

Hillsborough County

# North Airport Redevelopment Area

Infrastructure Assessment

February 2022



## Accommodation Statement

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## Executive Summary

In 2016, the Hillsborough County Economic Development Department created the Targeted Redevelopment Program to enhance and encourage development within several pilot areas. The primary objective of the program is to encourage private sector investment in sites and buildings that will encourage retention and attraction of businesses and jobs for the communities identified as pilot areas. One of these pilot areas is the North Airport Redevelopment Area. The purpose of the Infrastructure Assessment is to evaluate how well the current transportation, utility, and stormwater infrastructure will support infill redevelopment, redevelopment, and economic development in the North Airport Redevelopment Area, consistent with the Targeted Redevelopment Program goals.

This Infrastructure Assessment includes a Transportation Assessment (page 13) identifying locations for capacity, safety, mobility, and roadway condition improvements based on context sensitive users including pedestrians, cyclists, commuters, freight and commercial vehicles. The improvements identified in the Transportation Assessment seek to improve the roadway conditions of users and connections that promote development in the study area. Improvements in the highest areas of need include intersection safety improvements, complete street improvements including speed management and dedicated user facilities, and pavement rehabilitation or preventative treatments.

The Utility Assessment (page 34) estimates the available water and wastewater treatment plant capacity and potential transmission line upgrades necessary to better serve the existing development and support infill and redevelopment in the study area. Improvements in the highest areas of need include sewer system extension, converting septic to sewer facilities, and water system extension or replacement.

The Vulnerability Assessment (page 42) identifies areas with the highest flood potential. These locations should be a focus of flood mitigation and adaptation strategies to improve conditions for the existing development and promote redevelopment in the study area. Improvements in the highest areas of need should include roadway and area flood exposure treatments which could include but is not limited to hardening and elevating infrastructure, additional stormwater storage, bioswales, and landscaping.

The recommended actions (page 52) are a summary of the assessment findings and identification of the highest areas of need and respective recommended infrastructure improvements. A map of the recommended improvements is shown on page 55, Figure 22. A summary of assessment measures and improvement benefits is provided in the Assessment Matrix in Appendix A. The matrix may be used to further prioritize and identify improvement projects following more detailed project scope definition through analyses, public outreach and coordination with responsible parties including Hillsborough County departments, City of Tampa, Florida Department of Transportation, Tampa International Airport, and CSX.



## Section 1

# **Introduction and Context**



# Introduction and Context

## Background

In 2016, the Hillsborough County Economic Development Department created the Targeted Redevelopment Program to enhance and encourage development within several pilot areas. The primary objective of the program is to encourage private sector investment in sites and buildings that will encourage retention and attraction of businesses and jobs for the community identified as pilot areas. One of these pilot areas is the North Airport Redevelopment Area.

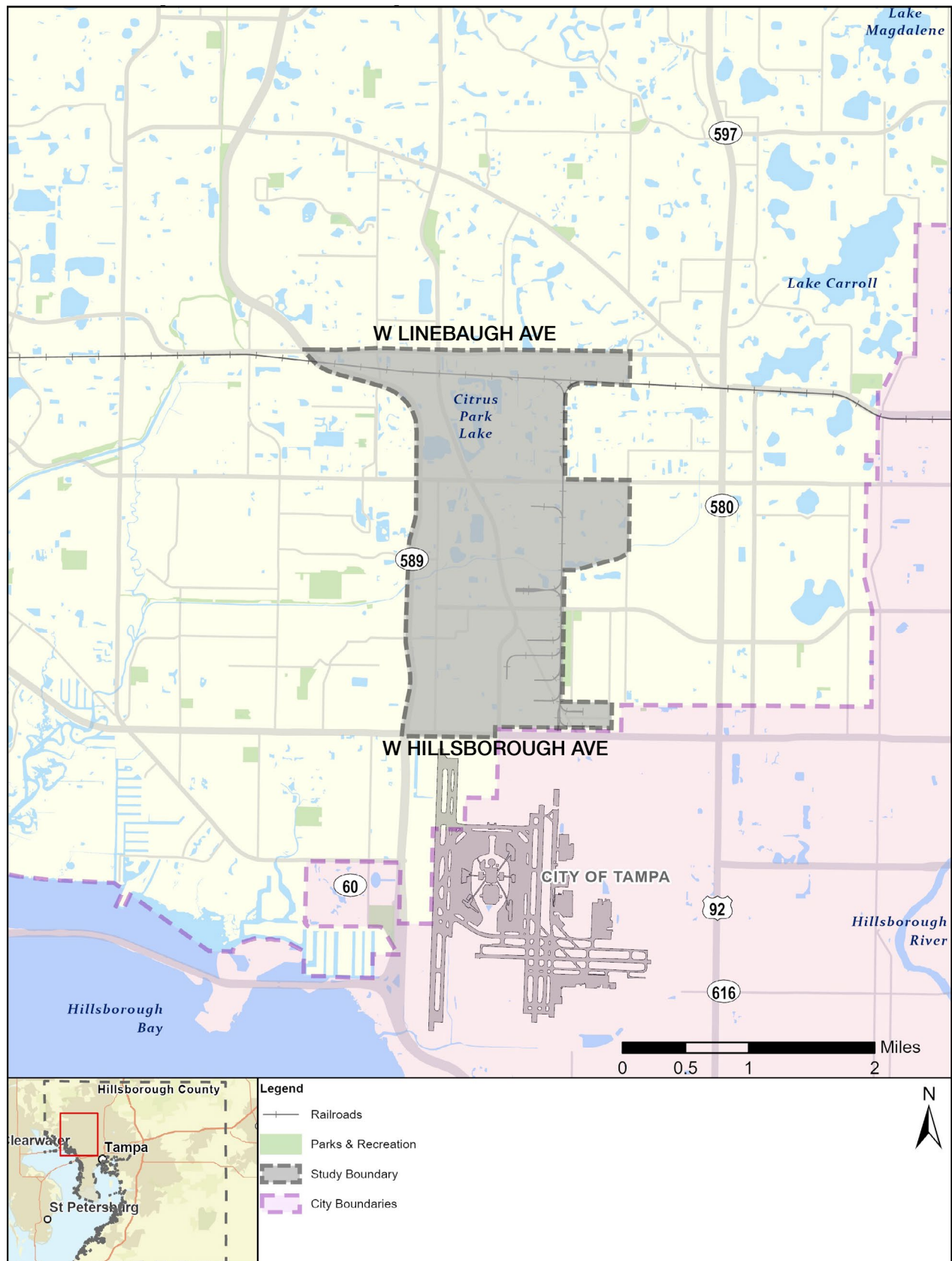
The North Airport Redevelopment Area, located in central Hillsborough County north of the Tampa International Airport, is comprised of approximately 1,426 gross acres of land. As shown in **Figure 1**, the redevelopment area is bounded by Linebaugh Avenue to the north, Hillsborough Avenue/State Road 580 to the south, Veteran's Expressway to the west, and the Woodland Center business park to the east. Freight rail lines traverse the north and east sides of the redevelopment area. The redevelopment area also borders the Tampa International Airport, as shown in **Figure 1**. Therefore, the expansion of Tampa International Airport will impact the redevelopment area and require thoughtful planning for the future.

## Project Purpose

The purpose of this assessment is to evaluate the current infrastructure in terms of how well the North Airport Redevelopment Area will support infill and redevelopment consistent with the economic development goals for the area. The infrastructure assessment, including a resiliency analysis, is the starting point to determine future investment and make infrastructure decisions. Another consideration of this study is the relationship between the redevelopment area as a whole and the surrounding major activity centers and future expansion opportunities. This infrastructure assessment provides recommendations that Hillsborough County can consider and implement as part of continued planning efforts in the North Airport Redevelopment Area. The recommendations focus on identifying current inadequacies in the existing critical infrastructure, as well as opportunities to plan for enhanced infrastructure. A critical element in the assessment will be providing recommendations to improve the resiliency of the existing infrastructure in the redevelopment area.



**Figure 1. North Airport Redevelopment Area**



## Study Area Context

### Study Boundary

The study boundary was developed based on the redevelopment area, as shown in **Figure 2**. The redevelopment area is bounded by W Linebaugh Avenue to the north, W Hillsborough Avenue/State Road 580 to the south, Veteran's Expressway to the west, and Woodland Center business park to the east

### Existing Land Use

The existing land uses within the redevelopment area are primarily non-residential. As shown in **Figure 3**, a large portion of the existing land uses include industrial, commercial, public/quasi-public/institutions, and vacant land, as well as some single-family residential uses dispersed throughout.

### Community Facilities

In the North Airport Redevelopment Area there are community facilities that include a school and an emergency service facility which are identified in **Figure 3**. There are no parks in the redevelopment area. There is one park, West Park, located just outside the redevelopment area along the east boundary.

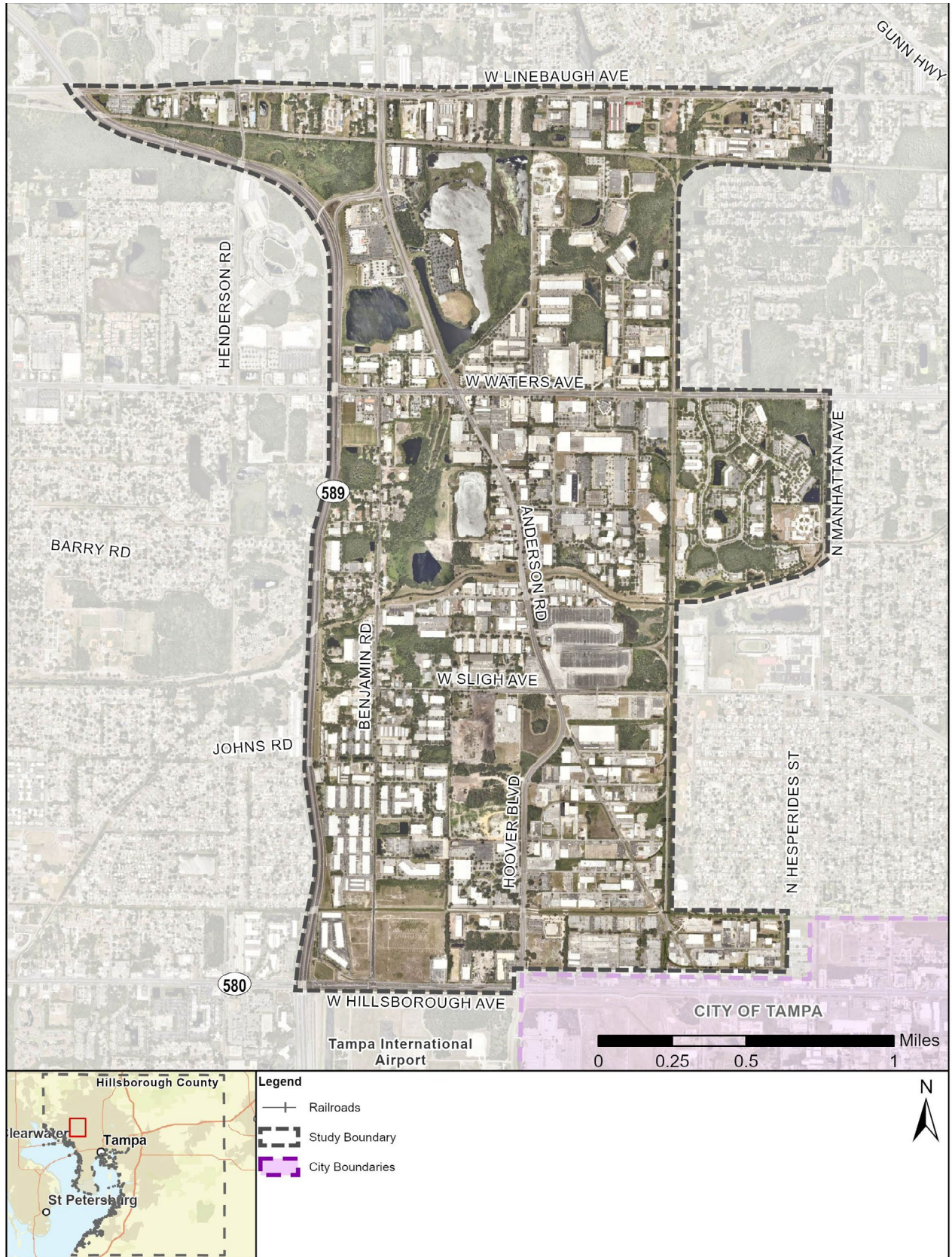
The one elementary school located in the redevelopment area is Crestwood Elementary which is located off N Manhattan Avenue. There is also a middle school located just outside the redevelopment area boundary, Pierce Middle School. There are other nearby schools that are located outside the redevelopment area including Leto High School, Alexander Elementary, Morgan Woods Elementary, Webb Middle School, Town and Country Elementary. **Table 1** shows existing and projected school capacities to the 2024-2025 school year of Crestwood Elementary. Crestwood Elementary has available capacity and is not projected to reach maximum capacity through 2025.

