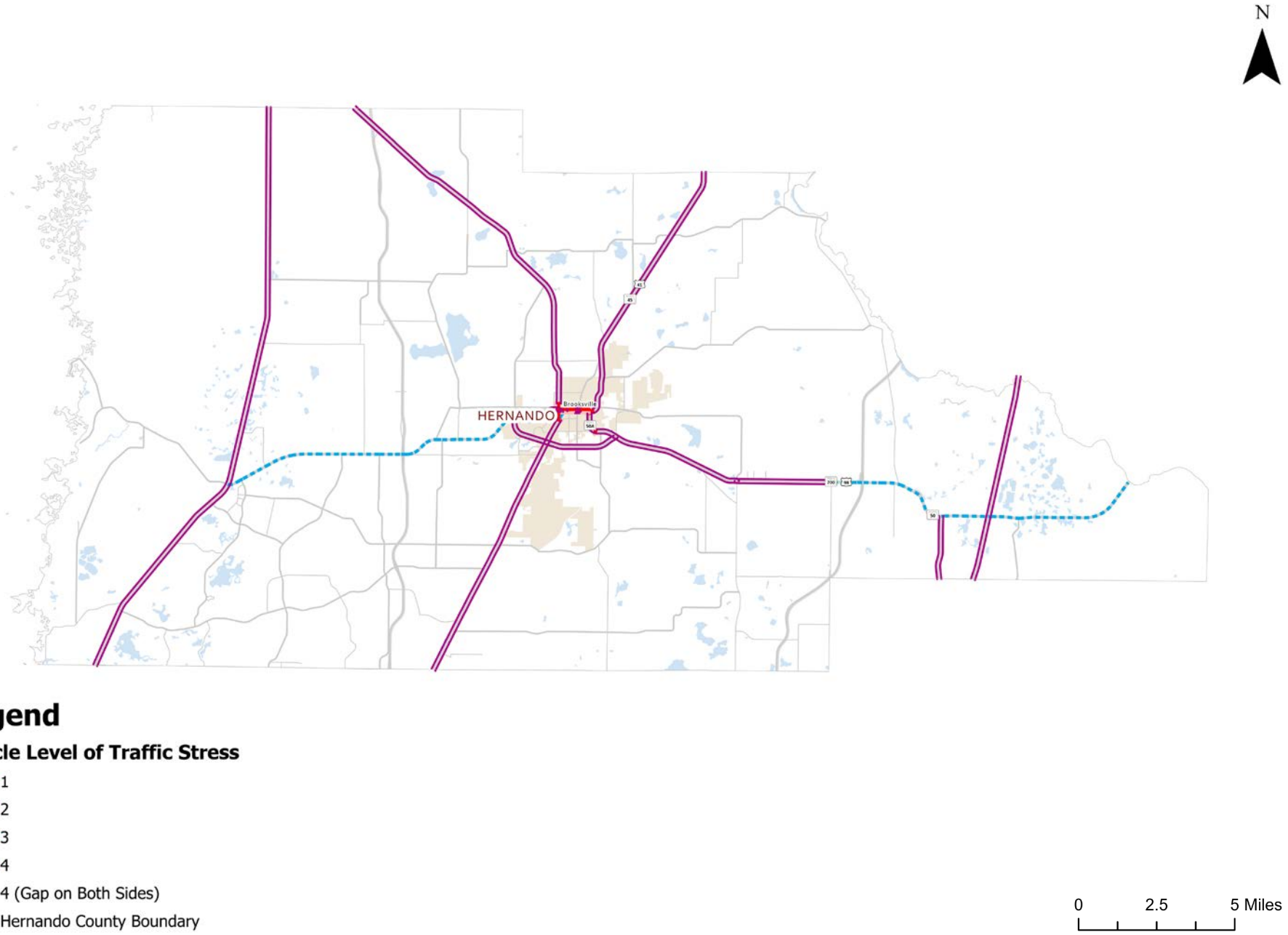


FIGURE 49. PASCO COUNTY PEDESTRIAN LEVEL OF TRAFFIC STRESS ON STATE ROADS

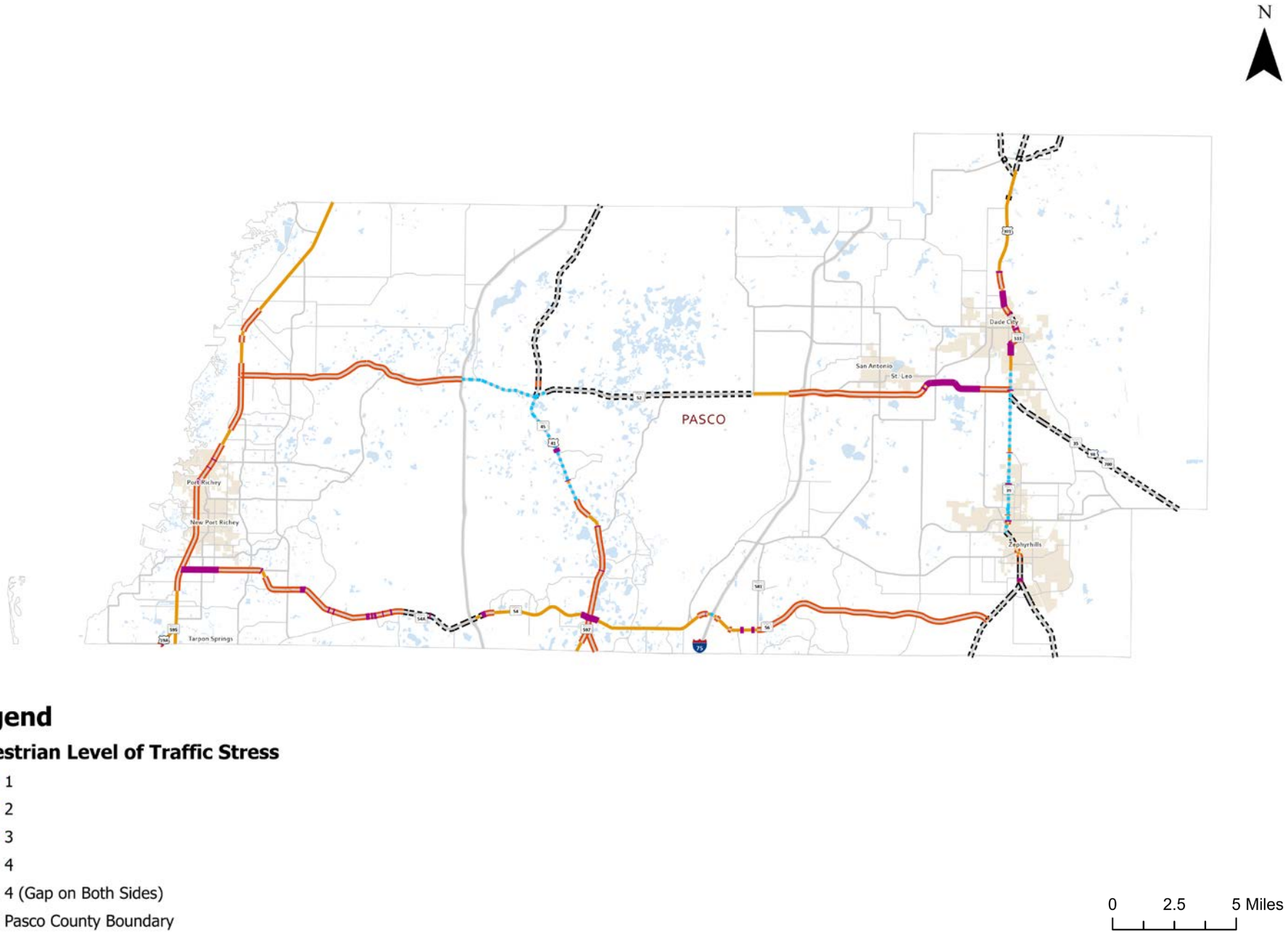


FIGURE 50. PASCO COUNTY BICYCLE LEVEL OF TRAFFIC STRESS ON STATE ROADS

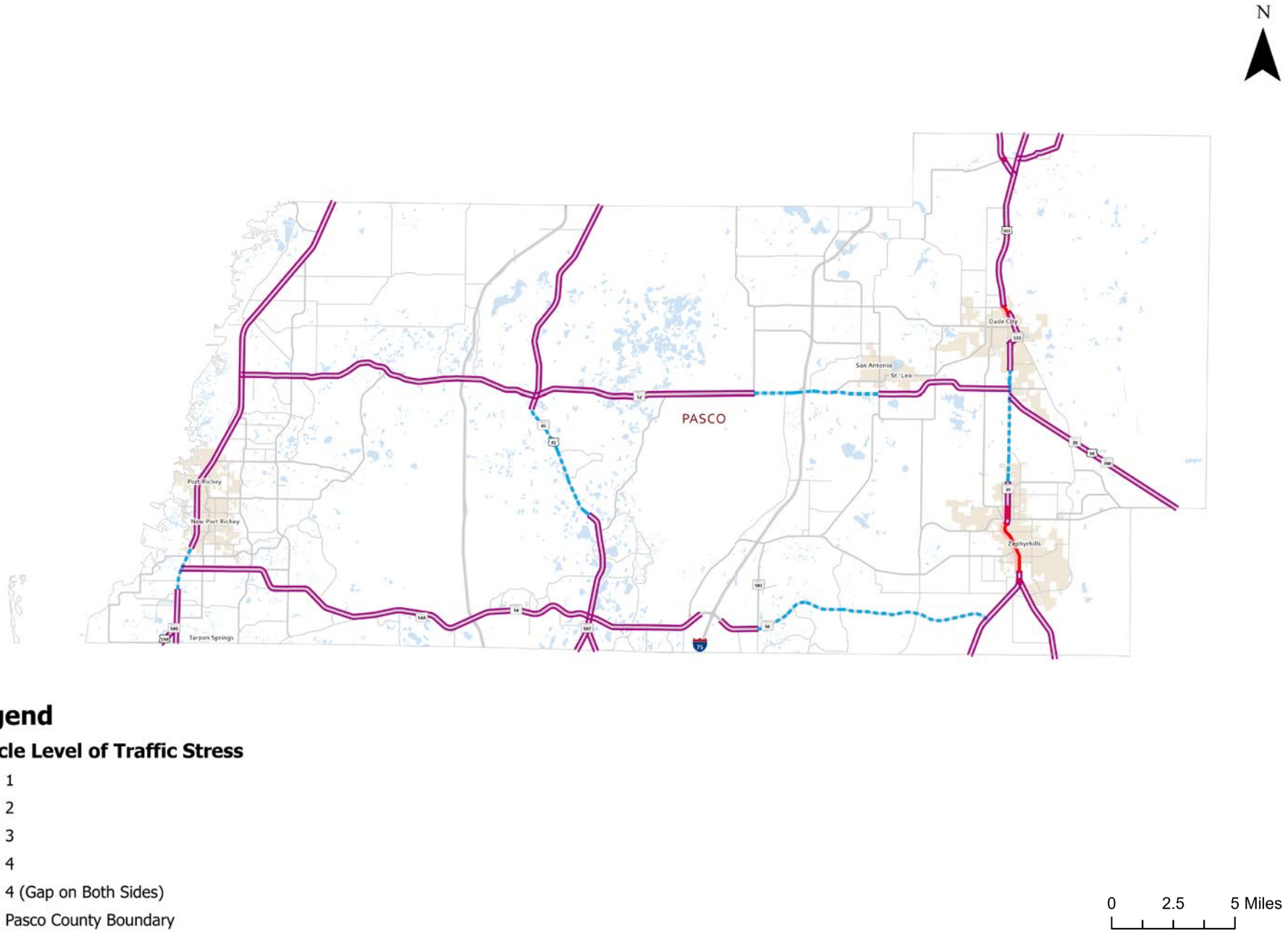


FIGURE 51. PINELLAS COUNTY PEDESTRIAN LEVEL OF TRAFFIC STRESS ON STATE ROADS

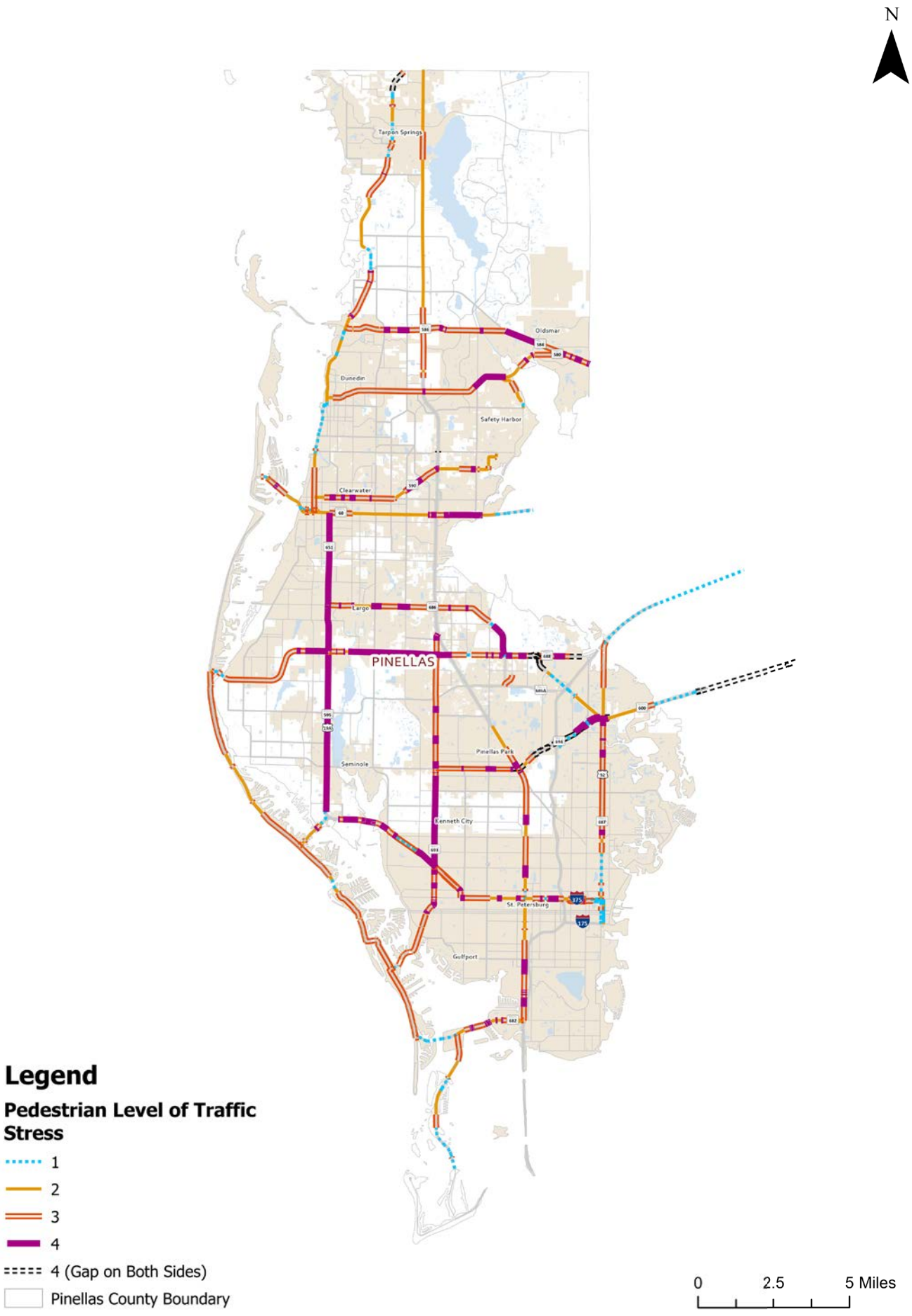


FIGURE 52. PINELLAS COUNTY BICYCLE LEVEL OF TRAFFIC STRESS ON STATE ROADS

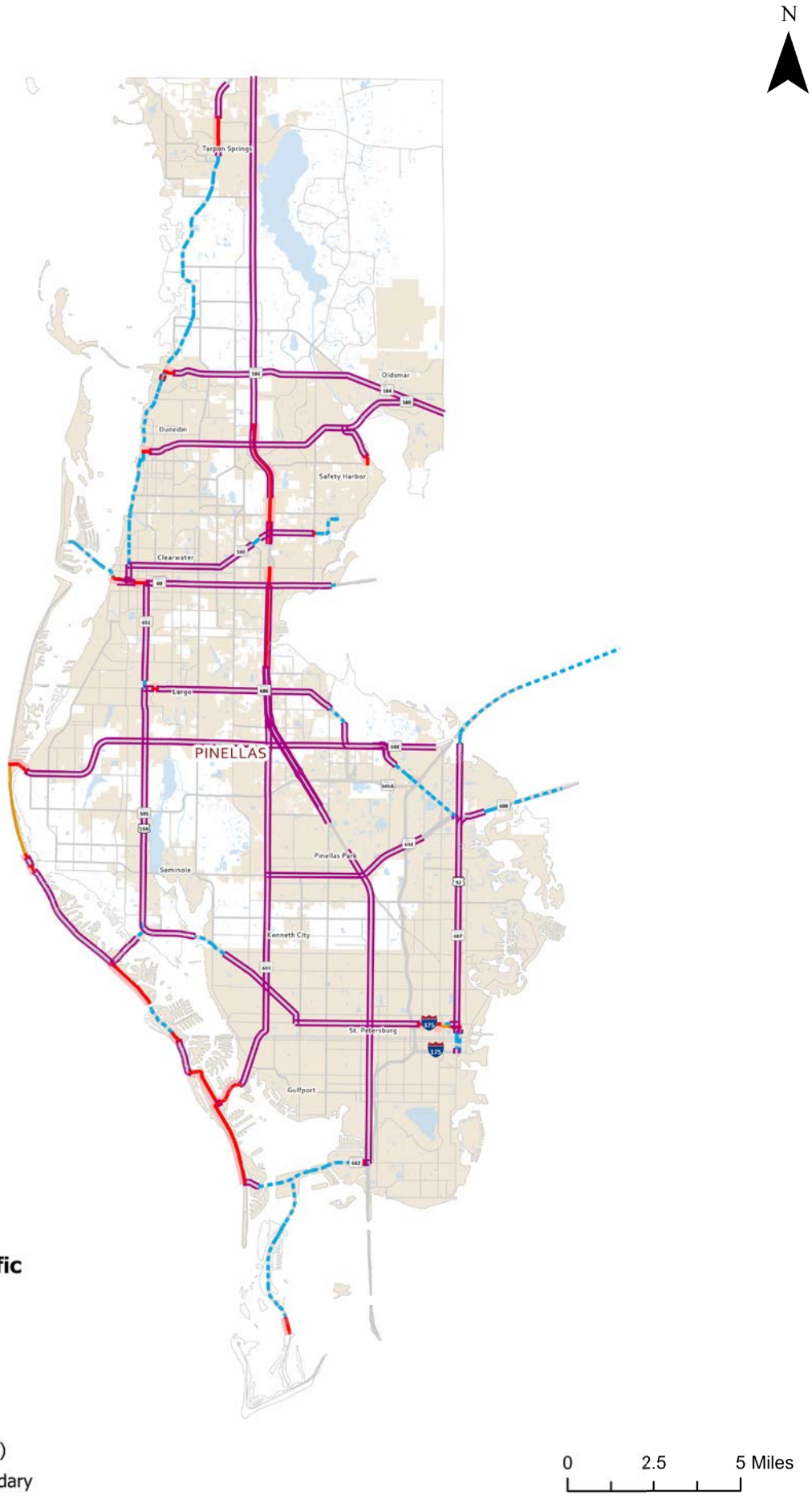


FIGURE 53. HILLSBOROUGH COUNTY PEDESTRIAN LEVEL OF TRAFFIC STRESS ON STATE ROADS

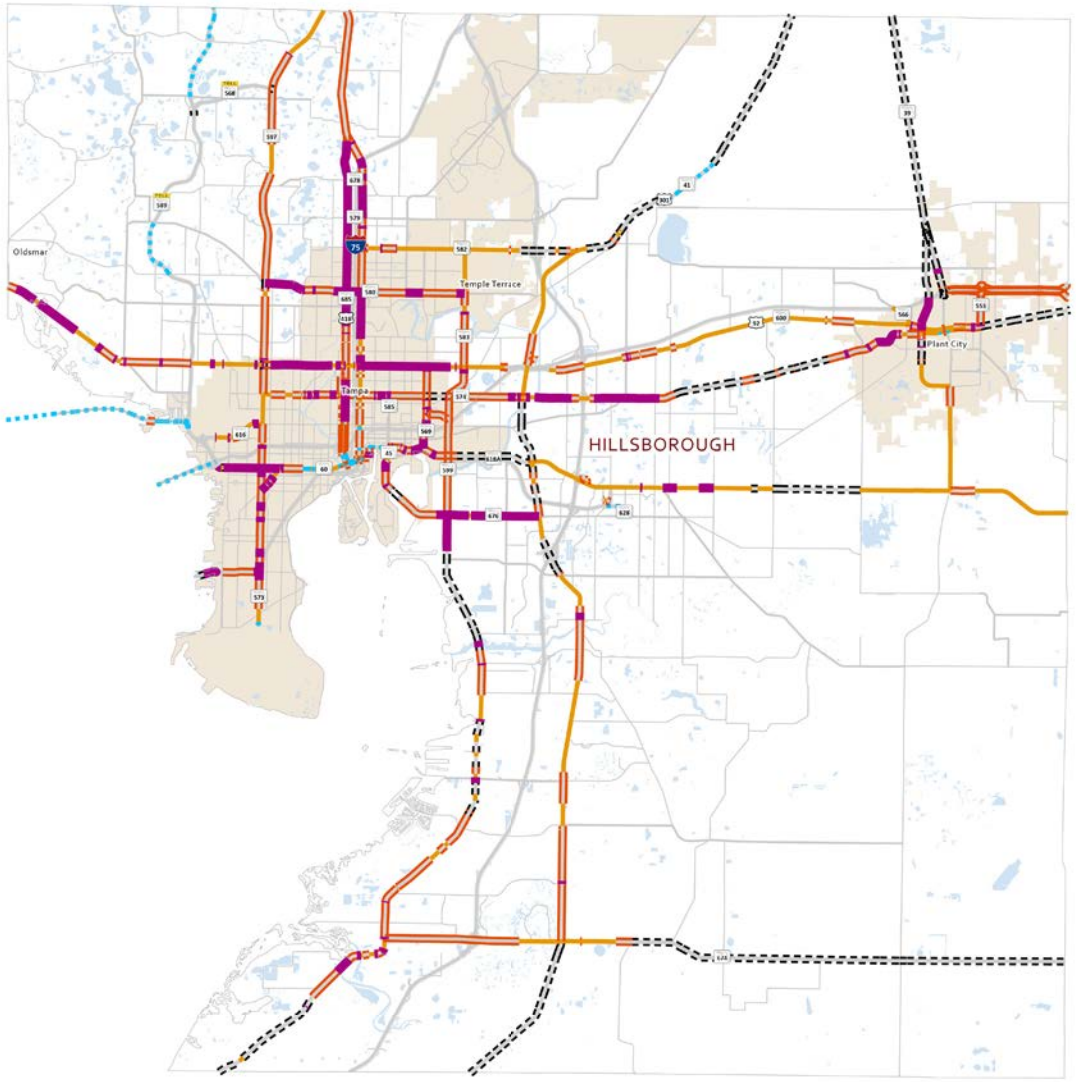
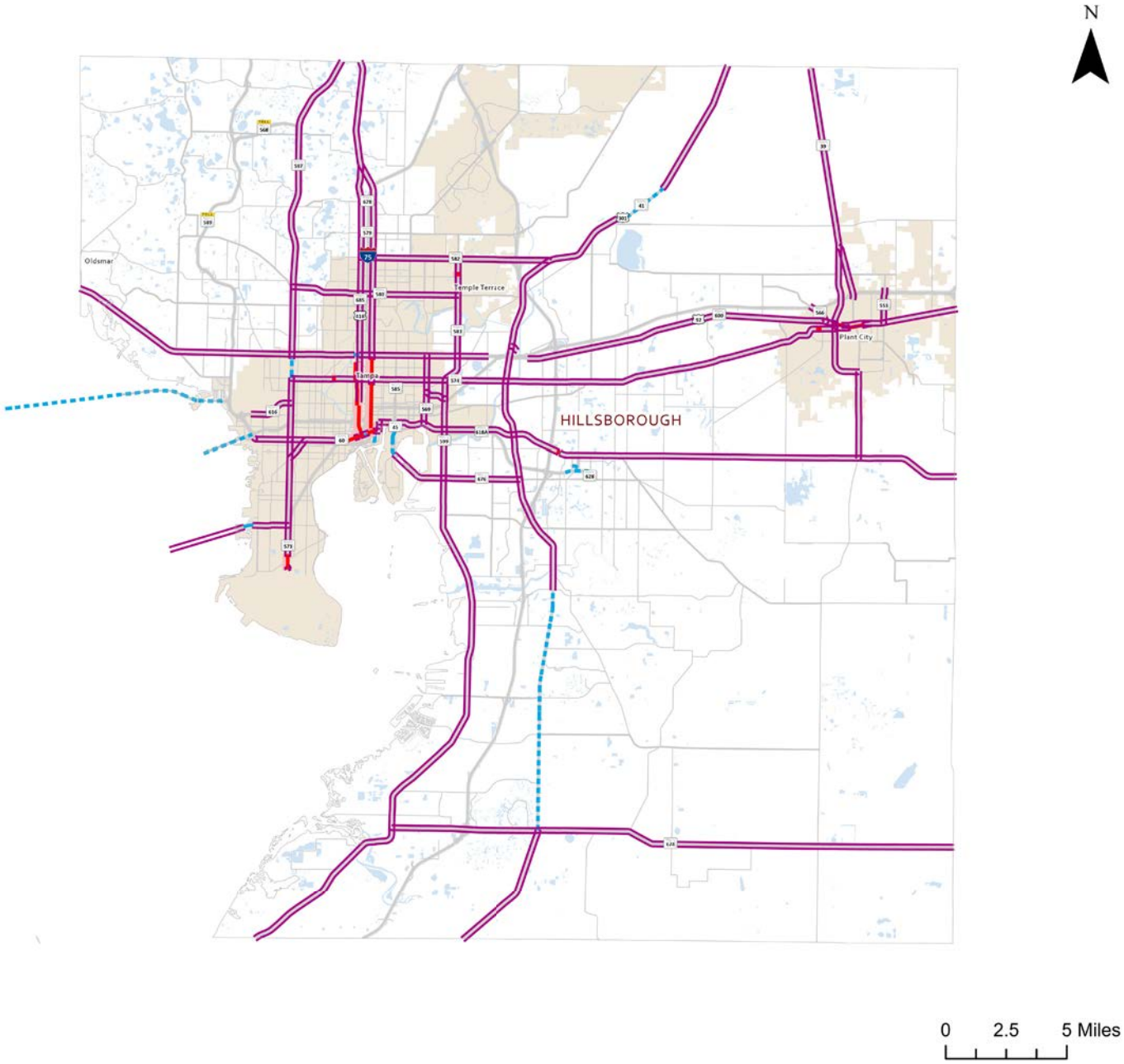


FIGURE 54. HILLSBOROUGH COUNTY BICYCLE LEVEL OF TRAFFIC STRESS ON STATE ROADS



DISTRICT 7 SHARED-USE NON-MOTORIZED (SUN) TRAIL PROGRAM

The Florida Shared-Use Non-motorized (SUN) Trail program was established in 2015 and directs FDOT to focus funding for developing a safe statewide system of interconnected, high priority, strategic paved non-motorized shared-use paths within the SUN Trail network for bicyclists and pedestrians. SUN Trail facilities are shown in Figure 55.

PEDESTRIAN CROSSINGS

The frequency of pedestrian crossing opportunities influences walkability and multimodal safety. Roads with limited crossing opportunities become barriers to walking. People who walk despite this challenge may be required to cross midblock or at locations without a marked crosswalk to avoid having to take an indirect route to their destination. Pedestrian crossing spacing tends to be related to the connectivity of the overall network, with sparse or disconnected networks limiting the routes that people can walk and the places they can cross the road. For this Plan, pedestrian crossing opportunities include marked crosswalks at traffic signals, rectangular rapid flashing beacons (RRFBs), and pedestrian hybrid beacons (PHBs).

As shown in Figure 56, most state roads in District 7 have limited pedestrian crossing opportunities (over 0.5-mile spacing). Pedestrian crossing frequency increases closer to the Tampa and St. Petersburg areas, with spacing from 0.25–0.5 mile. A few segments in these areas have very frequent crossings (less than 660-foot spacing, or about every one to two blocks). Plant City, Brooksville, and Inverness also have clusters of relatively frequent pedestrian crossing opportunities. When comparing crossing frequency to context classification, C2T and C3C segments tend to have shorter crossing spacing than the C1, C2 and C3R segments. Most of the C5 and C6 segments have frequent and very frequent crossing opportunities, while many C4-Urban General segments have frequent crossings. Generally, shorter crossing spacings correspond with lower speed limits. For most of the roadways that have a speed limit over 45 mph, the crossing opportunities are limited, with over 0.25-mile spacing between them.

SCHOOLS, PARKS, AND COMMUNITY CENTERS

Figure 57 shows key community destinations that generate walking and bicycling trips, such as public and private schools, civic centers, community centers, and state parks. These locations serve as important destinations and trip generators for both daily and recreational travel, attracting a mix of residents, students, and visitors. Schools represent a major source of pedestrian and bicyclist activity, especially within a two-mile walking distance, while civic and community centers support access to essential services and local events. State parks also contribute to recreational bicycling and walking activity across the District.

Hillsborough and Pinellas Counties contain the highest concentrations of schools and civic or community centers, reflecting their larger populations and urban development patterns. Additionally, the eastern portion of Hillsborough County shows a notable concentration of state parks, highlighting the area's recreational and environmental assets that also serve as important destinations for walking and bicycling.

PUBLIC TRANSPORTATION

Transit trips begin and end with a person walking or bicycling, which is why it is critical to provide adequate infrastructure near stops. Several transit agencies serve District 7, including Hillsborough Area Regional Transit Authority (HART), Hernando County Transit (TheBus), Citrus County (Connection), Pasco County Public Transportation (GoPasco), and Pinellas Suncoast Transit Authority (PSTA).

FIGURE 55. SUN TRAIL FACILITIES

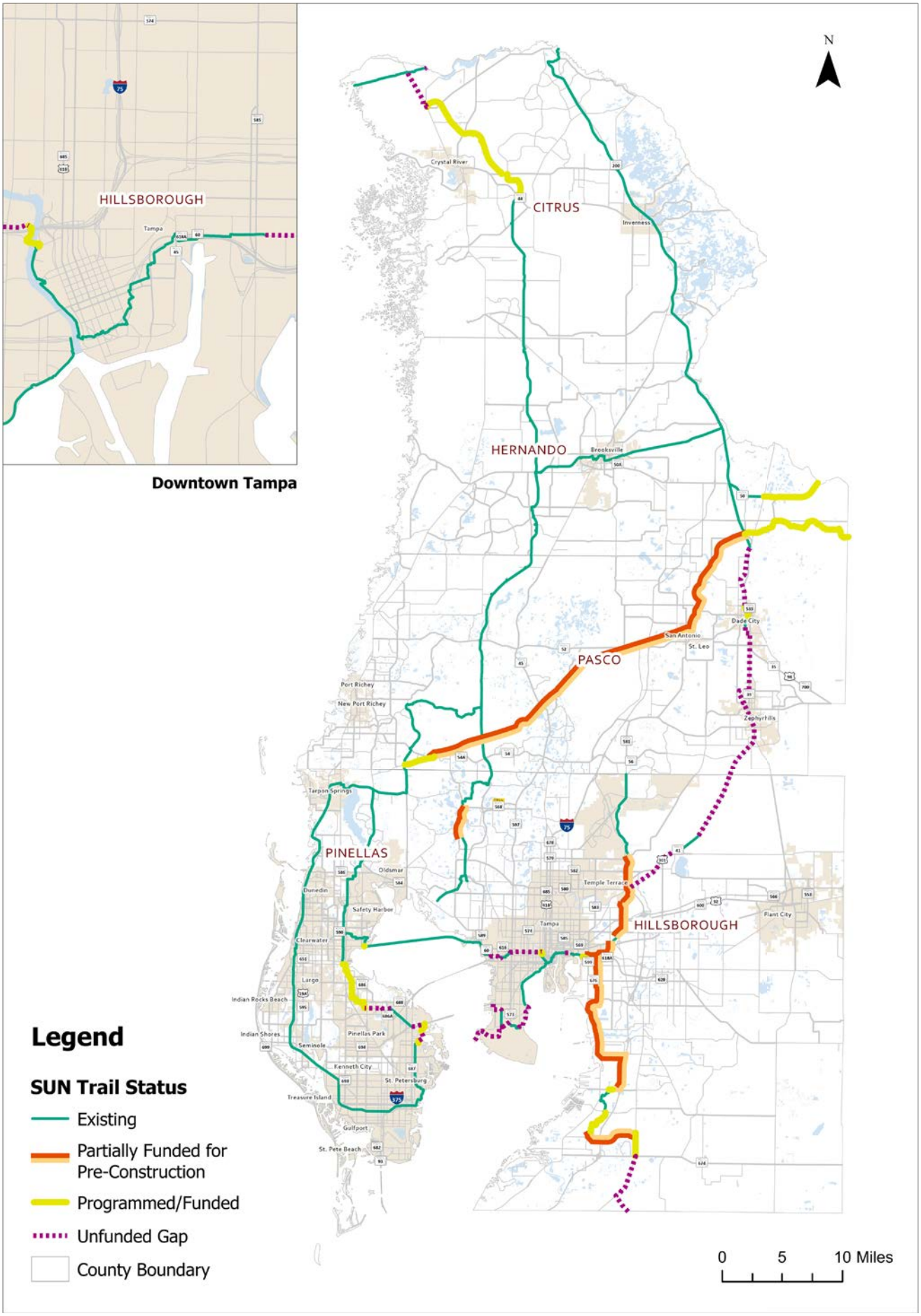


FIGURE 56. DISTRICTWIDE PEDESTRIAN CROSSING SPACING ON STATE ROADS

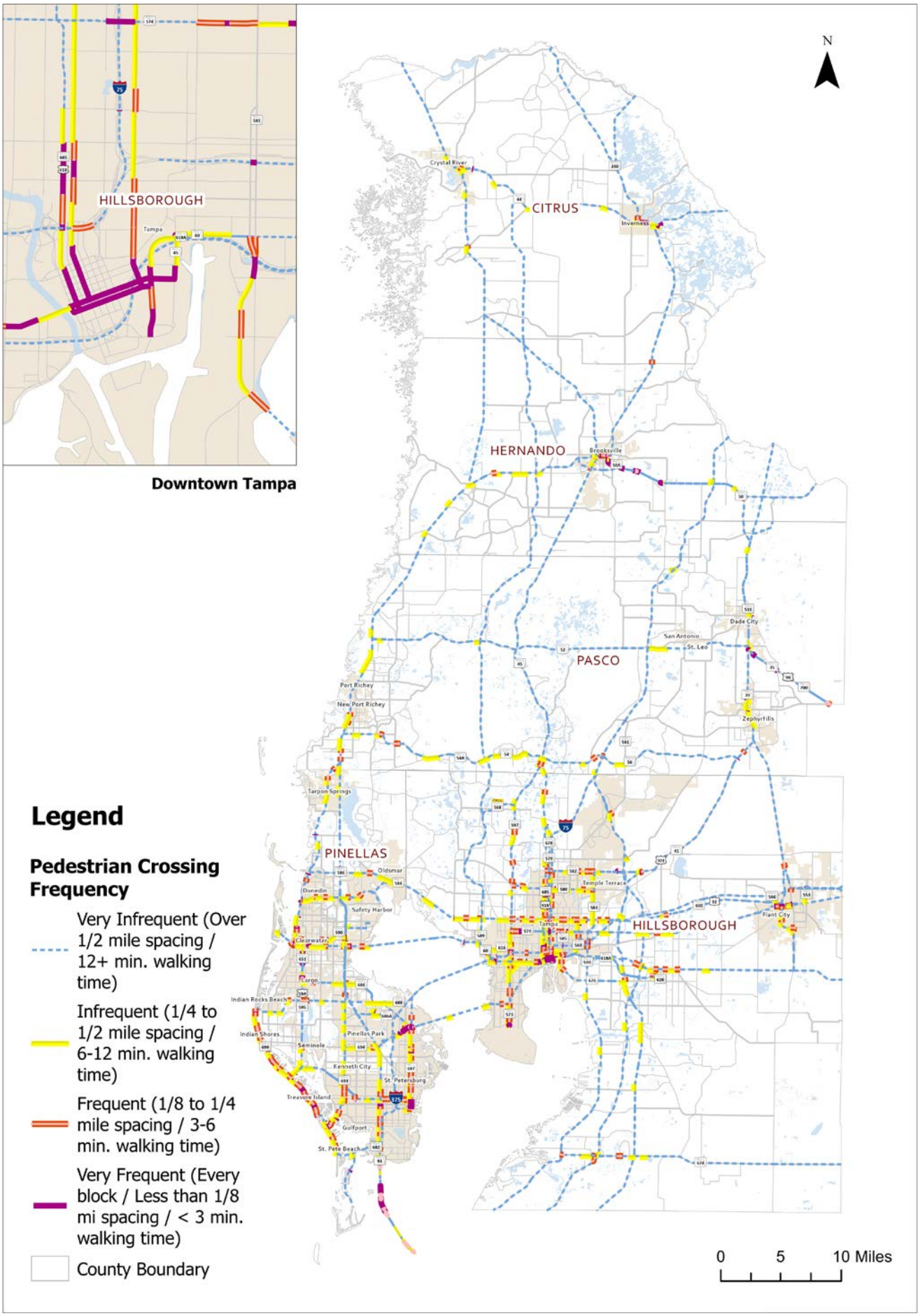
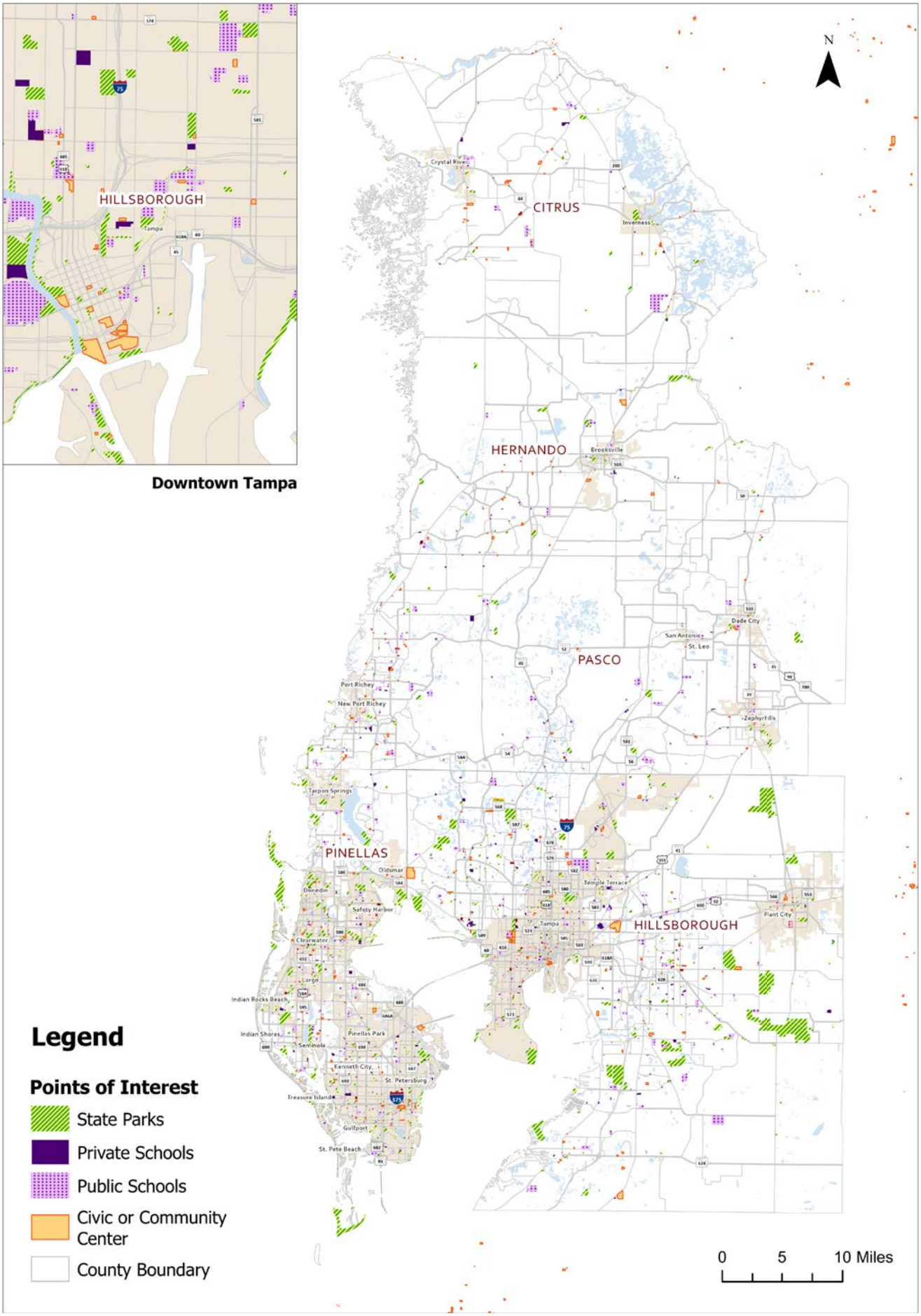


FIGURE 57. DISTRICT 7 SCHOOLS, PARKS, AND COMMUNITY CENTERS





Source: Kittelson

PLANNING & DESIGN GUIDANCE

This chapter provides guidance for planning and designing pedestrian and bicycle crossings and facilities with related resources. The guidance in this section is intended to be applied with the goal of developing facilities on the state roadway system and providing connections to local bicycle and pedestrian networks.