**Table 1. Existing and Projected School Capacities**

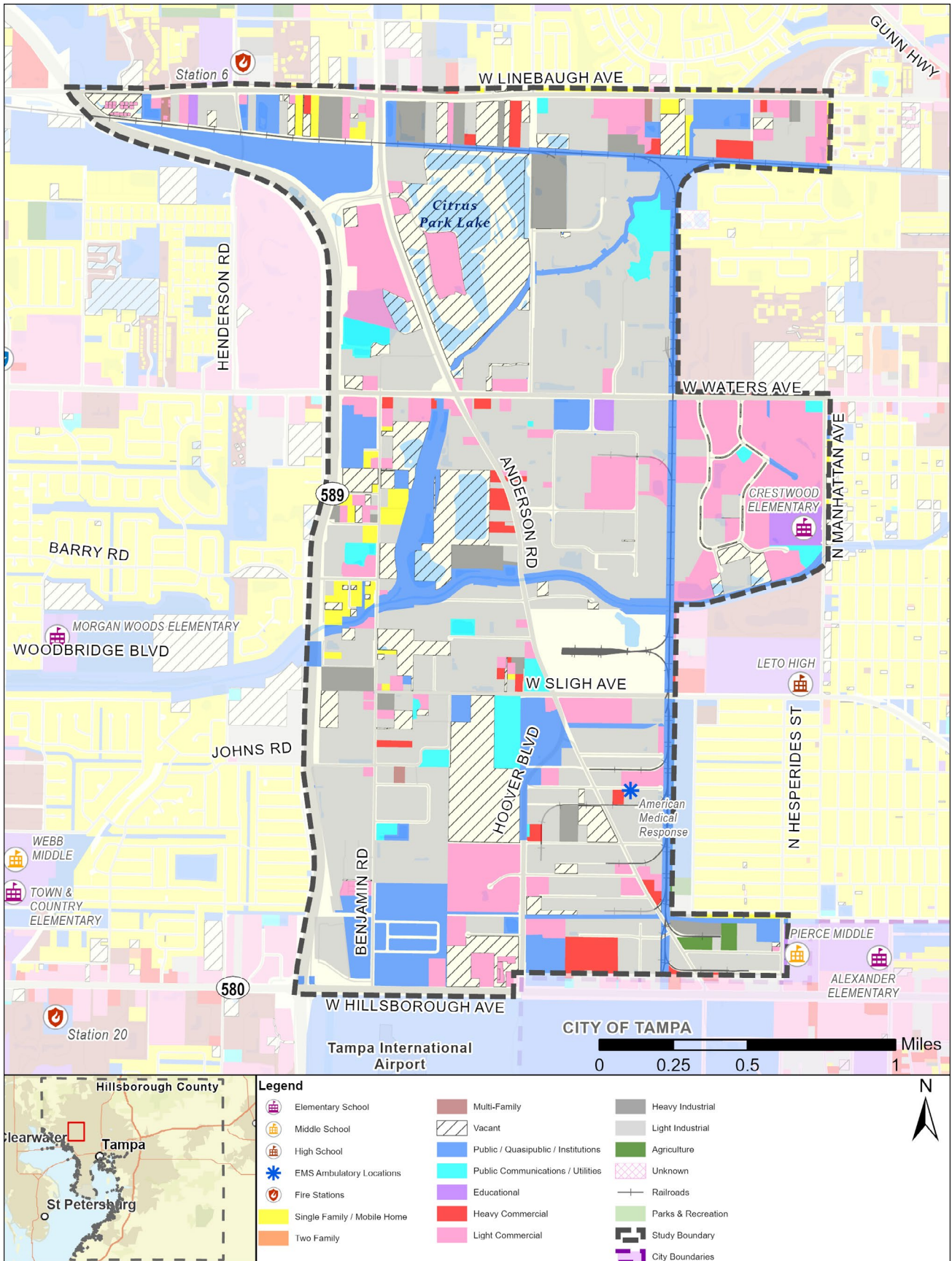
School	Actual 2019-2020 FISH Capacity	Actual 2019-2020 Utilization	Projected 2024-2025 Utilization
Crestwood Elementary	1,089	79%	80%

There is one emergency ambulatory service location within the redevelopment area. The American Medical Response is located off Hoover Road in the southeast section of the redevelopment area. There is one fire station, Fire Station 6, which is located just outside the redevelopment area to the northeast off W Linebaugh Avenue.

**Figure 2. Study Area Boundary**



**Figure 3. Existing Land Use and Community Facilities**



## Business and Demographics

An estimated 1,565 businesses are located in the redevelopment area that support 22,940 employees, based on 2021 ESRI Business Analyst data. The breakdown of businesses by North American Industry Classification System (NAICS) category are shown in **Table 2**. Retail Trade and Professional, Scientific and Tech Services make up the largest percent of total businesses in the redevelopment area at 12.9%, and 12.1%, respectively. The other significant businesses in the area based on percent of employees include manufacturing at 14.2%, Professional, Scientific and Tech Services at 12.2%, and wholesale trade at 11.6%. Many of the businesses are accessed by freight and truck, requiring a large footprint for parking lots and rail right-of-way.

**Table 2. NAICS Business Types**

2021 ESRI Forecast	Total Business	Total Employees
	1,565	22,940
NAICS Code	Percent of Total Business	Percent of Total Employees
Retail Trade	12.9%	9.8%
Professional, Scientific & Tech Services	12.1%	12.2%
Construction	11.0%	8.0%
Unclassified Establishments	10.7%	0.7%
Wholesale Trade	9.8%	11.6%
Manufacturing	6.8%	14.3%
Other Services (except Public Administration)	5.9%	3.4%
Health Care & Social Assistance	5.2%	6.5%
Administration & Support & Waste Management & Remediation	4.5%	7.6%
Transportation & Warehousing	4.2%	2.9%
Real Estate, Rental, & Leasing	4.0%	4.1%
Finance & Insurance	3.7%	2.8%
Accommodation & Food Services	3.1%	2.8%
Information	2.4%	6.2%
Arts, Entertainment & Recreation	1.5%	1.3%
Management of Companies & Enterprises	1.0%	0.4%
Education Services	0.8%	4.7%
Public Administration	0.2%	0.7%
Agriculture, Forestry, Fishing & Hunting	0.1%	0.0%
Mining	0.1%	0.0%
Utilities	0.0%	0.0%

Source: ESRI Business Analyst (2021)

The United States Census Bureau tool, OnTheMap, was used to summarize employee inflow and outflow within the study area based on most recently available data (2019). It should be noted that the number of employees vary between the OnTheMap and ERSI projection due to different data sources, timeframes and analysis methodologies. According to the OnTheMap application, approximately 99% of the labor market (employees in the area or residents in the area) comes from outside of the study area. The remaining labor market (1%) includes those who leave the study area for work, and who live and work in the study area.

The North Airport Redevelopment Area has an estimated population of 129 people and 59 households, based on ESRI 2021 projections. Residential uses are located on the edge of the redevelopment area including single-family homes south of W Linebaugh Avenue and east of Veteran’s Expressway. Population and employment statistics are included in **Table 3**.

Vulnerable populations in the redevelopment area include those 65 years old or older, which make up a higher percentage of the study area population compared to that of Hillsborough County. In addition, the households with an income less than \$25,000 represent a vulnerable population, while the median household income in the study area is greater than the County’s median household income, representing a less vulnerable population. A comparison of socioeconomic statistics for the redevelopment area and Hillsborough County is provided in **Table 4**.

**Table 3. Employment and Population Statistics**

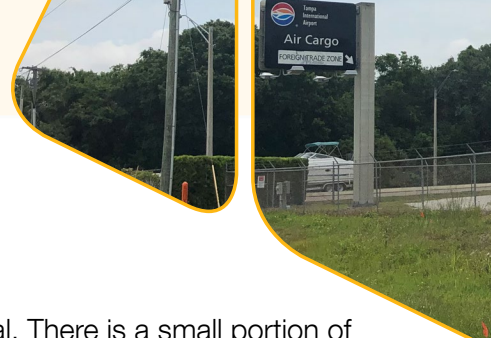
Population and Employment	North Airport Redevelopment Area
Total Employees	22,940
Total Population	129
Employee/Residential Population Ratio	177.83

Source: ESRI Business Analyst (2021)

**Table 4. Socioeconomic Data**

Socioeconomic Statistics	North Airport Redevelopment Area	Hillsborough County
<b>Income</b>		
Median Household Income	\$61,953	\$60,625
Percent of Households with Income Below \$25,000	17.0%	18.1%
<b>Age</b>		
Percent of Population 65 Years Old and Older	16.3%	15.7%
Percent of Population Younger than 15 Years Old	18.6%	18.1%
<b>Race</b>		
Percent of Population - Minority	26.2%	32.4%
Percent of Population - Hispanic Origin	52.7%	31.0%

Source: ESRI Business Analyst (2021)



## Future Land Use and Planned Development

The primary future land use in the redevelopment area is identified as Light Industrial. There is a small portion of the redevelopment area that is categorized as office commercial, community mixed-use, and residential. There is a limited amount of residential land in the redevelopment area and the Market Study completed for the area in 2017 suggested limited residential growth is anticipated. The Market Study noted there is already a diverse mix of workplace uses including a significant amount of office use and warehouse space as well as four hotels.

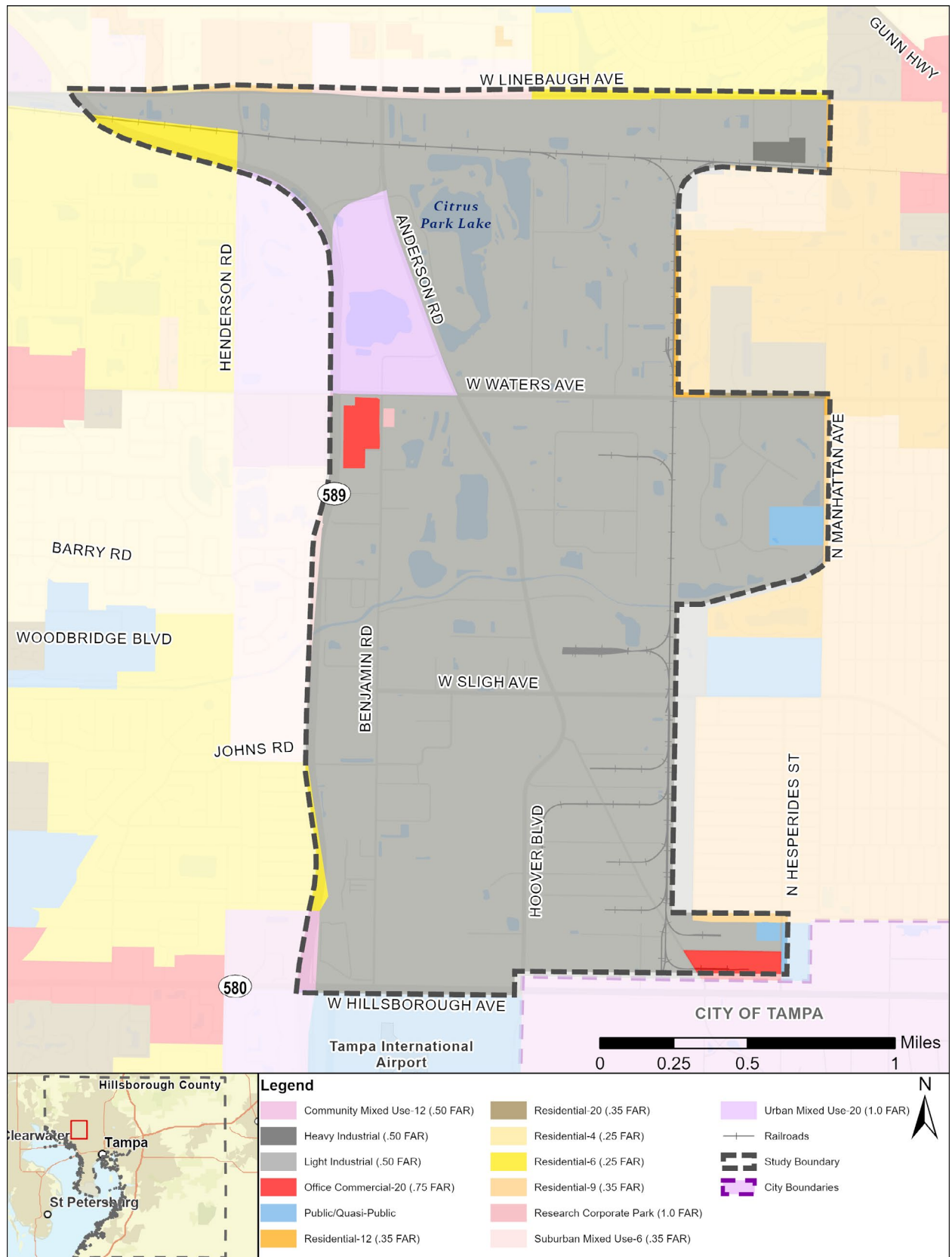
The Market Study noted the market strengths for this area include the central location in the region, regional highway access, proximity to the Westshore business district, and proximity to the airport. Due to allowable height restrictions for buildings adjacent to the airport, there is a possibility of impacts to potential redevelopment in the southern portion along W Hillsborough Avenue and W Knox Street. Additionally, the Market Study included discussions with CSX representatives. The discussions revealed that there are several existing railroad tracks and spurs in the North Airport Redevelopment Area are not owned or maintained by CSX.

Currently, there are approximately 395 acres of Planned Development (PD) within the redevelopment area. The planned developments may include a mixture of uses including residential units, office, and commercial opportunities. PD and competitive sites in the area include two competitive sites available for lease, two planned out competitive sites, and two competitive sites with available land that are zoned for industrial uses.

There are seven competitive sites identified in the North Airport Redevelopment Area. The Competitive Sites Program identifies locations with the capacity to support targeted office/industrial development and crafts policies and programs to guide public sector engagement and investment to meet economic development objectives. Most competitive sites have an approved Planned Development or Development of Regional Impact (DRI) Development Order with a minimum of 100,000 square feet of office and/or industrial entitlements or the site has appropriate zoning that allows for a minimum of 100,000 square feet of office/industrial targeted industry development. Competitive sites located in the redevelopment area have a lower threshold with a minimum of 50,000 square feet.