PEDESTRIAN FACILITIES

Sidewalk should be provided on roadways with context classifications C2T, C3C, C4, C5, and C6 and where demand is demonstrated within C1, C2, or C3R. Sidewalk should be provided on both sides of the roadway. If not feasible to have sidewalk on both sides, reasonable access to destinations such as homes, offices, stores, parks, and transit stops should be provided.

Other pedestrian enhancements can include geometric improvements to reduce crossing distances, such as curb extensions or pedestrian refuge islands. Additionally, speed management treatments like raised crosswalks (Type I or Type 2) or raised intersections can enhance safety for people crossing. More information on speed management treatments can be found in FDM 202.

Design guidance on treatments at signalized intersections is provided in FDM 232 and *Traffic Engineering Manual* (TEM). Enhanced crossings can include the following:

SIGNALIZED INTERSECTION



Source: Kittelson

MIDBLOCK PEDESTRIAN SIGNAL (MPS)



Source: Kittelson

PEDESTRIAN HYBRID BEACON (PHB)



Source: Kittelson

RECTANGULAR RAPID FLASHING BEACON (RRFB)



Source: Kittelson

TARGET SPACING FOR PEDESTRIAN CROSSINGS

Providing the appropriate frequency of enhanced pedestrian crossings helps to create an overall interconnected network by reducing the distance a person must walk or bike between their destinations.

Target spacing for crossings in this Plan is intended to be used in two ways:

- **Project approach:** On corridor projects the project team should review the existing and target spacing for pedestrian crossings. If the target spacing is not currently met, the team should review applicable guidance and site conditions for opportunities to add crossings in the project.
- **Systems approach:** A systems approach considers all locations in District 7 where the current target spacing is not met. District 7 can proactively identify priority locations to plan, design, and program enhanced crossings.

The target spacing for crossings is summarized based on context classification in Table 2. For areas with higher expected activity (such as C2T, C4, C5, and C6), walkable block lengths with consistent crossing opportunities should be provided. For more suburban areas (such as C3R and C3C), crossings should be within a walkable distance to pedestrian generators and attractors. Areas with lower expected pedestrian activity (such as C1 and C2) should have crossings as needed based on site-specific conditions.

TABLE 2. TARGET SPACING FOR PEDESTRIAN CROSSINGS

Context Classification	Target Maximum Spacing (Feet)
C1 and C2	As Needed
C2T	250[1]–500
C3R	Within 300 feet of pedestrian generator/attractor[2] OR no more than 2,460 (half mile spacing)
C3C	Within 300 feet of pedestrian generator/attractor[2] OR no more than 1,320 (quarter mile spacing)
C4	250[1]–660
C5 and C6	250[1]–660

[1]Minimum target spacing of 250 feet is based on typical block sizes in downtown Tampa, St. Petersburg, and Plant City and is intended to encourage provisions of enhanced pedestrian crossing at every block in downtown areas.

[2]Pedestrian generators and attractors may include transit stops, schools, parks and recreation spaces, high density/mixed-use developments, shopping/business centers, churches, trail crossings, or other pedestrian uses. In suburban contexts, enhanced pedestrian crossings located within 300 feet of pedestrian generators may be more common at midblock locations.

CROSSING LOCATIONS

Table 3 presents several indicators to assess the need and location for an enhanced pedestrian crossing. These indicators should be used in conjunction with guidance from the FDOT TEM and the *Manual on Uniform Traffic Control Devices* (MUTCD).

The TEM outlines the process for adding marked crosswalks at midblock locations and unsignalized locations. An engineering study should be completed that identifies the crossing type based on context classification, pedestrian and vehicular volumes, roadway characteristics, and attractors and generators (as outlined in TEM 5.2.6). Crosswalks should be located where they provide the shortest distance whenever practical.

TABLE 3. INDICATORS TO JUSTIFY INSTALLING CROSSINGS

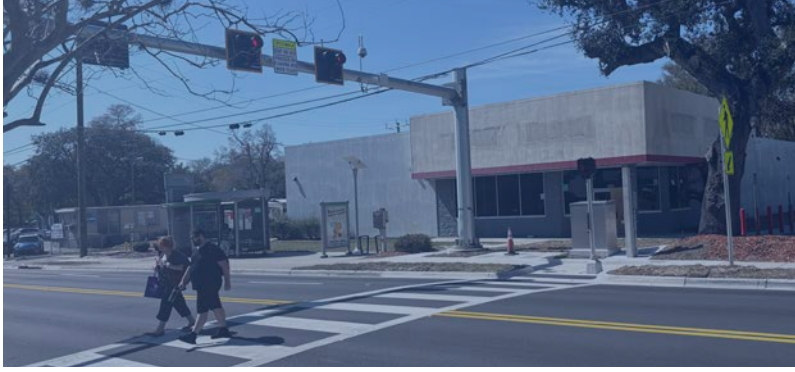
Indicator	Notes
Crash History	Crash history may include any number of fatal or severe injury crashes or high frequency of non-fatal/severe injury pedestrian/bicyclist crashes relative to other areas along the corridor. An engineering study should include the latest five years of non-motorist crashes in the vicinity of the proposed crosswalk and note the frequency, crash type, lighting, and pavement conditions (TEM 5.2.6).
Location of Pedestrian Generators/ Attractors	Generators and attractors can include transit stops, schools, parks and recreation spaces, high density/mixed-use developments, shopping/business centers, churches, trail crossings, or other pedestrian uses. Consider proximity to significant pedestrian generators and attractors to create a well-defined spatial pattern and flow between them, and consider the target spacing distance between crossings (TEM 5.2.5).
Posted and Operating Speed	Pedestrian signals and PHBs are appropriate for midblock crossing on non-limited access roadways of any posted speed. RRFBs should be used for crossing roadways with an operating speed of 35 mph or less.
Local Planning Recommendations	Local bicycle and pedestrian plans should be considered when identifying crossing locations.

Multilane roads present challenges to pedestrians because of longer crossing distances and often higher vehicle speeds. Roads with medians or center turning lanes may present opportunities to install median refuge islands.

FDM 222.2.3.2 cautions against locating a midblock crossing at locations with a crossing distance greater than 60 feet unless a median or crossing island is provided. On six-lane roads with a PHB or signal (or if the crossing distance exceeds 80 feet), a two-stage pedestrian crossing should be provided with a median refuge island. RRFBs should only be provided on roads with four or fewer through lanes in both directions. RRFBs may be provided on roads with five lanes if there is a median refuge island.

TREATMENT SELECTION

Identifying the appropriate crossing treatment requires meeting the requirements set in the TEM and MUTCD. TEM 5.2 outlines a matrix for treatments to apply at midblock crosswalks and unsignalized intersections. Guidance for installing a midblock or unsignalized intersection crosswalk is provided in Table 4.



Source: Kittelson

TABLE 4. PEDESTRIAN TREATMENT SELECTION MATRIX

Treatment	Posted Speed ≤35 mph	Posted Speed ≥40 mph
Step 1: Can I mark a crosswalk?		
Special Emphasis Crosswalk (Midblock and Uncontrolled Intersections)	**Recommended Thresholds:** C1, C2, C3R Context Classifications: • 20 or more pedestrians during a single hour (for any four consecutive 15-minute periods) • Shared-use path: May apply 50% reduction to pedestrian demand • School zone: No volume threshold is required C2T, C3C, C4, C5, C6 Context Classifications: • No volume data is required **Minimum Location Characteristics:** • Average daily traffic (ADT) ≥2,000 • Distance between proposed marked crosswalk and nearest existing intersection or crosswalk ≥300 feet ○ Can consider a proposed crossing between 100 to 300 feet from an alternate crossing if documented in engineering study • Proposed marked crosswalk is outside turn lanes and area of influence of signalized intersection	
Step 2: What device or geometric improvement should I select?		
Geometric Improvements	**Candidate Treatments:** • Speed tables[1] • Raised intersection[2] • Raised crosswalk[3] • Curb extension/bulb out • Median refuge island • Left turn hardening • Reduced turn radius/truck apron	**Candidate Treatments:** • Median refuge island • Left turn hardening • Reduced turn radius/truck apron

[1]Applicable for posted speeds of 25–30 mph

[2]Applicable for posted speed of ≤35 mph

[3]Applicable for posted speed of ≤30 mph

Treatment	Posted Speed ≤35 mph	Posted Speed ≥40 mph
RRFB	**Conditions that shall be met:** • ≤4 through lanes (both directions) OR 5 lanes with a median refuge island	Not permitted unless design variation is approved by FDOT Central Office Traffic Engineering Office (TEO). Study must include AADT, sight distance, speed data, five years of crash data, and supplemental data including location description, context classification, and observations.
PHB	**See criteria in MUTCD Chapter 4J as guidance for warrants:** • Complete engineering study per MUTCD Section 4J.01 • Consider if there are inadequate pedestrian crossings gaps, high vehicle speeds, and pedestrian delays **Option for C2T, C4, C5, C6 Context Classifications:** • If the location meets warrants for PHB, you can substitute and install a MPS using MUTCD Warrant 8 Roadway Network **Location Characteristics to Meet:** • ≥100 feet from stop-controlled side streets or driveways • If ≤100 feet from stop-controlled side street or driveways, install additional treatments such as blank out signs, static signs, and pavement markings	
Traffic Signal	**Recommended thresholds:** • Meet MUTCD warrant • Reduce minimum pedestrian volume after considering pedestrian crossing speed or isolated crosswalk in small community (MUTCD Warrant 4) **Location Characteristics to Meet:** • ≥300 feet from side streets or driveways with Stop or Yield signs	**Recommended thresholds:** • Meet MUTCD warrant • Reduce minimum pedestrian volume after considering pedestrian crossing speed or isolated crosswalk in small community or when 85th percentile speed on major street ≥35 mph (MUTCD Warrant 4) **Location Characteristics to Meet:** • ≥300 feet from side streets or driveways with Stop or Yield signs

Final selection to be based on engineering judgment per FDOT TEM and MUTCD considering demand, gaps, speed, crashes, and context classification.

PEDESTRIAN SIGN SELECTION

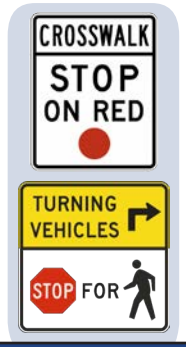
Table 5 shows guidance on selecting pedestrian signs to support marked crosswalks, enhanced pedestrian crossings, and controlled crossing treatments. These signing treatments should be used in conjunction with the TEM, the MUTCD, and the FDM.

Pedestrian signs are used to improve the visibility of crossing locations, reinforce driver yielding behavior, and communicate crossing priority. Sign selection should consider the crossing treatment type, roadway characteristics, posted speed, and presence of supplemental devices such as RRFBs, PHBs, or traffic signals.

TABLE 5. PEDESTRIAN SIGN SELECTION GUIDANCE















Treatment Type	W11-2 W16-9P	FTP-033-25	R10-15a or R10-23	R10-23a	R1-9a	R1-6a	FTP-030-25	R1-5b or R1-5c
Installation	Install Advance W11-2 (Pedestrian Crossing) sign assembly in advance of the midblock crossing and install W11-2 with W16-7P plaque at the crossing location in accordance with FDM Exhibit 230-9.	Add sign underneath RRFB. If installing in-roadway warning lights, also install this sign or Push Button to Turn on Warning Lights (R10-25).	Place at signalized intersections that warrant additional emphasis to turning drivers.	Install with PHB.	Overhead sign that can be applied with flashing yellow beacons.	Can be used with tubular markers as gateway treatments and placed at lane or edge lines (see TEM Figure 5.2-6).	Place at marked, unsignalized crosswalks.	Install one sign in each direction within 100 feet of the crosswalk at uncontrolled multilane approaches to midblock crossings (see FDM Exhibit 230-9).
Special Emphasis Crosswalk, Uncontrolled	Mandatory	Optional	Optional	Not Permitted	Optional	Recommended only if speed limit is 35 mph or less and four or fewer lanes	Optional	Optional
RRFB	Mandatory	Mandatory	Optional	Not Permitted	Optional	Recommended only if speed limit is 35 mph or less	Optional	Mandatory
PHB	Mandatory	Optional	Not permitted	Mandatory	Optional	Not permitted	Not permitted	Not permitted
MPS	Mandatory	Not permitted	Optional	Optional. R10-23 (Crosswalk-Stop on Red)	Optional	Not permitted	Not permitted	Not permitted
Traffic Signal	Not permitted	Not permitted	Optional	Not permitted	Not permitted	Not permitted	Not permitted	Not permitted

Adapted from TEM Table 5.2.1

PEDESTRIAN PAVEMENT MARKING SELECTION

Table 6 presents guidance for selecting pedestrian pavement marking treatments at existing crosswalk locations. This section builds on the crossing location and treatment selection guidance presented above and focuses on retrofitting considerations where pedestrian crossings are already installed.

The pavement marking treatments identified in Table 6 may be applied to improve visibility, reinforce crossing control, or address documented safety or operational concerns. Selection of pavement markings should consider the existing crossing treatment, roadway characteristics, and operational context, and should be evaluated through an engineering study when required.

DRIVEWAY CROSSINGS

Driveways introduce a point of conflict between pedestrians and vehicles. Wider driveway widths can increase this conflict, resulting in higher vehicle speeds and longer pedestrian crossing times.

Consider reducing the curb radius at driveways to reduce conflicts between people walking and bicycling and motorists turning in or out. The FDOT *Multimodal Access Management Guidebook* provides suggested curb radii based on driveway category and vehicle speeds. Pavement markings, such as standard or special emphasis crosswalks, should be used to draw attention to crossings at busy driveways.

TABLE 6. PEDESTRIAN PAVEMENT MARKING SELECTION GUIDANCE

Treatment Type	Crosswalk Type	Advanced Stop Line[1]	Pavement Word Marking (SCHOOL XING, PED XING)	In-Pavement Warning Markings[3]	In Road Lights
Uncontrolled Midblock	Special Emphasis	Recommended	Optional	Optional	Optional
Stop Controlled	Special Emphasis	Mandatory[2]	Optional	Optional	Not Applicable
RRFB	Special Emphasis	Recommended	Optional	Optional	Optional
PHB	Special Emphasis	Recommended	Optional	Optional	Optional. Requires Request to Experiment from FHWA
Midblock Traffic Signal	Special Emphasis	Mandatory	Optional	Optional	Optional. Requires Request to Experiment from FHWA
Traffic Signal at Intersection	Special Emphasis	Mandatory	Optional	Optional	Not Applicable
Roundabouts	Special Emphasis	Optional	Optional	Optional	Optional. Requires Request to Experiment from FHWA

Adapted from TEM Table 5.2.1.

[1] For a multilane approaches, a stop bar must be provided and set back 40 feet from the crosswalk to improve visibility of the crosswalk for vehicles in adjacent lanes.

[2] Requires engineering study and DTOE approval to install in-pavement warning markings. In-pavement warning markings can include BICYCLE (W11-1), PEDESTRIAN (W11-2), or COMBINED BICYCLE/PEDESTRIAN (W11-15) symbols as shown in the TEM 5.2.7.

[3] Stop line is assumed to be already existing.

PEDESTRIAN GAP ASSESSMENT

This Plan includes a gap assessment to identify locations along the state roadway network where pedestrian facilities are missing or do not meet District 7's preferred or minimum facility guidance. A gap is defined as a location with no pedestrian facility, and a substandard facility is defined as an existing facility that does not meet the required width. The gap assessment provides a consistent framework to support future planning, prioritization, and programming of multimodal improvements.

PROGRAMMED/RECENTLY COMPLETED PROJECTS

Programmed and recently completed projects were reviewed to identify locations where pedestrian and bicycle improvements are already planned or have been implemented. This review helps ensure that the gap assessment reflects current conditions, avoids duplicating planned investments, and supports coordination between ongoing projects and future multimodal planning efforts.

Figure 58 through Figure 62 present county-level maps of programmed and recently completed projects.



Source: FDOT

EXAMPLE OF SIDEWALK PROJECT

FDOT has filled several sidewalk gaps in recent years throughout District 7, in coordination with each MPO/TPO. In Pasco County, a sidewalk was recently constructed along US 41 near Land O'Lakes High School.

FIGURE 58. CITRUS COUNTY FUNDED/RECENTLY COMPLETED PROJECTS

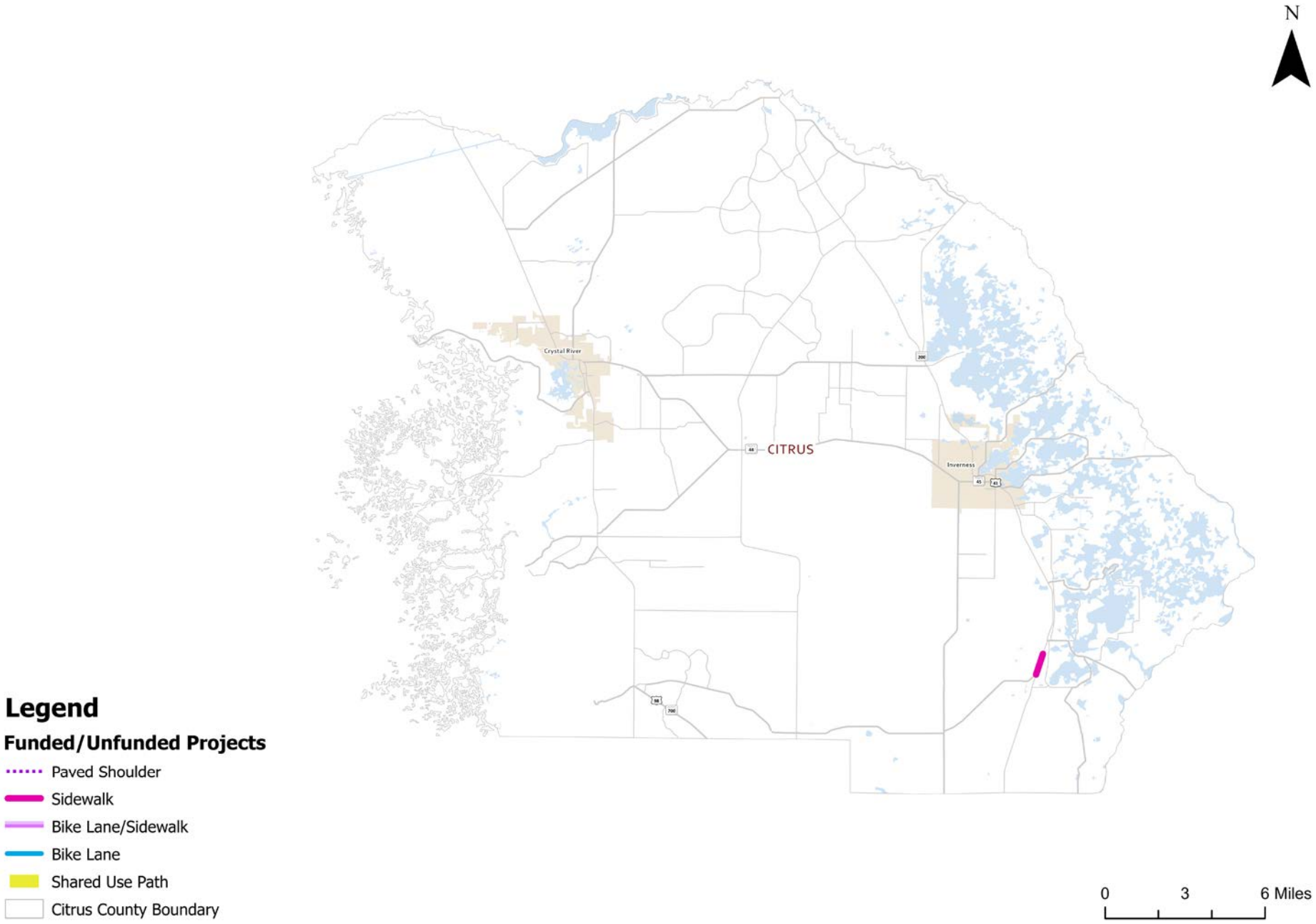


FIGURE 59. HERNANDO COUNTY FUNDED/RECENTLY COMPLETED PROJECTS

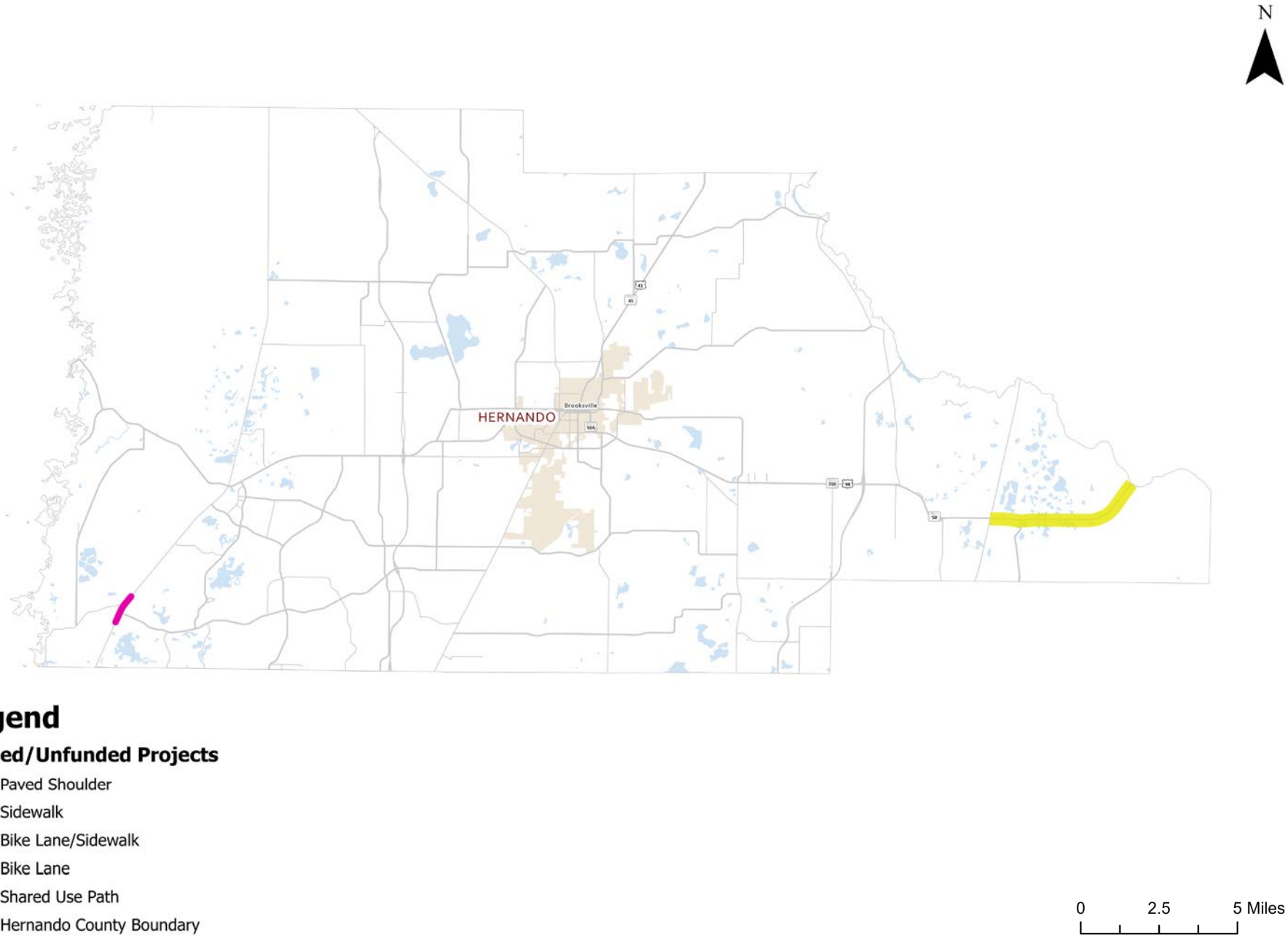


FIGURE 60. PASCO COUNTY FUNDED/RECENTLY COMPLETED PROJECTS

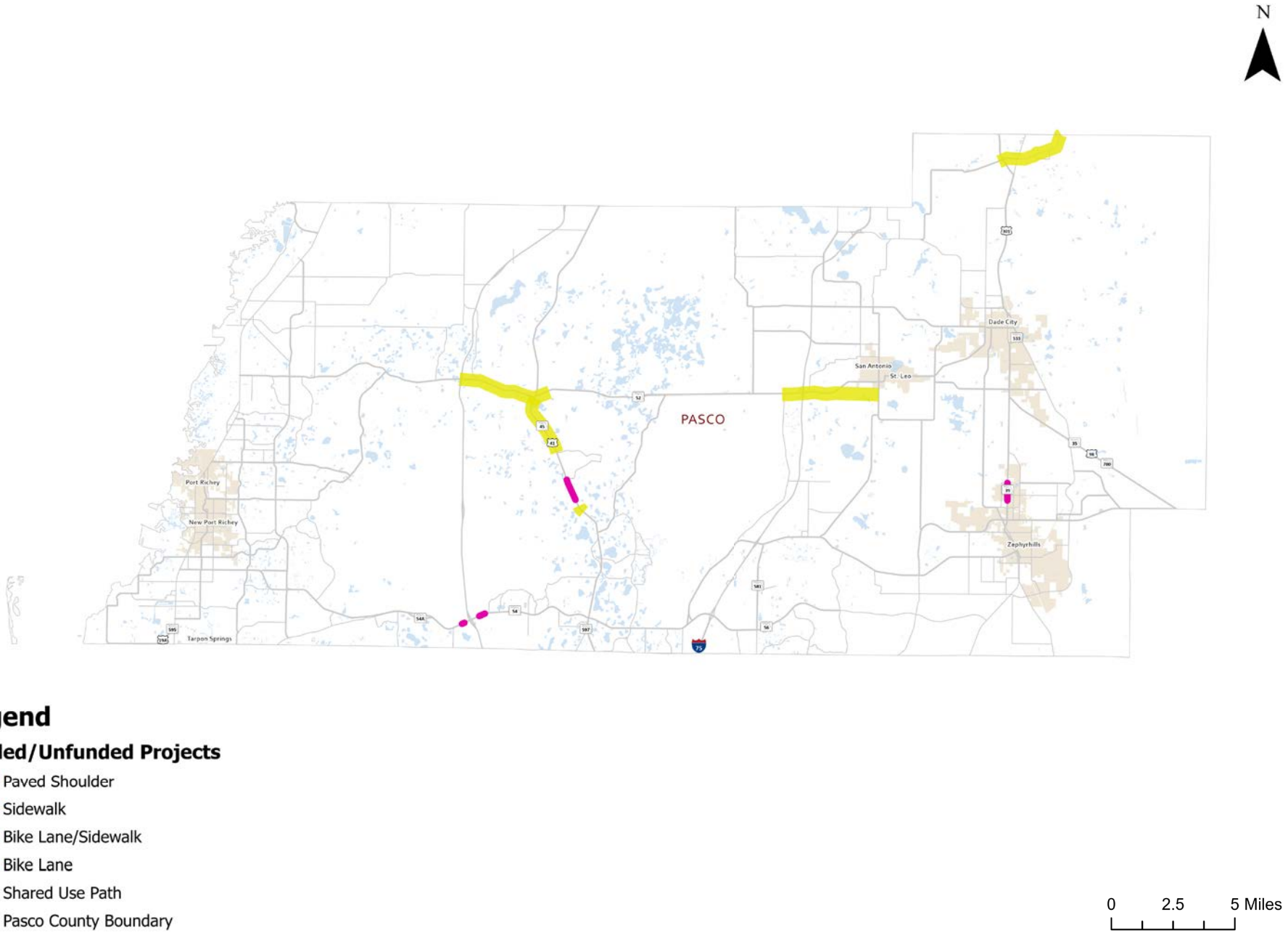


FIGURE 61. PINELLAS COUNTY FUNDED/RECENTLY COMPLETED PROJECTS

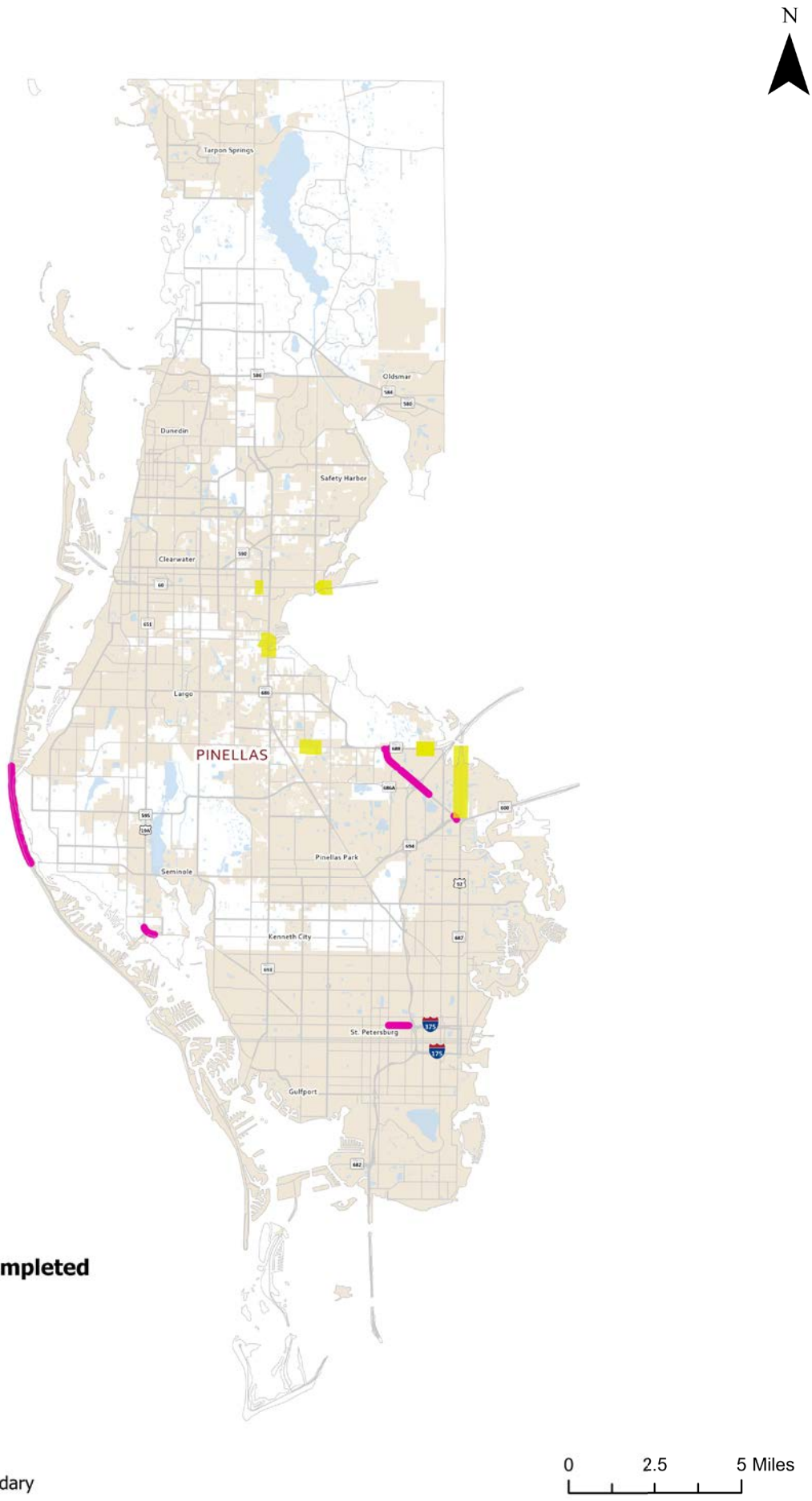
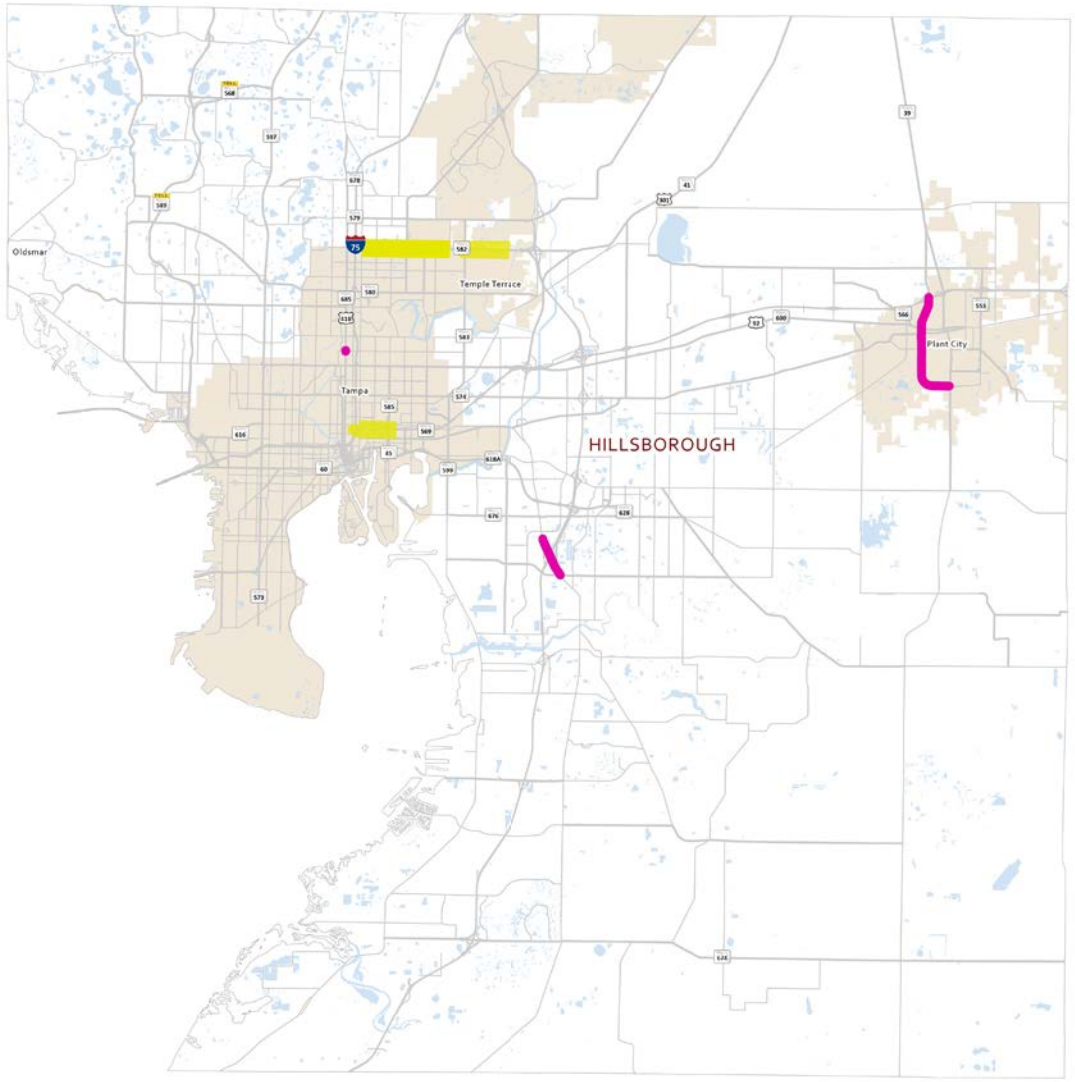


FIGURE 62. HILLSBOROUGH COUNTY FUNDED/RECENTLY COMPLETED PROJECTS



UNFUNDED PROJECTS

Unfunded projects were identified through a review of adopted local, regional, and corridor plans included as part of the existing conditions assessment. These plans often reflect long-term or visionary pedestrian and bicycle networks established by local agency partners and provide insight into desired future connections that are not yet programmed or funded.

Reviewing unfunded projects supports coordination with local agencies and helps align District 7 investments with locally identified priorities. These projects may inform future planning, refinement, and collaboration opportunities. They can be considered alongside the gap assessment and prioritization results to support a connected multimodal network.

Unfunded projects were identified through a review of adopted local, regional, and corridor plans included as part of the existing conditions assessment discussed in the Local Plan Section.

SUBSTANDARD PEDESTRIAN FACILITIES

Pedestrian facilities are considered substandard when sidewalk widths do not meet the minimum standards defined in the FDM. Sidewalk width requirements vary by context classification and are intended to support expected pedestrian activity, accessibility needs, and adjacent land use conditions.

Table 7 summarizes the minimum standard sidewalk widths by context classification as defined in the FDM. These widths should be used to identify substandard sidewalk segments and to inform retrofits, maintenance, and improvement decisions along corridors.

TABLE 7. SIDEWALK WIDTH BY CONTEXT CLASSIFICATION

Context Classification	Sidewalk Width (feet)
C1	5
C2	5
C2T	6
C3	6
C4	6
C5	10
C6	12

Adapted from FDM Table 222.2.1

Figure 63 through Figure 68 illustrate the location and extent of substandard pedestrian facilities across FDOT District 7. The map series includes a districtwide overview showing sidewalk segments that meet minimum width standards, gaps where sidewalks are missing, and substandard segments that do not meet width requirements. Segments are categorized as gaps, substandard sidewalks, or sidewalks that meet minimum width requirements.

> 50% of District 7 roadways do not have sidewalk along both sides of the road.

FIGURE 63. DISTRICTWIDE PEDESTRIAN FACILITIES WITH SUBSTANDARD WIDTHS

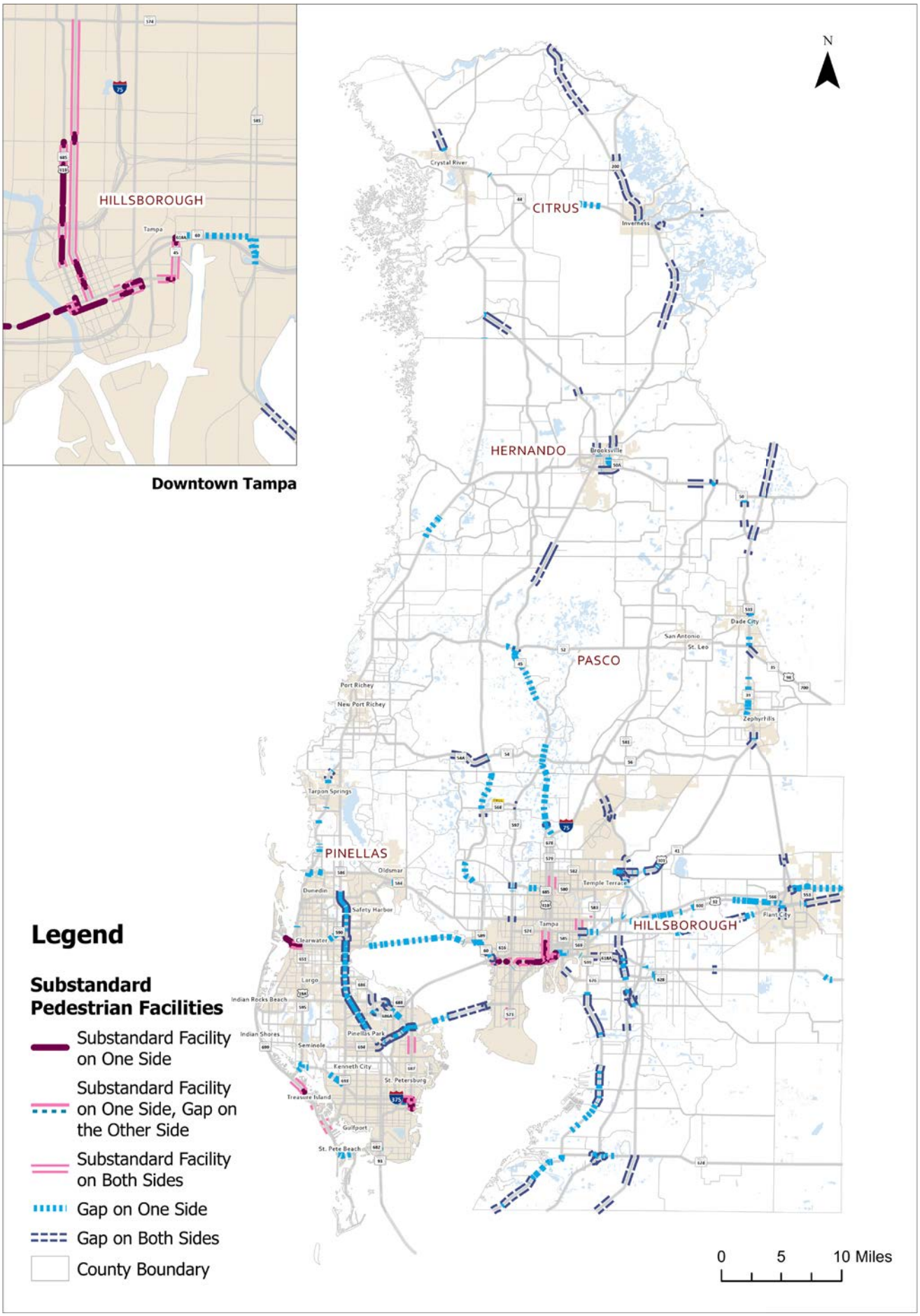


FIGURE 64. CITRUS COUNTY PEDESTRIAN FACILITIES WITH SUBSTANDARD WIDTHS

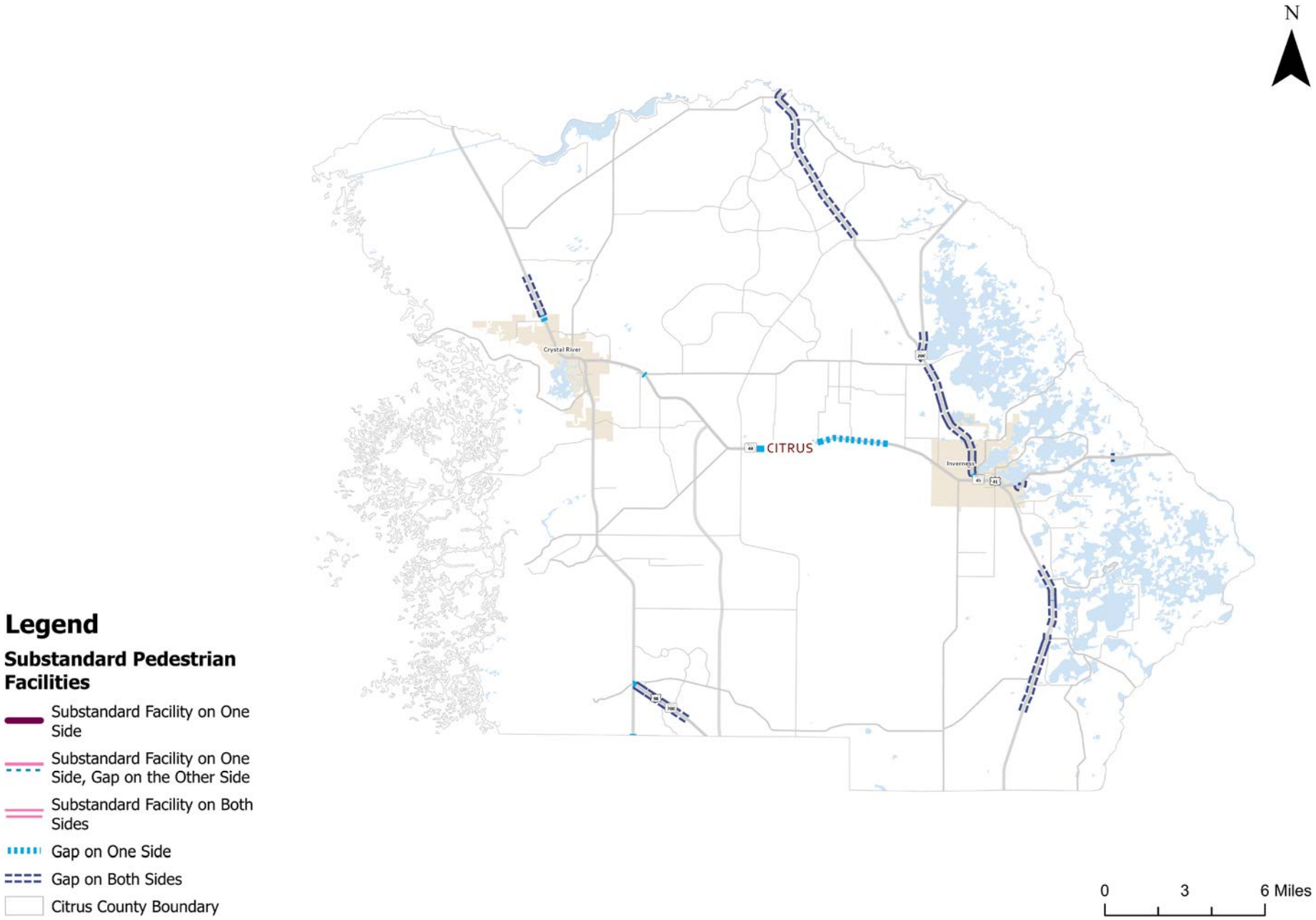


FIGURE 65. HERNANDO COUNTY PEDESTRIAN FACILITIES WITH SUBSTANDARD WIDTHS

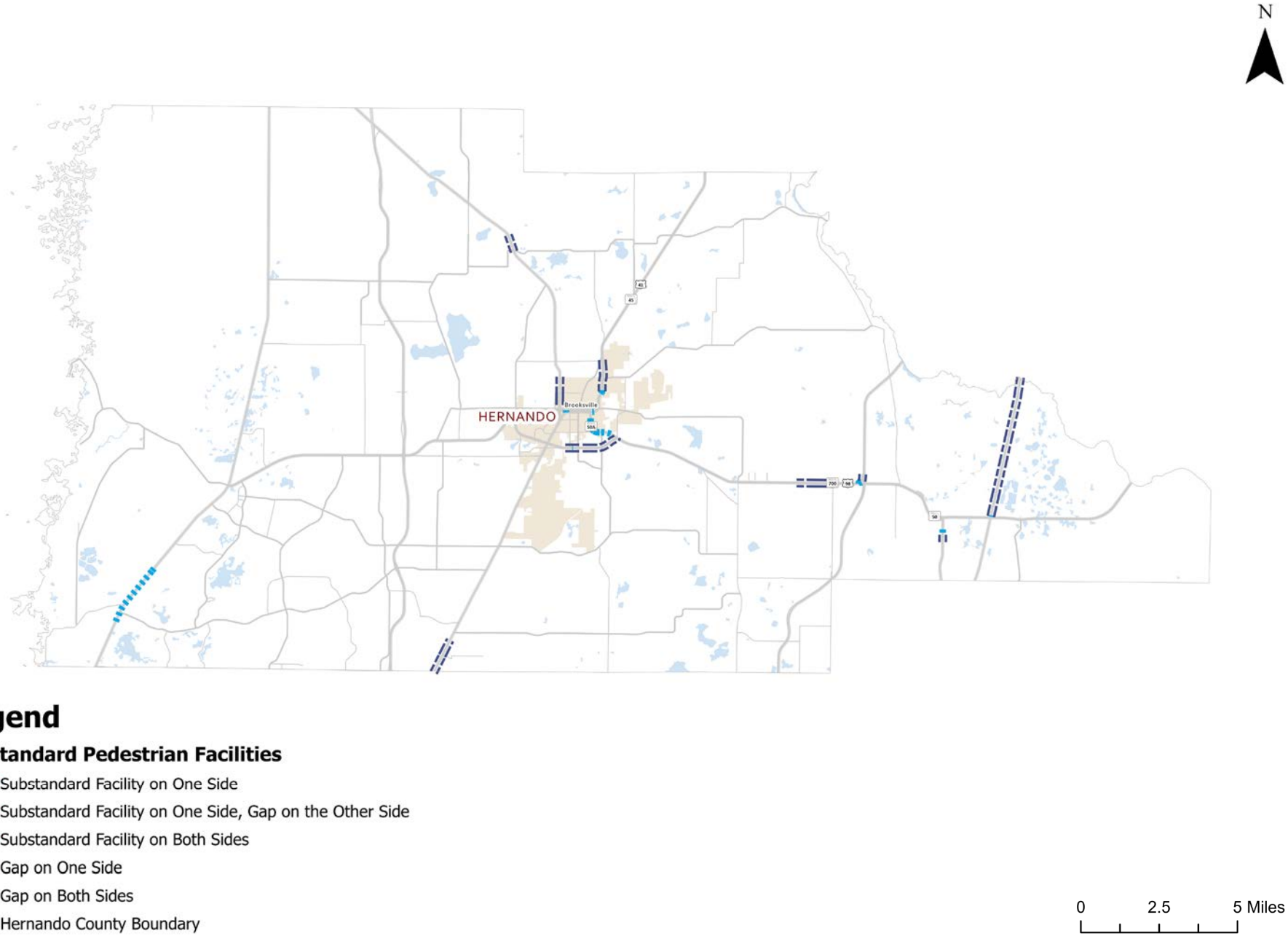


FIGURE 66. PASCO COUNTY PEDESTRIAN FACILITIES WITH SUBSTANDARD WIDTHS

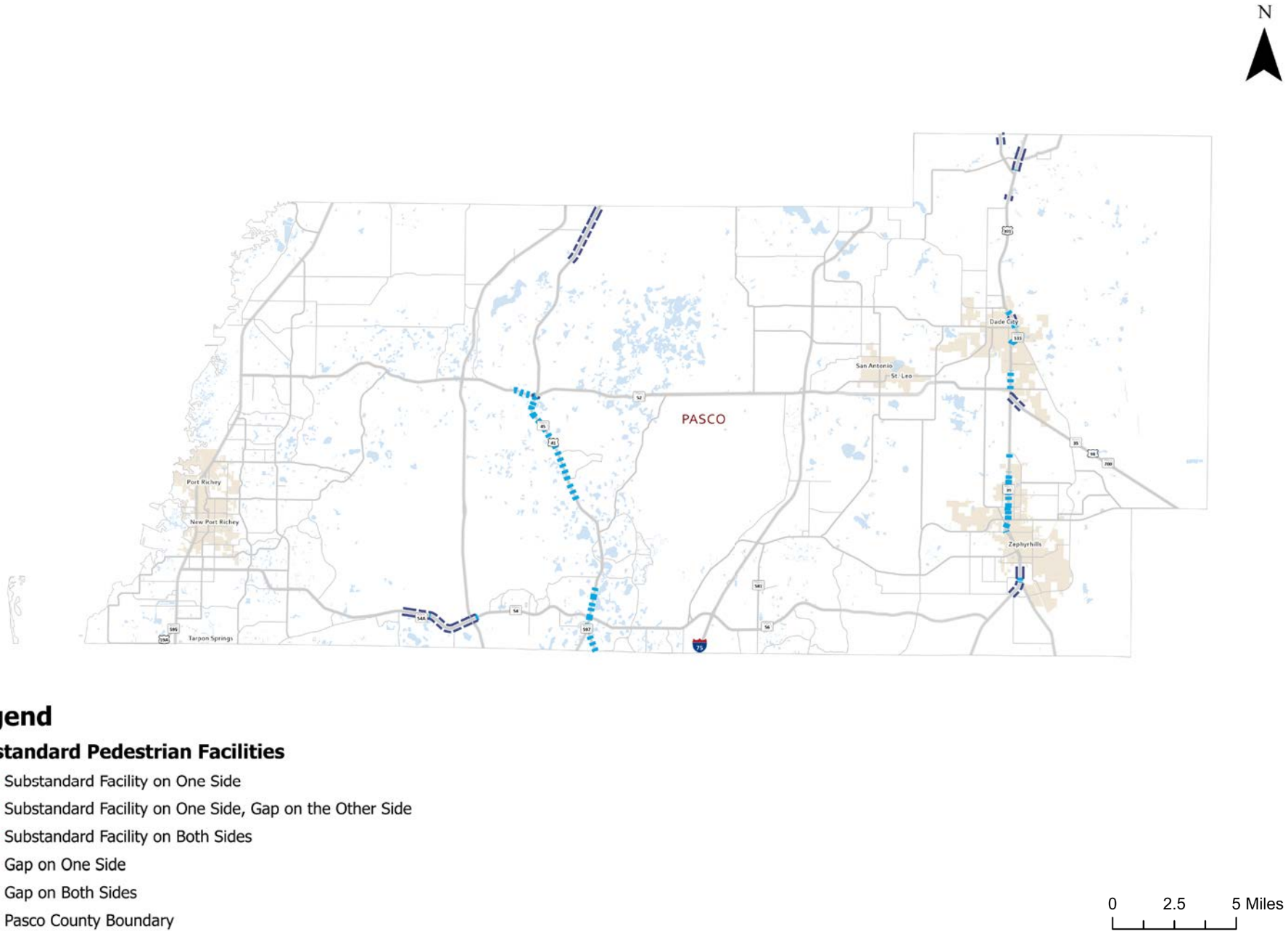


FIGURE 67. PINELLAS COUNTY PEDESTRIAN FACILITIES WITH SUBSTANDARD WIDTHS

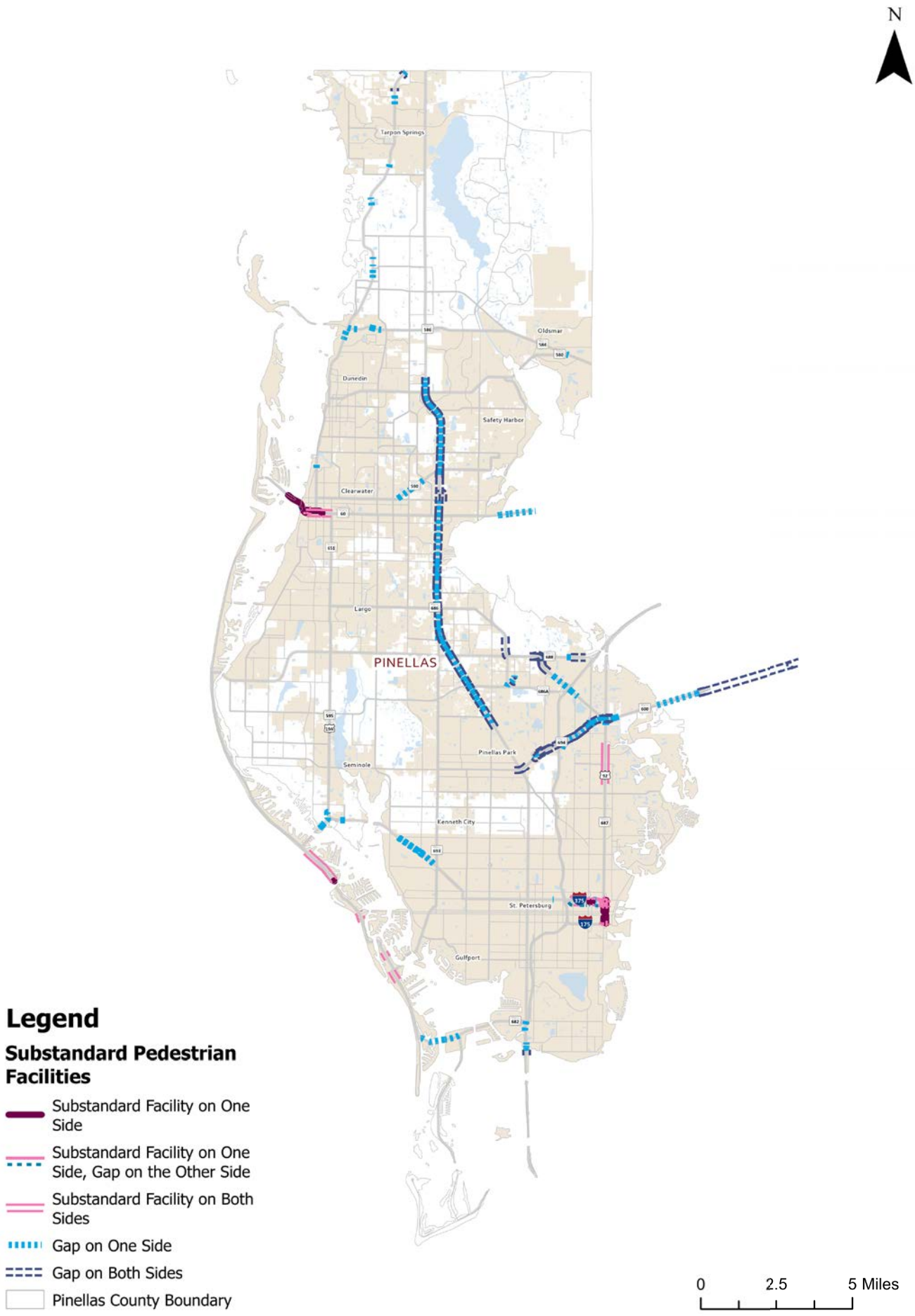
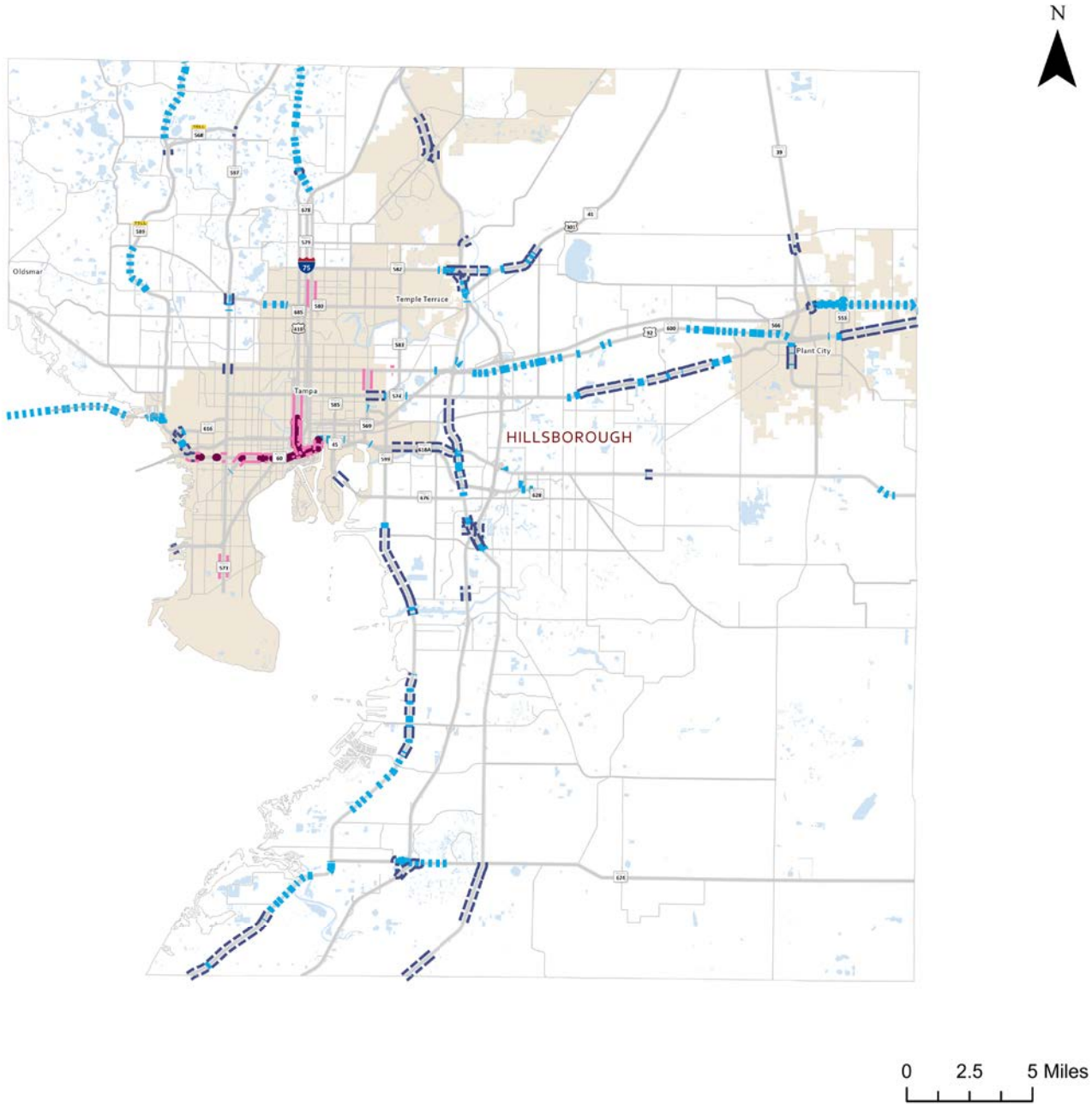


FIGURE 68. HILLSBOROUGH COUNTY PEDESTRIAN FACILITIES WITH SUBSTANDARD WIDTHS



Legend

Substandard Pedestrian Facilities

- Substandard Facility on One Side
- Substandard Facility on One Side, Gap on the Other Side
- Substandard Facility on Both Sides
- Gap on One Side
- Gap on Both Sides
- Hillsborough County Boundary

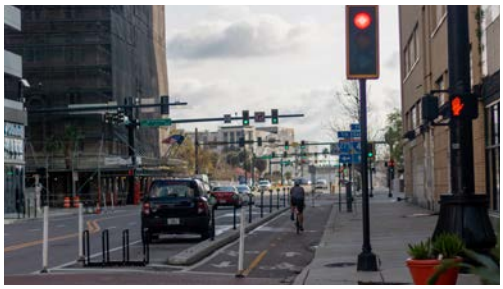
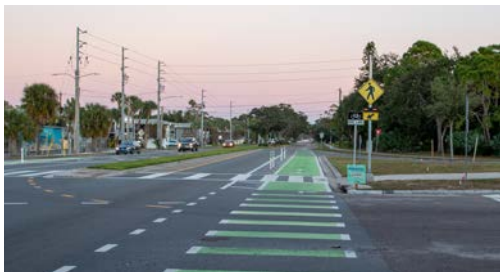
BICYCLE FACILITIES

This section provides guidance to support the selection of appropriate bicycle facilities and associated crossing treatments on state roadways in FDOT District 7. The guidance is consistent with FDOT policies and design standards, including the FDM and the Target Zero initiative and policy, and reflects national best practices and federal guidance such as the FHWA *Bikeway Selection Guide*, FHWA *Separated Bike Lane Planning and Design Guide*, American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities* (5th Edition), and relevant NCHRP research.

Bicycle facility selection should consider context classification, surrounding land use, traffic volumes, operating speeds, and network connectivity. While preferred bicycle facility types are identified throughout this chapter, corridor constraints, such as right-of-way limitations, existing development, and environmental features, may limit implementation in the short term. In these cases, minimum facilities or parallel routes may be considered to maintain connectivity and provide reasonable access to destinations. Where parallel routes are identified, coordination with local agency partners is necessary to ensure continuity and integration within the broader bicycle network.

TABLE 8. BICYCLE FACILITIES

Example	Facility Type	Description
	Shared Lane Markings	Shared lane markings or "sharrows" are optional pavement markings used to indicate a shared environment for bicycles and motor vehicles. Shared lane markings should be placed in the center of the lane and should avoid the door zone of any on-street parallel parking. Shared lane markings should only be used on roadways with a posted speed limit of 35 mph or less.
	Paved Shoulder	A paved shoulder is the portion of the roadway contiguous with the traveled way for accommodation of errant vehicles, stopped vehicles, bicycle traffic, and emergency use. Paved shoulders must be four feet or wider for bicycle use.
	Bicycle Lane	Bicycle lanes are a portion of a roadway designated for the exclusive use of bicyclists. Bicycle lanes can also be provided on flush shoulder roadways with speed limits of 45 mph or less if the criteria in FDM 223.2.1 is met.

Example	Facility Type	Description
	Buffered Bicycle Lane	A buffered bicycle lane is a bicycle lane that includes a painted buffer separating the bicycle lane from the adjacent vehicular travel lane. Seven feet is the standard width for buffered bicycle lanes in new construction projects.
	Two-Way Separated Bicycle Lane	A two-way separated bicycle facility, also known as two-way cycle track, is a bicycle way that accommodates bicycle travel in both directions within a single facility. It is located adjacent to and physically separated from the vehicular travel lane.
	One-Way Separated Bicycle Lane	A one-way separated bicycle facility is a bicycle way that operates in a single direction of travel. It is located adjacent to and is physically separated from the vehicular travel lane.
	Shared-Use Path	Shared-use paths are paved facilities physically separated from motorized vehicular traffic by an open space or barrier and are either within the highway right of way or an independent right of way.
	Urban Side Path	An urban side path is a type of shared use path. It may be used in C2T, C4, C5, and C6 context classifications where the design speed of the adjacent roadway is 35 mph or less.
	Sidewalk Level Separated Bicycle Lanes	Sidewalk level bike lanes (or raised bike lanes) are adjacent to the road. There should be a 2-foot detectable buffer between the sidewalk and the separated bicycle lane. Urban side path criteria applies in C2T, C4, C5, or C6 where the design speed is 35 mph or less. For other conditions, the shared use path design criteria applies. See FDM 223.2.4.2.

BICYCLE FACILITY SELECTION

Bicycle facility selection requires a coordinated approach that integrates policy direction, planning considerations, and engineering judgment. This framework provides flexibility in developing a connected bicycle network while accounting for each state roadway's unique context, constraints, and opportunities. The intent is to provide practitioners with a clear resource to weigh tradeoffs when selecting appropriate bicycle facilities on state roadways.

- **Policy:** FDOT District 7 will select facilities with the goal of developing a low-stress, high-comfort bicycle network that attracts users of all ages and abilities. This policy establishes District 7's vision and decision making framework for the bicycle network and informs both planning and bicycle facility selection on state roadways.
- **Planning:** This effort ensures bicycle facility selection is part of a broader corridor planning process that considers project purpose, multimodal needs, corridor context, network connectivity, and community goals.
- **Selection:** The selection process evaluates the feasibility of implementing the preferred bicycle facility within physical and financial constraints and provides flexibility to consider alternative facilities or parallel routes when needed to maintain network continuity.

Bicyclists have varying levels of comfort and stress tolerance when riding in traffic, which influences the type of facilities they are willing to use. As illustrated in Figure 69, the population can be broadly grouped into user types ranging from non-bicyclists to highly confident bicyclists. The majority of potential riders prefer low-stress environments with physical separation from motor vehicles or traffic-calmed conditions, while only a small share is comfortable riding in mixed traffic.

Understanding these differing comfort levels is critical to bicycle facility selection. Providing low-stress, separated facilities can expand bicycling to a broader portion of the population and support a more inclusive and connected bicycle network.

> The default target user will be the cautious group, unless unique conditions are present within the corridor that require special consideration. Such conditions could include the presence of a high quality, low-stress parallel route that can serve the cautious group and create the potential for the state roadway to serve more confident users.

FIGURE 69. BICYCLE USERS BY SEPARATION NEEDED



Adapted from the Portland Bureau of Transportation

Electric Bicycles

The use of electric bicycles (e-bikes) has increased significantly in recent years, expanding the range of users and trip types served by bicycle facilities. E-bikes can support longer-distance trips, reduce physical barriers to bicycling, and increase overall bicycle ridership across a wider range of ages and abilities. As e-bike use grows, bicycle facilities must accommodate a broader spectrum of operating speeds and user comfort levels.

The increased speed differential between e-bikes, conventional bicycles, pedestrians, and motor vehicles presents new design and operational challenges. Facility width, sight distance, and intersection treatments should consider interactions among users traveling at different speeds. These considerations should be integrated into bicycle facility planning and design to support safe and predictable operation for all users. Planners and engineers should first consider the target users when working on multimodal projects. They should review local ordinances to understand where e-bikes and e-scooters are permitted.

Type of Separation

The FDM defines several types of physical separation that may be used to create separated bicycle lanes, with the appropriate separation based on roadway speed and context. The purpose of separation is to reduce conflicts between bicyclists and motor vehicles, improve user comfort, and support safe and predictable operation.

For lower-speed roadways, a wider range of separation elements may be appropriate, while higher-speed roadways require more substantial separation. The following categories summarize separation types consistent with FDM 223 guidance and are organized by operating speed. Recommended separation widths and design criteria are provided in the FDM and should be considered during facility selection and design. Vertical separation should be provided for roadways with a posted speed of 40 mph or higher for a more comfortable facility with lower traffic stress.

- 35 mph or less
  - Tubular markers
  - Channelizing curb
  - Traffic separators
  - Islands
  - Rigid barriers
  - On-street parking
- 40–45 mph
  - Traffic separator
  - Islands
  - Rigid barriers
  - Different curb types

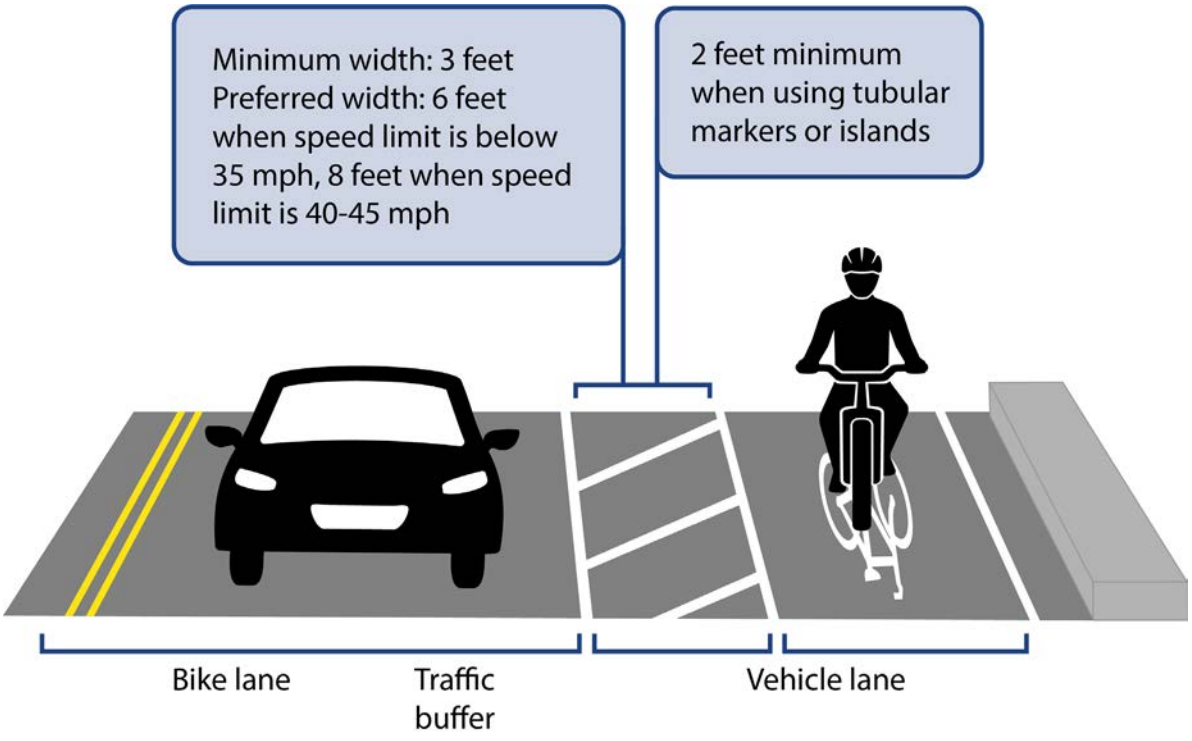
Shared-Use Path Separation: Shared-use paths should be clearly distinguished from the roadway as they operate as a separate facility. Where feasible, shared-use paths should be located away from the road and near the right-of-way line to reduce conflicts with vehicles. Minimum separation distances for curbed and flush shoulder roadways are provided in the FDM. In locations with high user volumes, multiple treatments may be considered to separate pedestrians and bicyclists using signage, pavement markings, or a combination of paved and soft-surface paths.

Separated Bicycle Facilities: Separated bicycle facilities should be used when separation can be maintained at intersections between bicycles and vehicles and conflicts are minimized. The preferred width for one-way separated bicycle facilities is 7 feet and for two-way facilities is 12 feet. Bicyclists should be prioritized at driveways and side street crossings. In District 7, where bicycle facilities and driveways conflict in parking lots, consider stop control for vehicles as opposed to stopping trail users.

Access Management: Driveways and intersections are common locations for bicycle crashes due to turning vehicle conflicts. Access management strategies should be applied to reduce the frequency and complexity of turning movements across bicycle facilities, particularly along separated bicycle lanes and shared use paths. Managing access spacing and driveway design can improve predictability and reduce conflict points.

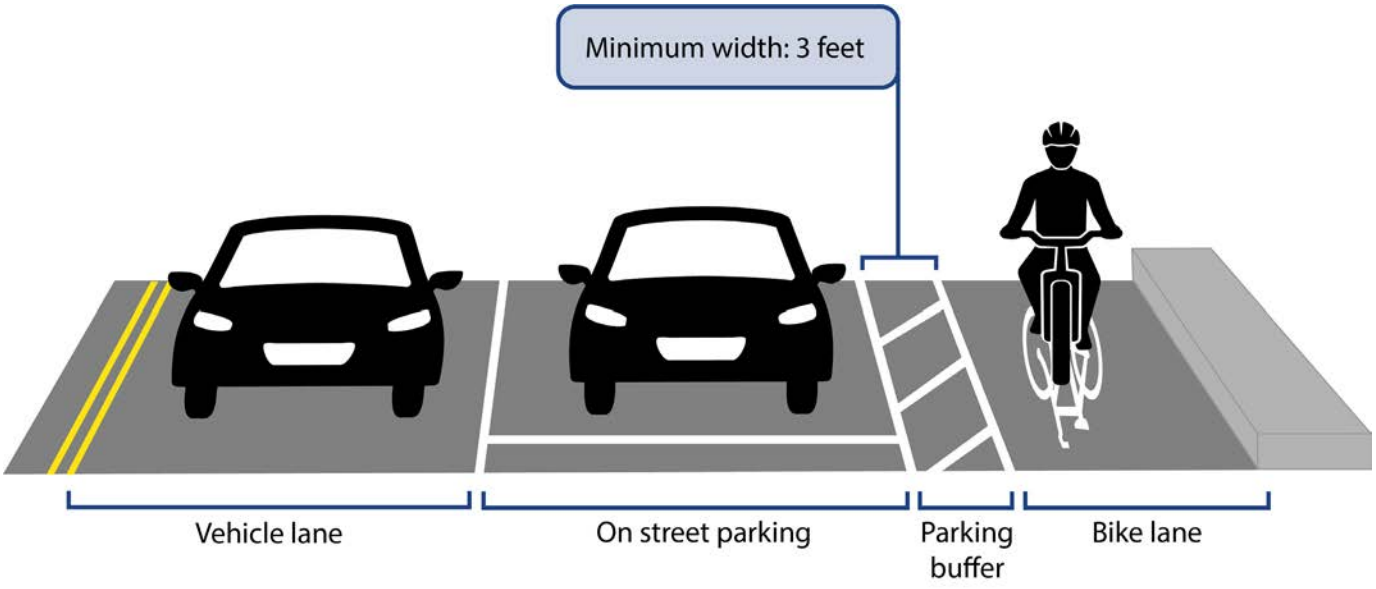
Priority and Right-of-Way Assignment: Frequent stopping reduces bicycling efficiency and comfort and can lead to noncompliance with traffic control. Bicycle facilities should be planned to minimize unnecessary stops.

FIGURE 70. TRAFFIC BUFFER WIDTHS



Source: Kittelson

FIGURE 71. PARKING BUFFER WIDTHS



Source: Kittelson

Feasibility: Feasibility considerations may influence bicycle facility selection, particularly where physical or right-of-way constraints are present. While funding and implementation constraints may affect facility type or phasing, these considerations should not result in facilities that compromise safety or performance. Alternative design solutions should be explored where constraints exist. A design variation is required whenever a bike facility is provided that does not meet design criteria.

SPEED MANAGEMENT

An essential consideration for bicycle facilities is the speed difference between users. This includes the speed between vehicles and bicycles as well as the speed between people biking and walking on trails or shared-use paths.

Speed management is especially important when considering interactions between motor vehicles and bicycles using on-street facilities. FDM 202 highlights treatments that follow speed management strategies to provide enclosure that gives drivers a frame of reference, engagement to provide visual and audio input to drivers, and deflection to add horizontal or vertical movement. These treatments are organized by context classification, design speed, and target speed. Installing traffic control devices such as RRFBs or PHBs can have the benefit of creating shorter blocks, creating engagement for drivers.

Policy

Policy sets the framework for determining the best bicycle facility. In the initial District 7 Bicycle Pedestrian Facility Plan, the following policy was set:

> FDOT District 7 will select facilities with the goal of developing a low-stress, high-comfort bicycle network that attracts users of all ages and abilities.

This policy remains as the guidance for selecting a bicycle facility in District 7.

Selection

Selecting an appropriate bicycle facility is critical to supporting safety, comfort, and network connectivity for users of all ages and abilities. Bicycle facility selection should balance policy direction, planning objectives, and engineering judgment while accounting for roadway context, traffic conditions, user comfort, and site constraints. Thoughtful selection helps ensure facilities function as intended, address identified needs and contribute to a cohesive and usable bicycle network.

Selecting the appropriate bicycle facility should consider the following factors.

Context Classification: The FDOT context classification system considers how the end user interacts differently with infrastructure based on the roadway type and surrounding land uses. Context classification is the starting point for selecting a bicycle facility type.

Stakeholder Engagement: Stakeholder engagement helps ensure bicycle facilities respond to local needs and planned uses of the corridor. Input from community members, local agencies, and corridor stakeholders can inform who the facility is intended to serve, how it will be used, and how it should connect to surrounding land uses and destinations. Engagement can also identify local concerns, operational issues, and opportunities for coordination that may influence facility selection and design.

Network Connectivity: Bicycle facilities should contribute to a continuous and legible network by linking destinations, addressing gaps, and providing consistent transitions between facility types. Connections to parallel routes, trails, and local streets should be considered to ensure the system operates as an integrated network rather than a series of isolated improvements.

End Users: Facility selection should reflect the needs and comfort levels of anticipated users, including riders of different ages, abilities, and experience levels. The level of separation, facility width, and design treatments should support predictable operation and accommodate a range of bicycling speeds and behaviors.

Modal Interactions: Design decisions should account for interactions with pedestrians, public transportation, and motor vehicles, particularly at intersections, driveways, and along conflict areas. Consideration of curbside activity, public transportation stop locations, and access frequency can help reduce conflicts and improve overall operational efficiency.

Implementation: Consider the project type and scope to understand how bicycle facilities can be implemented. Resurfacing scopes may present constraints, but engineers and planners should consider if there are any ways to accommodate elements of the preferred bicycle facility, such as maximizing curb ramp widths, reviewing pavement markings, and ensuring geometric decisions do not preclude the future facility. With a resurfacing project, there may be time and budgetary restraints, which mean it is not possible to achieve the preferred bicycle facility within that project. However, new construction or reconstruction may allow for moving curb or acquiring right of way to implement the preferred bicycle facility. Sometimes projects may require phasing as sections are built over time. Consider the ideal transitions along a facility if a project will be phased and how this impacts the experience of the user.

Bicycle Facility Selection Process

This Plan does not designate the required facility for each corridor in the District. However, it provides guidance for planners and engineers to consider preferred facility types and consider tradeoffs when selecting the bicycle facility. This guidance helps the decision making process while still allowing for engineering judgment and flexibility.

Clearly defining the project purpose is a critical step in bicycle facility selection. The project purpose should identify the primary needs the improvement is intended to address, such as safety, connectivity, access to key destinations, or operational performance, and establish how the bicycle facility supports broader corridor and multimodal objectives. A well-defined purpose provides context for evaluating tradeoffs and informs subsequent refinement, feasibility, and design decisions.

To follow this Plan, the preliminary bicycle facility selection is first identified based on context class, design speed and annual traffic volumes. This provides the preferred facility type which has been selected to emphasize providing separation and serving cautious riders. Additional bicycle facility types may still be allowed based on the FDM. This is the starting place to select a facility, but further assessment and refinement may be needed.

Factors such as network connectivity, target users, traffic composition (such as transit or truck usage), driveway locations, intersection frequency, and consistency with other projects impact facility selection. Acknowledging these unique factors at a corridor level may result in selecting a different bicycle facility type. Refinement and evaluation should consider right-of-way constraints, adjacent land use, existing infrastructure, safety and operational performance, coordination with local agency partners, and consistency with applicable standards and plans.