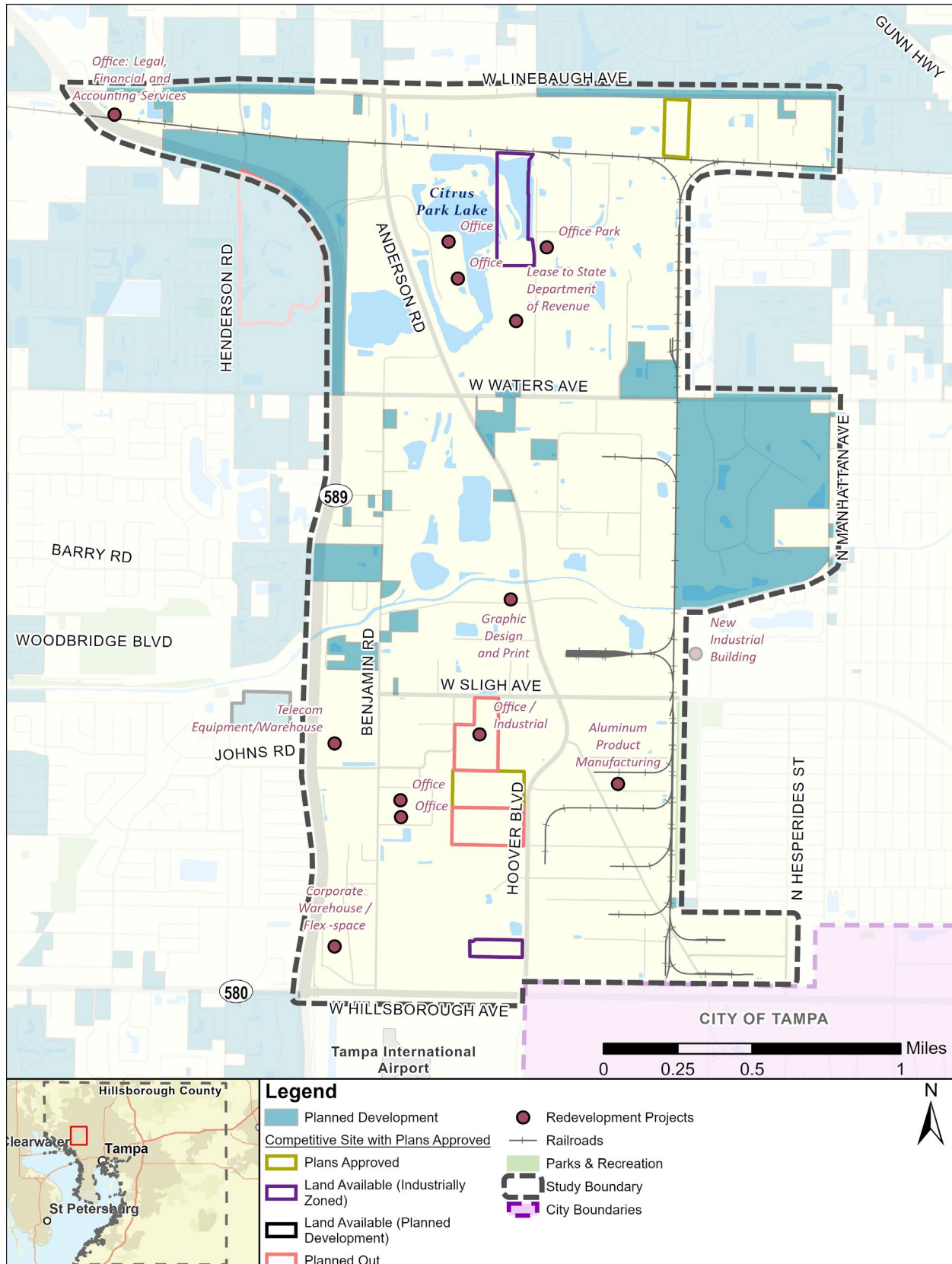
The redevelopment project locations shown in [Figure 5](#) are part of Hillsborough County's Targeted Redevelopment Grant program. The grant program targets development and uses in areas that are traditionally seen as declining in value or are underutilized relative to their location and existing built infrastructure. In the North Airport Redevelopment Area, these sites include site development and construction for manufacturing and logistics uses.

**Figure 4. Future Land Use Map**





**Figure 5. Planned Development and Competitive Sites**



## Section 2

# Transportation Assessment

# Transportation Assessment

The North Airport Redevelopment Area is generally bounded by state owned principal arterial roadways including Veterans Expressway to the west and Hillsborough Avenue to the south, County owned major arterial Linebaugh Avenue, and a CSX rail line to the east. Access into the study area is provided by major arterials including Waters Avenue, Sligh Avenue, and Anderson Road. These roadways provide access to employment areas for vehicles including trucks, but present barriers for vulnerable users like pedestrians and cyclists. Benjamin Road is defined as a collector roadway and is also a designated truck route. The majority of the roadways within the study area have Suburban Commercial context classification which is envisioned to include user facilities for higher non-vehicle activity. The roadway classifications and characteristics are described further in the following Transportation Assessment.

## Congestion Management

### Roadway Level of Service

Peak volume to capacity (v/c) data from the 2019 Level of Service (LOS) Report was reviewed as the most recently available data due to COVID-19 impacts to traffic conditions. Capacity is based on the adopted LOS for each roadway. A v/c ratio of 1.00 or greater indicates that the volume exceeds the capacity of the road and indicates areas with a high amount of peak congestion. The roadway v/c ratios and average daily traffic are shown in [Table 5](#) and [Figure 6](#).

**Table 5. Roadway V/C Ratios**

Roadway	Limits	Peak V/C	AADT
Anderson Road	City limits to Hoover Boulevard	0.76	10,629
	Sligh Avenue to Waters Avenue	0.68	25,207
	Waters Avenue to Linebaugh Avenue	0.88	33,000
Barry Road	Hanley Road to Benjamin Road	0.51	6,208
Benjamin Road	Hillsborough Avenue to Sligh Avenue	0.76	14,829
	Sligh Avenue to Waters Avenue	1.00	16,201
Henderson Road	Waters Avenue to Linebaugh Avenue	0.95	13,760
Hillsborough Avenue	Veteran's Expressway to Hoover Road	1.15	62,158
Hoover Boulevard	Hillsborough Avenue to Sligh Avenue	0.46	17,000
Linebaugh Avenue	Veteran's Expressway to Gunn Hwy	0.93	37,610
Manhattan Avenue	Henry Avenue to Humphrey	0.72	10,069
Sligh Avenue	Benjamin Road to Manhattan Avenue	0.58	9,050
Veterans Expressway	Memorial Hwy to Anderson Ramp	0.63	92,000
	Anderson Ramp to Gunn Hwy	0.49	72,600
Waters Avenue	Veteran's Expressway to Dale Mabry Hwy	0.90	50,500

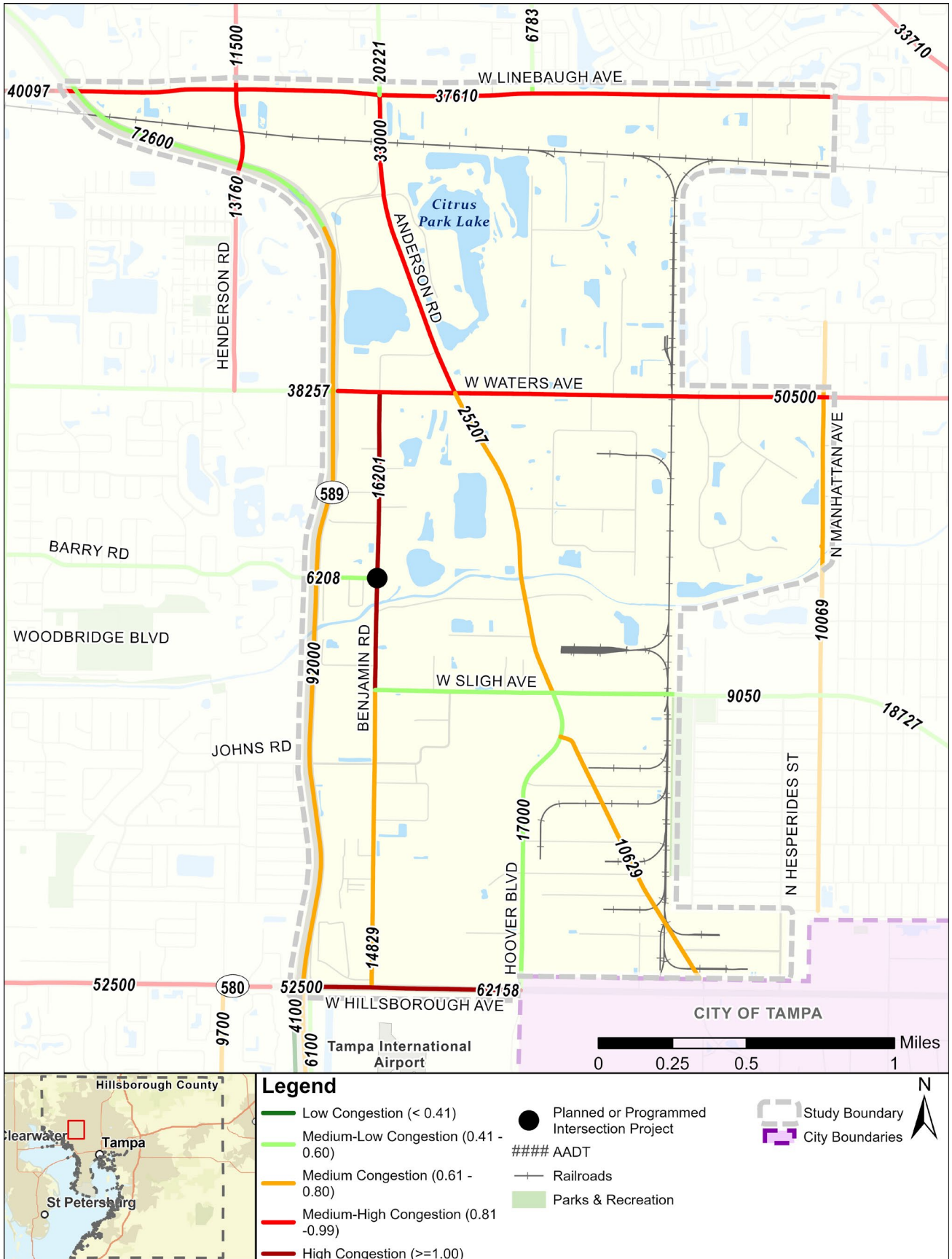
## Travel Time Reliability

To measure travel time reliability, Travel Time Index (TTI) data was documented from Iteris Clearguide for 2019. The Travel Time Index is the ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. The TTI was documented for the a.m. peak-hour period (7 a.m. to 9 a.m.) and the p.m. peak-hour period (4 p.m. to 6 p.m.).

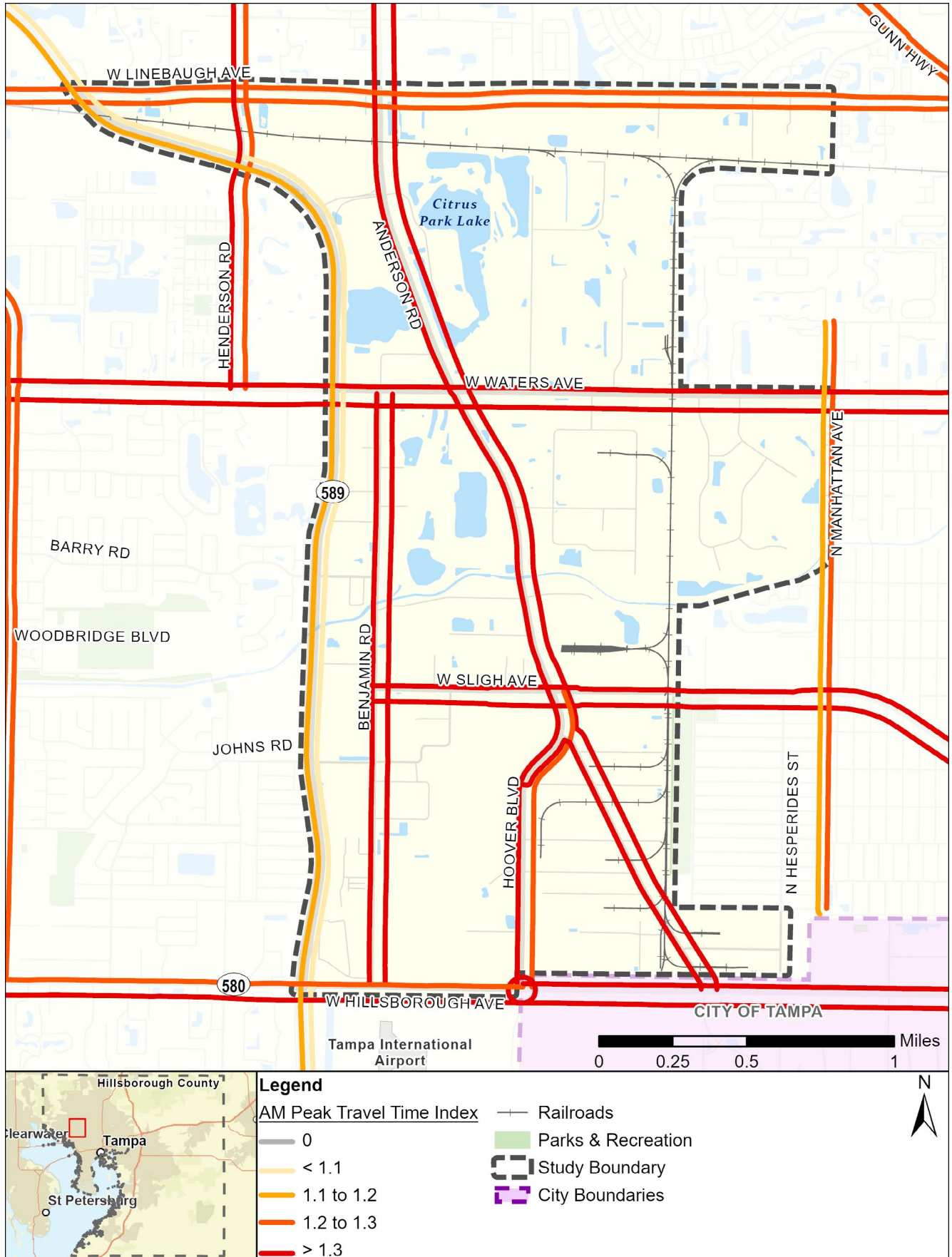
The morning TTI, **Figure 7**, indicates travel times greater than 30% of the free-flow speed travel time for both directions of W Sligh Avenue. Additionally, in the morning the northbound traffic along Benjamin Road and the southbound traffic along Anderson Road, Hoover Boulevard, and Henderson Road exceed the 30% free-flow speed travel time.

The evening TTI, **Figure 8**, indicates travel times greater than 30% of the free-flow speed travel time on both directions of W Waters Avenue, Hoover Boulevard, W Sligh Avenue, and the northbound direction along Henderson Road, Anderson Road, and Benjamin Road as well as the eastbound direction of W Hillsborough Avenue. The patterns suggest variability in travel time during peak periods for commuting traffic utilizing the northbound and southbound roads within the redevelopment area.