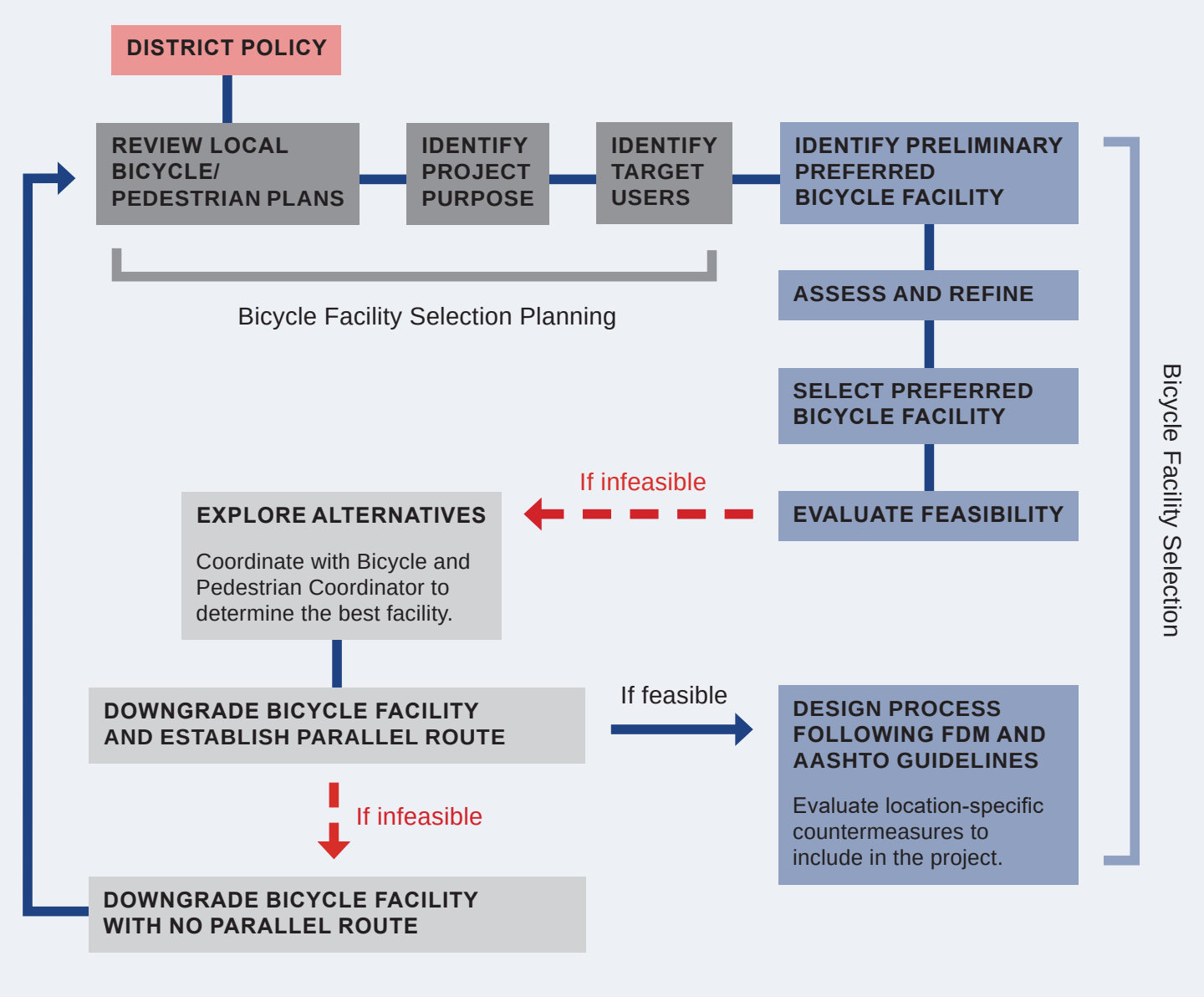
After the preferred bicycle facility is selected, consider the feasibility of implementation. This includes looking at constraints in space, such as limited right of way, utilities, or drainage impacts, as well as project constraints such as schedule and budget. While new construction must incorporate the appropriate FDM criteria, retrofitting projects in constrained spaces may not allow for right of way purchasing and may require the following:

- Reconfiguring existing roadway or street elements including changes to vehicle lanes, landscape, drainage, or parking
- Narrowing existing vehicle travel lanes or medians
- Removing existing turn lanes
- Modifying or removing existing on-street parking (such as converting angle parking to parallel parking)

If the selected bicycle facility is deemed feasible by the project engineer, the project moves into design. Where constraints limit implementation of the preferred facility, alternative or minimum treatments should be evaluated to maintain continuity within the multimodal network. Alternatives should begin by considering the next option using the following order:

- Shared-use path/separated bicycle lane
- Buffered bicycle lane
- Bicycle lane
- Shared lane markings

FIGURE 72. SELECTION PROCESS



Preliminary Bicycle Facility Selection

Selection of bicycle facilities should consider surrounding land use, context classification, traffic volumes, and operating speeds to support safe and comfortable bicycle travel. Context classification reflects the intensity of adjacent development, expected user activity, and the level of separation needed between bicyclists and motor vehicles.

Table 9 summarizes facility types based on context classification, traffic volumes, and operating speeds which are intended to support comfortable and low-stress bicycling for a broad range of users. The table is intended to guide preliminary facility selection and should be used in conjunction with the FDM and site-specific engineering judgment.

TABLE 9. PRELIMINARY PREFERRED BICYCLE FACILITY

Context Classification	Design Speed 25–30 mph, AADT <7,000 vpd	Design Speed 25–30 mph, AADT ≥7,000 vpd	Design Speed 35–45 mph	Design Speed >45 mph
C1 and C2				Paved shoulder or shared-use path[1]
C2T	Buffered bicycle lane	Separated bicycle lane	Separated bicycle lane or shared-use path[2]	
C3			Separated bicycle lane or shared-use path[2]	Shared-use path
C4	Buffered bicycle lane	Separated bicycle lane	Separated bicycle lane	
C5	Buffered bicycle lane	Separated bicycle lane	Separated bicycle lane	
C6	Buffered bicycle lane	Separated bicycle lane		

[1]Shared-use paths should be prioritized on rural corridors that attract a high volume of cyclists (FDM 224).

[2]For curbed roadways it is preferable to install one-way separated bicycle lanes on both sides of the roadway. If one-way separated bicycle lanes cannot be installed, two-way separated bicycle lane or shared use path should be considered. In areas with high pedestrian demand or more vulnerable users, a separated bicycle lane is preferred over a shared use path (FDM 224).

Parallel Routes

Parallel routes provide alternative low-stress bicycle and pedestrian travel options when conditions on the primary roadway are not suitable for all users. These routes can improve network connectivity, comfort, and safety by shifting bicycle and pedestrian travel to streets or corridors with lower traffic volumes, lower speeds, or fewer conflicts.

Implementation of parallel routes requires coordination with local agency partners, including cities, counties, and other roadway owners. Coordination is necessary to ensure route continuity, consistent design treatments, maintenance responsibilities, and alignment with local plans and policies. Parallel routes should be identified and evaluated as part of a connected multimodal network rather than as isolated segments.

Minimum Required Bicycle Facilities

In some locations, site constraints may limit the ability to implement preferred bicycle facilities. Constraints may include right-of-way limitations, existing development, environmental features, or operational considerations. Table 10 identifies the minimum required bicycle facility by context classification, design speed, and traffic volume to ensure a basic level of bicycle accommodation where preferred facilities cannot be provided. The table is intended to guide minimum facility selection and should be used in conjunction with the FDM and site-specific engineering judgment. Figure 73 to Figure 78 illustrate if the existing facility meets the preliminary minimum required bicycle facilities, based on Table 10.

To illustrate the location and magnitude of need for upgraded or new bike facilities, each existing bicycle facility and preferred facility was assigned a tier indicating the level of separation and comfort, as shown in Table 10. Figure 79 to Figure 84 show the extent of the deviation in the number of tiers between the existing facility and the preferred bicycle facilities.

TABLE 10. MINIMUM REQUIRED BICYCLE FACILITY

Context Classification	Design Speed 25–30 mph, AADT <7,000 vpd	Design Speed 25–30 mph, AADT ≥7,000 vpd	Design Speed 35–45 mph	Design Speed >45 mph
C1 and C2				Paved shoulder or shared use path[1]
C2T	Marked shared lane (sharrow)	Bicycle lane	Buffered bicycle lane[2]	
C3			Buffered bicycle lane	Shared use path
C4	Marked shared lane (sharrow)	Bicycle lane	Buffered bicycle lane[2]	
C5	Marked shared lane (sharrow)	Bicycle lane	Buffered bicycle lane [2]	
C6	Marked shared lane (sharrow)	Bicycle lane		

[1]Shared-use paths should be prioritized on rural corridors that attract a high volume of cyclists (FDM 224).

[2]Urban side path may be used in C2T, C4, C5, and C6 if design speed is 35 mph or less. In C5 or C6 the urban side path must provide a separate sidewalk to accommodate the higher pedestrian demand (FDM 224).

[3]Bicycle lanes can be used on roadways with design speed of 45 mph but best practice is to consider other facility types for design speed greater than 30 mph per FDM 223.

TABLE 11. BICYCLE FACILITY TIERS

Tier	Facility Type
1	Shared use path/ Separated bicycle lane
2	Buffered bicycle lane
3	Bicycle lane
4	Paved shoulder/Marked shared lane
5	No facility (existing gap)

FIGURE 73. DISTRICTWIDE MINIMUM REQUIRED BICYCLE FACILITIES

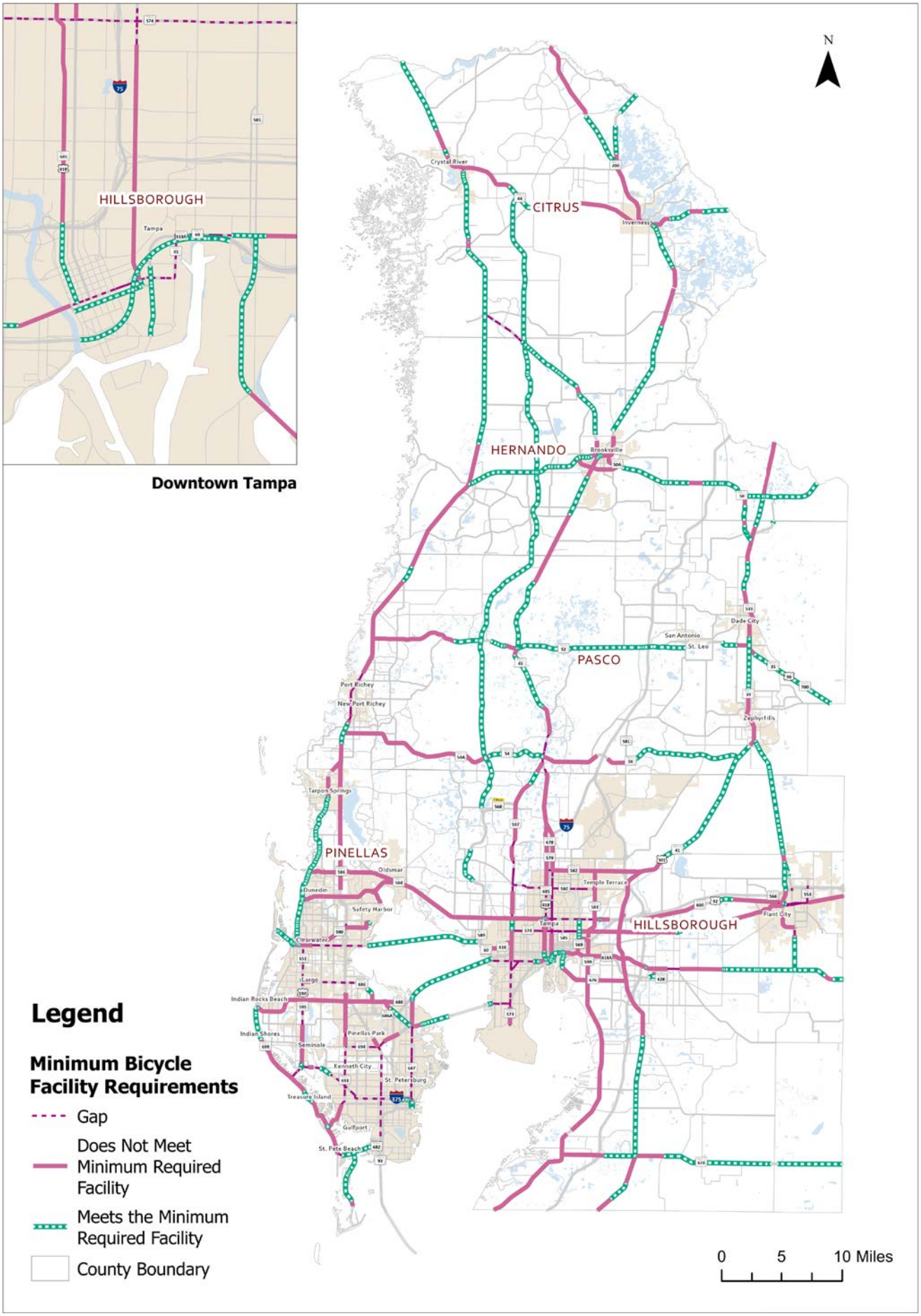


FIGURE 74. CITRUS COUNTY MINIMUM REQUIRED BICYCLE FACILITIES

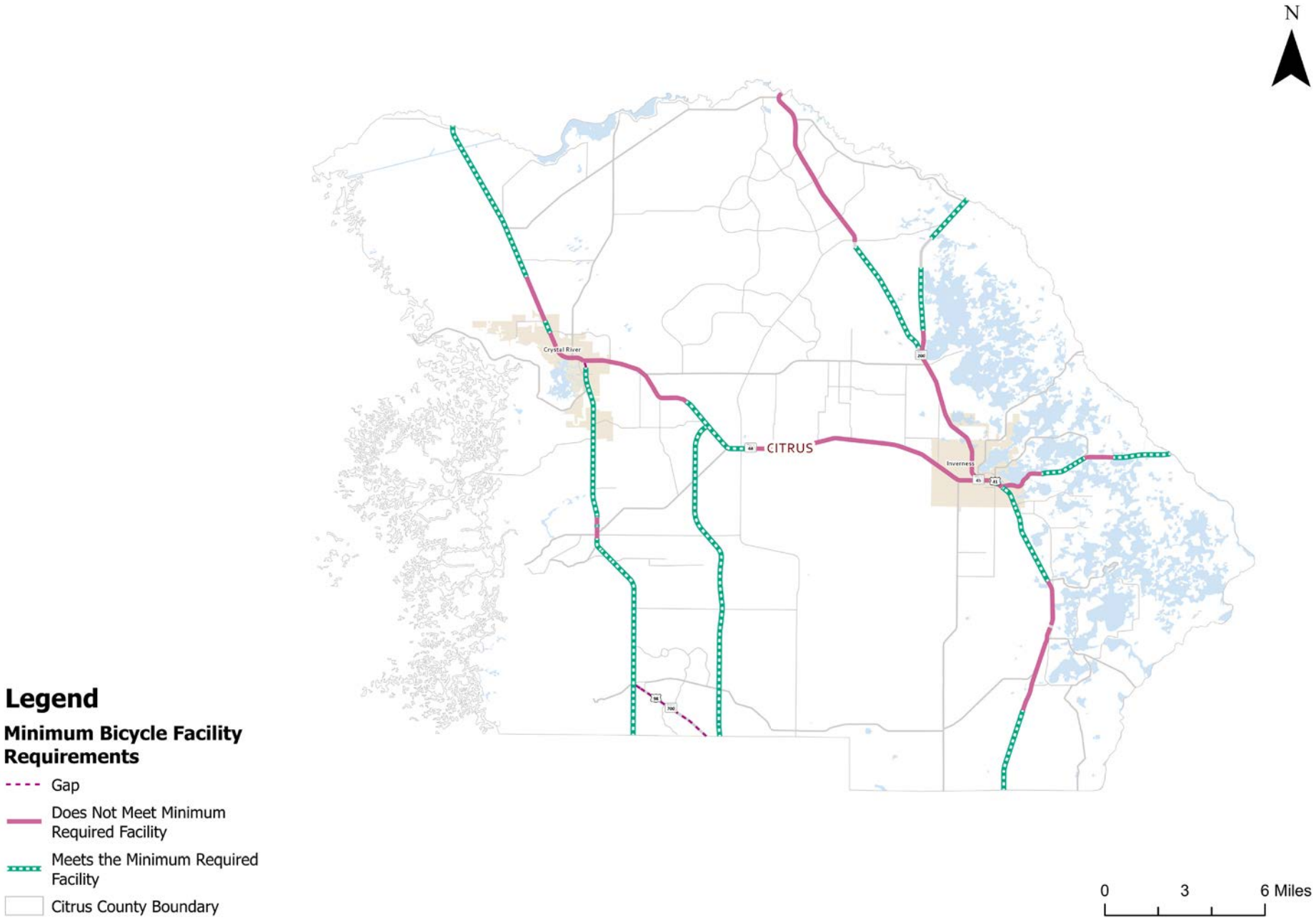


FIGURE 75. HERNANDO COUNTY MINIMUM REQUIRED BICYCLE FACILITIES

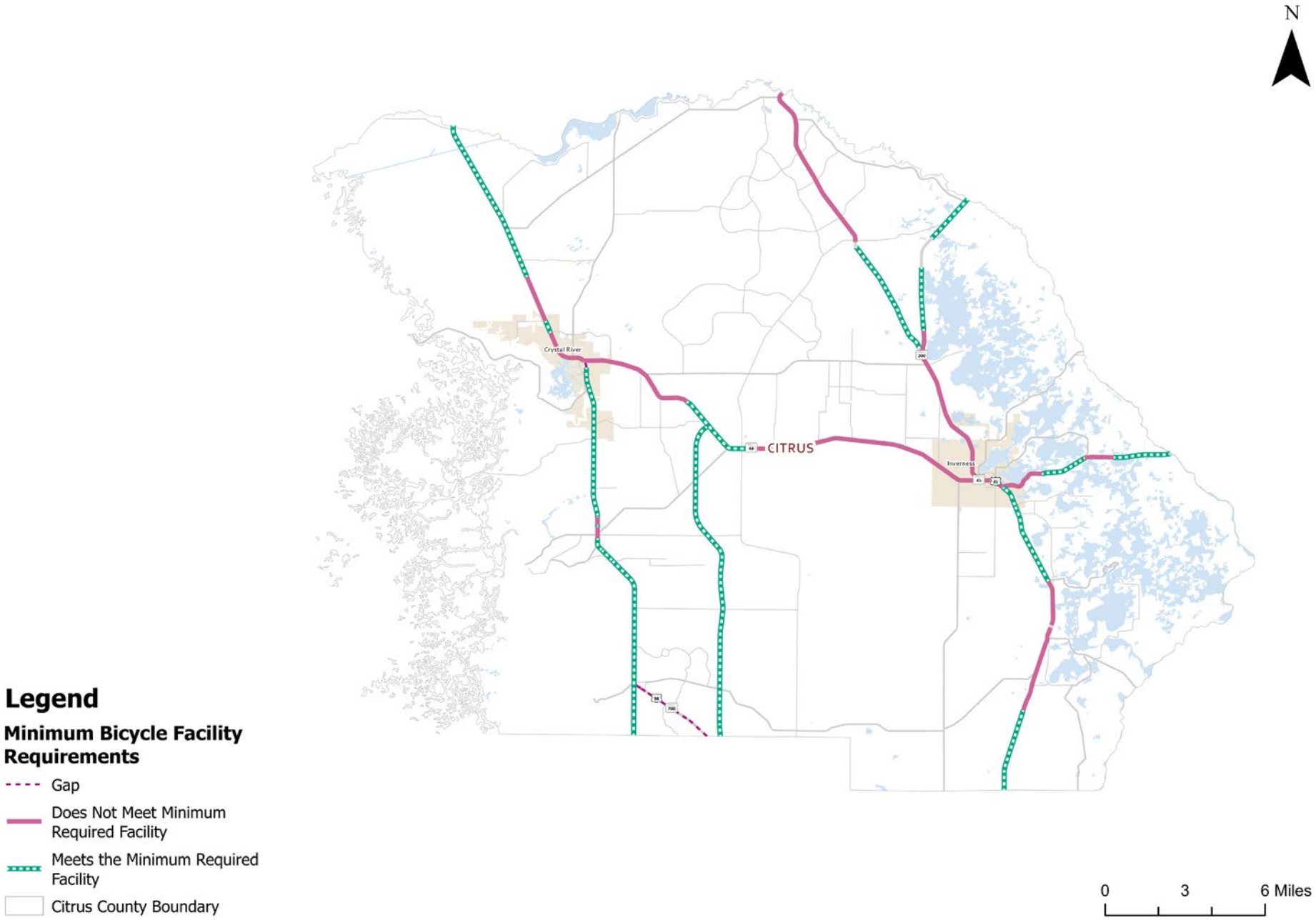


FIGURE 76. PASCO COUNTY MINIMUM REQUIRED BICYCLE FACILITIES

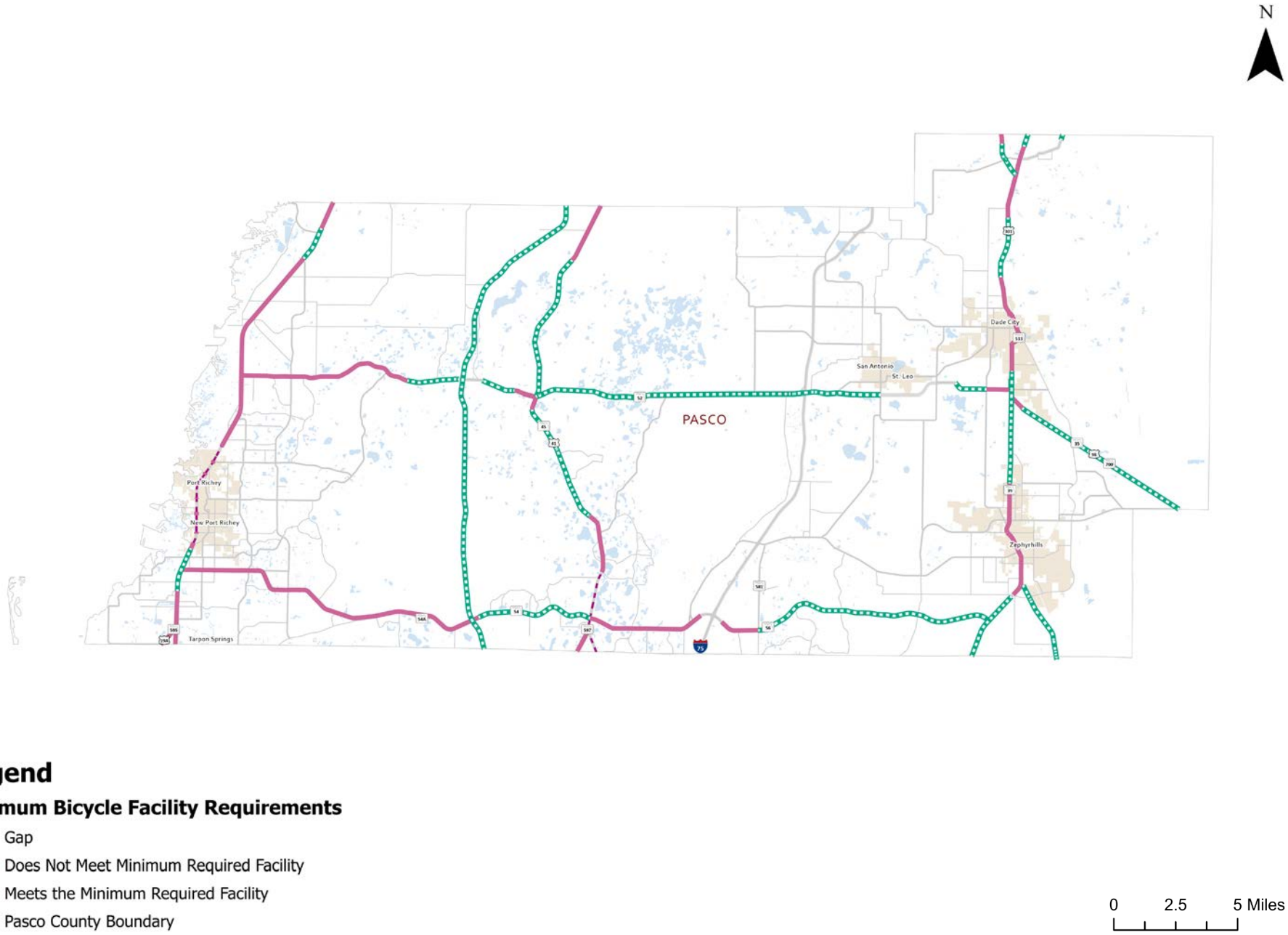


FIGURE 77. PINELLAS COUNTY MINIMUM REQUIRED BICYCLE FACILITIES

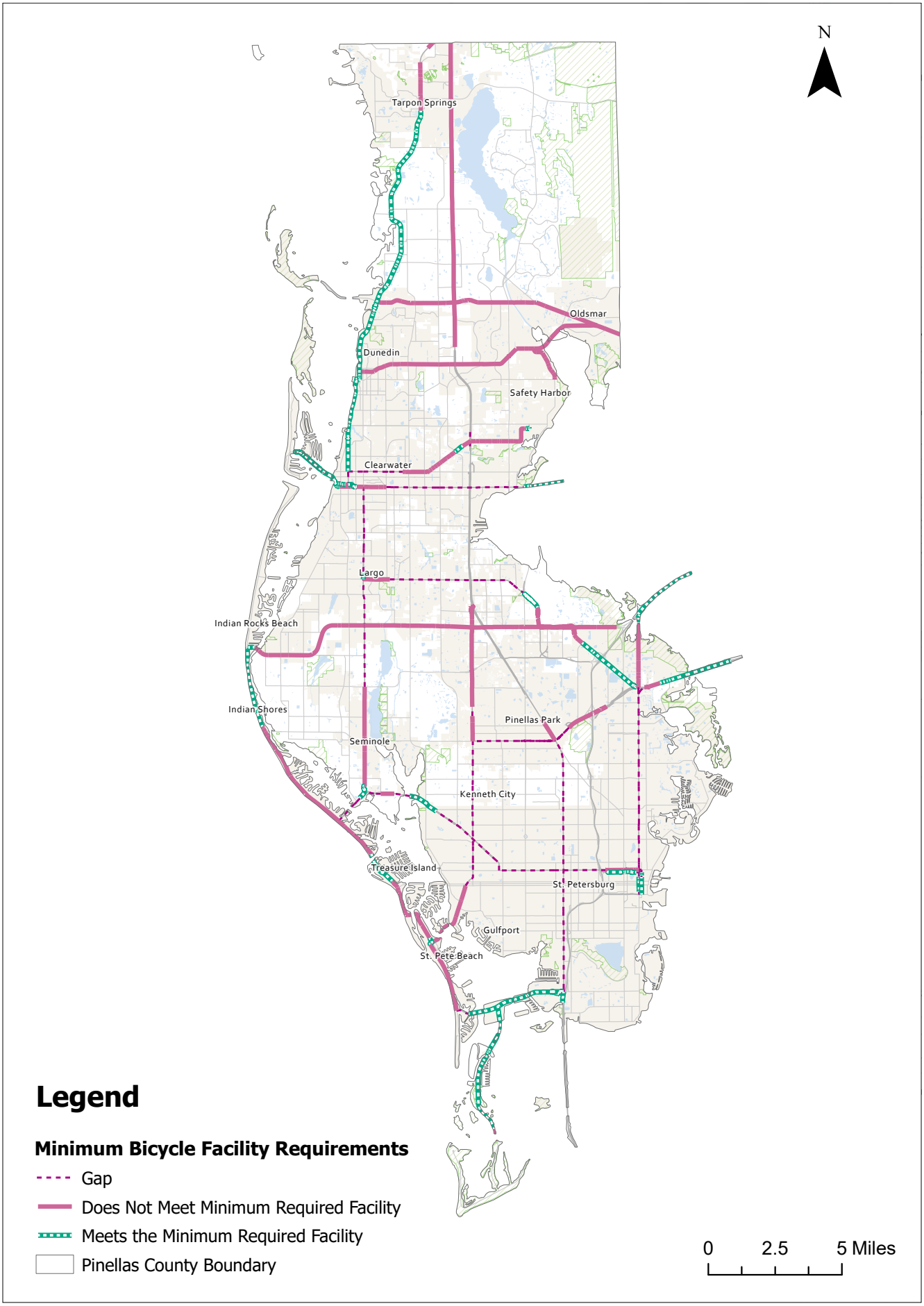
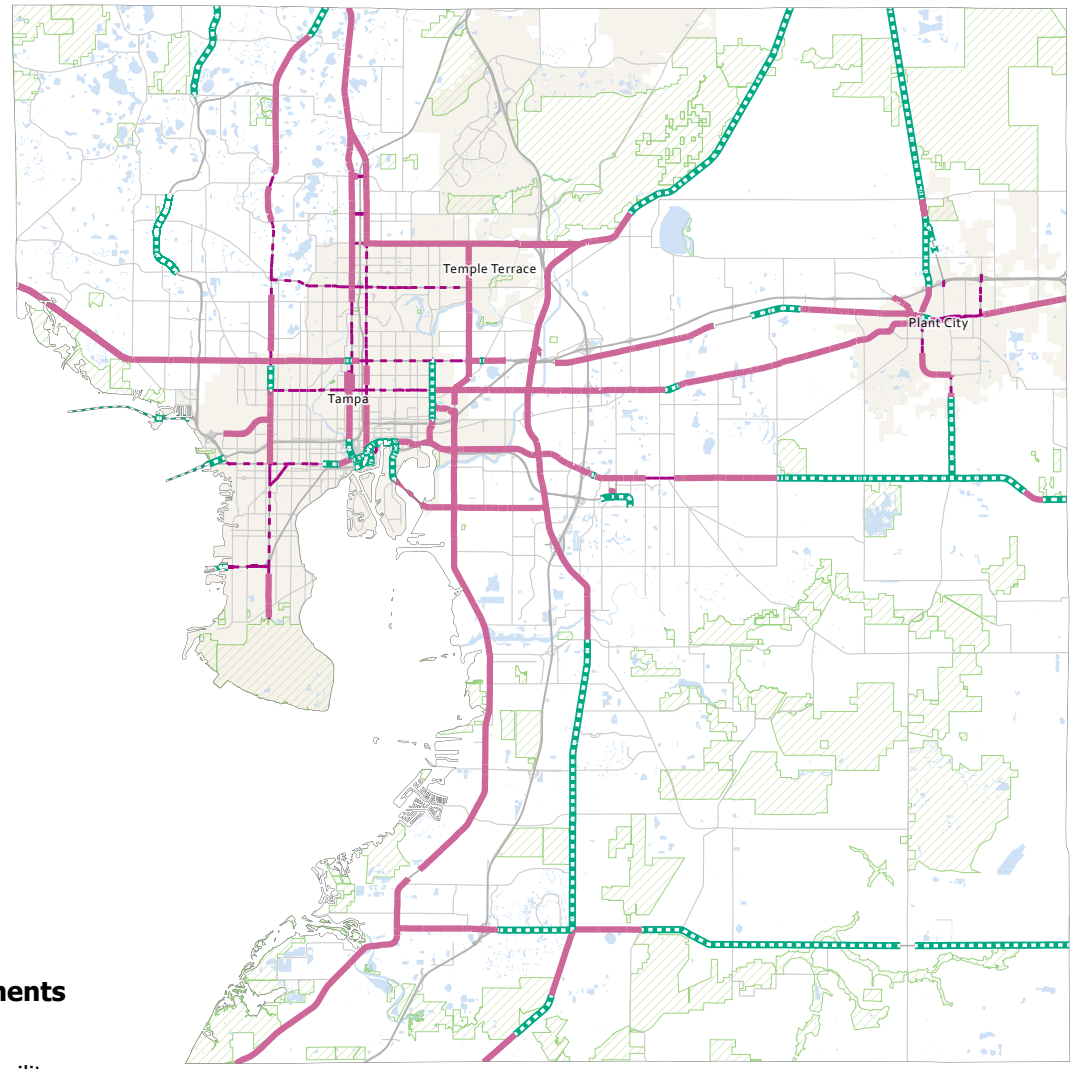


FIGURE 78. HILLSBOROUGH COUNTY MINIMUM REQUIRED BICYCLE FACILITIES



Legend

Minimum Bicycle Facility Requirements

- Gap
- Does Not Meet Minimum Required Facility
- Meets the Minimum Required Facility
- Hillsborough County Boundary

FIGURE 79. DISTRICTWIDE DEVIATION FROM PREFERRED BICYCLE FACILITIES

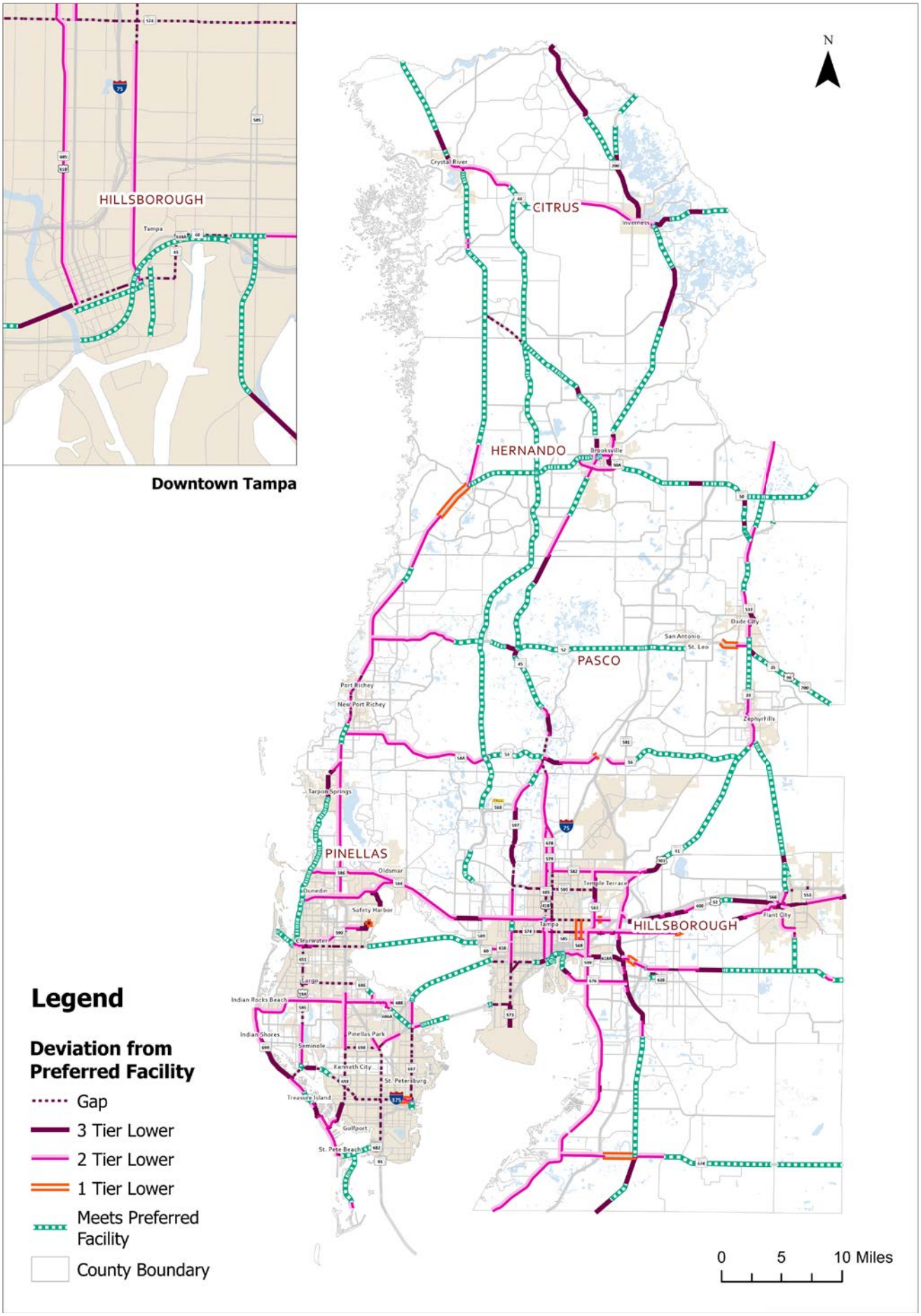


FIGURE 80. CITRUS COUNTY DEVIATION FROM PREFERRED BICYCLE FACILITIES

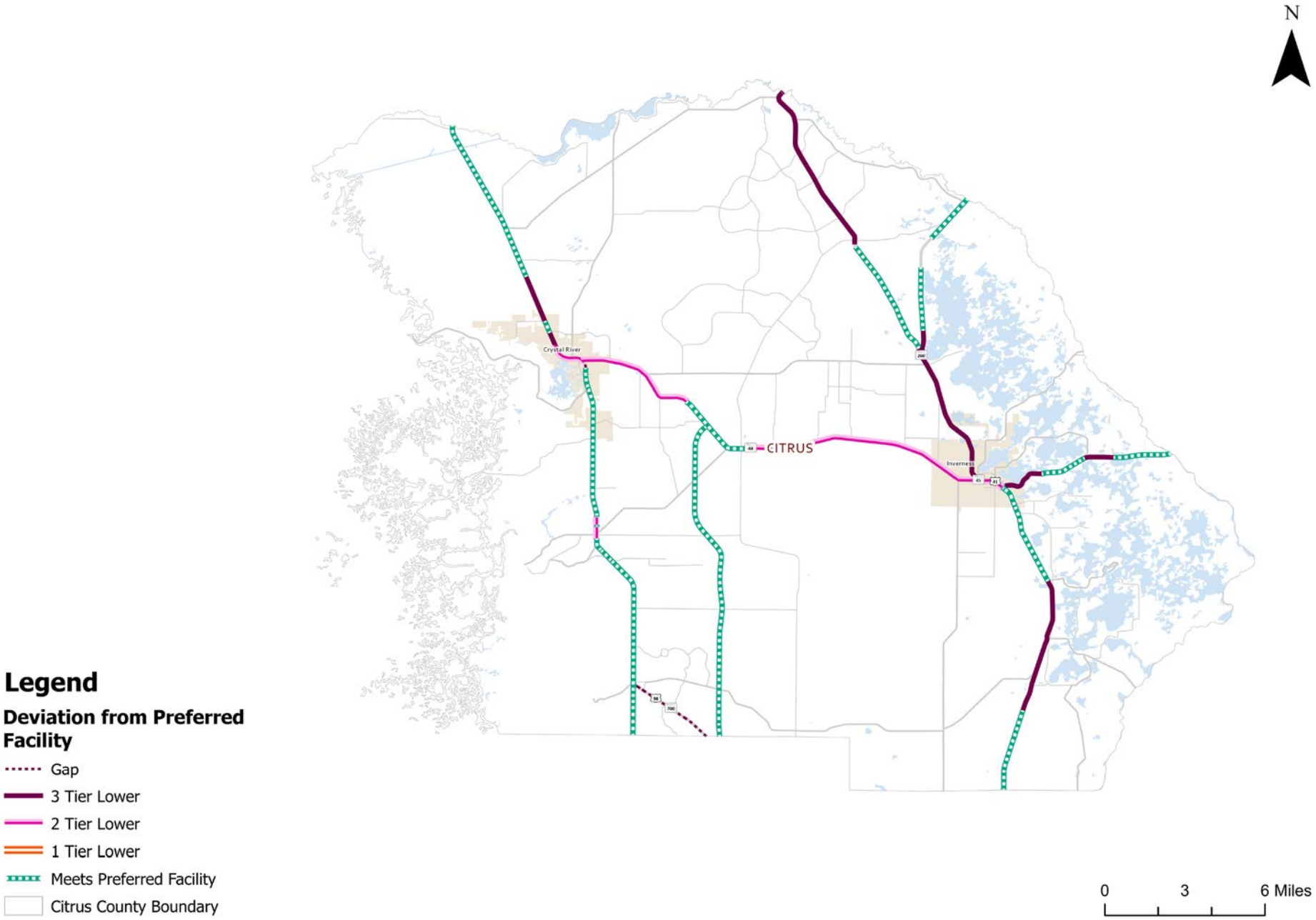


FIGURE 81. HERNANDO COUNTY DEVIATION FROM PREFERRED BICYCLE FACILITIES

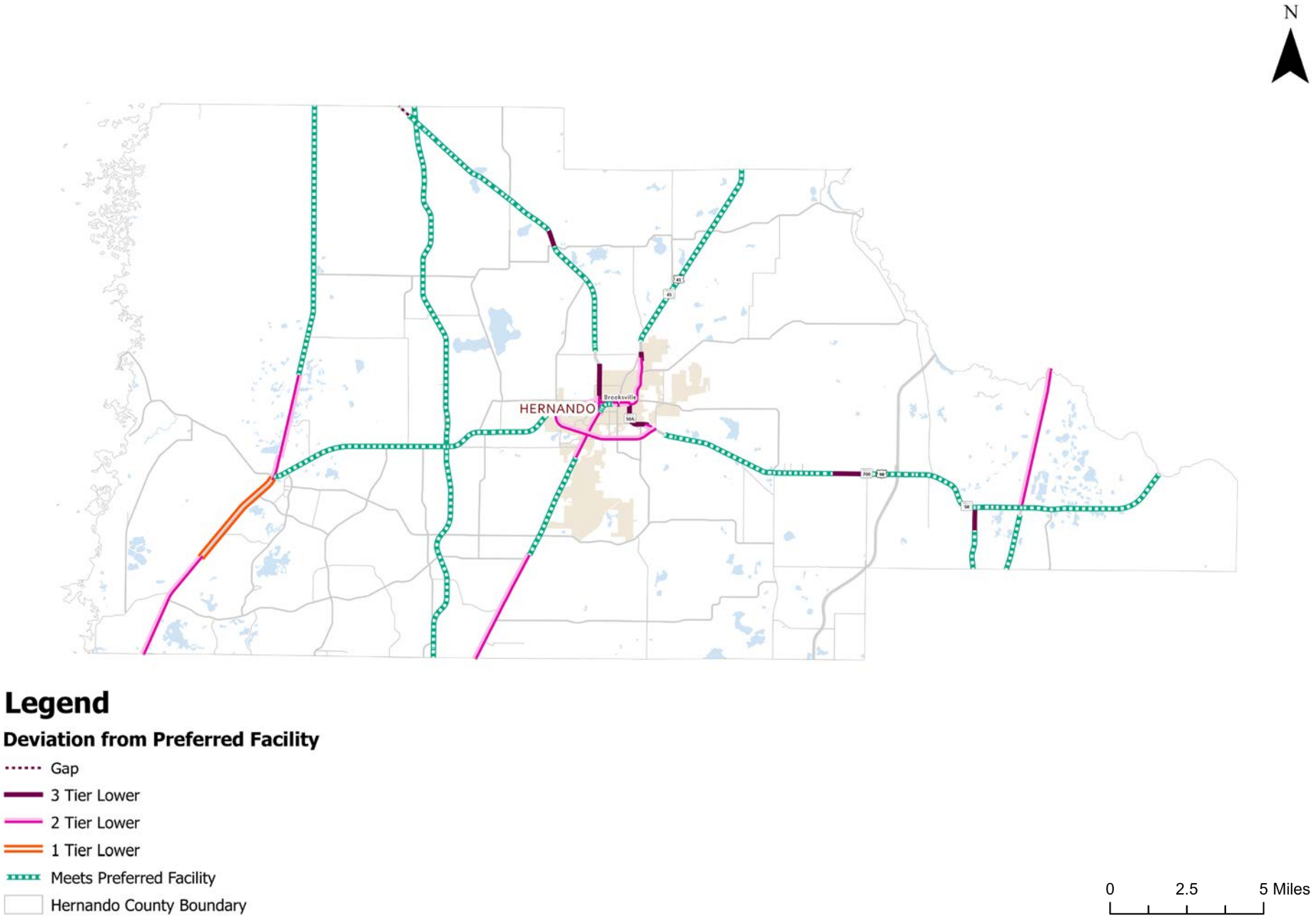


FIGURE 82. PASCO COUNTY DEVIATION FROM PREFERRED BICYCLE FACILITIES

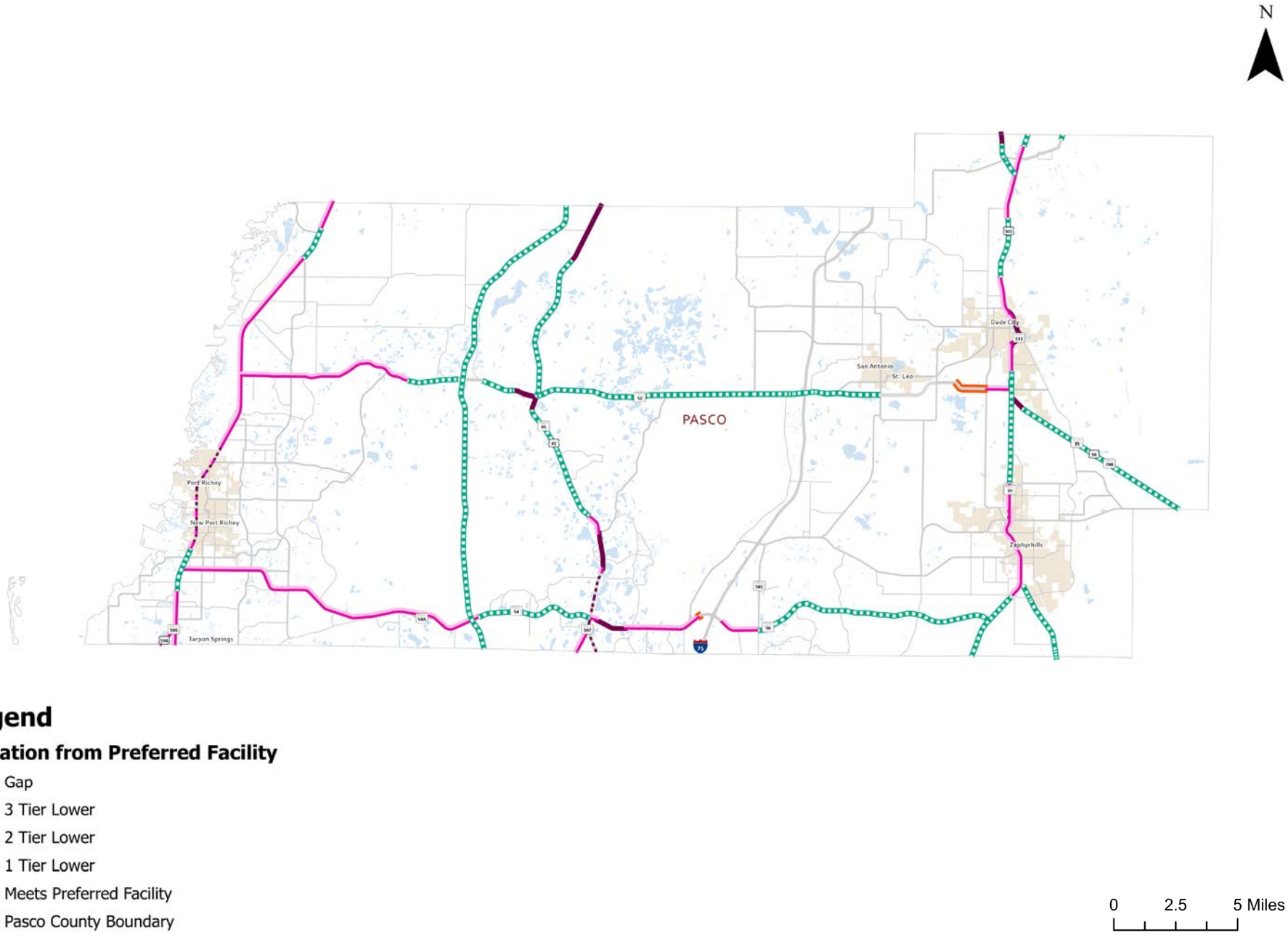


FIGURE 83. PINELLAS COUNTY DEVIATION FROM PREFERRED BICYCLE FACILITIES

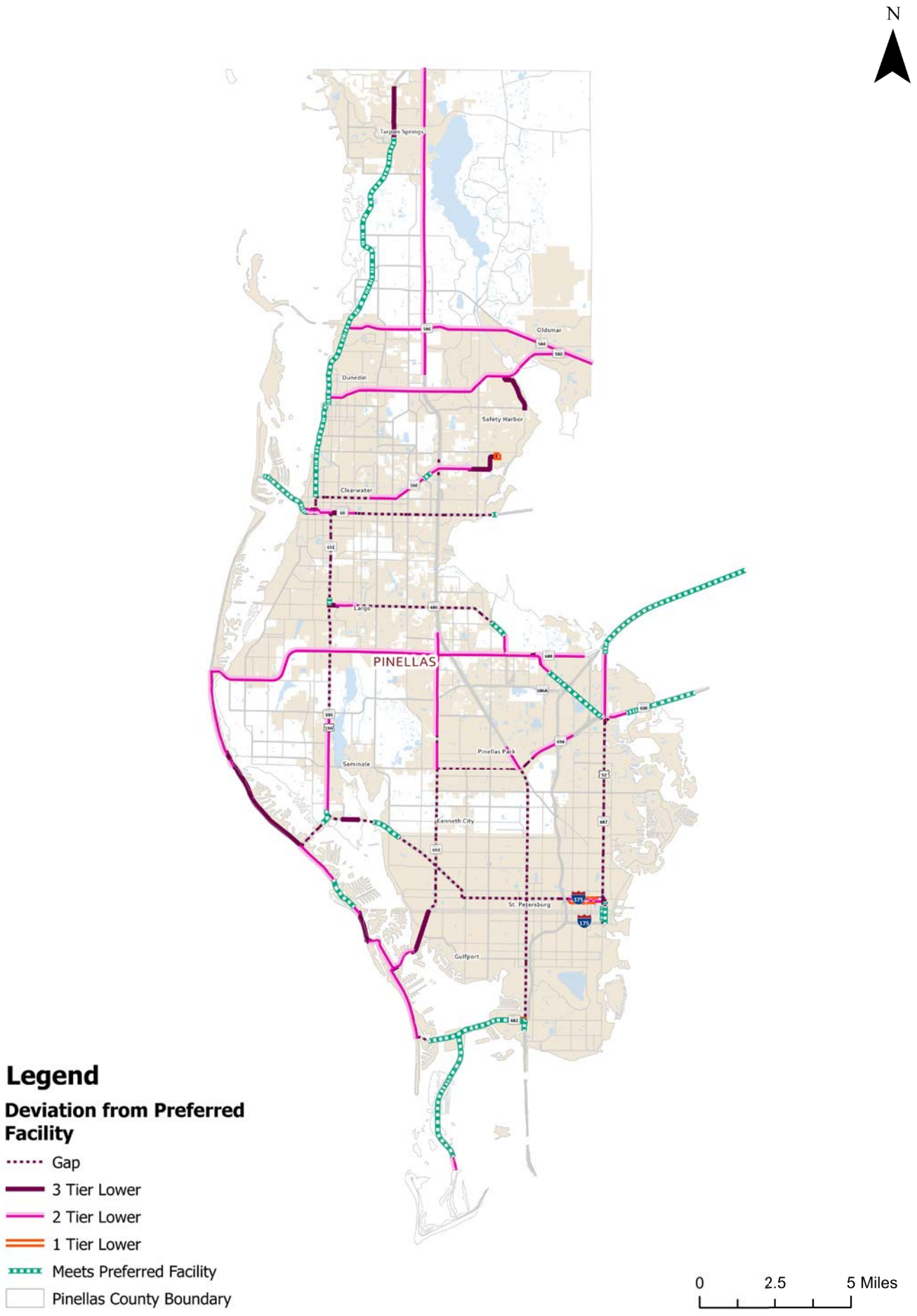
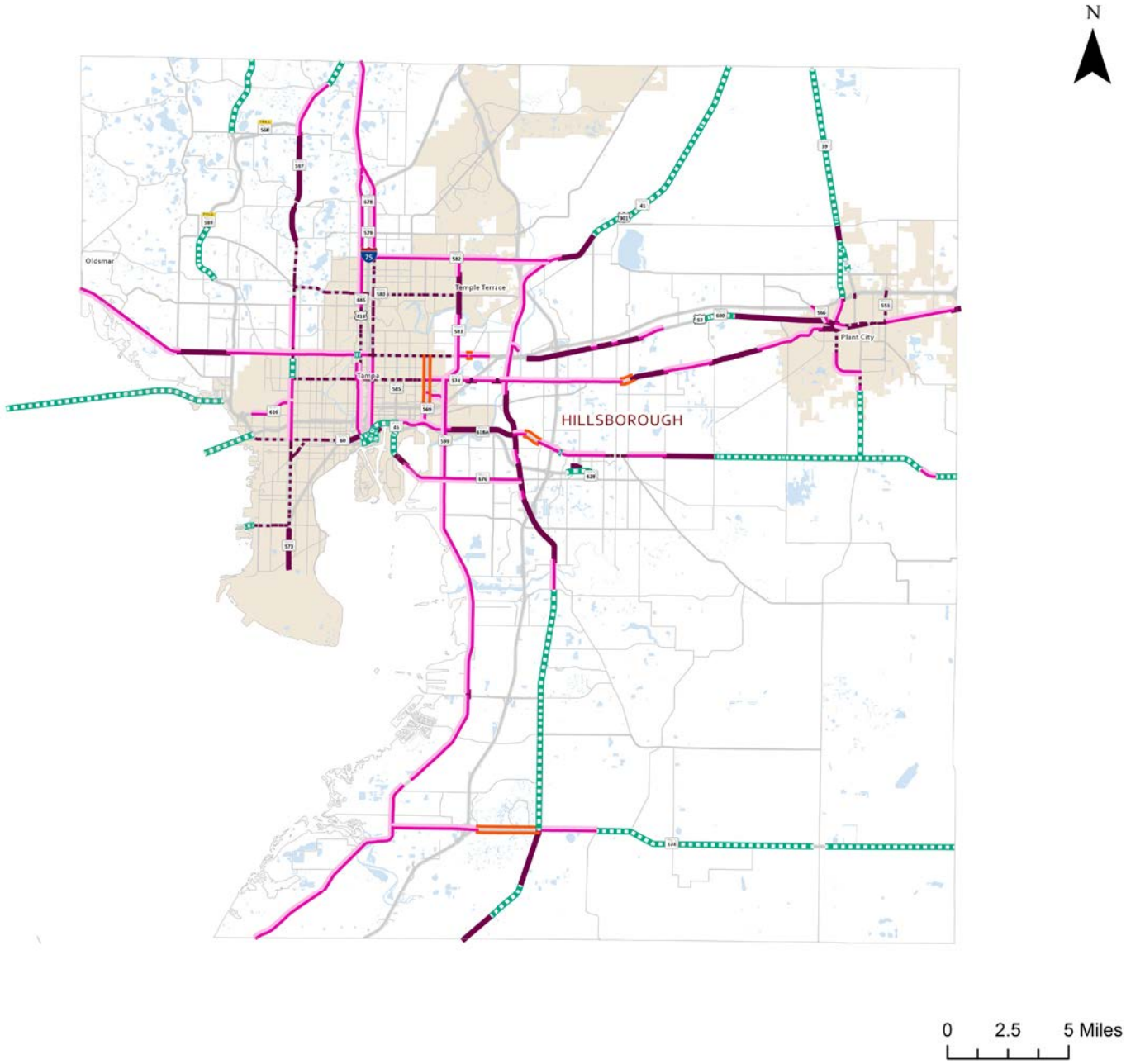


FIGURE 84. HILLSBOROUGH COUNTY DEVIATION FROM PREFERRED BICYCLE FACILITIES



INTERSECTION GEOMETRY

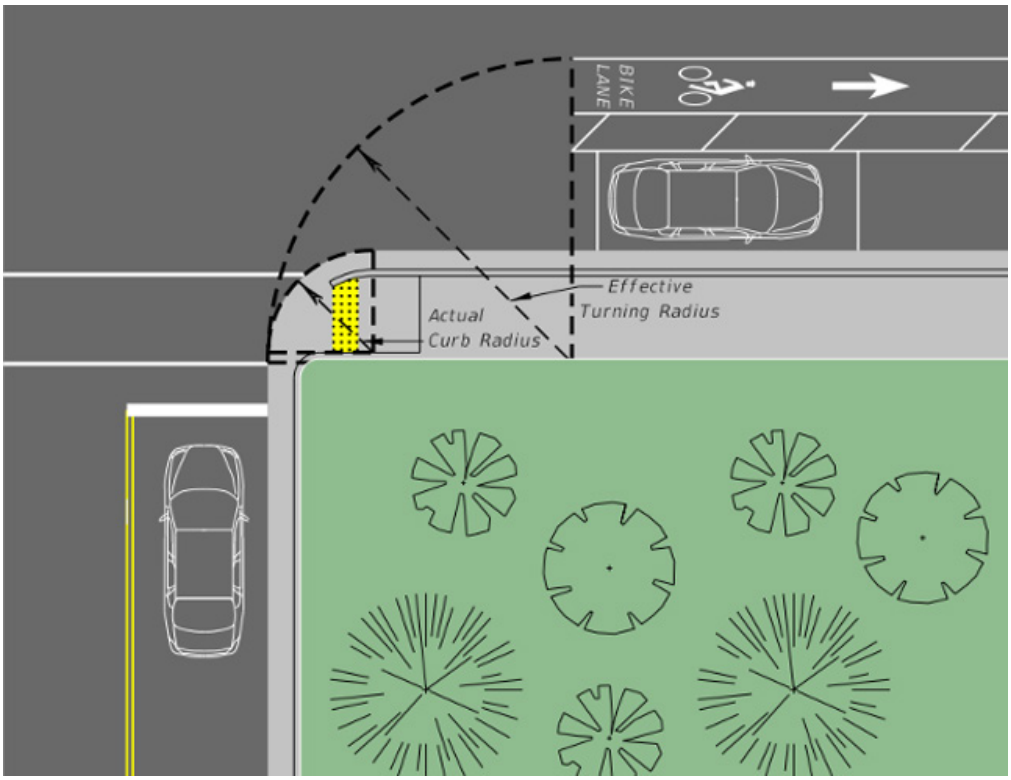
Intersection geometry plays a critical role in managing vehicle turning speeds and reducing conflicts with pedestrians and bicyclists. Large curb radii and channelized right turns can encourage higher-speed turning movements, increasing crash risk and reducing yielding behavior. Geometric treatments such as reduced curb return radii, tighter corner design, and elimination or modification of free-flow right turns help slow turning vehicles, shorten crossing distances, and improve visibility between users. These strategies are consistent with FDM 202 speed management principles.

REDUCING CURB RADIUS

Consider if additional pavement for parking or bicycle lanes increases the effective turning radius allowing for a reduced curb radius, as illustrated in Figure 85. Reducing the curb radius slows turning vehicles improving safety for people walking and bicycling.

At larger intersections where turning movements must accommodate freight or transit vehicles, truck aprons may be used to balance speed management with operational needs. Truck aprons allow larger vehicles to navigate tighter turning radii while maintaining slower design speeds for passenger vehicles. When applying these treatments, designers should carefully consider pedestrian desire lines, curb ramp placement, and crossing geometry to ensure accessibility and comfort, particularly in high-activity contexts.

FIGURE 85. DIAGRAM OF TURN RADII



Source: FDM 214.3.1

CROSSING TREATMENTS

Intersections and driveways are critical locations for bicyclist comfort and safety and represent a key opportunity to improve network connectivity through coordination with local agency partners. Many gaps and stress points in the bicycle network occur at crossings where turning movements, access density, and vehicle speeds can discourage bicycle travel. Consistent and context-sensitive crossing treatments can improve predictability, reduce conflicts, and support comfortable bicycle movements across jurisdictional boundaries.

GREEN BICYCLE MARKINGS

FDM 223.2.1.4 outlines the requirements for using green colored pavement markings. Generally, these are used to increase conspicuity in areas where there are conflicts between motor vehicles and bicycles. These locations include at bicycle boxes or when a bicycle lane crosses a right turn lane or bus bay. Green bicycle markings should be considered a supplement but not a substitution for required bicycle pavement markings. Using green bicycle markings requires approval of the District Design Engineer.

UNSIGNALIZED INTERSECTIONS AND DRIVEWAYS

Based on the driveway categories set in the *Multimodal Access Management Guidebook* (2023), Table 12 summarizes guidance on different crossing treatments. The table assumes that driveway categories A, B, C, and D are unsignalized intersections. Driveway categories E, F, and G are assumed to be signalized.

Unsignalized intersections, including driveways and side streets, present frequent conflict points between motor vehicles, pedestrians, and bicyclists. The type and intensity of treatment at these locations should be based on the volume of turning movements, crossing demand, and the type of pedestrian or bicycle facility present.

Figure 86 to Figure 88 illustrate different facilities and applicable treatments. Guidance for unsignalized intersections is differentiated by driveway and side street volume, with more robust treatments applied as vehicle volumes and conflict potential increase. Typical crossing treatments and layouts are provided for different pedestrian and bicycle facility types, allowing flexibility in application. Guidance is intended to support design decisions using engineering judgment and should be applied in accordance with MUTCD, TEM, FDM, and applicable FDOT standards.

- **May (option):** A statement of practice that is a permissive condition and carries no requirement or recommendation
- **Should (guidance):** A statement of recommended but not mandatory practice in typical situations with deviations allowed if engineering judgment or study indicates the deviation to be appropriate
- **Shall (standard):** A statement of required, mandatory, or specifically prohibitive practice

SPEED MANAGEMENT FOR BICYCLISTS

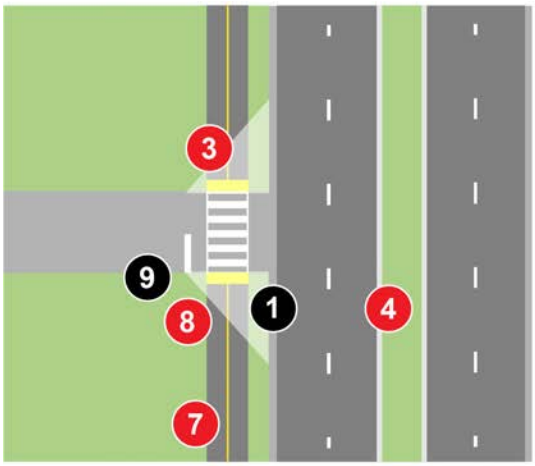
On bicycle facilities such as trails or shared-use paths, there may be a need to install speed management treatments to slow people bicycling prior to intersections. This can include establishing a facility speed limit or installing speed bumps, different materials for hardscape to differentiate a change, medians, or clear signage, such as warning signs when approaching intersections.

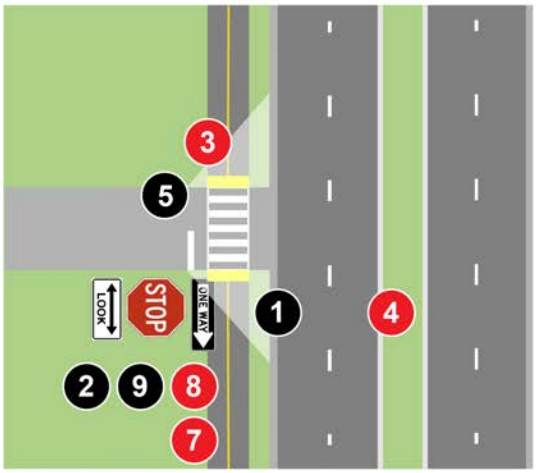
TABLE 12. CROSSING TREATMENTS

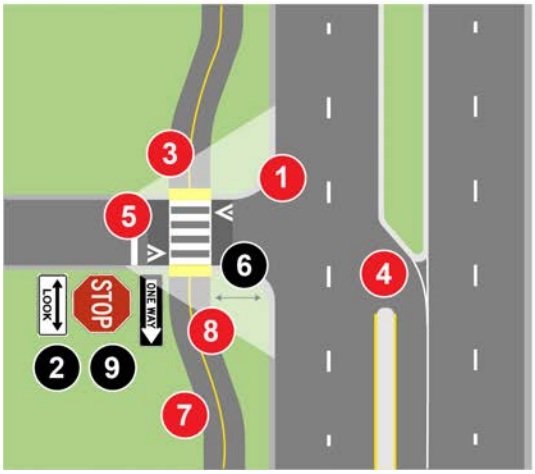
Crossing Treatment Category	Control Type	Driveway Category	Vehicle Trips per Day	Vehicle Trips per Hour	Typical Land Uses
Low Volume Driveway	Unsignalized	A	1–20	1–5	1 or 2 single family homes
Medium Volume Driveway	Unsignalized	B	21–600	6–60	3 to 60 housing or apartment units, small office in converted home
High Volume Driveway	Unsignalized	C	601–1,200	61–120	Small strip shopping center (20,000 to 75,000 square feet)
High Volume Driveway	Unsignalized	D	1,201–4,000	121–400	Shopping center (150,000 square feet), grocery/drugstore with 10 to 15 smaller stores
High Volume Driveway	Signalized	E	4,001–10,000	401–1,000	Local mall, wholesale club
High Volume Driveway	Signalized	F	10,001–30,000	1,001–3,000	Regional mall (outlet)
High Volume Driveway	Signalized	G	30,001+	3,001+	Large regional mall

Crossings Along Shared-Use Path

FIGURE 86. SHARED USE PATH UNSIGNALIZED INTERSECTION CROSSING GUIDANCE







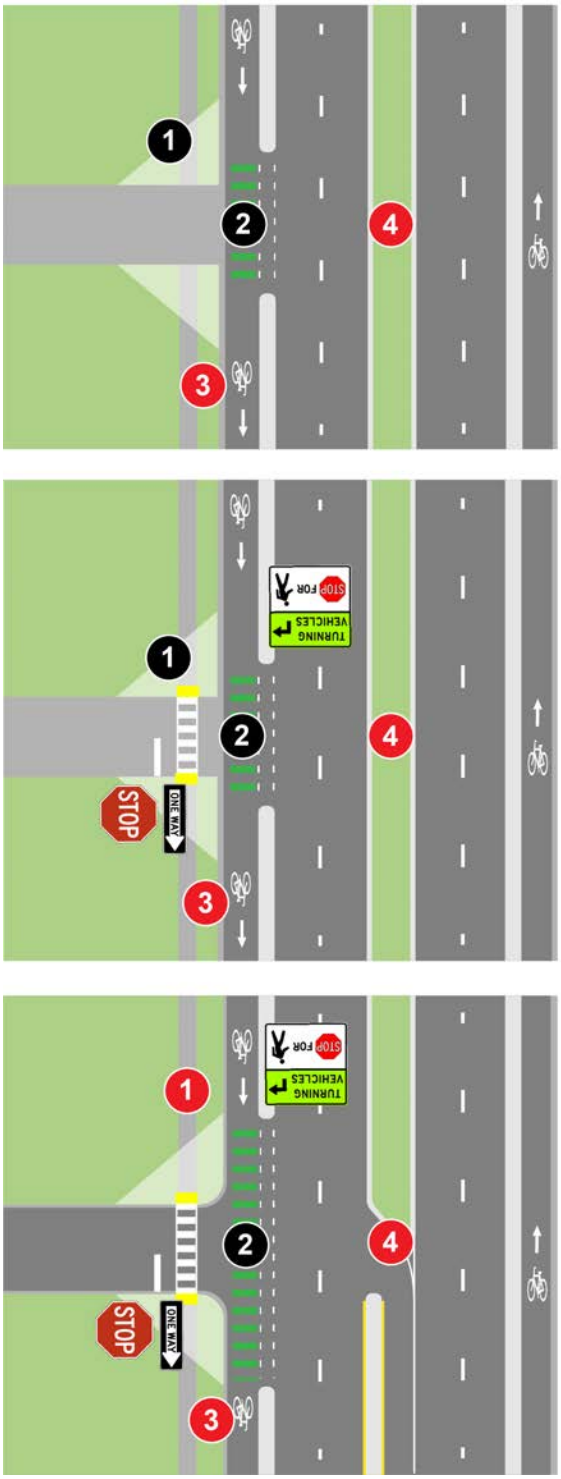
Applicable in some cases

Applicable in all cases

1. Minimum corner radii should be used to slow speeds of turning vehicles through conflict zones with path users. Also applicable to low and moderate volume driveways on flush shoulder roadways.
2. Signing on side streets or driveways, specifically a "Look" (R15-8) sign should be used to alert drivers to expect two-way bicycle traffic.
3. Given the width of the two-way separated bicycle lane, additional measures should be used to reduce the likelihood of accidental entrance by motor vehicles, including use of a flexible delineator placed on the centerline of the bikeway or a "No Vehicles" sign.
4. Turning conflicts should be minimized through access management strategies, such as closed medians or reducing driveway openings.
5. Raised crosswalks may be used to slow motorist speeds and increase visibility of trail users in the crosswalk. Also applicable at moderate volume driverways on flush shoulder roadways.
6. The shared use path should be offset from the edge of the travel way to accommodate storage of one vehicle. If this is not possible, stop control on the path approach may be considered.
7. Centerline pavement markings should be provided on the shared use path 50 feet in advance of the crossing to alert path users of the upcoming conflict zone.
8. To avoid encroachment of vehicles exiting driveways into the separated bicycle lane, objects that obscure sight distance should not be included within the sight triangle at the edge of the driveway/side street.
9. Stop lines should be provided on the driveway or side street approach in advance of the crosswalk (except a low volume driveways). Stop or yield control should not be used on path approaches whenever possible.

Crossings Along Separated Bicycle Lane (One-Way)

FIGURE 87. SEPARATED BICYCLE LANE (ONE-WAY) UNSIGNALIZED INTERSECTION CROSSING GUIDANCE



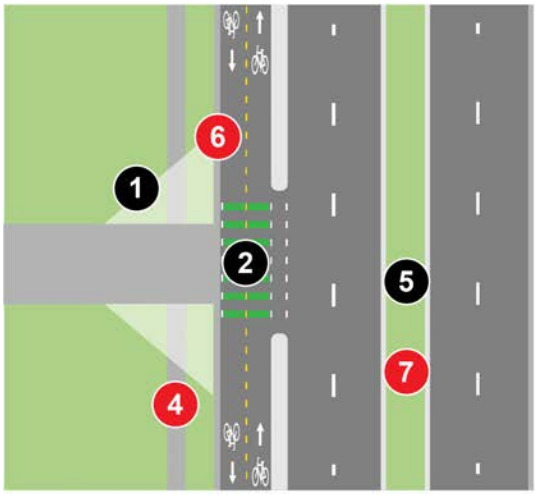
Applicable in some cases

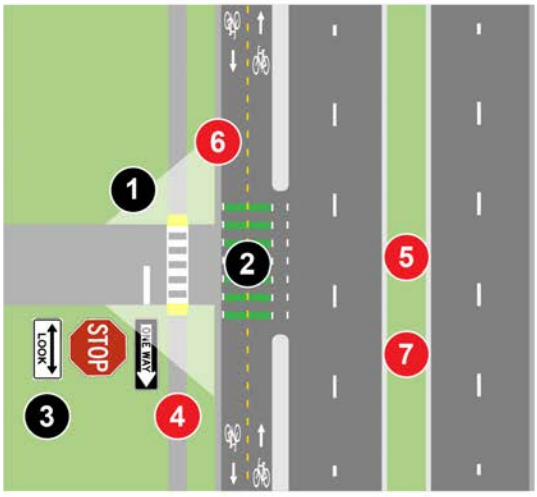
Applicable in all cases

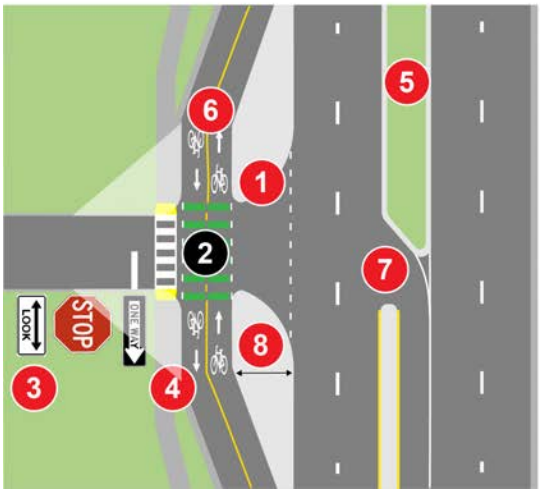
1. Minimum corner radii should be used to slow speeds of turning vehicles through conflict zones. Also applicable to low and moderate volume driveways on flush shoulder roadways.
2. Green colored pavement markings should be used in conflict areas to increase awareness of the separated bicycle lane and reinforce the expected bicyclist behaviors to motorists.
3. To avoid encroachment of vehicles exiting driveways into the separated bicycle lane, objects that obscure sight distance should not be included within the sight triangle at the edge of the driveway/side street.
4. Turning conflicts should be minimized through access management strategies, such as closed medians or consolidating driveways.

Crossings Along Separated Bicycle Lane (Two-Way)

FIGURE 88. SEPARATED BICYCLE LANE (TWO-WAY) UNSIGNALIZED INTERSECTION CROSSING GUIDANCE







Applicable in some cases

Applicable in all cases

1. Minimum corner radii should be used to slow speeds of turning vehicles through conflict zones. Also applicable to low and moderate volume driveways on flush shoulder roadways.
2. Green colored pavement markings should be used to increase awareness of the separated bicycle lane and reinforce the expected bicyclist behaviors to motorists.
3. Signing on side streets or driveways, specifically a "look" (R15-8) sign should be used to alert drivers to expect two-way bicycle traffic.
4. To avoid encroachment of vehicles exiting driveways into the separated bicycle lane, objects that obscure sight distance should not be included within the sight triangle at the edge of the driveway/side street.
5. Turning conflicts should be minimized through access management strategies such as closed medians or reducing driveway openings.
6. Given the width of the two-way separated bicycle lane, additional measures should be used to reduce the likelihood of accidental entrance by motor vehicles, including use of a flexible delineator placed on the centerline of the bikeway.
7. Turning conflicts should be minimized through access management strategies.
8. The two-way separated bicyce lane should be offset from the edge of travel way to accommodate storage of one vehicle. If this is not possible, stop/yield control on the bicycle lane approaches may be considered.

SIGNALIZED INTERSECTIONS

Signalized intersections are key areas of conflicts due to higher traffic volumes, turning movements, and interactions with people walking and bicycling. Pedestrian treatments at signalized intersections should focus on improving visibility, reducing exposure, and providing adequate crossing opportunities. In higher-activity contexts such as C4, C5, and C6, reducing pedestrian delay and improving signal responsiveness can significantly influence compliance and overall walkability.

Signal timing strategies can be used to enhance pedestrian safety and support speed management objectives. Leading pedestrian intervals (LPIs) provide pedestrians with a head start to increase visibility and reduce conflicts with turning vehicles. Additional strategies may include shorter cycle lengths, pedestrian recall, adjusted clearance intervals, rest in red, and coordination with vehicle progression to discourage excessive speeds.

Guidance for signalized intersection countermeasures varies based on context and facility type. Guidance for planners and engineers is provided in a matrix in Figure 89. Recommendations are summarized into the following:

- Countermeasures that should always be considered
- Countermeasures that may be a candidate treatment
- Countermeasures that are generally not an appropriate treatment

FIGURE 89. SIGNALIZED INTERSECTION CROSSING TREATMENT

Key	Context Classification	Shared Use Path	Two-Way Separated Bicycle Lane	One-Way Separated Bicycle Lane	Bicycle Lane	Paved Shoulder
● Signifies that the countermeasure should always be considered, but not mandated or required, based on engineering judgement. ◯ Signifies that the countermeasure may be a candidate treatment. Absence of letter signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.	C-1 and C-2	● A ◯ ◯ ◯ ● E ◯ ● G ◯ ● I ● J ◯ ● L	*Bicycle Facility Condition Not Appropriate in this Context*	*Bicycle Facility Condition Not Appropriate in this Context*	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯
	C-3	● A ◯ ◯ ◯ ● E ◯ ● G ◯ ● I ● J ◯ ● L	● A ● B ● C ◯ ● E ◯ ● G ● H ● I ● J ● K ● L	● A ● B ● C ● D ● E ◯ ● G ● H ● I ● J ● K ● L	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯
	C-2T, C-4, and C-5	● A ◯ ◯ ◯ ● E ◯ ● G ◯ ● I ● J ◯ ● L	● A ● B ● C ◯ ● E ◯ ● G ● H ● I ● J ● K ● L	● A ● B ● C ● D ● E ◯ ● G ● H ● I ● J ● K ● L	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯
	C-6	● A ◯ ◯ ◯ ● E ◯ ● G ◯ ● I ● J ◯ ● L	● A ● B ● C ◯ ● E ◯ ● G ● H ● I ● J ● K ● L	● A ● B ● C ● D ● E ◯ ● G ● H ● I ● J ● K ● L	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯	● A ● B ● C ● D ● E ● F ● G ● H ● I ● J ● K ◯

A. Special Emphasis Crosswalk, Lighting, Parking Restrictions, Pedestrian Countdown Signals, Curb Radius Reduction
B. Bicycle Lane Extension Through Intersection, Green Pavement Markings
C. Bicycle Signal Phasing
D. Bike Boxes
E. Crossing Islands
F. Keyhole Lane
G. No Turn on Red
H. Protected Intersection Treatment
I. Protected Only Left Turn Phases
J. Bicycle Optimized Signal Timings
K. Two-Stage Bicycle Turn Boxes
L. Offset Crossing/Bend Out

Signal operations, including timing and phasing, can reduce conflicts and delays for people walking and bicycling. While treatments need to context specific, operations should follow the Safe System Approach and look for ways to separate users in time and space. When evaluating a signalized intersection, engineers and planners should evaluate the impact to pedestrian delay.

Signal operations should consider the needs of people walking and bicycling by:

- Separating users in space by reducing or minimizing crossing conflicts
- Separating users in time
- Minimizing delay for people walking and bicycling
- Increasing visibility of people walking and bicycling

Countermeasures at signals that separate users in space include:

- Slow the approach speed and turn speed of right turning vehicles to reduce conflicts between people walking and bicycling by reducing the turning radius (which can include installing truck aprons to accommodate truck traffic when needed).
- Eliminate continuous flow or channelized right turn movements. If this movement cannot be removed, a pedestrian activated signal should be considered where right turn volume is high, there is poor sight distance between right turns and people crossing, or less restrictive measures (such as raised crossings or signage) have not been successful.
- Evaluate the need for turn lanes at signals. Additional lanes increase the crossing distance for people walking and bicycling.

Countermeasures at signals that separate users through time include:

- Leading pedestrian intervals should be considered at all signalized locations and provide a minimum of 3 seconds for people crossing to get a head start before a vehicle has the green light. LPIs have been shown to reduce conflicts and crashes between people crossing and motorists turning.
- Concurrent protected crossings allow people walking and bicycling to cross parallel and concurrently with vehicular through traffic. This requires left or right turns to have their own phase with designated turn arrows requiring exclusive turn lanes and signal heads.
- Right turn on red can be restricted or a blank-out sign can be used to restrict a right turn when a pedestrian activates the signal.
- Delayed turn/leading through interval holds motorists turning right but allows concurrent vehicles to start at the same time as pedestrians crossing. This requires an exclusive right turn lane but has less impact on vehicular operations at the intersection while still giving people walking and bicycling a longer head start time.
- Protected only left turns separate people walking and bicycling from motorists turning left through signal phases.
- Flashing yellow arrow left turn with delayed turn holds left turning vehicles with a red while allowing the through movement and pedestrians to proceed. This allows pedestrians to have a head start and reduces conflicts with permissive left turning vehicles. The time can be determined similar to a leading pedestrian interval (TEM 3.11.5.2).
- Flashing yellow arrow left turn with “Omit by Ped” allows a permissive left turn movement to be omitted when a pedestrian activates the signal and would conflict with the WALK or flashing DON’T WALK interval. This separates the motorist turning left from people crossing by preventing left-turning vehicles from proceeding while pedestrians are crossing. “Omit by Ped” should be considered where a flashing yellow arrow and exclusive left turn lane exist, left turning vehicles conflict with a pedestrian crosswalk, and crashes have occurred between permissive left turning vehicles and people walking in the crosswalk. A delayed turn may be preferable in certain locations, as it restricts the left turns for a short period of time as opposed to omitting the movement.

Countermeasures that minimize delay for people walking and bicycling include the following:

- Installing pedestrian recall puts a continuous call for the pedestrian phase. This gives people crossing an opportunity to cross every cycle without using a push button. This treatment may be beneficial for high pedestrian activity areas (such as C2T, C4, C5, or C6 context) or near arrival or dismal times at schools. Pedestrian recall may be suitable in areas with high pedestrian activity or where compliance with the push buttons is low. Pedestrian recall could be considered when the green time for the adjacent vehicle movement is more than the combined time of the WALK and Flashing DON'T WALK times.
- Rest in walk allows the pedestrian signal to be in the WALK phase when there is no conflicting vehicle movement and minimizes delay for people walking (especially in areas with intermittent vehicles). Rest in walk extends the duration of the walk interval regardless of pedestrian calls which reduces waiting time and should be considered in C2T, C4, C5, and C6.
- Shortening the cycle length can reduce delay for all users. Ideally, 120 seconds should be the maximum cycle length in urban areas (such as C2T, C4, C5, and C6). Cycle lengths could even be half-cycled to still allow vehicle progression and minimize delay for people walking.
- Bicycle-friendly signal progression should be reviewed for high activity areas and cycle tracks (in C5 and C6 contexts). This timing minimizes the stopping delay for people biking. According to NACTO, progression speeds between 10 mph and 18 mph are considered compatible with bicycle speeds in urban areas.
- Passive detection for people walking and bicycling can call the pedestrian phase and extend the clearance interval when needed.
- Rest in red occurs when the signal defaults to the red phase when there is no demand and may be beneficial for off peak periods with low volumes or at night. Rest in red can promote speed management along corridors by discouraging excessive speeding.

Countermeasures that increase visibility for people walking and bicycling include the following.

Intersection Bicycle Boxes

At signals, bicycle boxes designate space for waiting bicyclists and increase their visibility. Requirements are set in the MUTCD Section 9B.18. To install a bike box, the requirements are designated in the MUTCD, and illustrated in Figure 90, and include:

- Prohibiting right turns on red
- Protective left turn phasing
- Presence of a bicycle lane (preceding the bike box)
- Presence of receiving facility on the opposite side of intersection
- No more than one through lane on the approach
- Approaches with a posted speed of 35 mph or less

Two-stage bicycle turn boxes allow another option for bicyclists making a left turn.

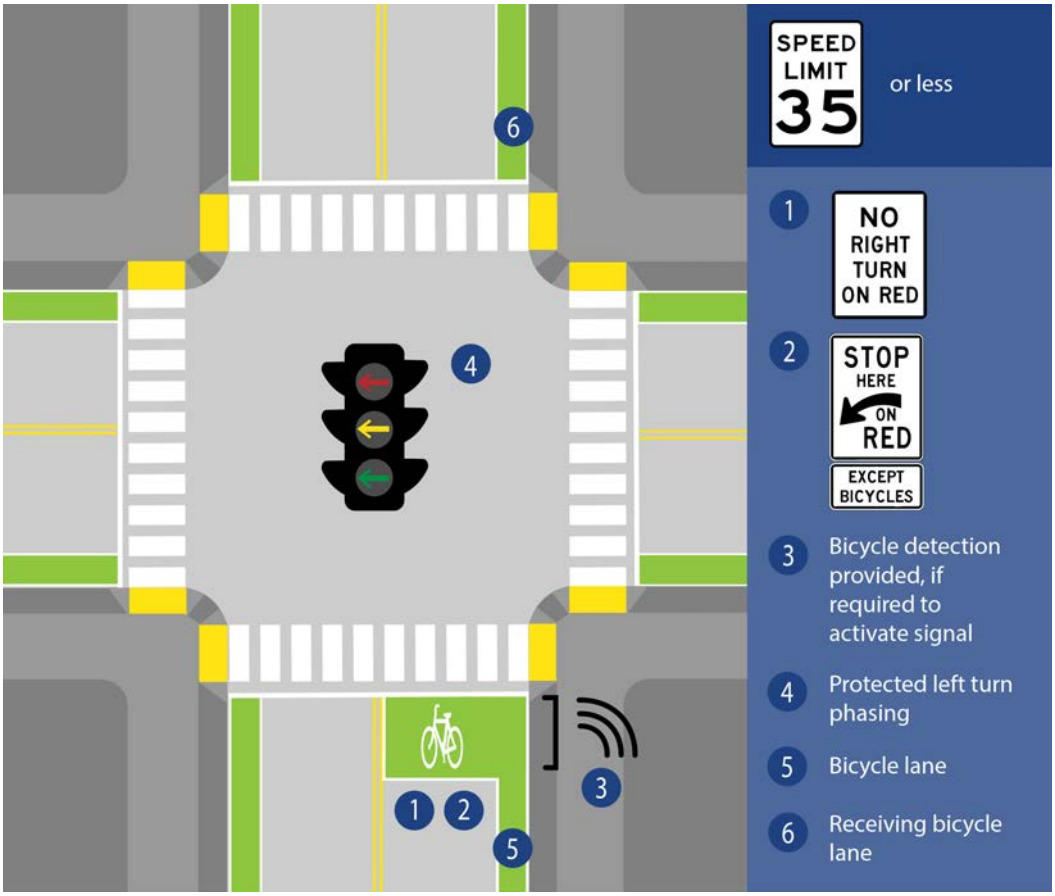
Blank-out Signs

Blank-out signs give flexibility to restrict movements such as no turn on red when activated by a person walking or bicycling.