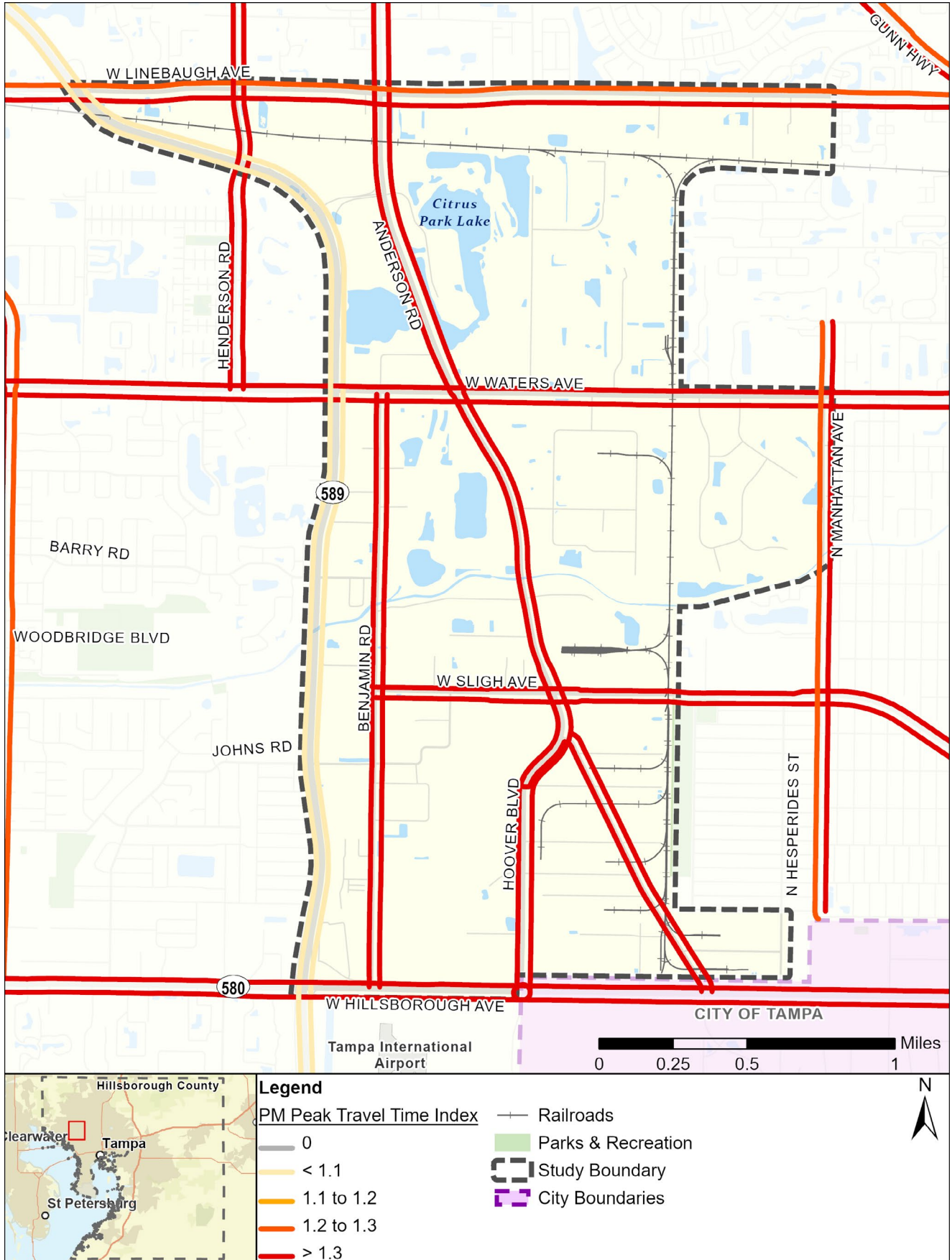
**Figure 6. Peak Volume to Capacity**



**Figure 7. AM Travel Time Index (TTI)**



**Figure 8. PM Travel Time Index (TTI)**



## Trucking and Freight

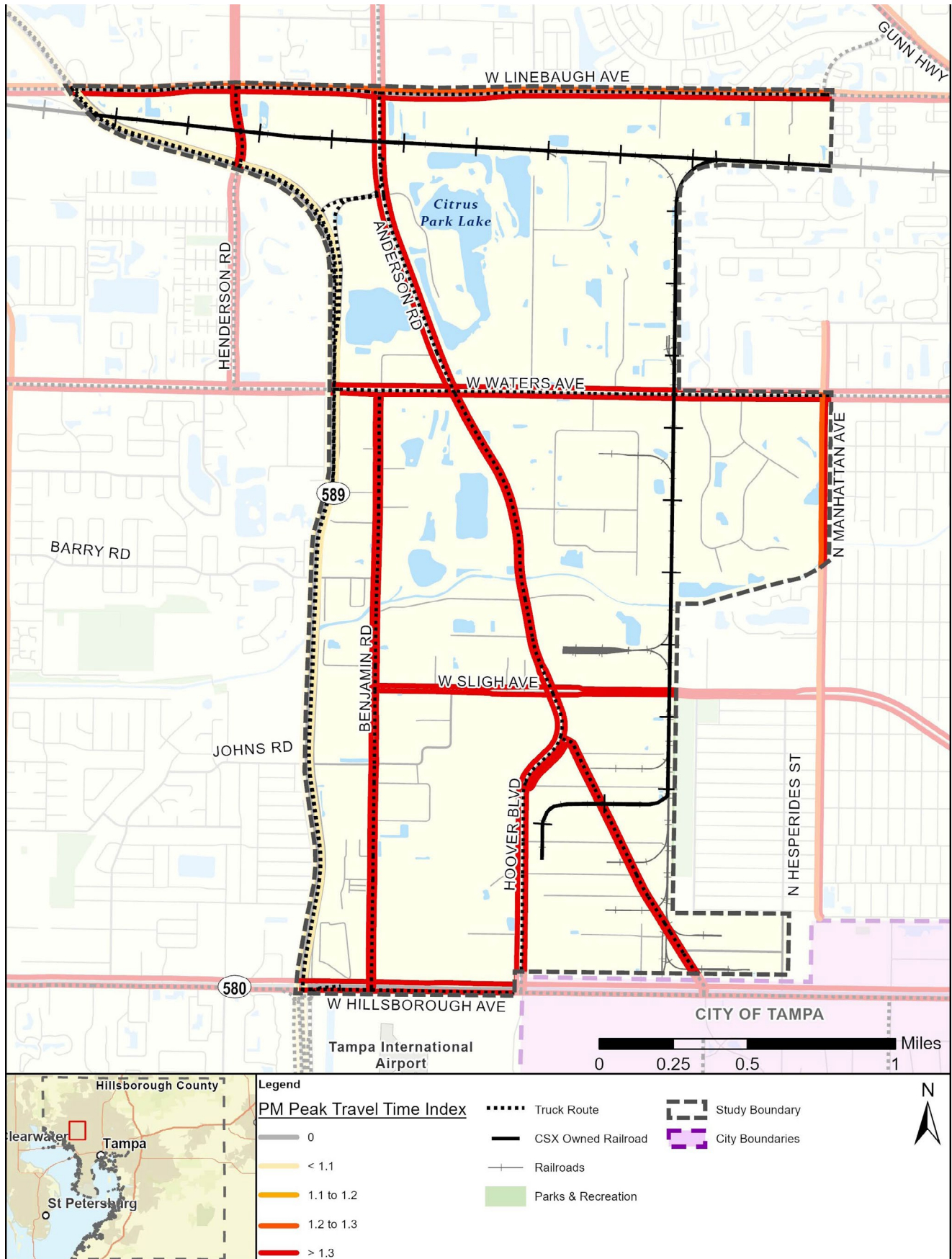
As defined in the Hillsborough TPO's 2016 Freight Logistics Zone Strategic Plan, the North Airport Redevelopment Area is within a logistics cluster with heavy freight activity. As a result of the industrial uses and freight-oriented businesses, several truck routes and rail lines connect to and serve the redevelopment area. To better serve industrial and freight-oriented uses, it is important for the identified routes to be reliable from a travel time and pavement condition perspective. Truck routes are shown in **Figure 9** with underlying p.m. peak-hour TTI, and in **Figure 10** with the underlying pavement condition. Pavement condition is discussed further beginning on page 22.

As noted in the Market Study for the redevelopment area, CSX representatives have determined several of the existing tracks and spurs in the area are not maintained or owned by CSX. The mix of CSX and private ownership limits the ability to improve rail connections that can ultimately improve the shipping activity in the area and region, an expressed interest by CSX. The tracks and spurs owned by CSX are shown in **Figure 10**.

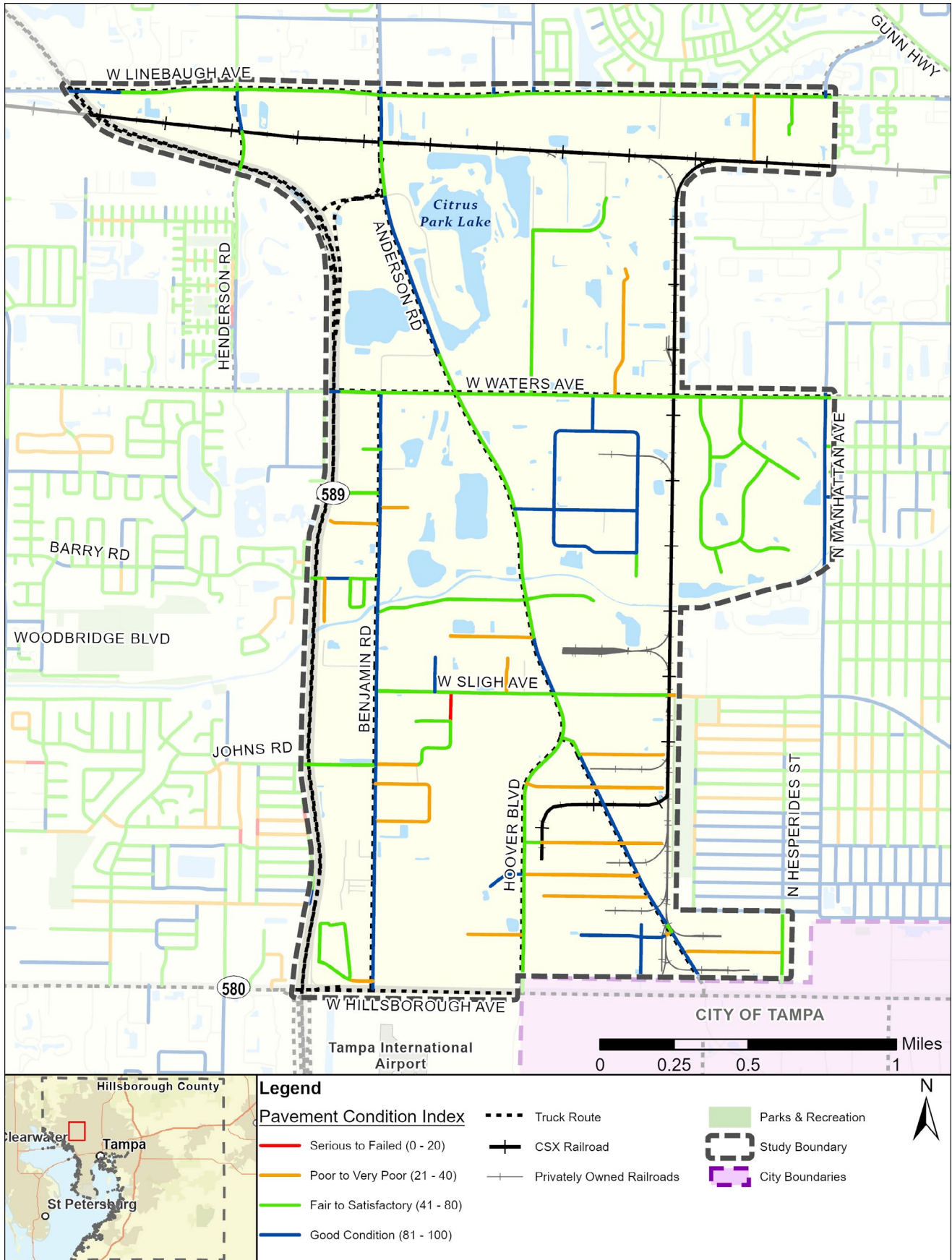
Based on rail volumes from the Federal Railroad Administration, 1 train per week operates on the CSX track (Drew Spur) in the North Airport Redevelopment Area. This spur has low utilization compared to the activity countywide which may be attributed to the termini within the redevelopment area. The CSX freight rail use has been reviewed by agencies throughout the region for potential passenger use for over 10 years. Although this segment of the CSX track would not be recommended for passenger use, it connects to other segments that may provide regional commuter rail potential.



**Figure 9. Truck Routes and PM Travel Time Index (TTI)**



**Figure 10. Truck Routes and Pavement Conditions**



## Planned and Programed Projects

Funded and unfunded planned projects aimed to manage congestion within the redevelopment area were reviewed from the Hillsborough County Capital Improvement Program (CIP), Hillsborough TPO, and FDOT. The planned or programmed projects are described below:

- Hillsborough County CIP 69600096: Benjamin Road & Barry Road - installation of signals and milling and resurfacing with varying shoulder widening to improve traffic flow, efficiency and congestion

Adopted as part of the Comprehensive Plan, the Corridor Preservation Plan (CPP) identifies right-of-way, general alignments and standards for transportation corridors to support development patterns as defined in the Future Land Use Element over the 30-year time-frame. The CPP will be updated in 2022. The roadways in the redevelopment area as defined in the Corridor Preservation Plan include the following laneage:


- Anderson Road (6 lanes)
- Benjamin Road (4 lanes)
- Hoover Road (6 lanes)
- Linebaugh Avenue (6 lanes)
- Sligh Avenue (4 lanes west of Anderson, 6 lanes east of Anderson)

# Resurfacing

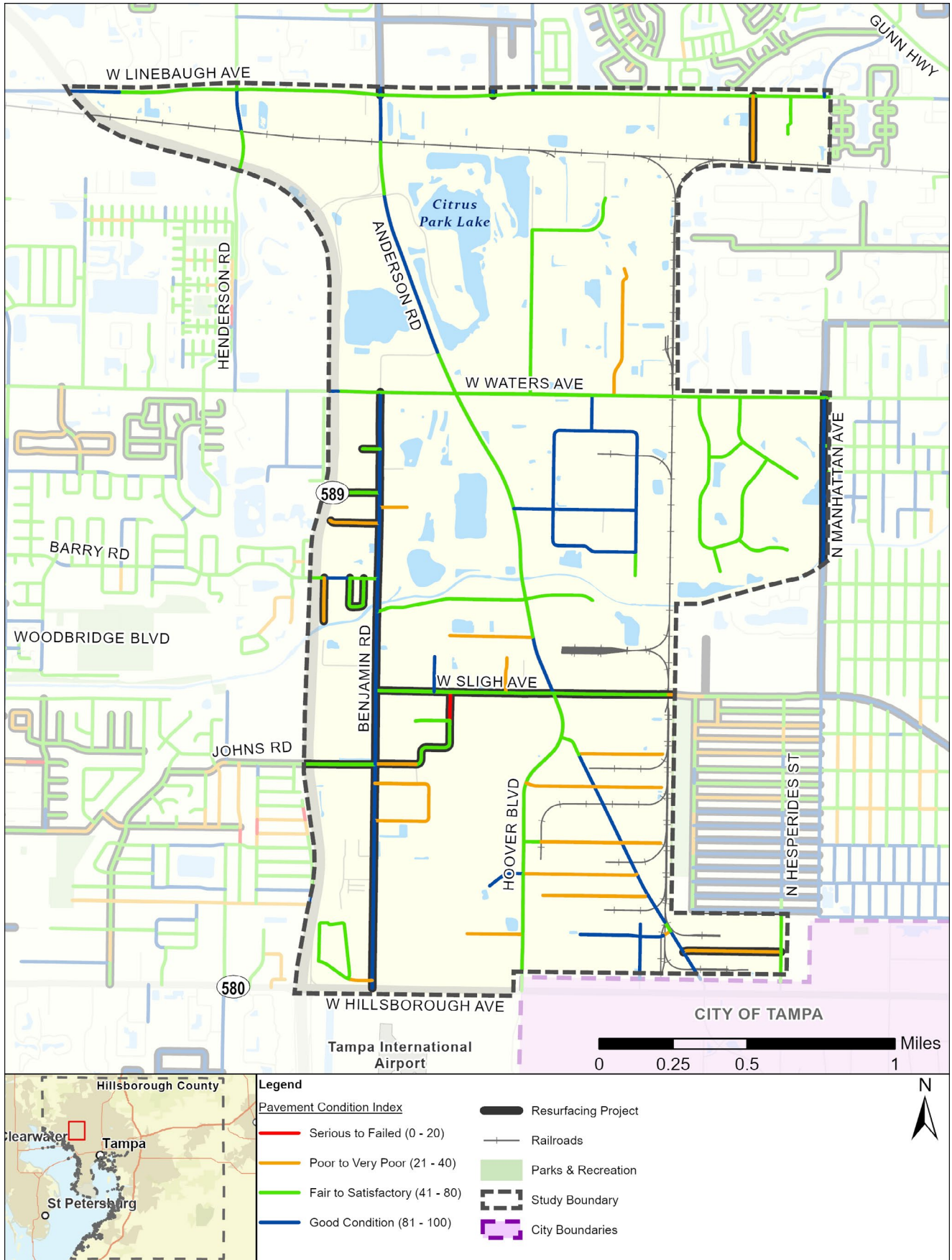
The roadway pavement condition inventory for all non-state roadways within the study area boundary is based on pavement condition data from July 2021. Roadway pavement condition is scored out of 100 to indicate the pavement condition index (PCI). Hillsborough County’s pavement condition target is 55. Approximately 27% of the total linear feet of roadway (143,732 ft) in the redevelopment area has a PCI score of 55 or higher. **Figure 11** shows roadways with the following score categories: Good, Fair to Satisfactory, Poor to Very Poor, and Serious to Failed.

**Figure 11** also shows the planned, unfunded resurfacing projects within the redevelopment area including Sligh Avenue from Benjamin Road to Manhattan Road, Benjamin Road from Hillsborough Avenue to Waters Avenue, and minor local streets connecting from Benjamin Road.

**Table 6. Pavement Condition and Improvements**

<p><b>Good</b></p> 	<p>Roadways identified in good condition are not recommended for improvements at this time.</p>	<p><b>Routine Maintenance</b></p> 
<p><b>Fair to Satisfactory</b></p> 	<p>The roadways are identified as fair to satisfactory conditions and are recommended to be considered for preventative treatments:</p> <ul style="list-style-type: none"> <li>• Hoover Boulevard to Hillsborough Avenue to Sligh Avenue</li> <li>• Linebaugh Avenue from Veterans Expressway to Mullis City Way</li> <li>• Sligh Avenue from Benjamin Road to railroad</li> <li>• Waters Avenue from Veterans Expressway Manhattan Avenue</li> <li>• Local Streets – Barry Road, Johns Road, Hesperides Street, Cheri Court, Thompson Center Court, Jet View Circle, Crenshaw Street, Barry Lane, Gardner Court Drive, Woodland Center Boulevard, Woodland Corporate Boulevard, Cluster Oak Court, Bald Cypress Place, Seedling Circle, Eagle Trail Drive</li> </ul>	<p><b>Preventative Treatments</b></p> 
<p><b>Poor to Very Poor</b></p> 	<p>The following roadways are identified as poor to very poor conditions and are recommended to be considered for major rehabilitation:</p> <ul style="list-style-type: none"> <li>• Local Streets – Johns Road, Hanna Avenue, Knollwood Street, Knox Street, Idlewild Avenue, Clifton Street, Hangar Court, Conaty Drive, Benjamin Center Drive, Pioneer Park Boulevard, Turnmor Drive, Ann Ballard Road, Sunstate Street, and North Trask Street</li> </ul>	<p><b>Major Rehab</b></p> 
<p><b>Serious to Failed</b></p> 	<p>The following roadways are identified as serious to failed conditions and are recommended to be considered for reconstruction:</p> <ul style="list-style-type: none"> <li>• South of Sligh Avenue, Johns Road from Thompson Center Court to Sligh Avenue</li> </ul>	<p><b>Reconstruction</b></p> 

**Figure 11. Pavement Condition and Planned Improvements**



## Mobility and Safety

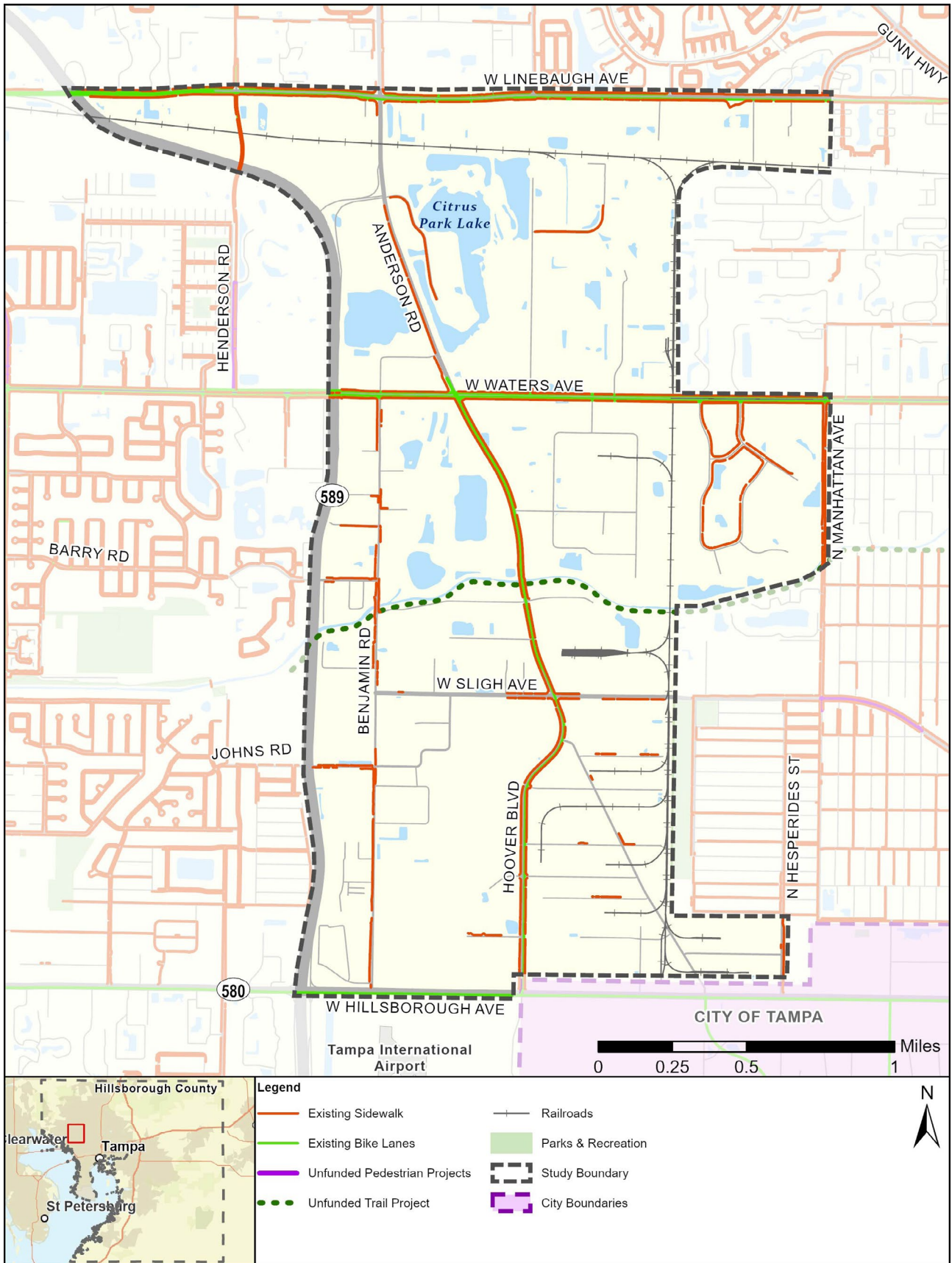
### Multimodal Facilities

Multimodal facilities provide non-vehicle connections to destinations and activity centers. Multimodal facilities in the redevelopment area include sidewalks, bicycle lanes, and connections with Hillsborough Area Regional Transit Authority (HART) routes and stops. Sidewalks are available along W Linebaugh Avenue, W Waters Avenue, and Anderson Road. There are also fragmented portions of the sidewalk located along Sligh Avenue, Benjamin Road, and local roads throughout the redevelopment area (Figure 12). Bicycle facilities are also present in the redevelopment area. Bike lanes are available on W Linebaugh Avenue, W Waters Avenue, W Hillsborough Avenue, Hoover Boulevard, and Anderson Road.

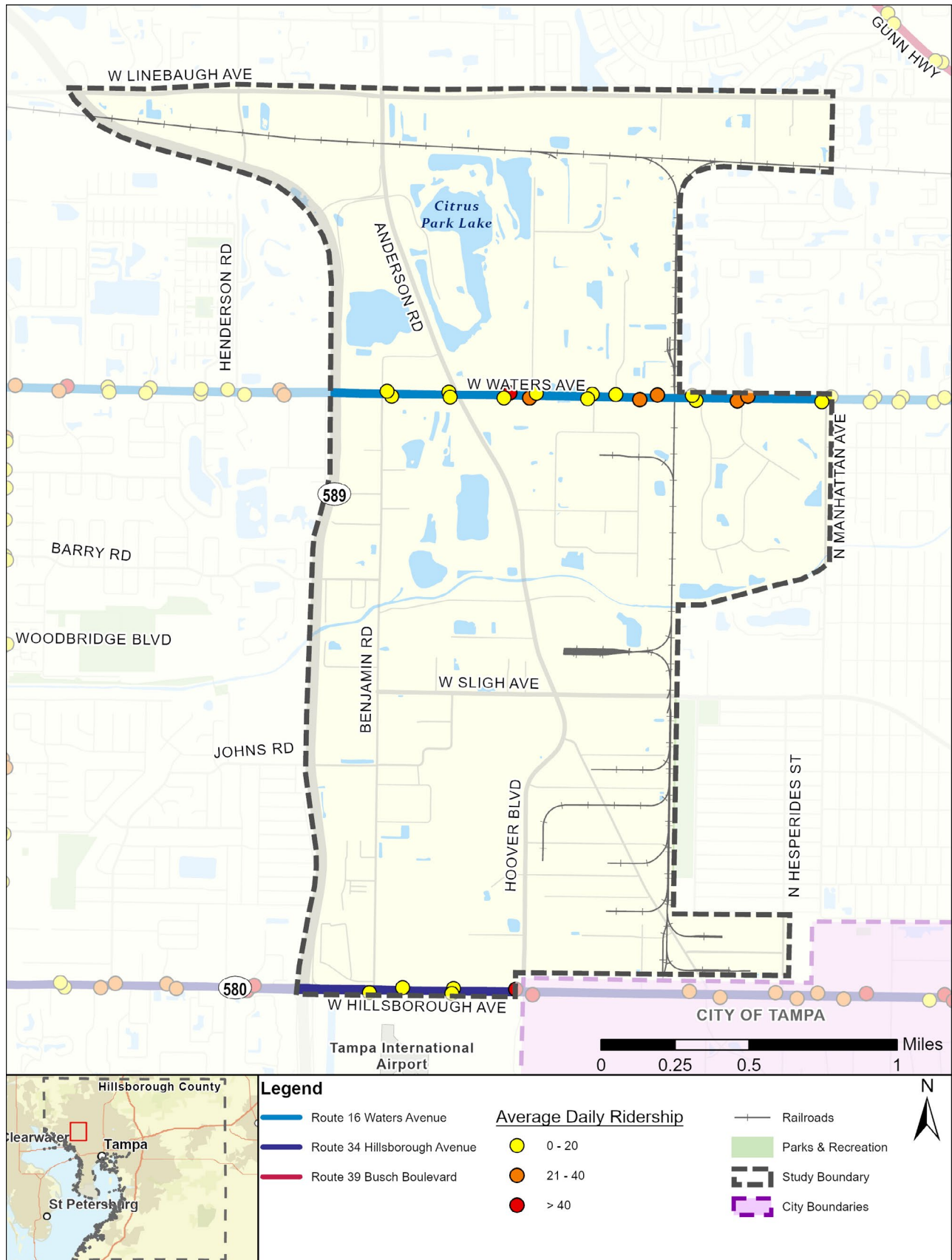
Unfunded multimodal improvements include the Kirby Canal Trail which is proposed to follow the canal through the redevelopment area and connect to the Town N Country Greenway.