ROUNDABOUTS

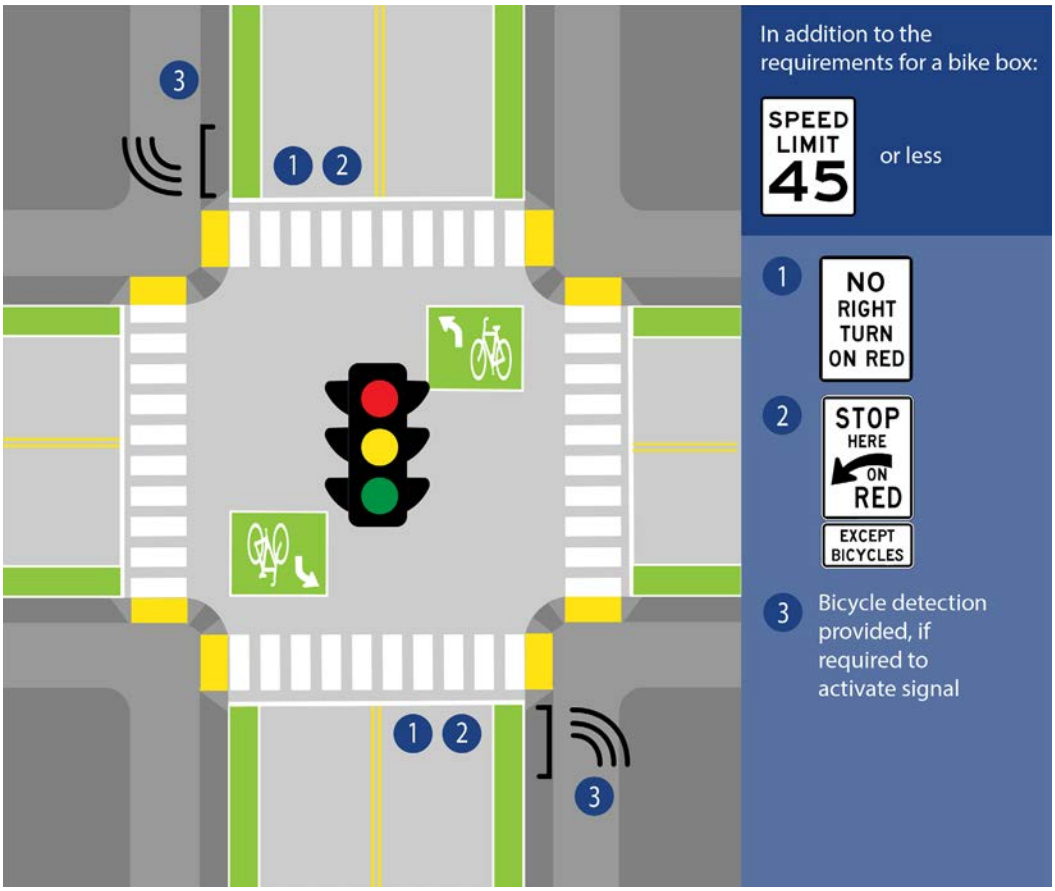
Guidance on pedestrian and bicycle facilities at roundabouts can be found in FDM 213. Crosswalks should be provided at every approach leg of a roundabout and should minimize pedestrian crossing distance. Guidance for splitter islands is included in FDM 213.3.5, and guidance to include both a pedestrian crosswalk and crossing for a separated bicycle lane is in 213.10. Consider including RRFBs or PHBs at multilane roundabout crossings if there are faster vehicular speeds or increased conflicts between road users.

FIGURE 90. BICYCLE BOX



Source: Kittelson

FIGURE 91. TWO-STAGE BICYCLE TURN BOXES



Source: Kittelson

PUBLIC TRANSPORTATION

Transit stops introduce unique operational and safety considerations for pedestrians and bicyclists due to frequent stopping, passenger loading and unloading, and crossing movements. Where bicycle facilities are located adjacent to bus bays or curbside transit stops, design treatments should minimize conflicts between transit vehicles, bicyclists, and pedestrians.

When bicycle lanes are provided adjacent to a bus bay, a keyhole bicycle lane should be considered between the bus bay and the outside travel lane. Along corridors with high-frequency transit service, alternatives should be evaluated to locate separated bicycle lanes on the opposite side of the roadway or on a parallel route where feasible. Design of bicycle facilities at transit stops should be consistent with applicable FDOT guidance and the *Separated Bike Lane Planning and Design Guide.*

ADDITIONAL DESIGN CONSIDERATIONS

This section outlines unique circumstances and other considerations that may influence the development of bicycle facilities.

On-Street Parking

On-street parking adjacent to bicycle facilities can introduce operational and safety challenges, including door zone conflicts and vehicle movements into and out of parking spaces. FDM 223.2.1.3 provides specific guidance for bicycle facilities adjacent to on-street parking, including the use of shared lane markings adjacent to angle parking, buffered bicycle lanes adjacent to parallel parking where sufficient width is available, and shared lane markings where minimum widths cannot be met.

Lighting

Adequate lighting is an important consideration for improving visibility of and safety for bicyclists and pedestrians. FDM 213 identifies required lighting criteria for roadways, intersections, midblock crossings, sidewalks, and shared-use paths, including illumination levels, uniformity, and glare control, which should be considered when evaluating or designing multimodal facilities. The *Multimodal Access Management Guidebook* notes for midblock crossings, lighting should be provided in advance of the crosswalk as opposed to directly centered overhead.

Tactile Directional Indicators

Consider the use of tactile directional indicators at midblock crossings and roundabouts to guide pedestrians that may be visually impaired. Consider how to use these indicators to align complex intersections to guide the pedestrian with the pathway and crosswalk. As much as possible, crosswalks should be aligned with a straight path of travel.

Accessible Pedestrian Signal

Installing an accessible pedestrian signal (APS) should follow guidance in MUTCD Section 4K and TEM 3.7.1. Approval from the District Traffic Operations Engineer is required at any crossings on the State Highway System. An engineering study should be completed that considers factors such as demand, phasing, intersection complexity, right turn movements, vibrotactile pedestrian devices, and pedestrian safety especially for locations with more than four lanes or posted speed limits greater than 35 mph. The process should also include coordination with the partner local agency.

If installing an accessible pedestrian signal detector, if the pedestrian clearance time only allows a person to cross to the median, a pedestrian signal detector in the median should also be installed.

Keyhole Lanes

Keyhole lanes, or bicycle lanes located between a through lane and an adjacent right-turn lane, are used to reduce conflicts between right-turning vehicles and bicyclists at intersections and driveway approaches. Keyhole lanes are required in the FDM for certain curbed and flush shoulder roadways with bicycle lanes. They are not permitted for separated bicycle lanes, where separation between bicyclists and vehicles should be maintained through intersections.

Sight Distance

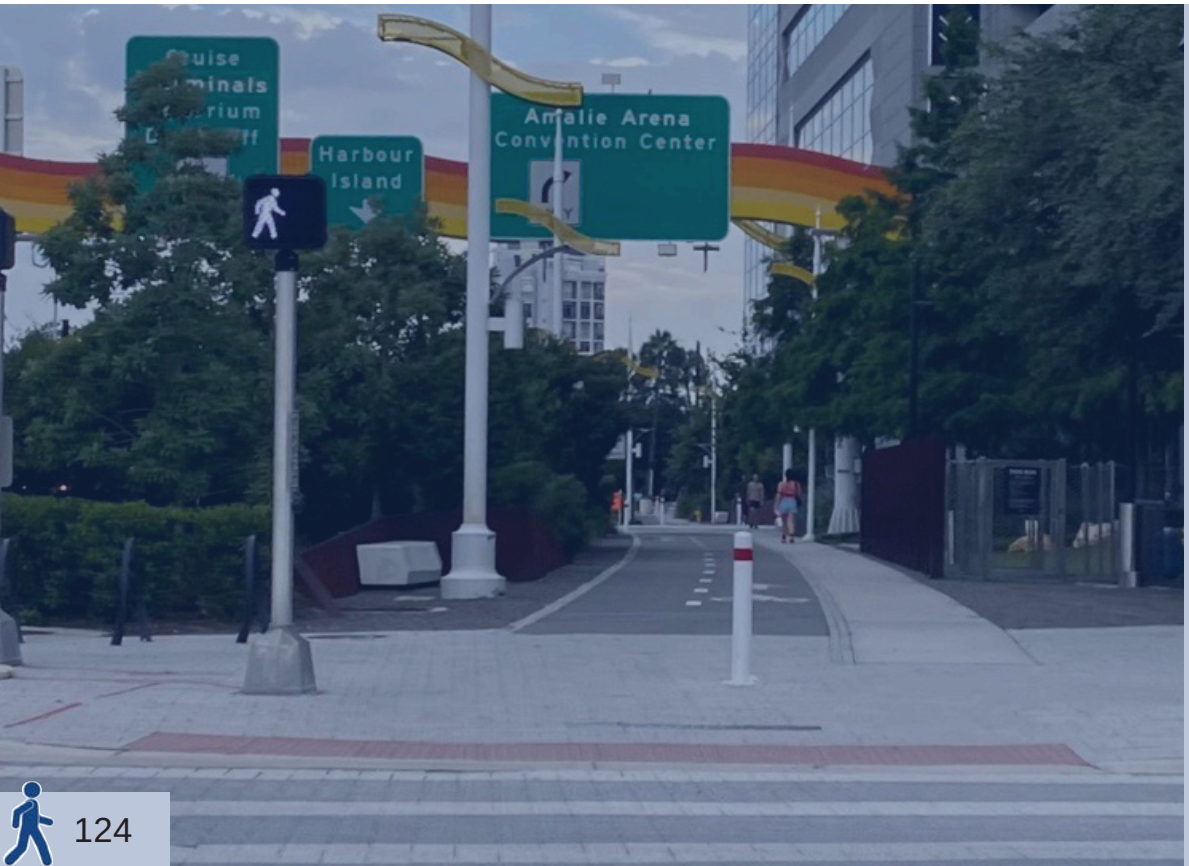
Adequate sight distance at driveways and intersections is critical to reducing crash risk for bicyclists, particularly where turning movements occur. Obstructions such as parked vehicles, landscaping, street furniture, or utilities can limit visibility and increase the likelihood of conflicts, especially for unexpected bicycle movements, such as contraflow travel on two-way separated bicycle lanes or shared-use paths. Sufficient sight distance should be maintained for all users at driveway and intersection locations.

Bicycle Ramps

Consider how transitions between bicycle facilities impact the user. Bicycle ramps should be used to connect on-street bicycle facilities to shared use paths (or separated bicycle facilities at sidewalk level) on curbed roads. FDM 223.2.6 includes information on the desired angle and geometrics to create these transitions.

Interchange Ramps

Bicycle lanes should be connected to shared-use paths using bicycle ramps at interchange ramps. At an interchange, consider providing both an exit ramp (from the bicycle lane to the sidewalk) and an entry ramp (from the sidewalk to the bicycle lane), as well as any supplemental green markings within keyhole lanes. Speed management strategies should be considered to lower speeds through these conflict areas. FDM 211.18.1 includes additional guidance on bicycle ramps at interchange areas.



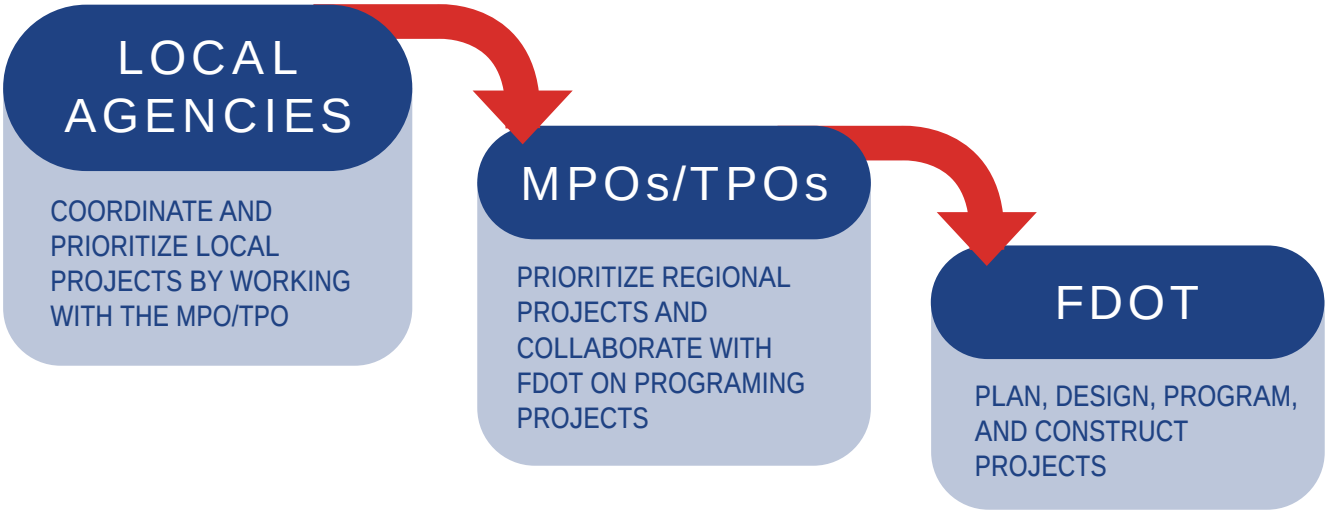
Source: Kittelson

NEXT STEPS

This Plan is intended to guide the integration of bicycle and pedestrian facilities into ongoing and future projects across FDOT District 7. Planners and engineers should use the guidance early in the project development process to inform scoping, evaluate tradeoffs, and identify opportunities to incorporate appropriate multimodal facilities within project limits, schedules, and budgets.

The Plan also provides a framework to identify gaps in the bicycle and pedestrian network and inform future investment decisions. As a next step, District 7 will continue to identify opportunities and support coordination with local agency partners. Local agencies can work with their MPO to prioritize bicycle and pedestrian projects for funding. Local agencies can collaborate with District 7 by working with their MPO/TPO to prioritize local needs on the state system, collaborate on local agency pedestrian and bicycle plans, and contribute local funds to projects.

FIGURE 92. AGENCY RELATIONSHIPS



CASE STUDY: EAST BAY DRIVE

District 7 partnered with the City of Largo to enhance East Bay Drive. District 7 was planning to resurface East Bay Drive as part of the Resurfacing, Restoration, and Rehabilitation program. The City of Largo contributed local funds to expand the project scope and reduce the existing median width to add buffered bicycle lanes. Local agencies can look for similar opportunities to collaborate with District 7 to enhance pedestrian and bicycle projects on state facilities.

> Local agencies can learn more in the Partnering with FDOT: Local Government Resource Guide.


Source: FDOT

APPENDIX A:

ROADWAY CHARACTERISTICS BY COUNTY



Source: Kittelson

ACCESS CLASSIFICATION ON STATE ROADS BY COUNTY

FIGURE 93. CITRUS COUNTY ACCESS CLASSIFICATION

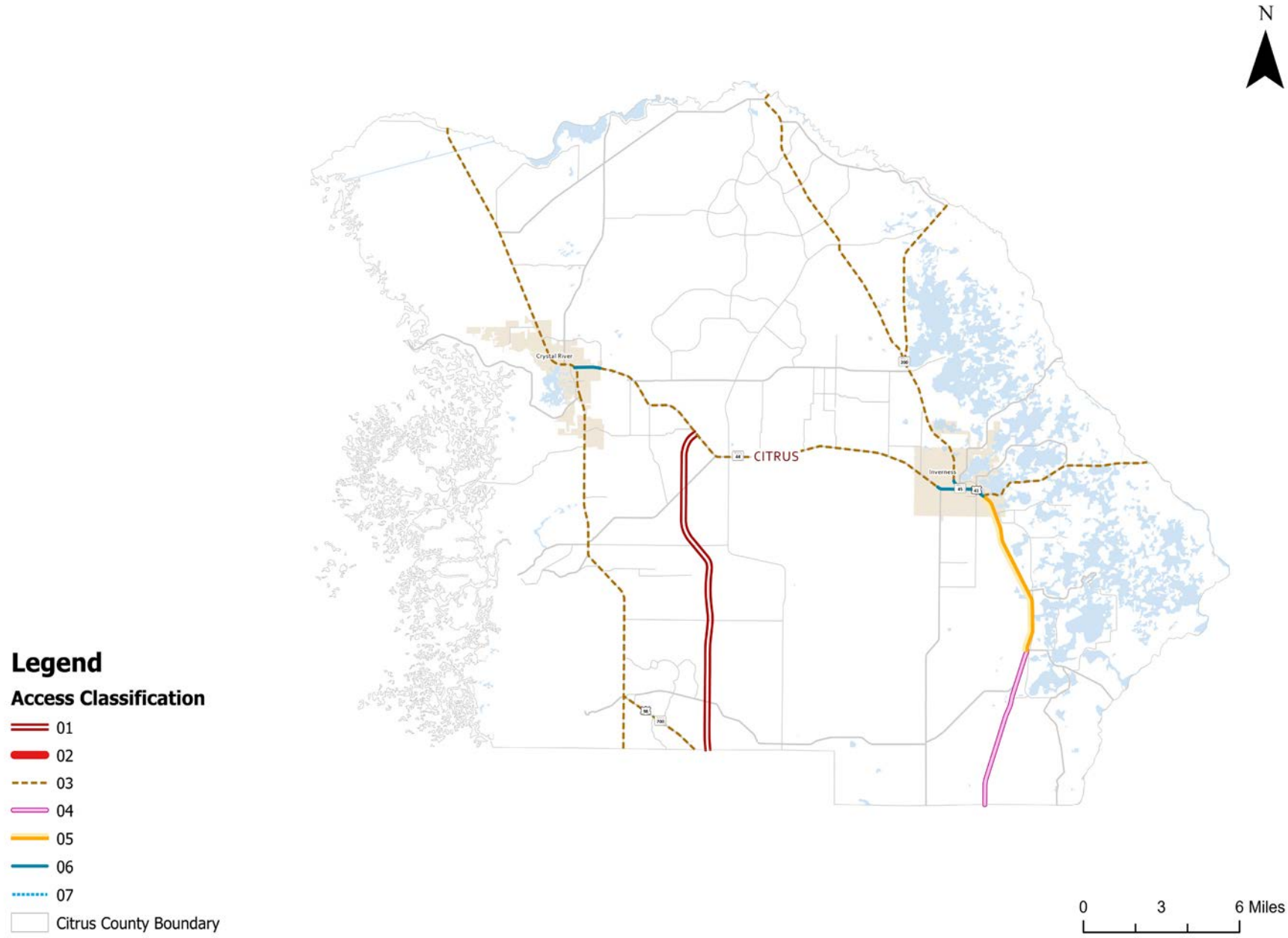


FIGURE 94. HERNANDO COUNTY ACCESS CLASSIFICATION

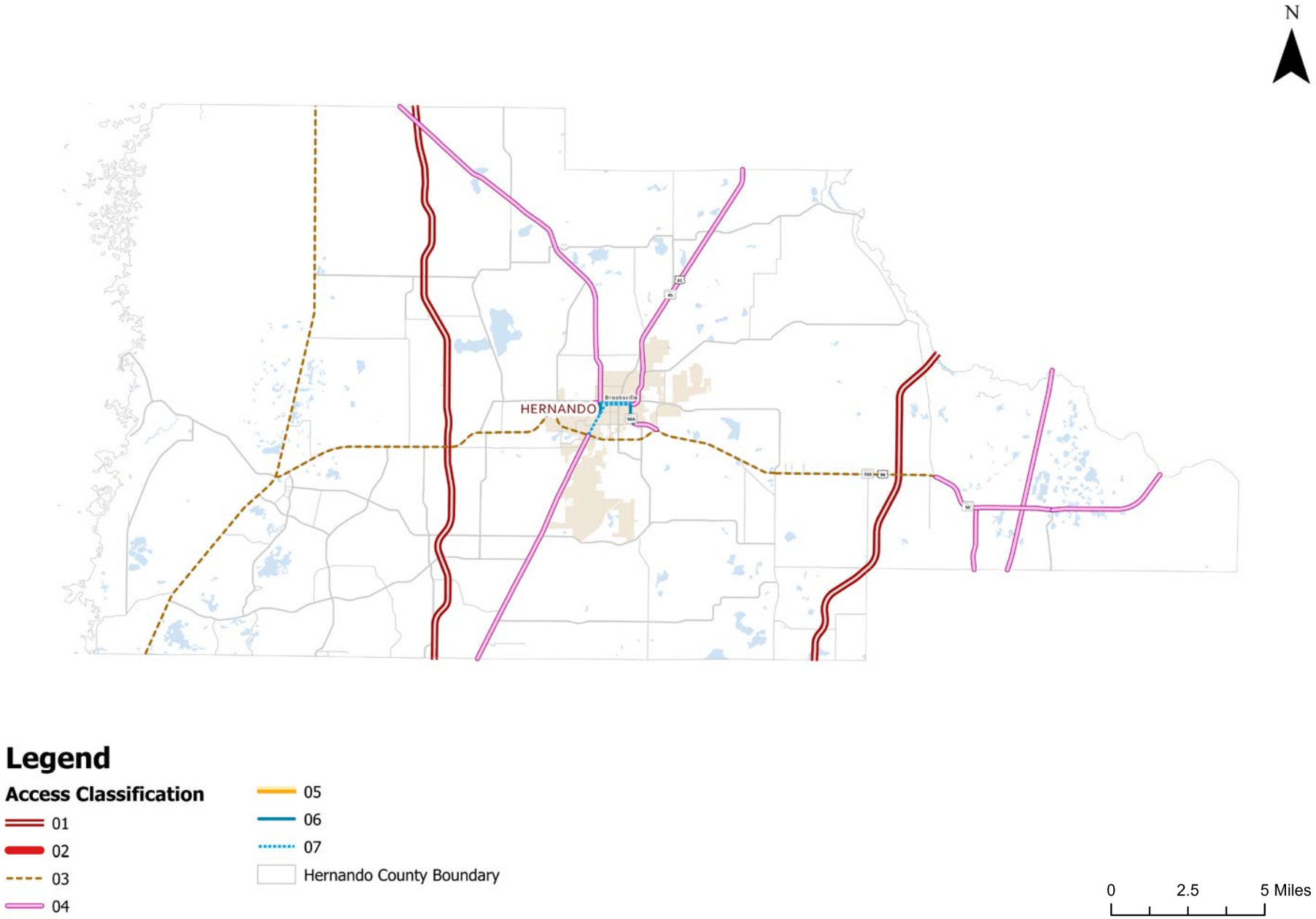


FIGURE 95. PASCO COUNTY ACCESS CLASSIFICATION

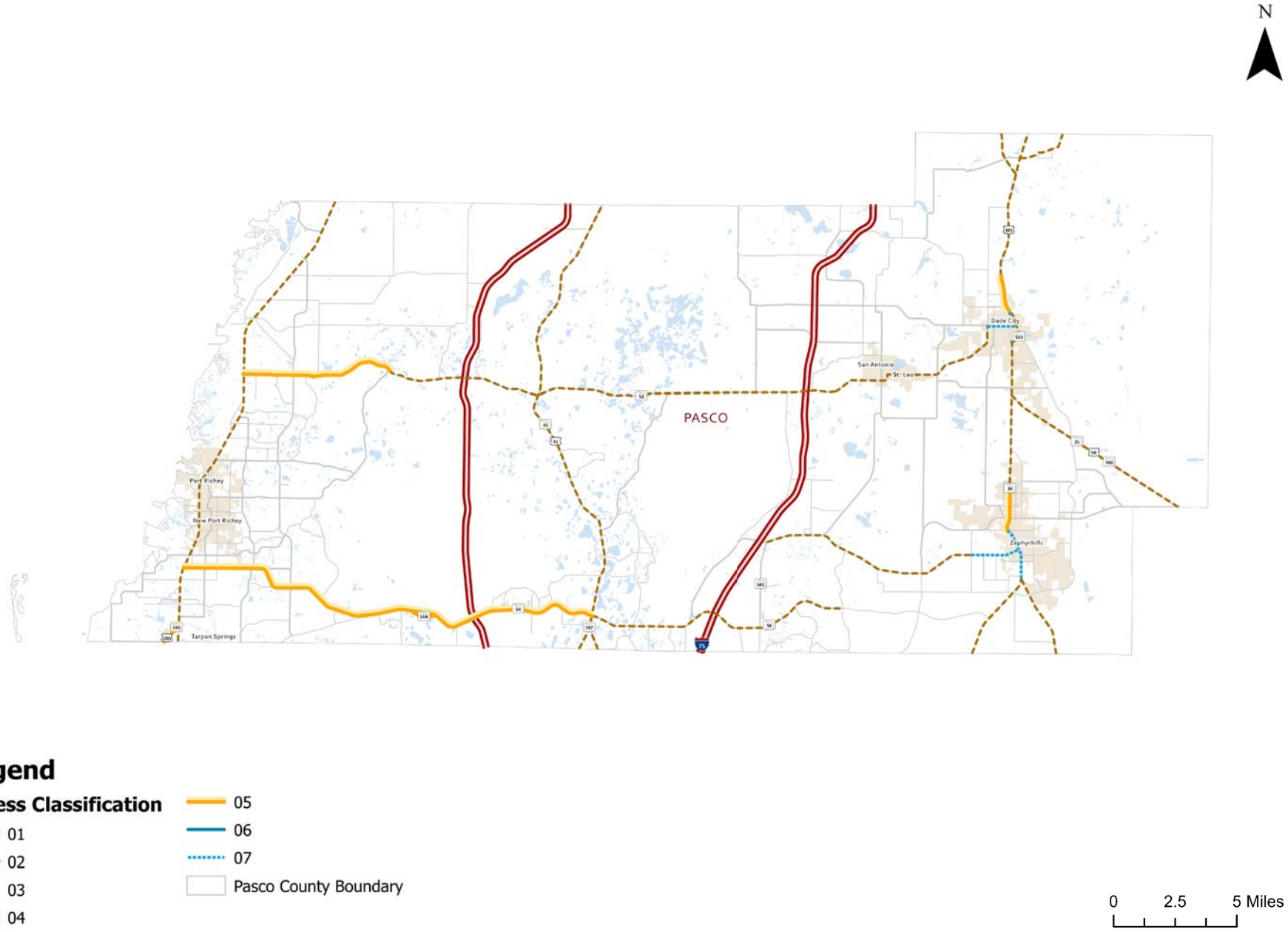


FIGURE 96. PINELLAS COUNTY ACCESS CLASSIFICATION

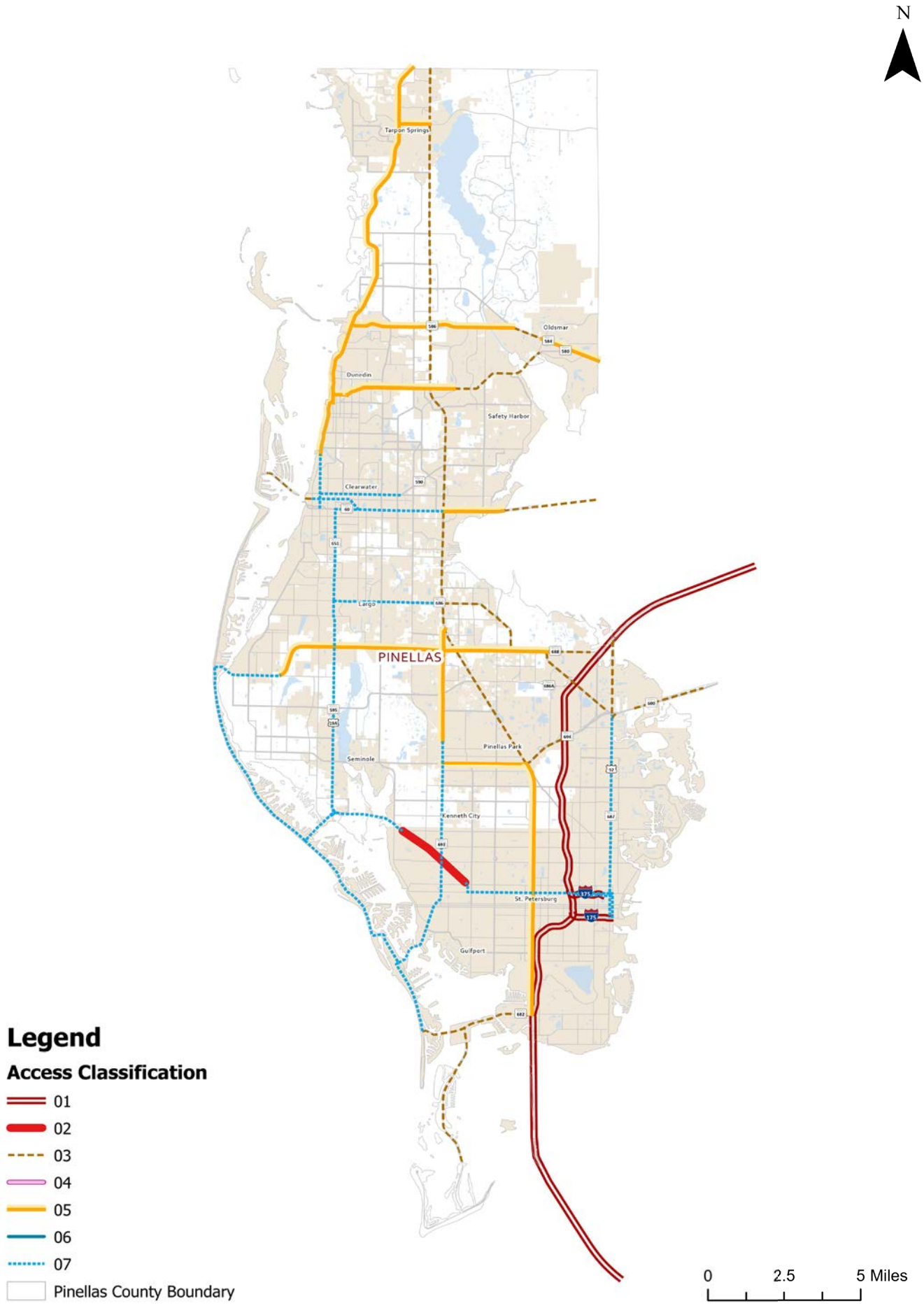
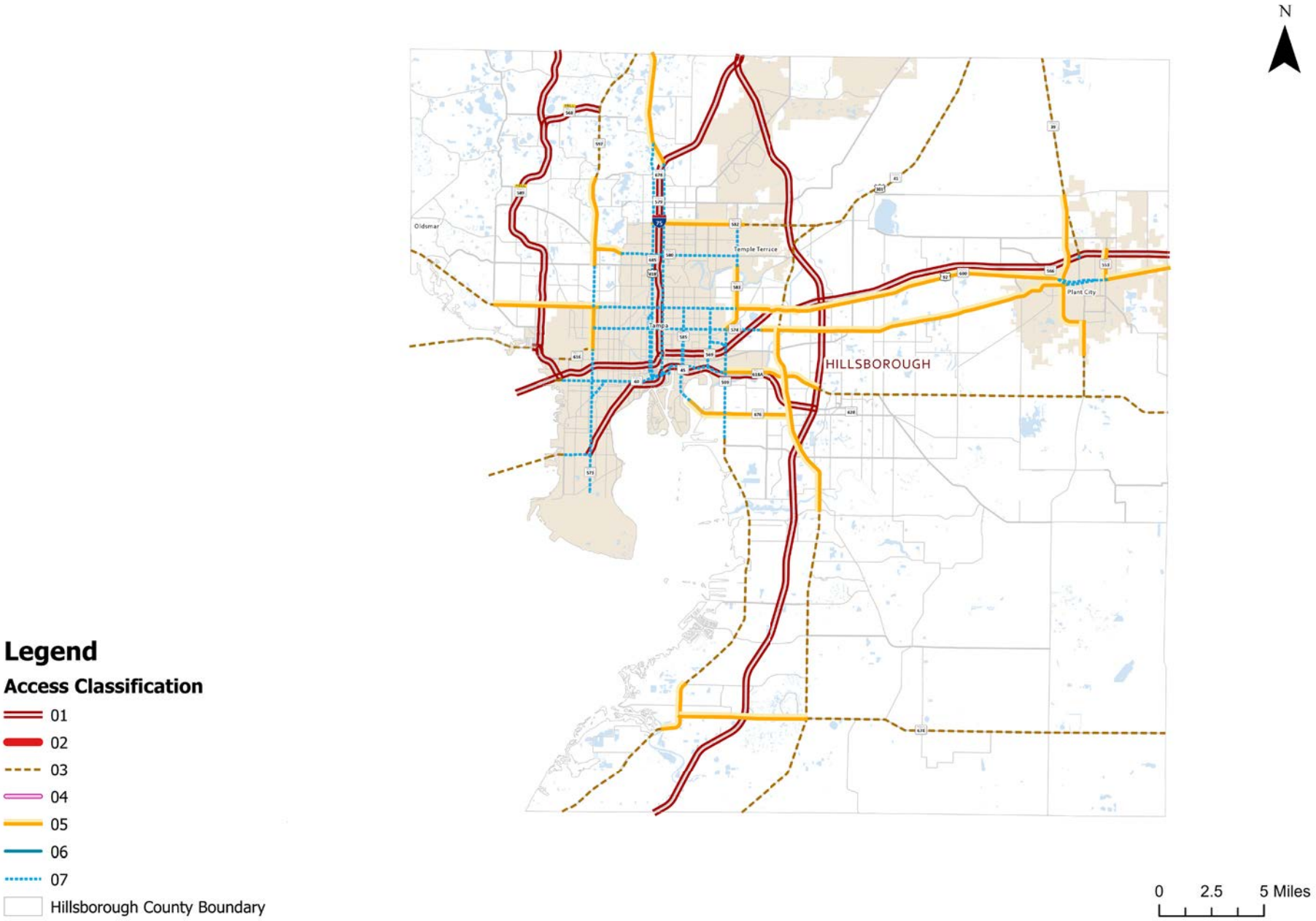