HART provides transit service in the redevelopment area via Route 16 on Waters Avenue and Route 34 on E Hillsborough Avenue. Along these routes, the stops at the intersection of Waters Avenue & Comfort Suites and Waters Avenue & Woodland Corporate Boulevard have the highest daily average ridership activity in the redevelopment area (Figure 13). Funded transit improvements identified in HART Transit Development Plan (TDP) in the redevelopment area include 15-minute frequency enhancements for Route 34 and the addition of Sunday service for Route 16. A new on-demand service area for HART's HyperLINK service is also identified as a funded TDP improvement in the redevelopment area.

**Figure 12. Existing and Planned Pedestrian and Bicycle Facilities**



**Figure 13. HART Routes with Stop Activity**





## Safety

Peak hour crash data from 2015 to 2019 was reviewed for the redevelopment area based on Hillsborough County data. During this timeframe, 1,242 crashes were reported within the redevelopment area (**Table 7**). Of those crashes, there were no fatalities reported but 28 crashes reported resulted in 33 serious injuries (**Table 8**). Except for crashes reported on the Veteran's Expressway, most serious injury crashes were rear end crashes reported on W Waters Avenue.

**Table 7. Crashes by Crash Type (Peak Hour, 2015 - 2019)**

Crash Type	2015	2016	2017	2018	2019	Total	Percent
Angle	24	18	36	27	25	130	10%
Bike	4	2	0	0	1	7	1%
Head On	6	3	2	7	6	24	2%
Hit Fixed Object	11	8	8	9	15	51	4%
Hit Non-Fixed Object	3	0	0	4	0	7	1%
Left Turn	14	17	7	12	12	62	5%
Pedestrian	1	0	0	0	1	2	0%
Rear End	150	126	137	151	166	730	59%
Right Turn	4	2	3	5	8	22	2%
Run Off Road	32	43	38	31	35	179	14%
Sideswipe	5	0	2	2	4	13	1%
U-Turn	0	1	0	0	1	2	0%
Unknown	2	4	1	4	2	13	1%
<b>Total</b>	<b>256</b>	<b>224</b>	<b>234</b>	<b>252</b>	<b>276</b>	<b>1,242</b>	<b>100%</b>

Source: Hillsborough County Crash Data Management System

**Table 8. Crashes by Highest Severity (Peak Hour, 2015 - 2019)**

Highest Crash Severity	2015	2016	2017	2018	2019	Total
Fatal	0	0	0	0	0	0
Incapacitating	14	2	1	3	8	28
Non-Incapacitating	21	18	21	19	26	105
Possible Injury	56	41	46	61	46	250

Source: Hillsborough County Crash Data Management System

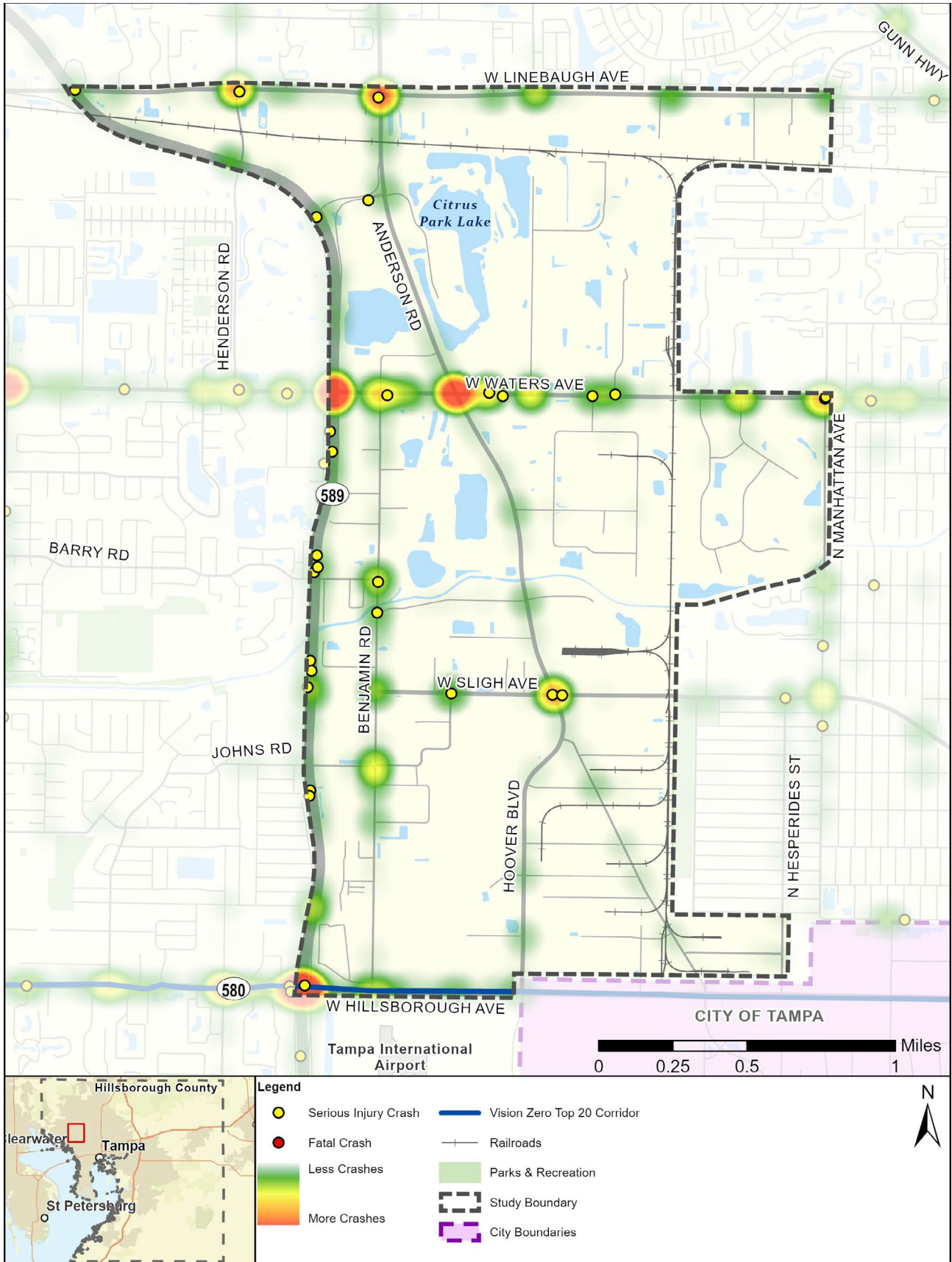
Intersection safety improvements are recommended at the following intersections based on a pattern of crash types identified at the following locations:

- **Linebaugh Avenue & Anderson Road:** based on the high number of reported rear end crashes, intersection safety improvements could include signal timing adjustments and review of sight distances and traffic control visibility.
- **Anderson Road & W Waters Avenue:** based on the high number of reported rear end crashes and sideswipe crashes, intersection safety improvements could include signal timing adjustments and review of sight distances, lane geometry, and traffic control visibility.
- **Hoover Boulevard/Anderson Road & Sligh Avenue:** based on the high number of reported rear end crashes and angle crashes, intersection safety improvements could include signal timing adjustments and review of sight distances, access management, and traffic control visibility.
- **W Waters Avenue & N Manhattan Avenue:** based on the high number of reported rear end crashes, intersection safety improvements could include signal timing adjustments and review of sight distances and traffic control visibility.

Planned intersection improvements include the following CIP projects:

- Anderson Road and Sligh Avenue improvements (CIP: 69679046) – realigning eastbound and westbound movements, northbound right-turn lane, new or replaced sidewalks
- Benjamin Road and Barry Road intersection improvements (CIP: 6960096) – signalized intersection, milling and resurfacing, pedestrian connectivity
- CR 584 (Waters Avenue) and Florida Mining Boulevard (CIP: 69679026) – signalize intersection, turn lane improvements, median opening modifications and pedestrian enhancements

**Figure 14. Crash Hot Spot Map (Peak-Hour, 2015 - 2019)**



## Context Classification

Context based classifications have been defined for all the County maintained roadways and prioritize the users of the roadway to best serve them and support the adjacent land use, and development patterns. Context based classifications provide a link between land use and transportation planning efforts by defining overall development patterns and form for collector and arterial roadways.

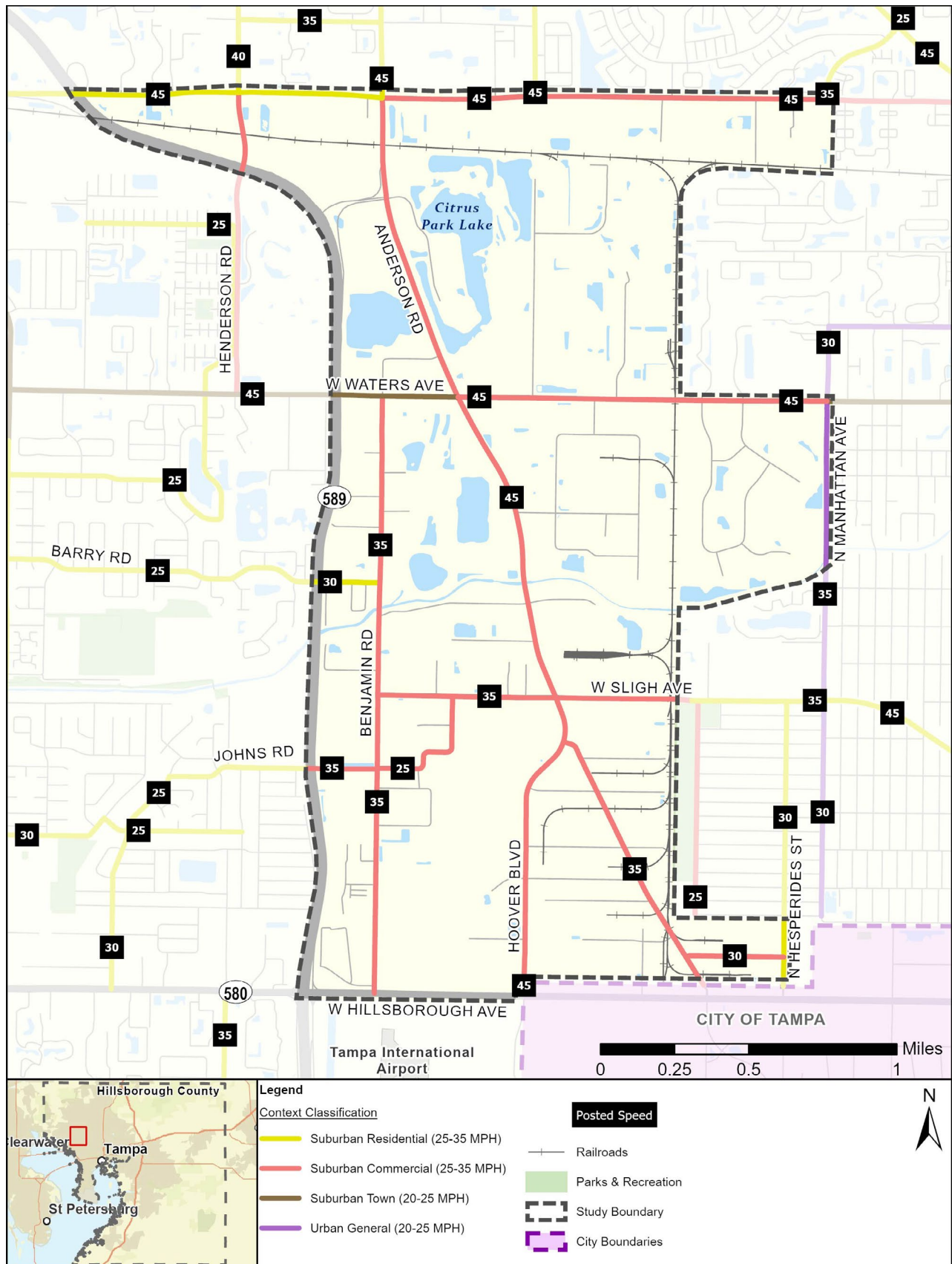
Along with context based classifications, the County’s Complete Street Guidebook and County Design Manual provide guidance to implement appropriate street improvements for the context of the roadway, travel modes, and community environment. Hillsborough County’s Context Based Classification system includes five contexts derived from Future Land Use Community Plans – Rural, Suburban Residential, Commercial, Town, and Urban General.

The context classifications of County roads in the North Airport Redevelopment Area include Suburban Residential, Suburban Commercial, Suburban Town, and Urban General. As indicated in **Table 9**, all of the study roadways currently have a posted speed that is greater than the target speed for their respective context classifications. It is recommended to implement speed management techniques in order to reduce the posted speed limit based on the target context classification speed. Each context classification includes typical section design elements that are designated as high and low priority. The missing required elements identified in **Table 9** are considered high priority for each context classification and are recommended improvements for the roadways.

**Table 9. Context Classifications**

Roadway	Context Classification	Posted Speed	Target Speed	Missing Required Elements
Anderson Road	Suburban Commercial	<b>45 MPH</b>	25 – 35 MPH	Shared Use Path
Benjamin Road	Suburban Commercial	35 MPH	25 – 35 MPH	Shared Use Path
Hoover Boulevard	Suburban Commercial	<b>45 MPH</b>	25 – 35 MPH	Shared Use Path (remove on street bike lane and widen sidewalk)
W Linebaugh Avenue	Suburban Residential/ Suburban Commercial	<b>45 MPH</b>	25 – 35 MPH	Shared Use Path (remove on street bike lane and widen sidewalk)
N Manhattan Avenue	Urban General	<b>35 MPH</b>	20 – 25 MPH	Dedicated pedestrian and bike facilities
Sligh Avenue	Suburban Commercial	35 MPH	25 – 35 MPH	Shared Use Path
Waters Avenue	Suburban Commercial	<b>45 MPH</b>	25 – 35 MPH	Shared Use Path (remove on street bike lane and widen sidewalk)
Waters Avenue	Suburban Town	<b>45 MPH</b>	20 - 25 MPH	Dedicated pedestrian and bike facilities

**Figure 15. Context Classification Map**



## Transportation Infrastructure Assessment Findings

The Transportation Assessment included a review of the existing roadway conditions along Hillsborough County maintained roadways and state facilities based on available data. The review of congestion, mobility, and safety conditions included data for volume to capacity ratios, travel time index, Context Classifications, pavement conditions, existing truck routes, existing HART routes, and crash patterns.