FIGURE 97. HILLSBOROUGH COUNTY ACCESS CLASSIFICATION



COUNTY LANES AND TRAFFIC VOLUMES

FIGURE 98. CITRUS COUNTY VEHICLE TRAFFIC VOLUMES

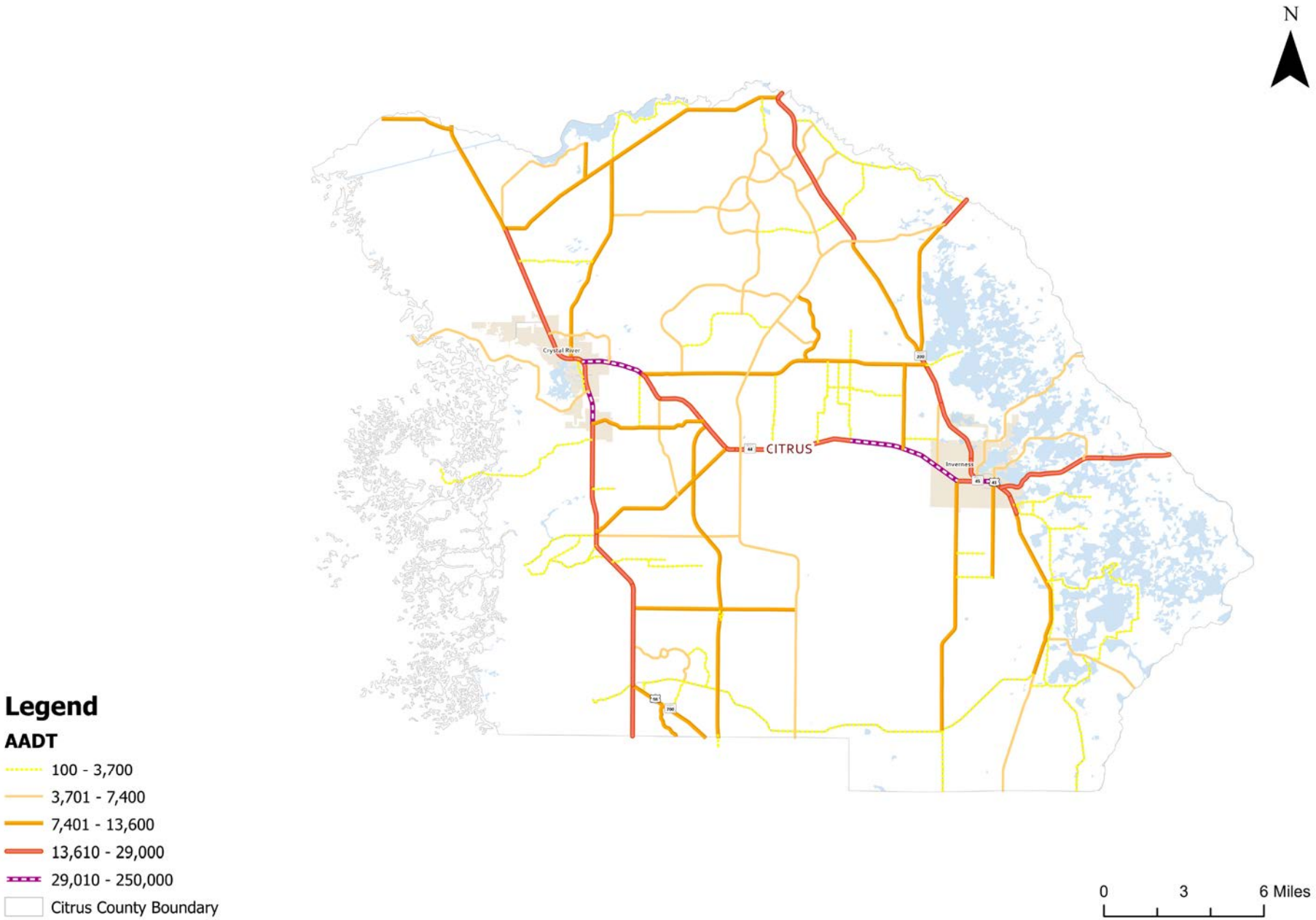


FIGURE 99. CITRUS COUNTY NUMBER OF LANES

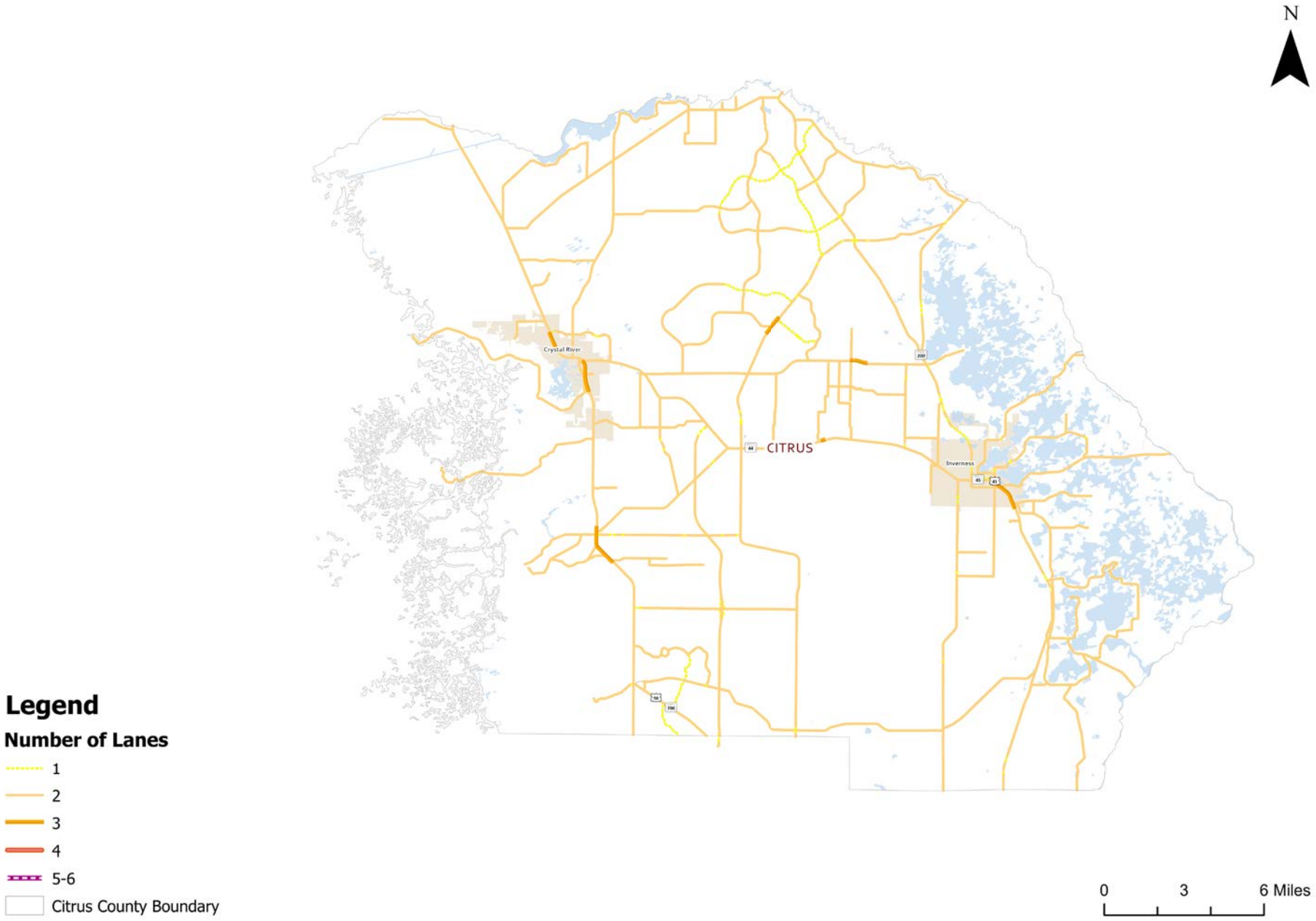


FIGURE 101. HERNANDO COUNTY VEHICLE TRAFFIC VOLUMES

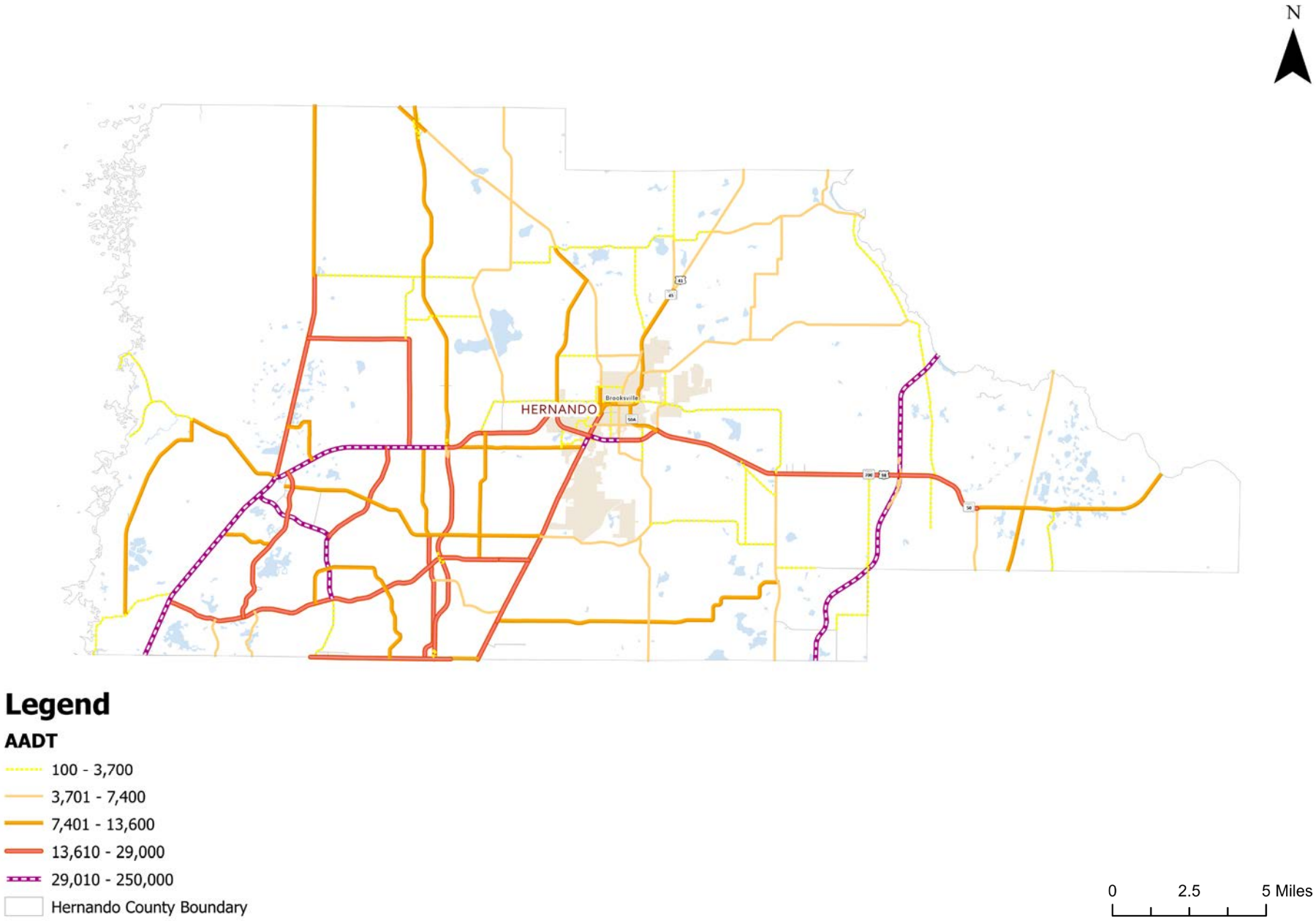


FIGURE 102. HERNANDO COUNTY NUMBER OF LANES

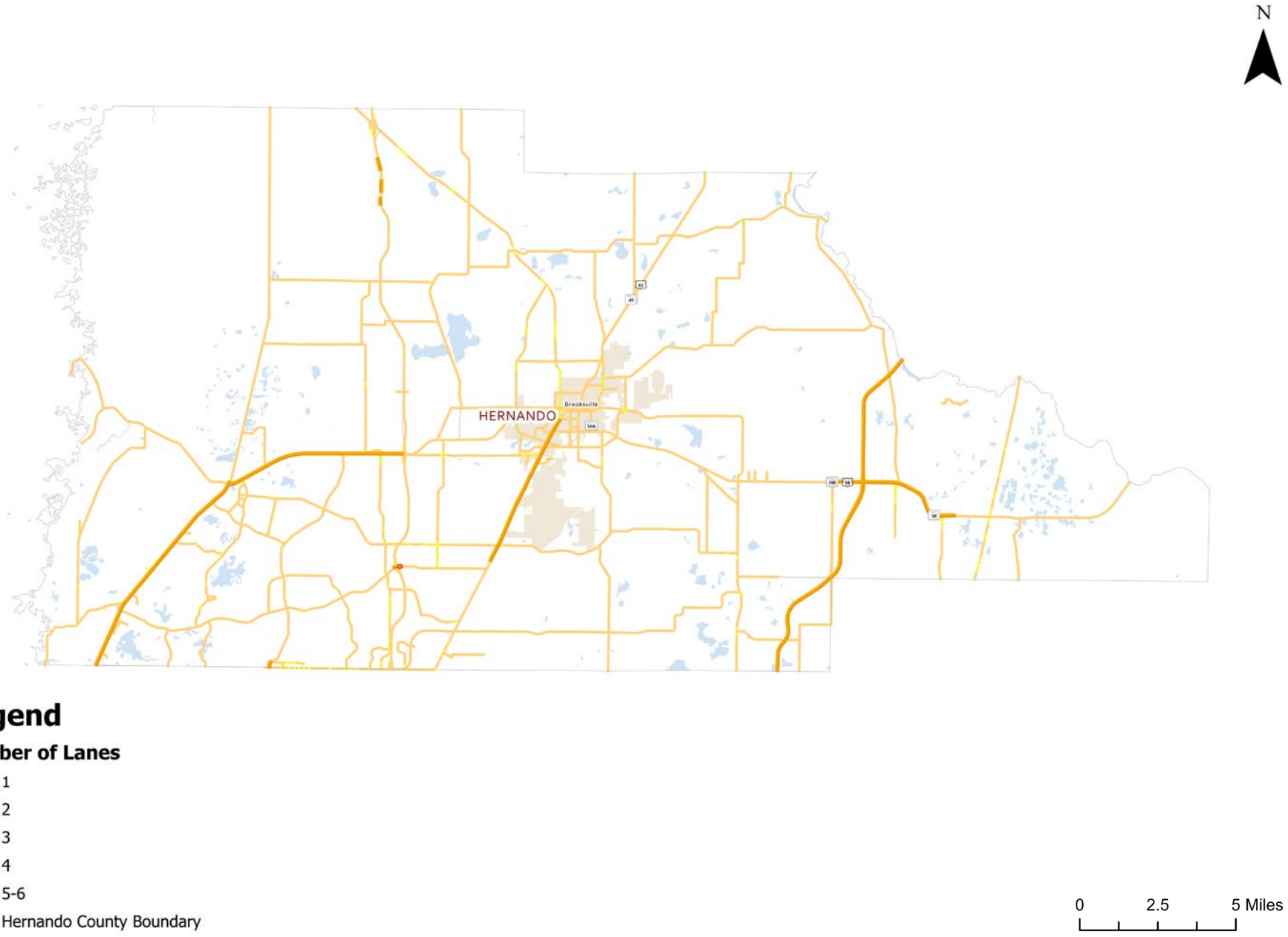


FIGURE 103. PASCO COUNTY VEHICLE TRAFFIC VOLUMES

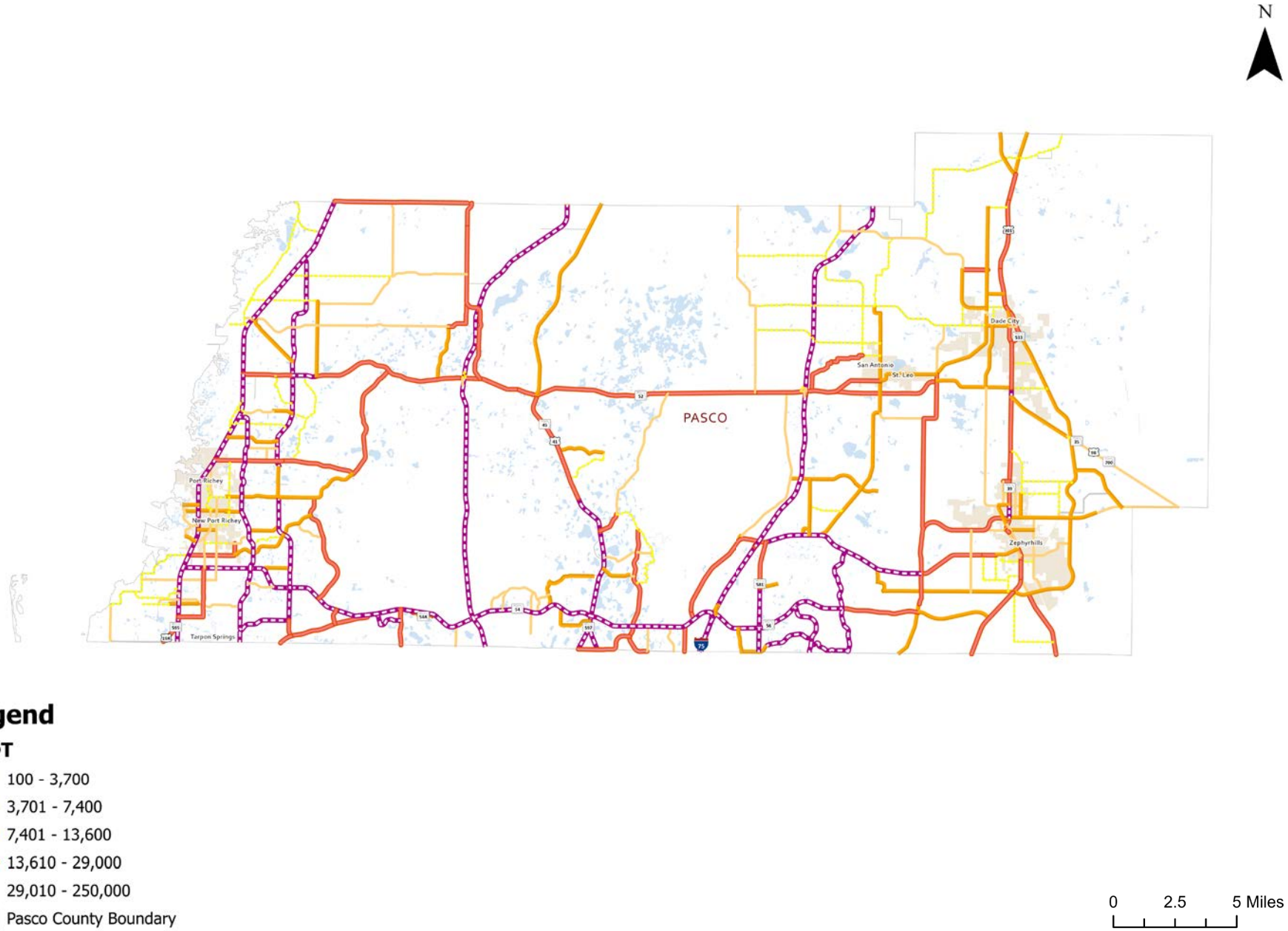


FIGURE 104. PASCO COUNTY NUMBER OF LANES

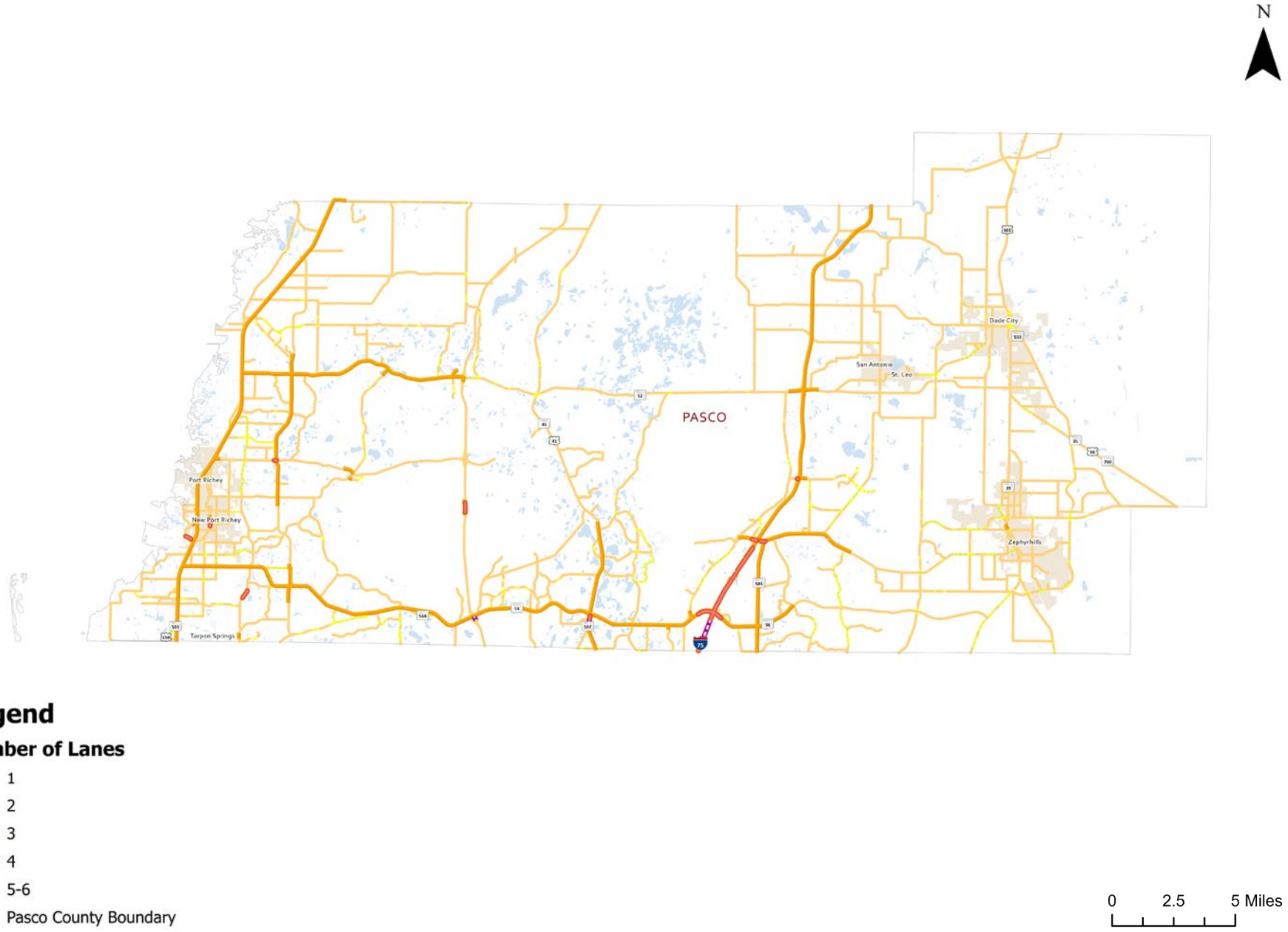


FIGURE 105. PINELLAS COUNTY VEHICLE TRAFFIC VOLUMES

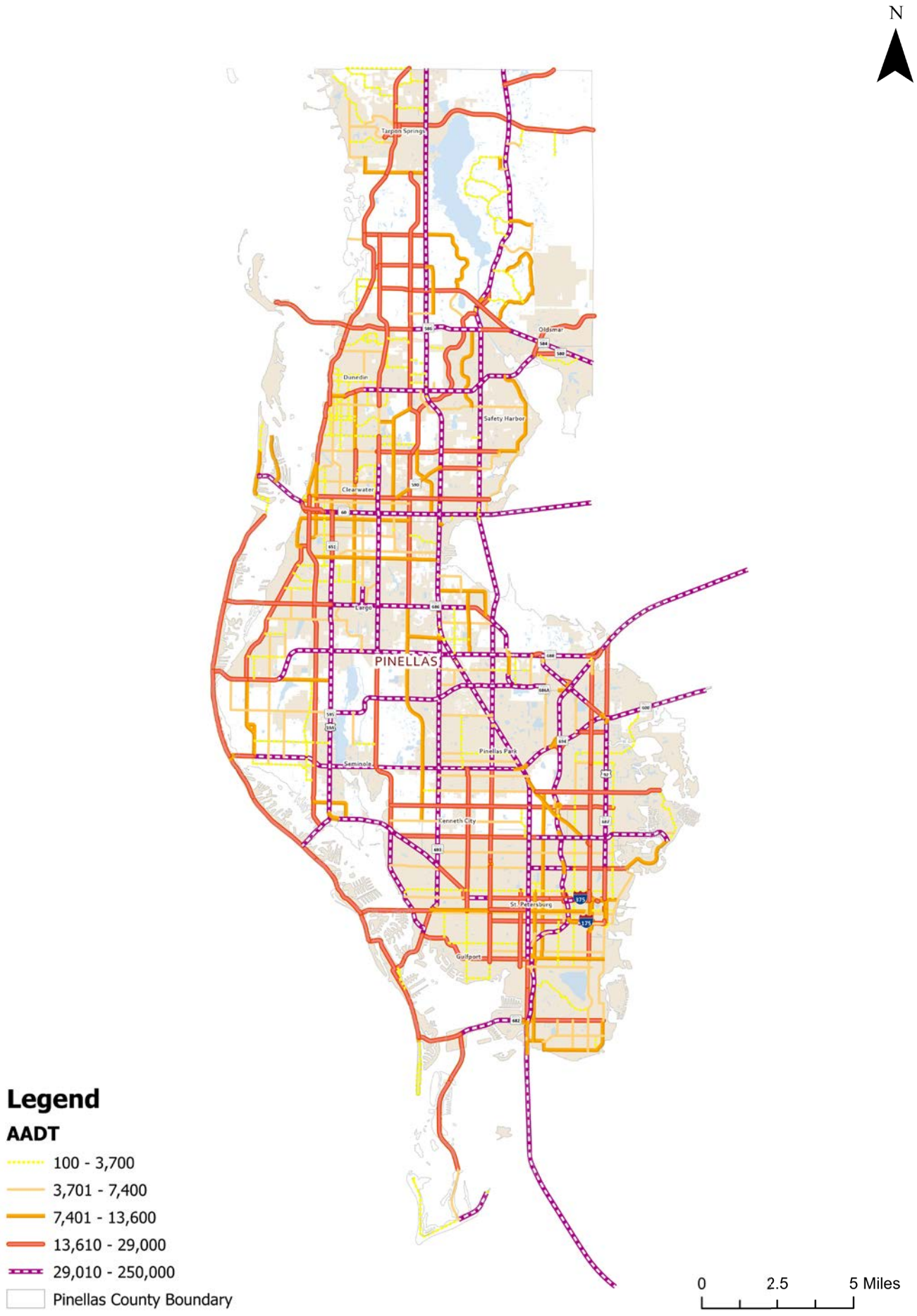


FIGURE 106. PINELLAS COUNTY NUMBER OF LANES

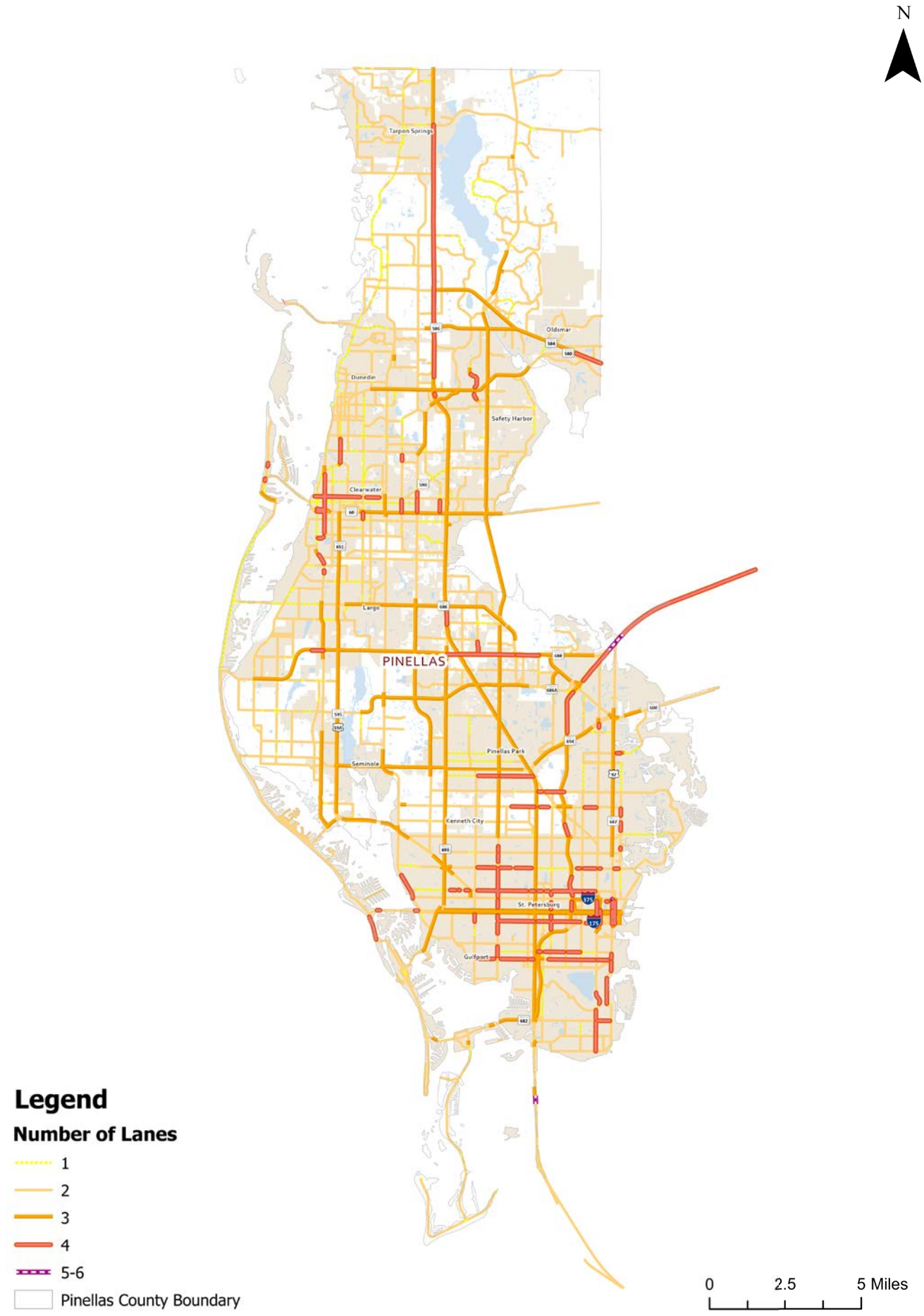


FIGURE 107. HILLSBOROUGH COUNTY VEHICLE TRAFFIC VOLUMES

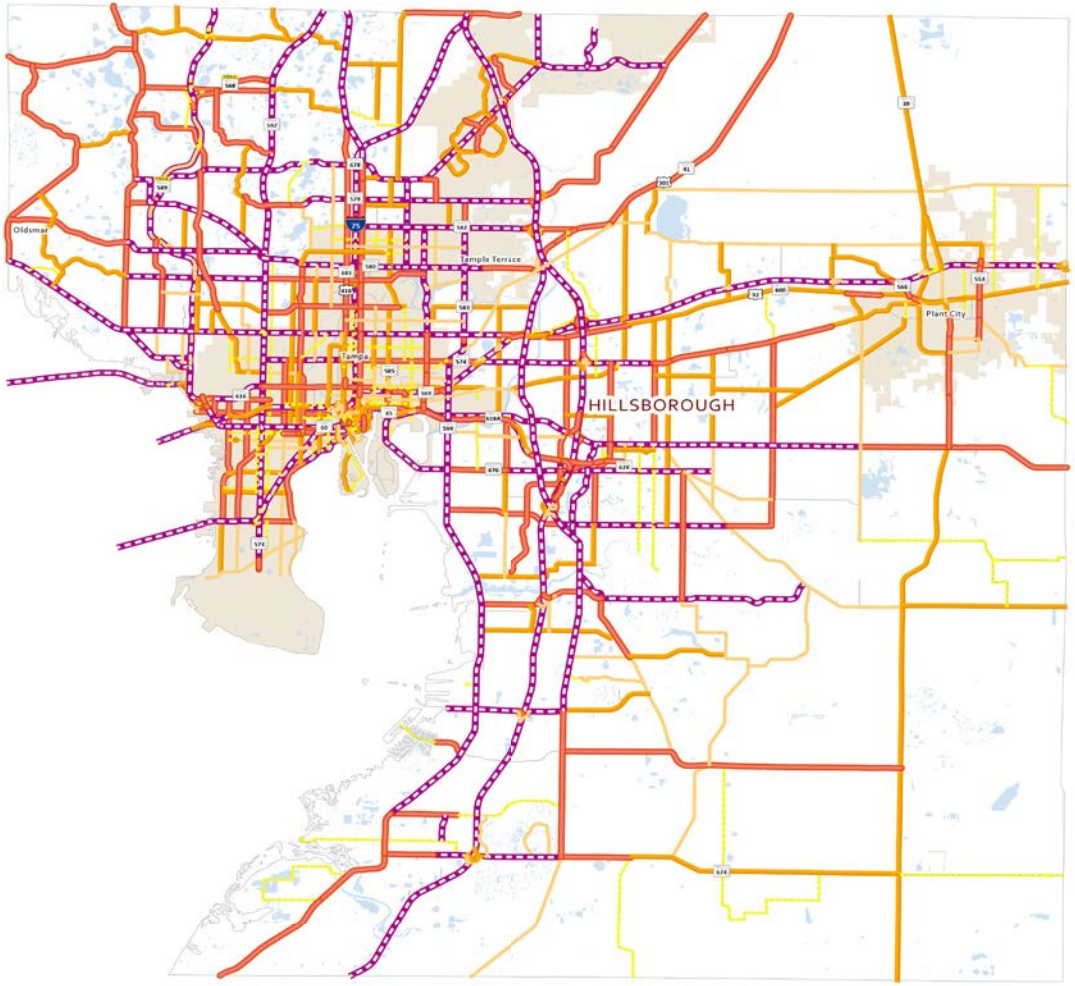
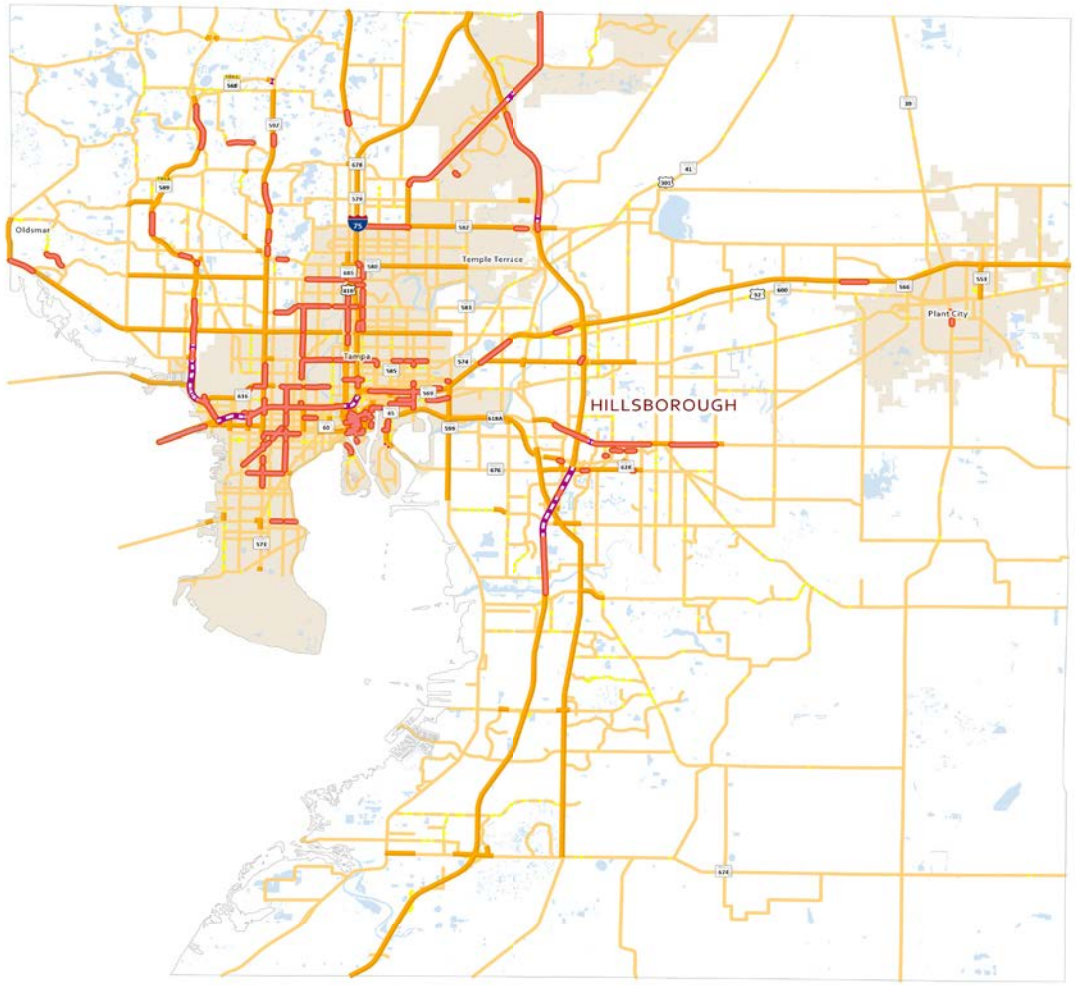


FIGURE 108. HILLSBOROUGH COUNTY NUMBER OF LANES



POSTED SPEED LIMITS ON STATE ROADS BY COUNTY

FIGURE 109. CITRUS COUNTY POSTED SPEED LIMITS

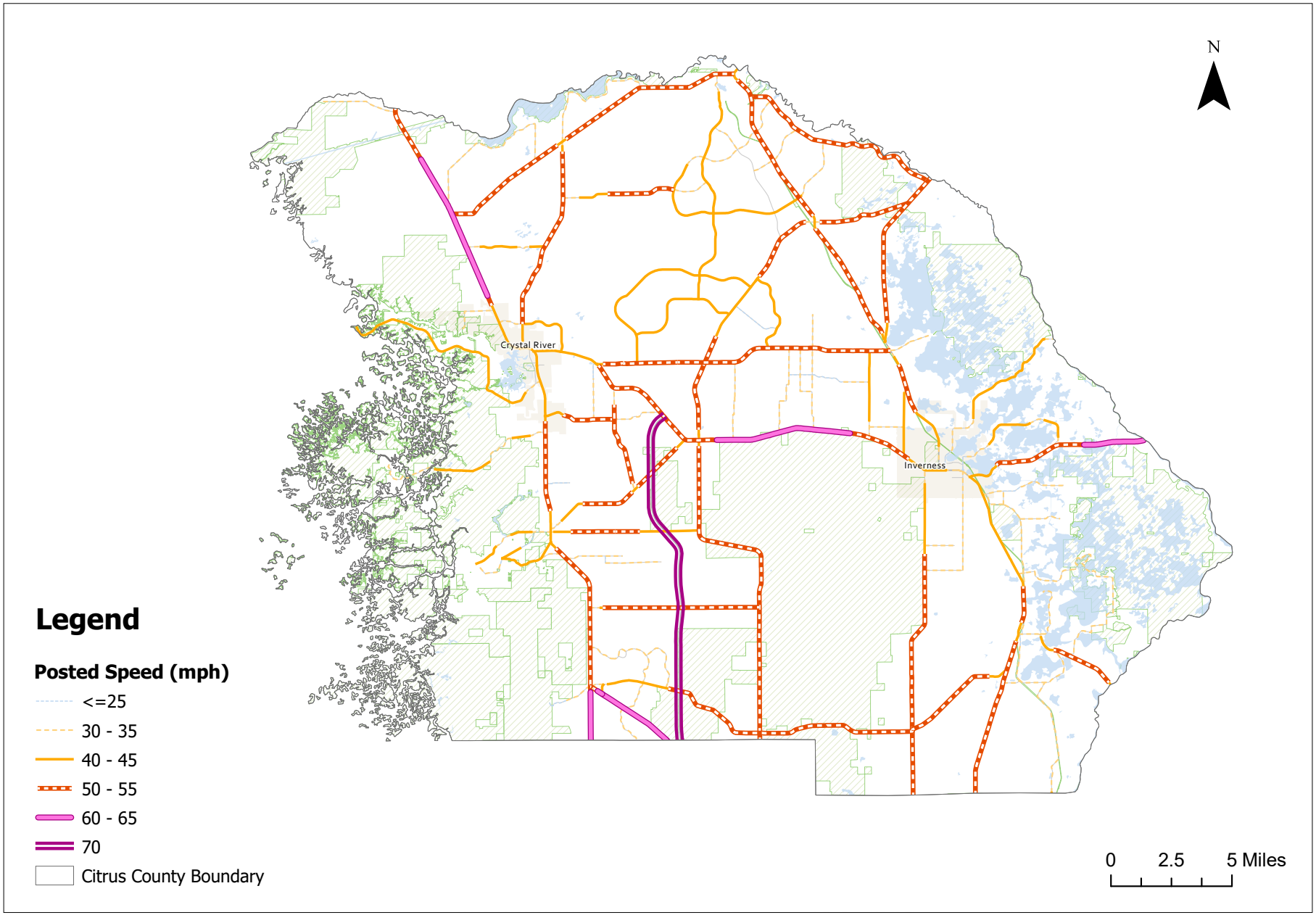


FIGURE 110. HERNANDO COUNTY POSTED SPEED LIMITS

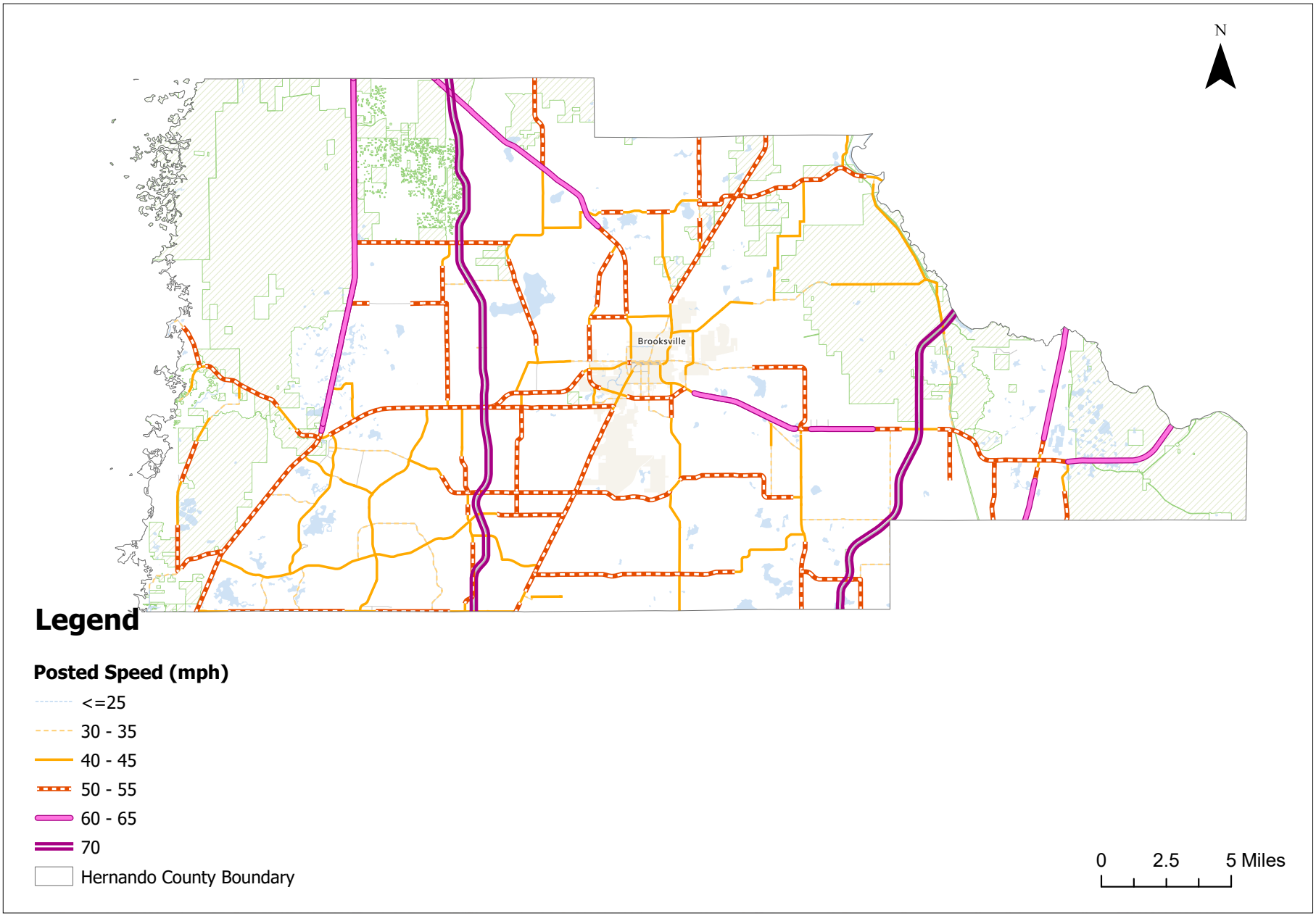


FIGURE 111. PASCO COUNTY POSTED SPEED LIMITS

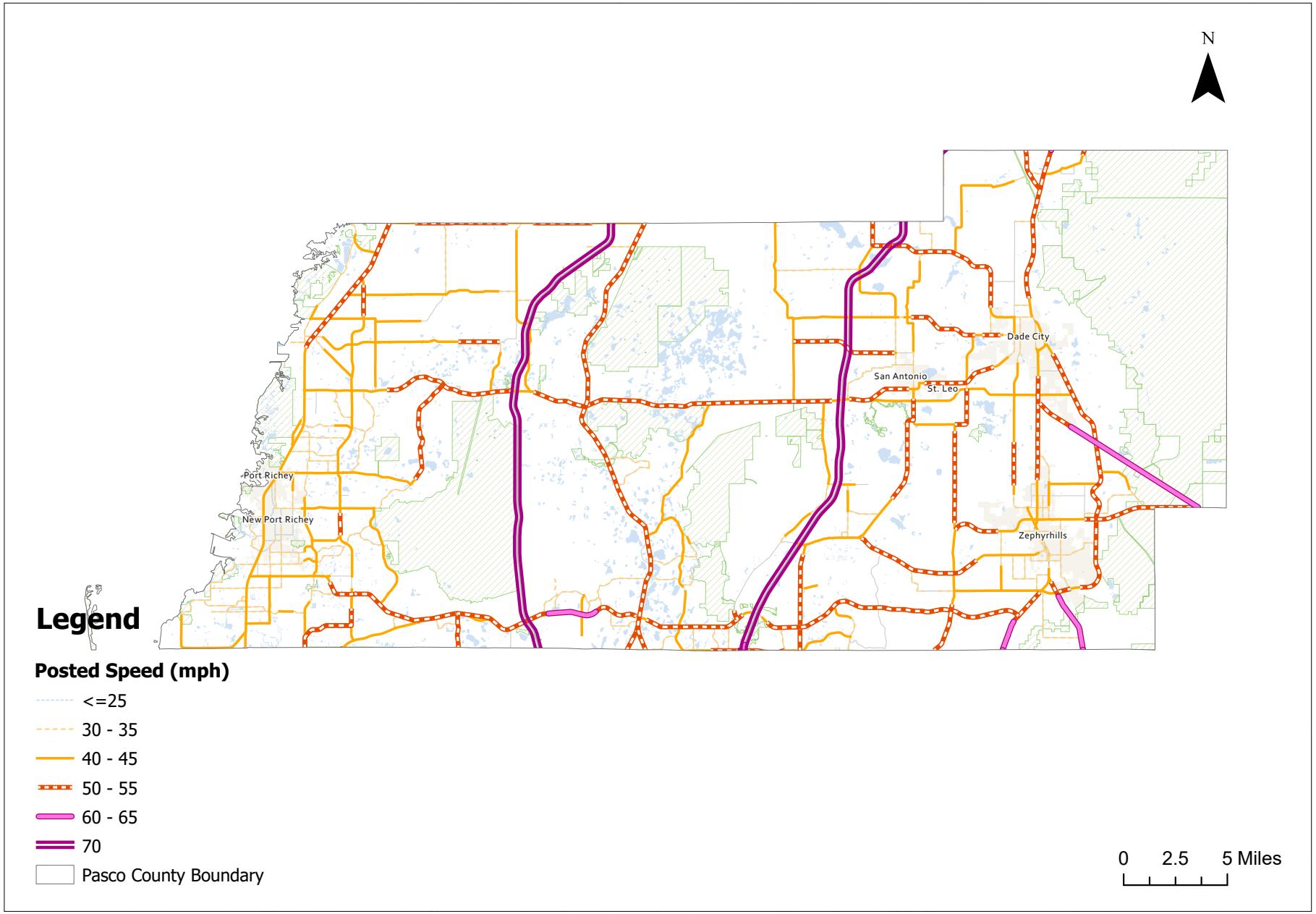


FIGURE 112. PINELLAS COUNTY POSTED SPEED LIMITS

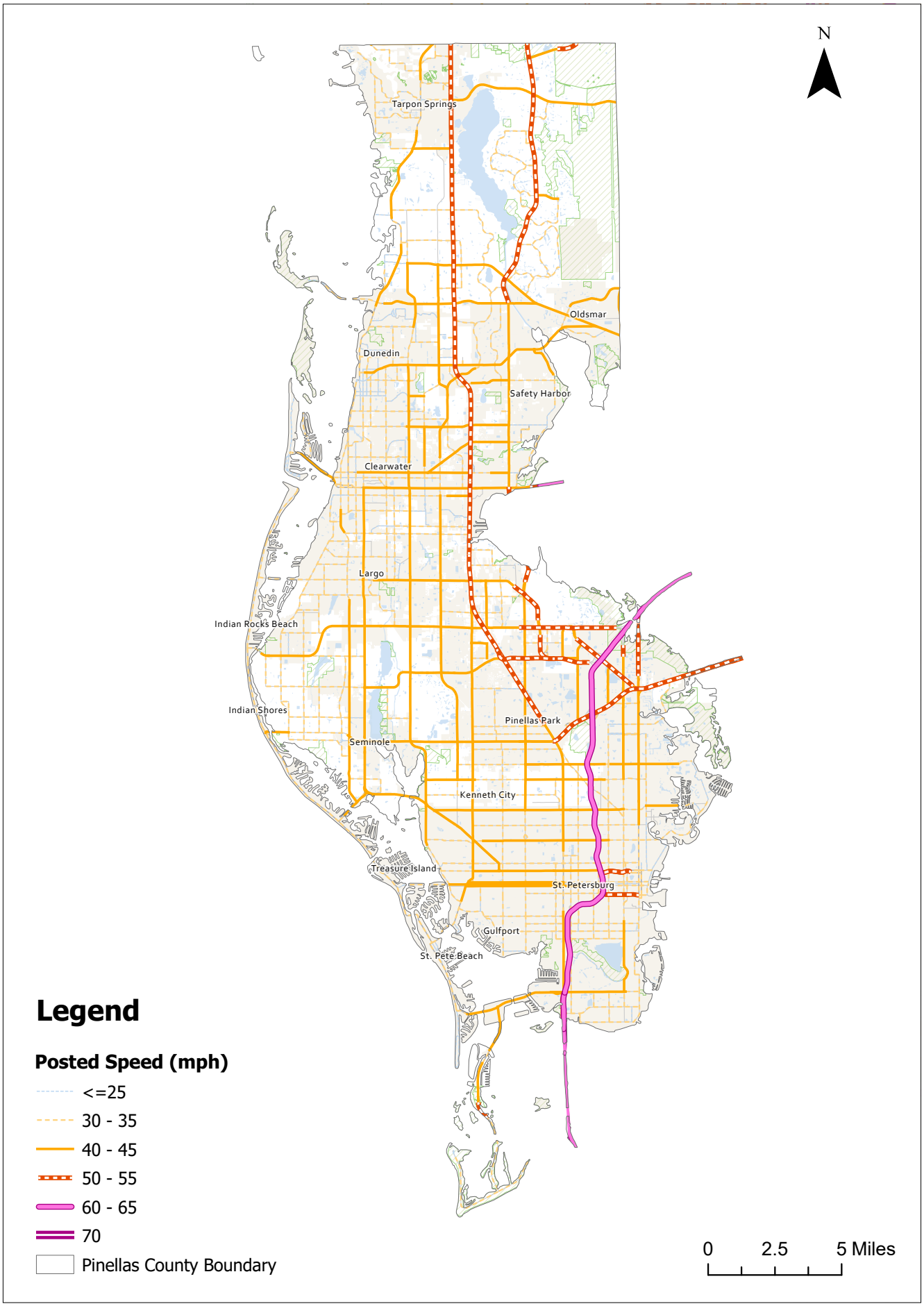
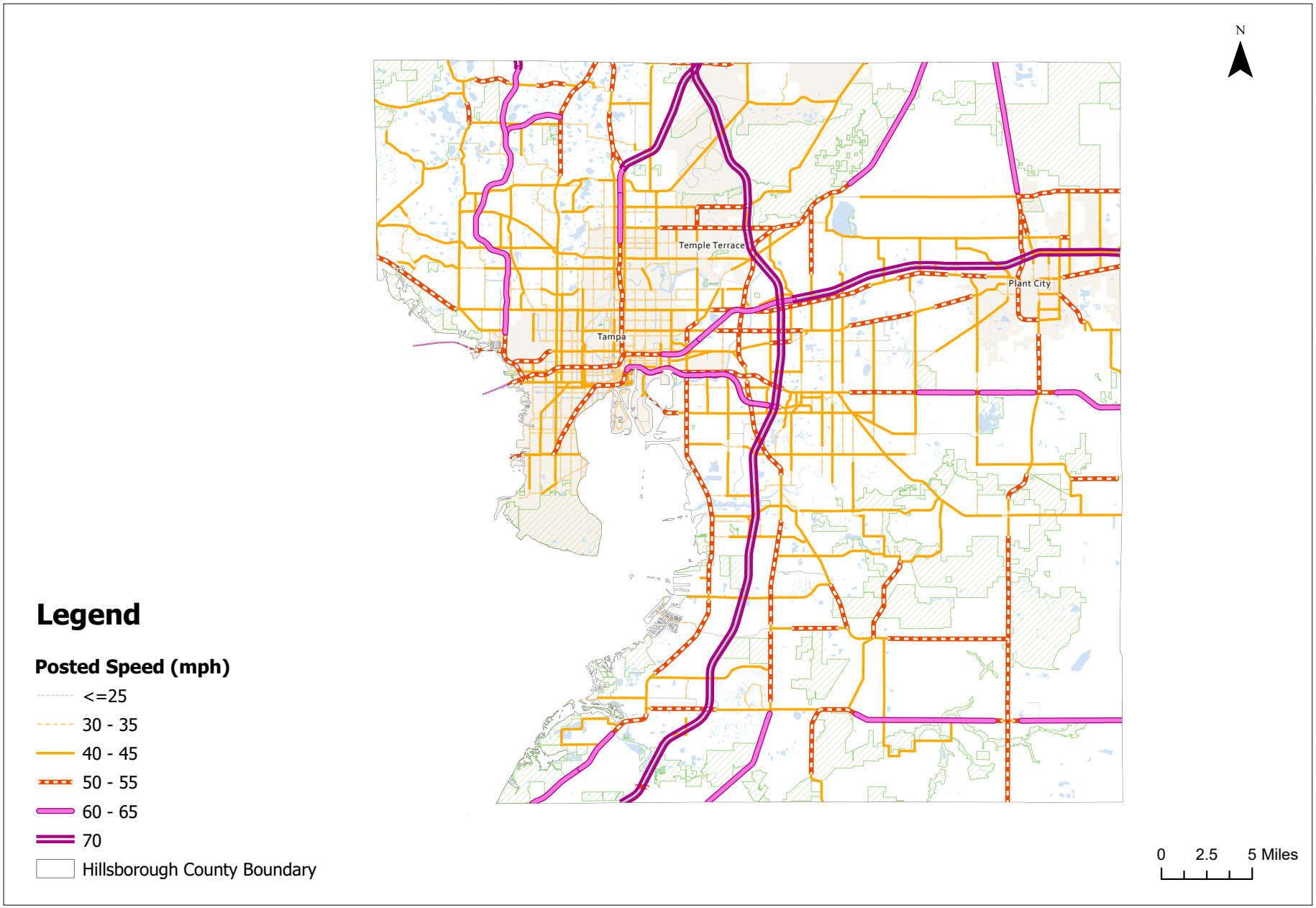


FIGURE 113. HILLSBOROUGH COUNTY POSTED SPEED LIMITS



EXISTING CROSSING SPACING ON STATE ROADS BY COUNTY

FIGURE 114. CITRUS COUNTY PEDESTRIAN CROSSING SPACING

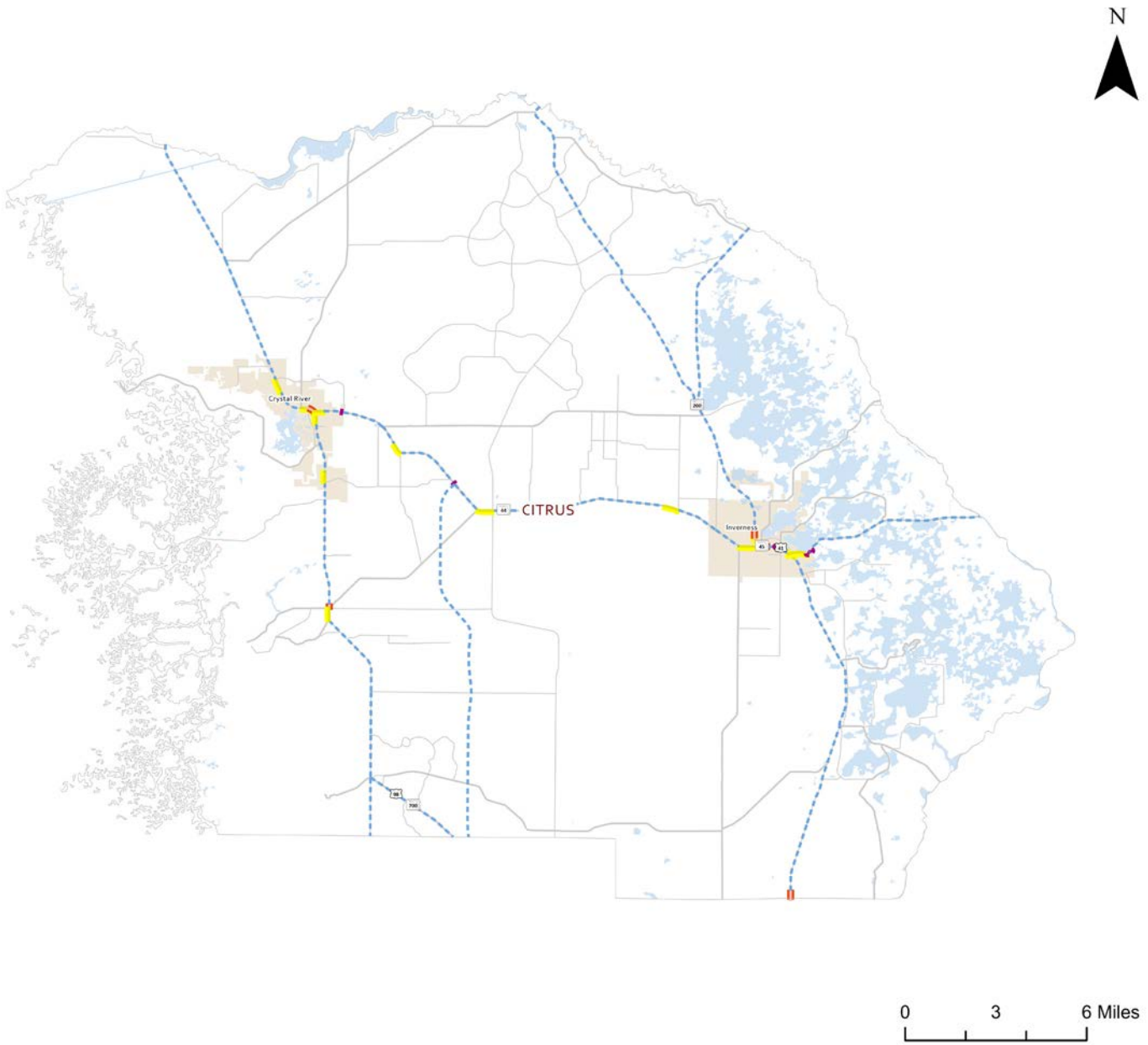


FIGURE 115. HERNANDO COUNTY PEDESTRIAN CROSSING SPACING

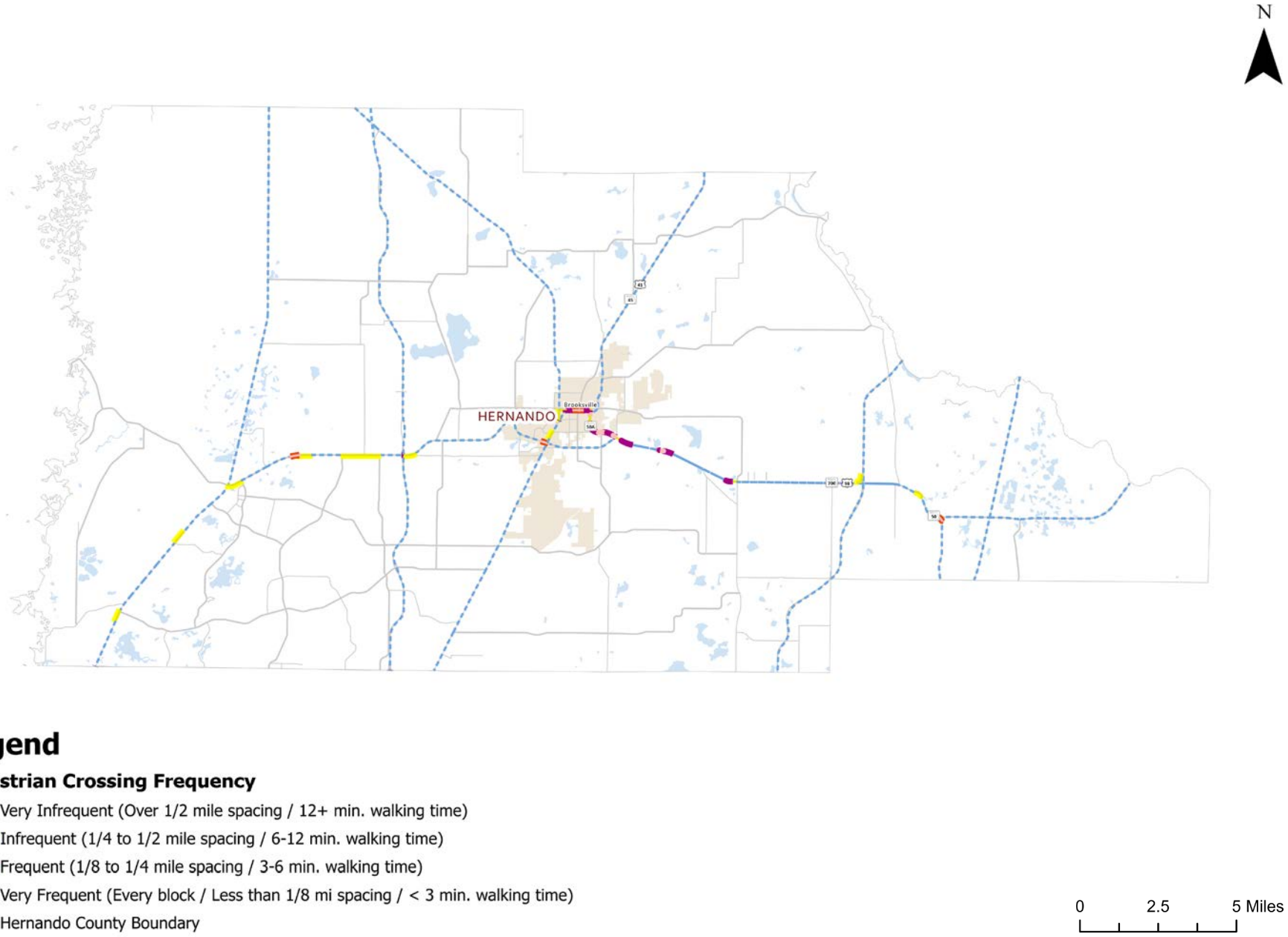


FIGURE 116. PASCO COUNTY PEDESTRIAN CROSSING SPACING

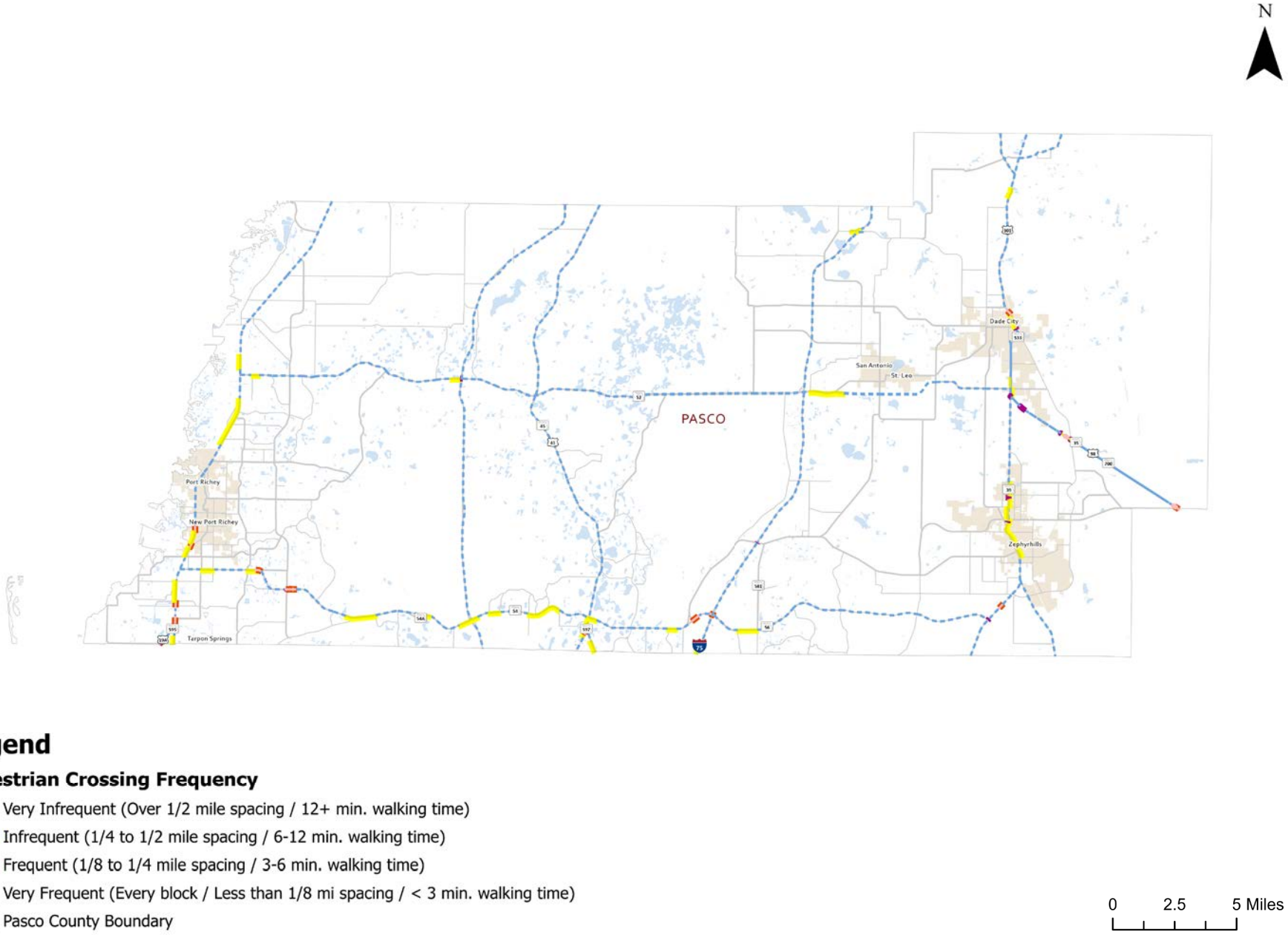


FIGURE 117. PINELLAS COUNTY PEDESTRIAN CROSSING SPACING

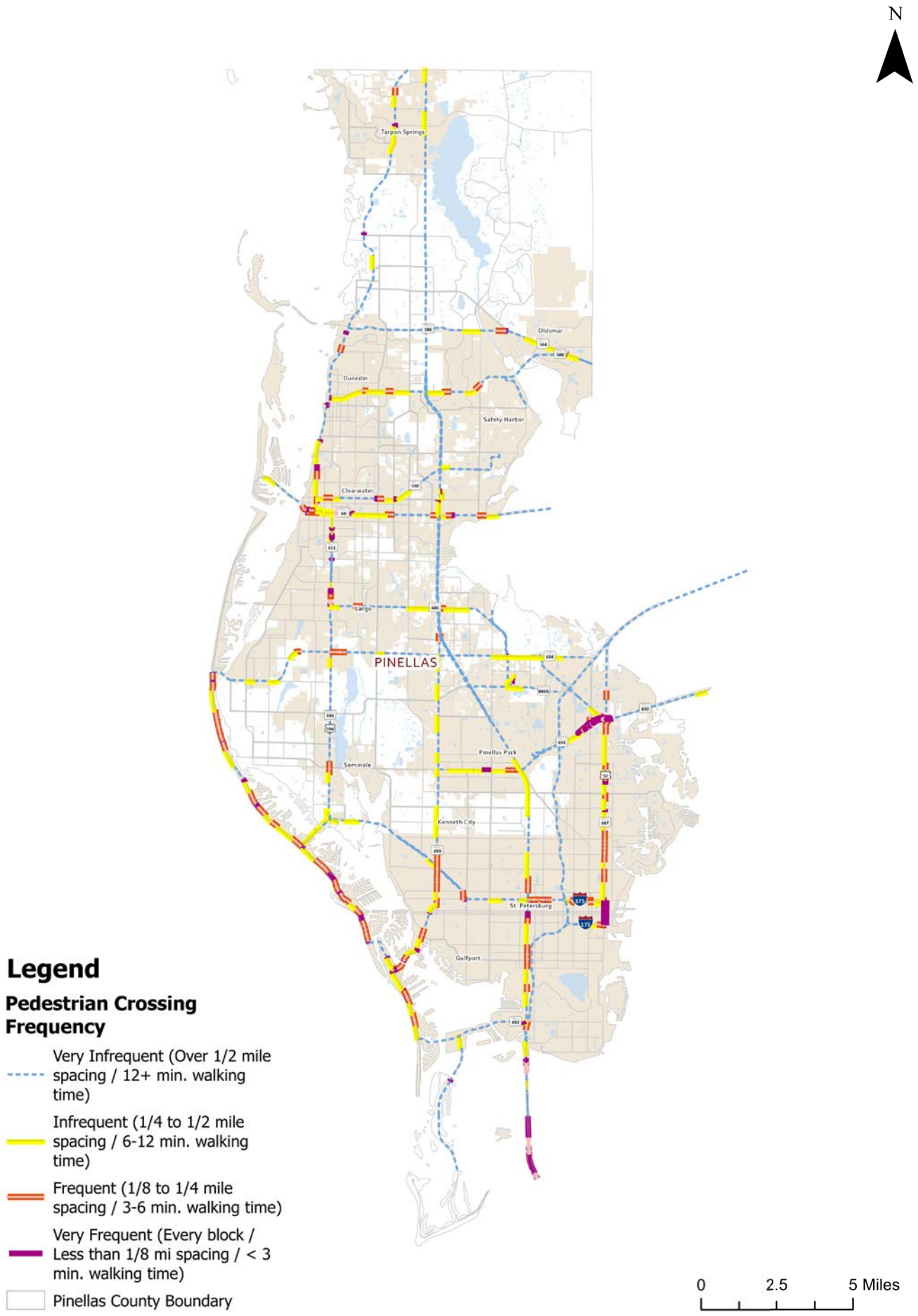
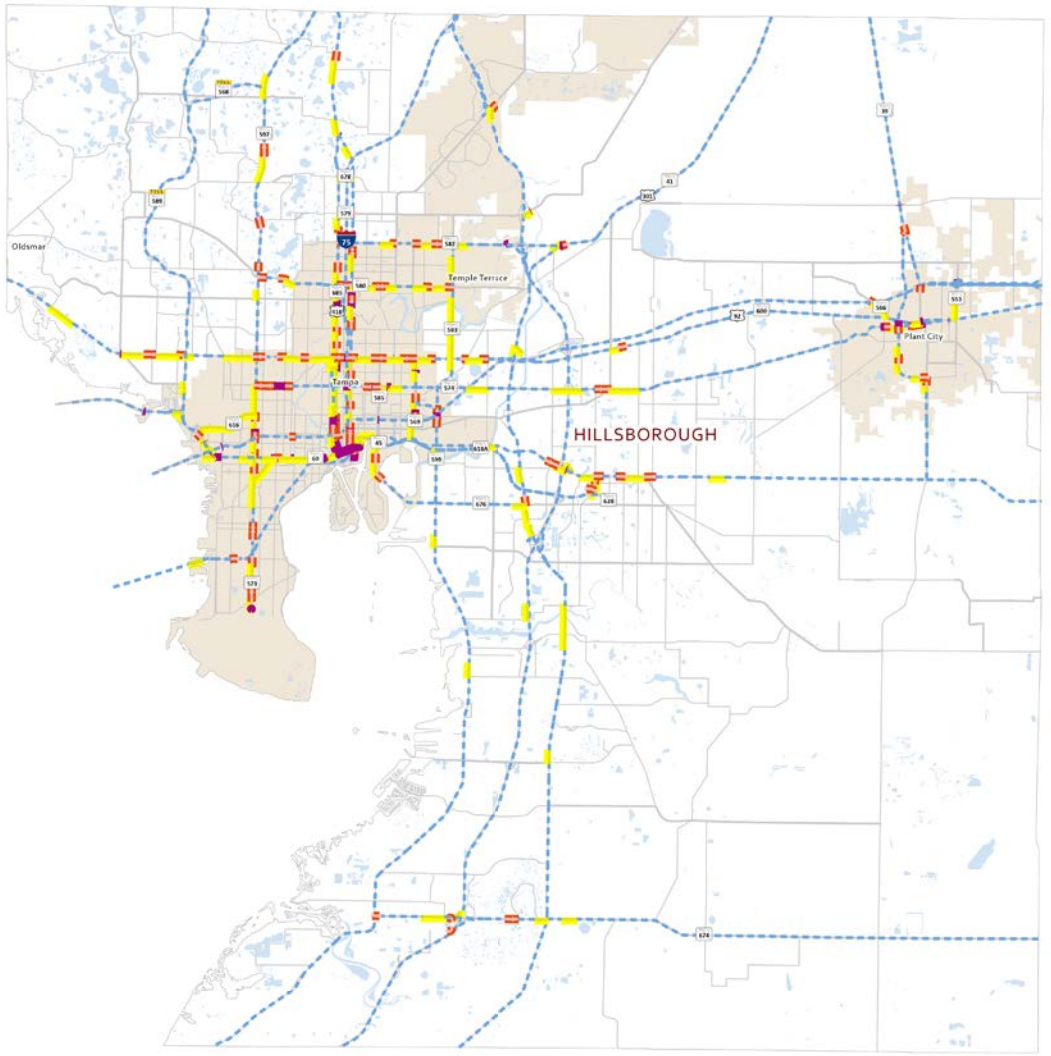


FIGURE 118. HILLSBOROUGH COUNTY PEDESTRIAN CROSSING SPACING



Legend

Pedestrian Crossing Frequency

- Very Infrequent (Over 1/2 mile spacing / 12+ min. walking time)
- Infrequent (1/4 to 1/2 mile spacing / 6-12 min. walking time)
- Frequent (1/8 to 1/4 mile spacing / 3-6 min. walking time)
- Very Frequent (Every block / Less than 1/8 mi spacing / < 3 min. walking time)
- Hillsborough County Boundary

APPENDIX B:

LEVEL OF TRAFFIC STRESS FLOWCHARTS



Source: Kittelson

LEVEL OF TRAFFIC STRESS FLOWCHARTS

FIGURE 119. LEVEL OF TRAFFIC STRESS FLOW CHART

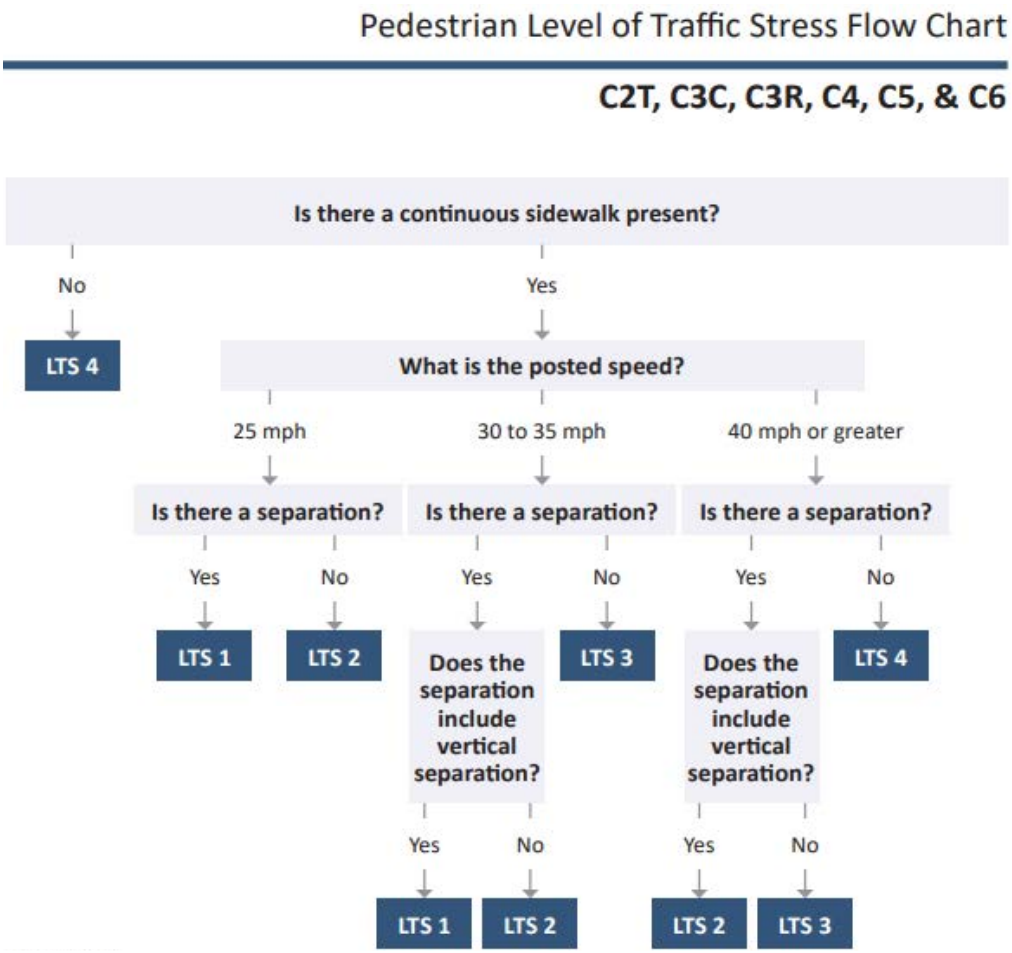


FIGURE 120. BICYCLE LEVEL OF TRAFFIC STRESS FLOW CHART WITH FACILITY

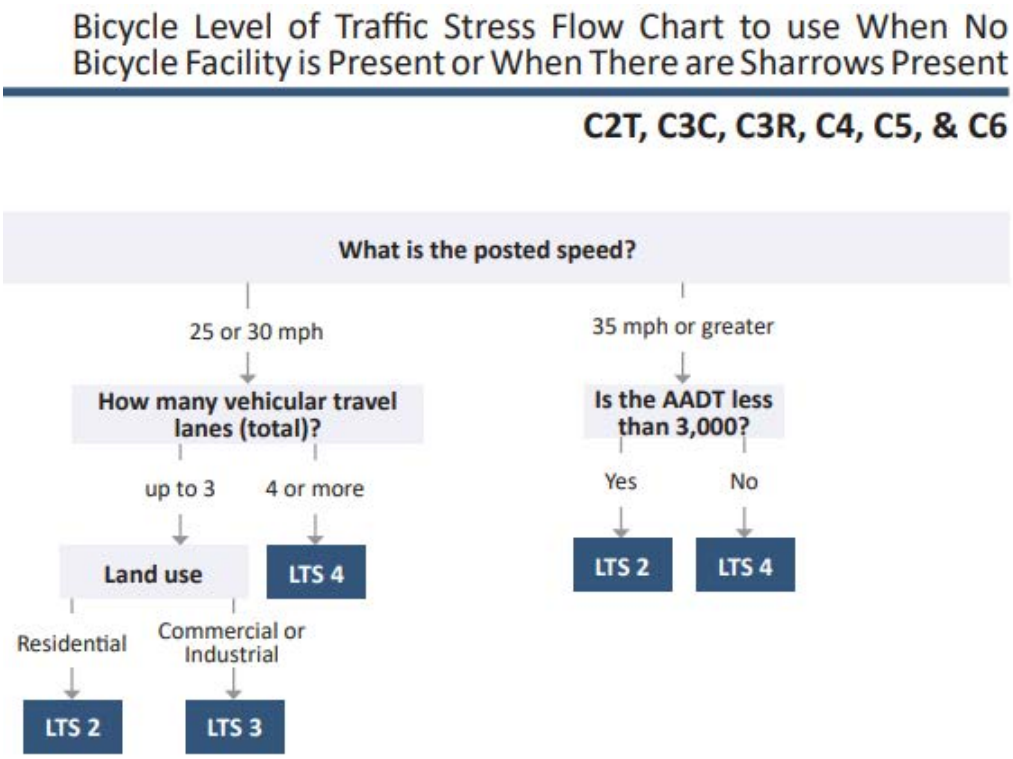
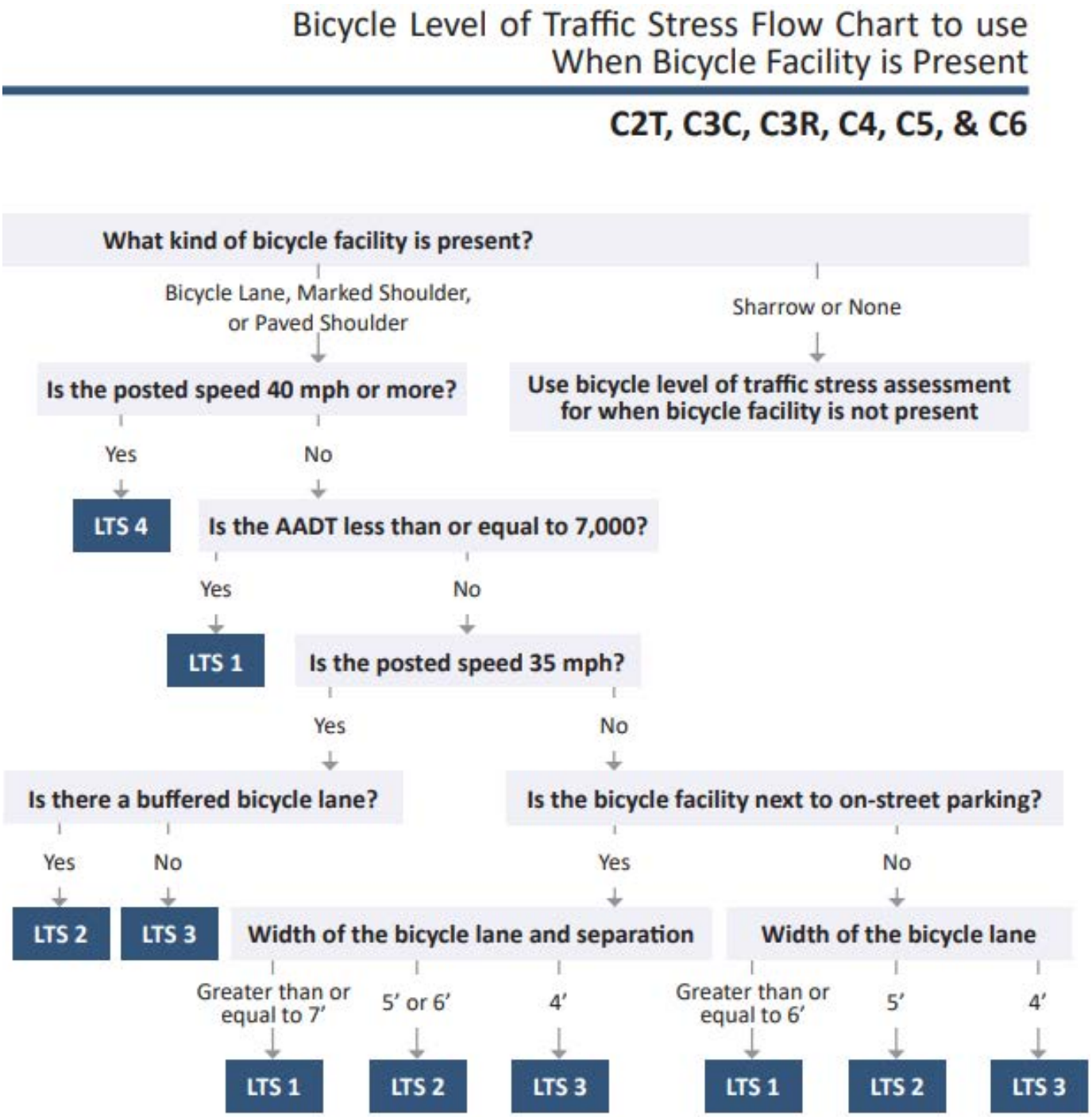


FIGURE 121. BICYCLE LEVEL OF TRAFFIC STRESS FLOW CHART WITHOUT FACILITY



APPENDIX C:

REFERENCE GUIDE TO BICYCLE FACILITY SELECTION



Source: Kittelson

REFERENCE GUIDE TO BICYCLE FACILITY SELECTION

Context	Posted Speed	AADT	Minimum Requirement		Recommended		Standard Sidewalk Width
			Bicycle Facility	Width	Bicycle Facility	Width	
C1/C2	50–70 MPH		Paved shoulder	4 feet	Paved shoulder or shared use path[1]	4+ feet or 10–14 feet	5 feet
C2T	25–30 MPH	< 7,000	Marked shared lane		Buffered bicycle lanes	6–7 feet	6 feet
		≥ 7,000	Conventional bicycle lane	5–6 feet	Separated bicycle lanes	7+ feet	6 feet
	35 MPH		Buffered bicycle lane	6–7 feet	Separated bicycle lanes or shared use path[2]	7+ feet or 10–14 feet	6 feet
C3	35–45 MPH		Buffered bicycle lane	6–7 feet	Separated bicycle lane or shared use path[2]	7+ feet or 10–14 feet	6 feet
	50–70 MPH		Shared use path	10–14 feet	Shared use path	10–14 feet	
C4	25–30 MPH	< 7,000	Marked shared lane		Buffered bicycle lane	6–7 feet	6 feet
		≥ 7,000	Conventional bicycle lane	5–6 feet	Separated bicycle lane	7+ feet	6 feet
	35–45 MPH		Buffered bicycle lane	6–7 feet	Separated bicycle lane	7+ feet	6 feet
C5	25–30 MPH	< 7,000	Marked shared lane		Buffered bicycle lane	6–7 feet	10 feet
		≥ 7,000	Conventional bicycle lane	5–6 feet	Separated bicycle lane	7+ feet	10 feet
	35–45 MPH		Buffered bicycle lane	6–7 feet	Separated bicycle lane	7+ feet	10 feet
C6	25–30 MPH	< 7,000	Marked shared lane		Buffered bicycle lane	6–7 feet	12 feet
		≥ 7,000	Conventional bicycle lane	5–6 feet	Separated bicycle lane	7+ feet	12 feet

[1]Shared use paths should be prioritized on rural corridors that attract a high volume of cyclists (FDM 224).

[2]For curbed roadways it is preferable to install one-way separated bicycle lanes on both sides of the roadway. If one-way separated bicycle lanes cannot be installed, two-way separated bicycle lane or shared use path should be considered. In areas with high pedestrian demand or more vulnerable users, a separated bicycle lane is preferred over a shared use path (FDM 224).