Based on a review of the existing volume to capacity ratios and Context Classification considerations, the following roadways are recommended for complete street and safety improvements that could include speed reduction, improved facilities for all modes, and congestion reduction measures:

- Anderson Road from Linebaugh Avenue to Sligh Avenue
- Benjamin Road from Waters Avenue to Hillsborough Avenue
- Hoover Road from Hillsborough Avenue to Sligh Avenue
- Linebaugh Avenue from Veterans Expressway to Mullis City Way
- Manhattan Avenue from Waters Avenue to Broad Street
- Sligh Avenue from Benjamin Road to railroad crossing
- Waters Avenue from Veterans Expressway to Manhattan Avenue
- Hillsborough Avenue from Veterans Expressway to Hoover Road

Intersection safety improvements are recommended at the following intersections based on a pattern of crash types. Improvements should take into consideration access management strategies, lane geometry, existing pedestrian and bike facilities, and sight distance, following a detailed safety analysis at the intersection locations.

- Linebaugh Avenue & Anderson Road
- Anderson Road & W Waters Avenue
- Hoover Boulevard/Anderson Road & Sligh Avenue
- W Waters Avenue & N Manhattan Avenue

Based on the pavement condition index of County maintained roadways in the study area, the following roadways have poor to very poor pavement condition and are recommended to be considered for major rehabilitation:

- Local Streets – Johns Road, Hanna Avenue, Knollwood Street, Knox Street, Idlewild Avenue, Clifton Street, Hangar Court, Conaty Drive, Benjamin Center Drive, Pioneer Park Boulevard, Turnmor Drive, Ann Ballard Road, Sunstate Street, and North Trask Street

The following roadways are identified as serious to failed conditions and are recommended to be considered for reconstruction:

- South of Sligh Avenue, Johns Road from Thompson Center Court to Sligh Avenue

To further identify the project scopes for the transportation improvements, identifying the required funding sources, public engagement, and coordination with partner agencies including the City of Tampa and Florida Department of Transportation, should be completed.



## Section 3

# **Utilities and Services Assessment**



# Utilities and Services Assessment

## Central Services

This analysis includes identifying the water/sewer service provider, water and wastewater treatment plant permitted capacities, and locations of large water/sewer transmission infrastructure. Traffic Analysis Zone (TAZ) data and future land use data from 2015 to 2045 were used to determine future population growth in the study area. Hillsborough County and City of Tampa utility GIS files, 2018 City of Tampa Howard F. Curren AWTP Phase 2 Master Plan Report, 2018 City of Tampa Master Plan Report – Potable Water Master Plan, Florida Department of Environmental Protection (FDEP) permit data, and 2018 Hazen and Sawyer Hillsborough County Septic Tank Conversion – Neighborhood Prioritization Report were used to analyze the existing utility infrastructure. The projected water demand and wastewater flow increase was estimated from the future population growth to determine if there is enough capacity available to support the anticipated growth in the redevelopment area.

The North Airport redevelopment area is served by a combination of City of Tampa and Hillsborough County water and wastewater collection and transmission systems. The City of Tampa manages approximately 75% of the water mains in the study area, with Hillsborough County providing water to the northern portion of the area (around 25% of the service area). The study area is served by the Hillsborough County Northwest water system, which includes the Fawn Ridge Water Treatment Plant (WTP), the Lake Park WTP, and the City of Tampa David L. Tippin WTP. There is one interconnect between the City of Tampa and Hillsborough County water systems within the study boundary. Hillsborough County provides all the wastewater collection services to the area. Based on the available GIS data, the wastewater flows are treated by the County owned Northwest Regional Water Reclamation Facility (WRF).

## Future Land Use/Growth

A map showing the future land use of the North Airport redevelopment area is included in this report, see [Figure 5](#). The primary land use is light industrial, with larger areas of urban mixed use, office commercial, and public/quasi-public. The study area also includes small portions of residential, heavy industrial, and community mixed use land.

Based on the future land use from the provided TAZ data, Hillsborough County population projections in the North Airport redevelopment area are expected to have a population increase of 440 people from 2015 to 2045. Using the Hillsborough County standard of 300 gallons per day (GPD) water demand per Equivalent Residential Connection (ERC), this population growth is estimated to increase the water flows by approximately 0.13 million gallons per day (MGD). Using the County standard of 200 GPD of wastewater per ERC, this population growth is estimated to increase the wastewater flows by approximately 0.09 MGD.



## Existing Public Water and Wastewater Capacity

### Water Treatment Plant Capacity

The David L. Tippin WTP, managed by the City of Tampa, serves the majority of the redevelopment area. As reported in the 2018 City of Tampa Master Plan Report – Potable Water Master Plan, the treatment plant has a max flow of 120 million gallons per day (MGD) and an annual average daily flow of 81 MGD. The City of Tampa water production capacity at the David L. Tippin WTP has adequate production capacity to serve the growth of this redevelopment area. The northern portion of the redevelopment area is served by Hillsborough County’s Northwest water system. This potable water system has a permitted capacity of 56 MGD of flow and a maximum flow is 30.3 MGD, as received from the County. The available Hillsborough County potable water production capacity at the Northwest system is 25.7 MGD for new development or redevelopment if needed. The water main interconnect between Hillsborough County and City of Tampa also serves as a redundancy and emergency backup for the potable water system in the event of an emergency.

### Wastewater Treatment Plant Capacity

The North Airport redevelopment area wastewater is treated by the Hillsborough County Northwest Regional WRF, all sewer infrastructure is owned and maintained by Hillsborough County. This treatment plant has a permitted capacity of 30 MGD, with an annual average flow of 17.05 MGD and a maximum flow of 19.34 MGD, as provided by the County. This leaves 12.95 MGD of available wastewater treatment plant capacity (annual average flow) for new development or redevelopment.

See [Table 10](#) below for a summary of the capacity analysis.

**Table 10. System Capacity Analysis**

Facility		ID	Permit Capacity (MGD)	Annual Average Flow (MGD)	Max Flow (MGD)	Available Annual Average Flow Capacity (MGD)
Name	Type					
David L. Tippin	WTP	FLR20EB89	120	81	120	39
Northwest	WS	6290388	56.0	-	30.3	25.7
Northwest Regional	WRF	FL0041670	30	17.05	19.34	12.95

# Existing Public Water and Wastewater Large Transmission Lines

## Water

The North Airport Redevelopment Area has several water transmission lines within its boundaries including the following:

- Benjamin Road - 16" ductile iron water main (City of Tampa, installed 1979)
- Henderson Road - 16" ductile iron water main (Hillsborough County, installed 1982)
- Sligh Avenue - 24" ductile iron water main (City of Tampa, installed 1989)
- Waters Avenue - 20" ductile iron water main (City of Tampa, installed 1999)

Ductile iron pipe has a service life expectancy of 50 or more years, these mains should still be in fair condition and should have adequate remaining useful life. There is one interconnect between the Hillsborough County and City of Tampa water systems within the area boundary providing an emergency backup for the potable water system in the event of an emergency. **Figure 16** is a map of the existing water distribution infrastructure in this area.

## Wastewater

The redevelopment area has several Hillsborough County owned wastewater force mains within its boundaries including:

- Waters Avenue - 24" ductile iron force main (Hillsborough County, installed 1989)
- Hoover Boulevard/Anderson Road - 6" PVC force main (Hillsborough County, installed 1998)
- Linebaugh Avenue - 8" PVC force main (Hillsborough County, installed 2000)

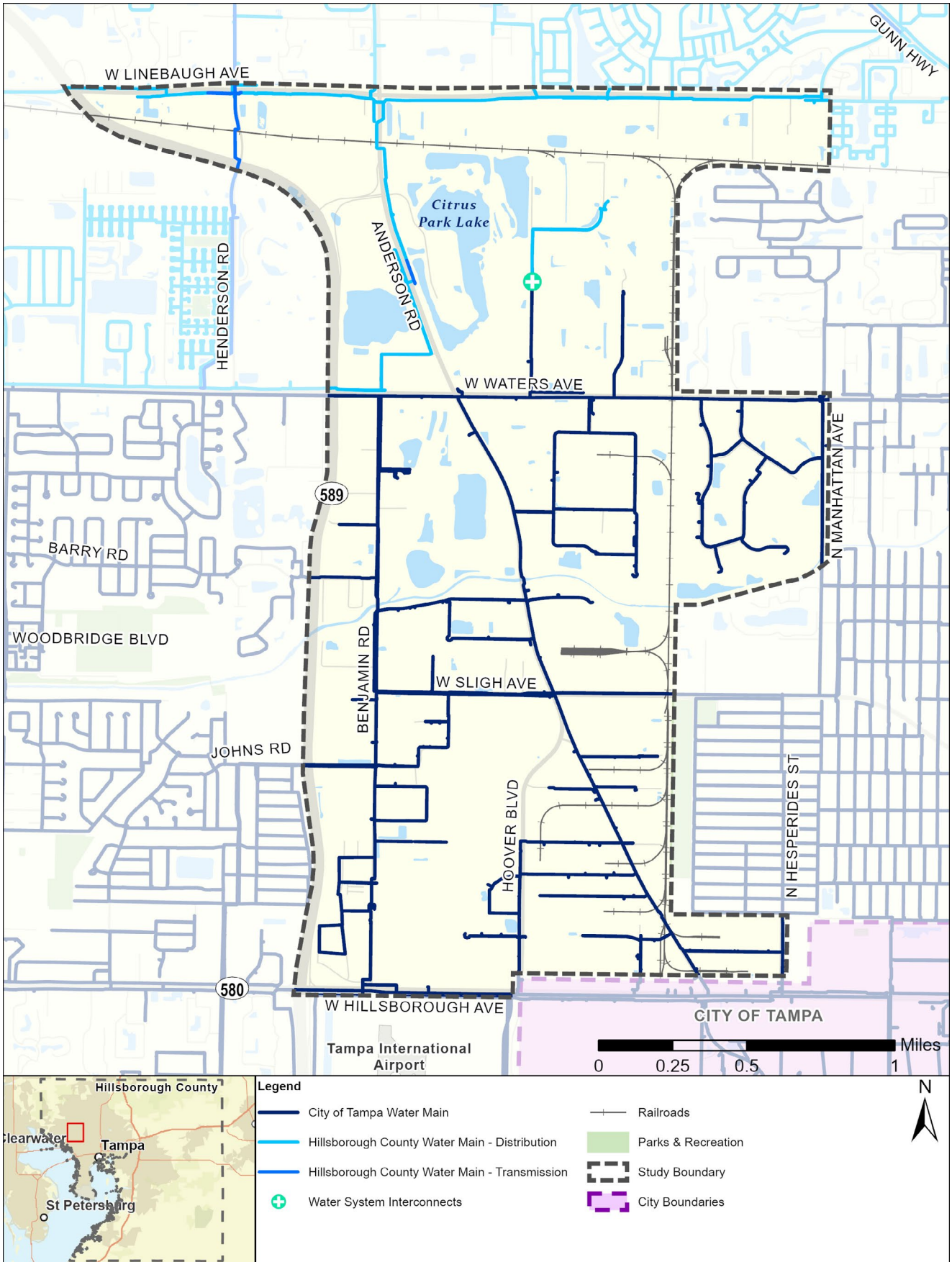
Ductile iron and PVC pipes have an expected useful life of 50 to 60 years and are expected to be in fair condition with adequate remaining useful life. There is a small amount of gravity main and a total of 9 lift stations within the study boundary that make up the wastewater collection system. **Figure 17** is a map of the existing wastewater infrastructure in this area.

## Septic Tanks

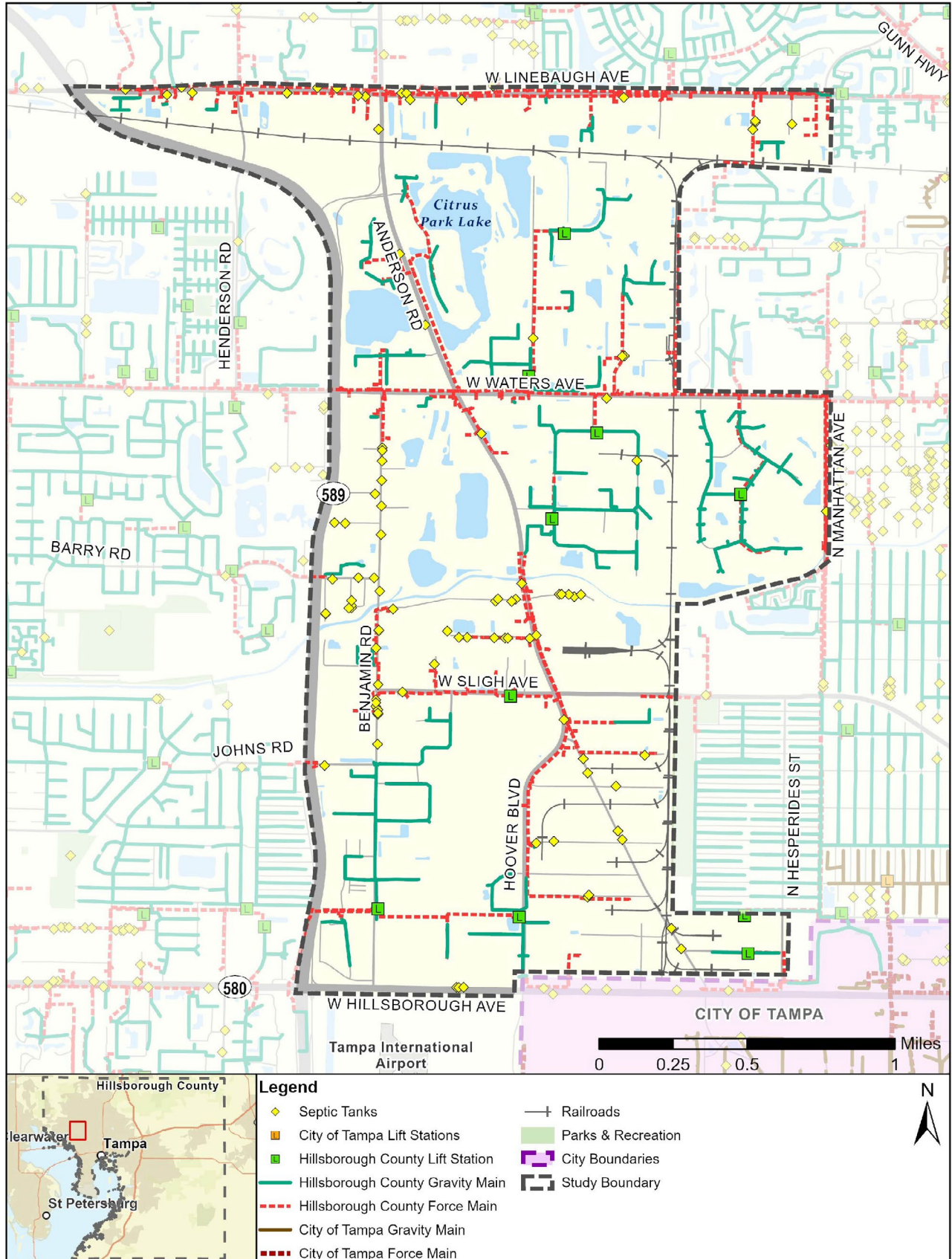
According to the Florida Water Management Inventory – Hillsborough County Wastewater Map, there is a mix of septic and sewer systems in the area. Developments along Benjamin Road, Pioneer Park Blvd, Crenshaw Street, and Anderson Road are supported by a total of 101 septic systems. Locations of the septic tanks are shown on the wastewater infrastructure map (**Figure 17**).

In the 2018 Hazen and Sawyer Hillsborough County Septic Tank Conversion-Neighborhood Prioritization Report, the North Airport redevelopment study area falls within Town N' Country group B of potential septic to sewer conversion. In this report, parcels that already had wastewater service were removed from the study and only parcels that were single family residential were labeled as a priority for conversion. The County has an estimated a total of \$39.4M for septic to sewer improvements in Town 'N Country group B but does not include the North Airport Redevelopment Area at this time. Based on this assessment of the wastewater infrastructure, one location with existing single family residential and septic systems along Benjamin Road may be a candidate for septic to sewer conversion.

**Figure 16. Water Infrastructure Map**



**Figure 17. Wastewater Infrastructure Map**



## Water and Wastewater Infrastructure Assessment Findings

The Traffic Analysis Zone (TAZ) data and future land use data provided by Hillsborough County for the North Airport redevelopment area shows a 440 person increase in population from 2015 to 2045. The Hillsborough County Northwest water system currently has 25.7 MGD of available permit capacity and the City of Tampa David L. Tippin WTP has 39 MGD of available permit capacity to support the anticipated 0.13 MGD estimated potable water demand increase. Although both City of Tampa and Hillsborough County provide potable water, Hillsborough County owns and maintains all the public sewer infrastructure. The Hillsborough County Northwest Regional WRF currently has 12.95 MGD of available permit capacity to support the anticipated 0.09 MGD increase in wastewater flow if needed. This capacity analysis is based on available permitted capacities of the water and wastewater treatment facilities, no hydraulic capacity analysis of water/sewer transmission mains was completed.

Based on the water and wastewater infrastructure assessment completed for the North Airport Redevelopment Area, potable water is available to all redevelopment projects identified in Figure 5 of the report except for the two sites along Citrus Park Lake that will need water transmission main extensions. Sewer collection is available for all redevelopment project sites except the two projects along Anderson Road and the project on Johns Road, which have septic systems. Further evaluation of the County's and City of Tampa's potable water, sewer, and septic systems need to be studied prior redevelopment. The following action items have been identified for the North Airport Redevelopment Area:

- Coordination between the County and City of Tampa utility departments to identify capacity issues in the potable water and sewer collection/transmission systems
  - Study existing potable water hydraulic model to determine pipe capacity and sizing needs of future developments with new water demands
  - Study existing wastewater collection, transmission, and wastewater treatment plant capacity to determine if the increased wastewater flow will affect the system
- Extend sewer collection/transmission system to the redevelopment projects along Anderson Road and Johns Road to eliminate the septic sewer system
- Extend potable water transmission mains to the redevelopment projects along Citrus Park Lake
- Provide water and sewer service connection along street areas that are not currently served to promote redevelopment:
  - Hoover Blvd area was identified as an area that the County will need to coordinate water transmission main extension
  - Anderson Road and Benjamin Road were areas identified as areas the County will need to coordinate sewer collection/transmission system extensions to eliminate septic to sewer systems





## Section 4

# **Vulnerability Assessment**



# Vulnerability Assessment

## Exposure Analysis

This analysis evaluates the exposure of Hillsborough County assets within the redevelopment area. The exposure analysis is the first step in completing a vulnerability assessment identifying potential flood threats and assets exposed to flooding.

As part of this analysis, Asset Threat Matrices were developed to identify the flood exposure for the following assets:

- County Maintained Roads
- Evacuation Routes
- Hospitals
- Shelters
- Schools
- Libraries
- Public Pump Stations

There are no fire stations, libraries, hospitals, or shelters within the North Airport redevelopment limits.

The County assets within this area were analyzed based on four flood threats, 100-year event, FEMA Flood Maps, Category 1 Hurricane, and Category 3 Hurricane. The North Airport Redevelopment Area is within the Northwest Five Watershed and therefore the SWFWMD Board Certified Northwest Five Watershed 100-year floodplain was used for the 100-Year Floodplain analysis.

To determine if an asset is exposed to flooding, the flood data is overlaid on top of the asset location. If the flood area intersects the asset footprint, then the asset is considered exposed.

### County Maintained Roads

There are 54 County maintained roadways identified within the North Airport Redevelopment Area. The 100-Year Event exposed approximately 70% of the County maintained roads to flooding. FEMA Flood Maps exposed approximately 48% of the County maintained roads. Category 1 Hurricane did not expose any County maintained roads in the North Airport Redevelopment Area, but the Category 3 Hurricane was found to expose approximately 33% of County maintained roads. These percentages refer to how many roads were impacted out of the total number of roads, not the total length of roadways submerged. Integrating flood depths is the next step of the vulnerability analysis. The asset threat matrix [Table 12](#) identifies each County maintained road and its exposure to flooding during each flood threat.

The results of this analysis were compared to the results of the USF Hillsborough County Community Vulnerability Study. The USF study maps indicate Veterans Expressway will be exposed to flooding by the Category 3 Hurricane with Intermediate-Low Sea Level Rise and High Sea Level Rise.

The maps for the 100-Year Event, FEMA Flood Map, and Category 1 and 3 Hurricanes are shown in [Figure 18](#), [Figure 19](#), [Figure 20](#), and [Figure 21](#).

**Table 11. Summary of County Maintained Roads Exposure**

	Delaney Creek Watershed 100-Year Event	FEMA Flood Maps	Category 1 Hurricane	Category 3 Hurricane
% County Maintained Roads Exposed	70.37	48.15	0.00	33.33





**Table 12. County Maintained Roads Asset Threat Matrix**

County Maintained Roads	Exposure			
	NW5 Watershed 100-Year Event	FEMA Flood Maps	Category 1 Hurricane	Category 3 Hurricane
Anderson Rd	⬇	⬇		⬇
Ann Ballard Rd		⬇		
Bald Cypress Pl	⬇			
Barry Ln		⬇		⬇
Barry Rd	⬇			⬇
Benjamin Center Dr	⬇			⬇
Benjamin Rd	⬇	⬇		⬇
Bridle Path Ln	⬇	⬇		⬇
Cheri Ct	⬇			
Cluster Oak Ct				
Eagle Trail Dr	⬇	⬇		
Eisenhower Blvd				
Florida Mining Blvd	⬇	⬇		
Gardner Court Dr				
Hangar Ct	⬇			
Henderson Rd				
Hillsborough-Veterans N Ramp				⬇
Hoover Blvd	⬇	⬇		⬇
Johns Rd	⬇			⬇
N Hesperides St	⬇	⬇		
N Manhattan Ave	⬇	⬇		
N Trask St	⬇	⬇		
Nixon Rd				
Pioneer Park Blvd	⬇	⬇		
Plantation Blvd				
Savarese Blvd	⬇			
Savarese Cir	⬇			
Seedling Cir		⬇		

County Maintained Roads	Exposure			
	NW5 Watershed 100-Year Event	FEMA Flood Maps	Category 1 Hurricane	Category 3 Hurricane
Southern Comfort Blvd	⬇	⬇		⬇
Sunstate St	⬇	⬇		
Tampa West Blvd	⬇			⬇
Turnmore Dr	⬇			⬇
Veterans Expy N	⬇	⬇		⬇
W Clifton St	⬇	⬇		
W Comanche Ave	⬇	⬇		
W Crenshaw St	⬇	⬇		⬇
W Flora St	⬇			⬇
W Hanna Ave	⬇	⬇		
W Hillsborough Ave	⬇			⬇
W Idell St				
W Idlewild Ave	⬇			
W Knollwood St	⬇			
W Knox St	⬇	⬇		
W Linebaugh Ave	⬇	⬇		
W Rio Vista Ave	⬇			
W Sitka St				
W Sligh Ave	⬇	⬇		⬇
W Waters Ave	⬇	⬇		
Williams Rd				
Woodland Center Blvd	⬇	⬇		
Woodland Corporate Blvd				

## Evacuation Route

The evacuation routes in this redevelopment area are W Hillsborough Avenue and Veterans Expressway. W Hillsborough Avenue is exposed to flooding only in the Category 3 hurricane. Veterans Expressway is exposed to flooding for the 100-Year Event, FEMA, and Category 3 Hurricane threats, as shown in [Table 13](#).

**Table 13. Evacuation Route Asset Threat Matrix**

Evacuation Routes	Exposure			
	NW5 Watershed 100-Year Event	FEMA Flood Maps	Category 1 Hurricane	Category 3 Hurricane
W Hillsborough Ave				✓
Veterans Express Way	✓	✓		✓

## Pump Stations

All nine pump stations within the North Airport Redevelopment Area were evaluated for this assessment. Three pump stations were exposed to flooding by the 100-Year Event and FEMA Flood Maps. There were no pump stations exposed by the Category 1 Hurricane and one pump station is exposed by the Category 3 Hurricane, as shown in [Figure 21](#) and [Table 14](#).

**Table 14. Pump Station Asset Threat Matrix**

Pump Stations	Exposure			
	NW5 Watershed 100-Year Event	FEMA Flood Maps	Category 1 Hurricane	Category 3 Hurricane
Sligh				
Tampa West	✓			
Savarese				
Woodland Center				
Hoover				
Benjamin		✓		✓
Comanche #1	✓	✓		
Florida Mining	✓	✓		
Eagle Trail				

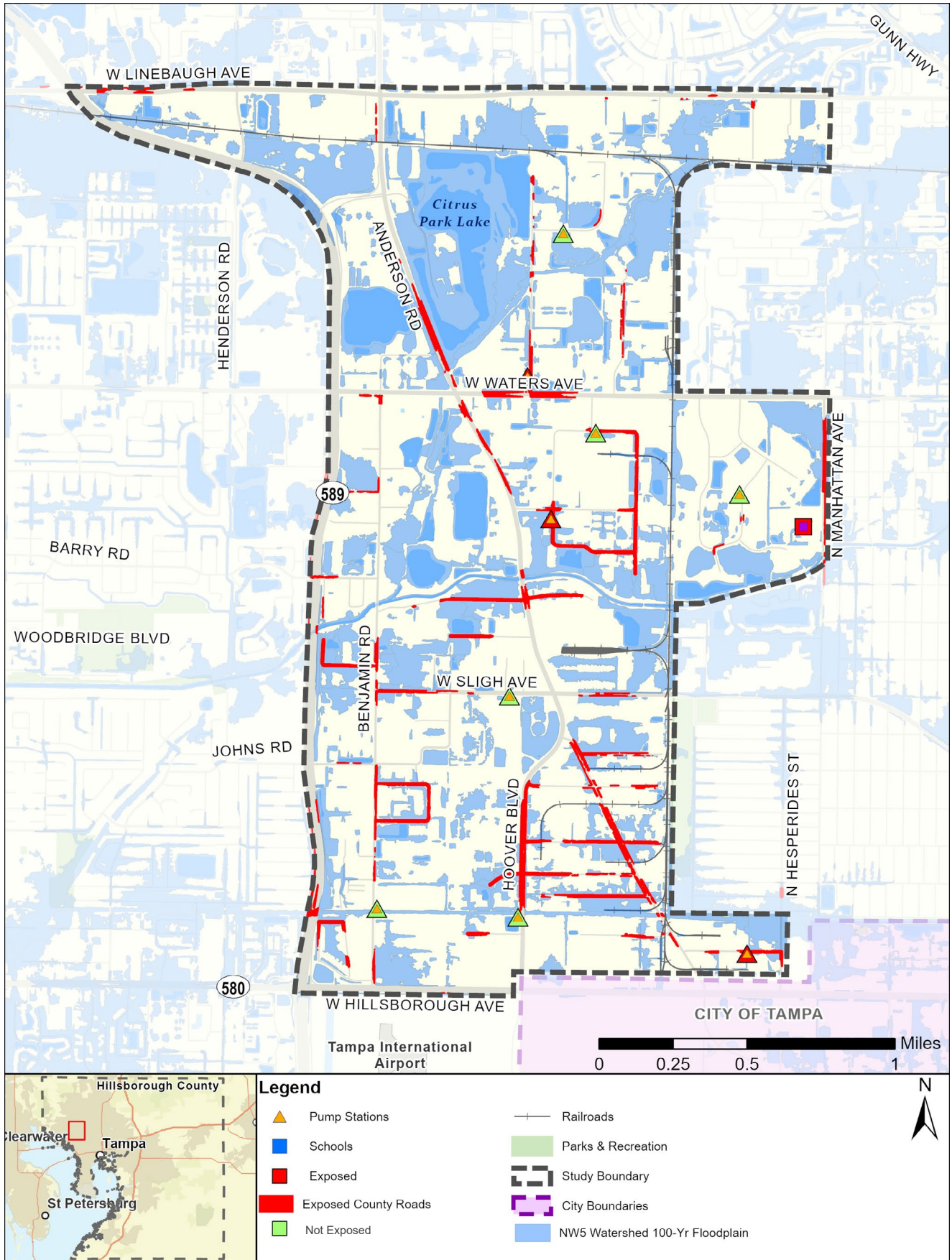
## Schools

Crestwood Elementary is the only school in the North Airport Redevelopment Area. The school is only exposed during the 100-Year Event, as shown in [Figure 18](#) and [Table 15](#).

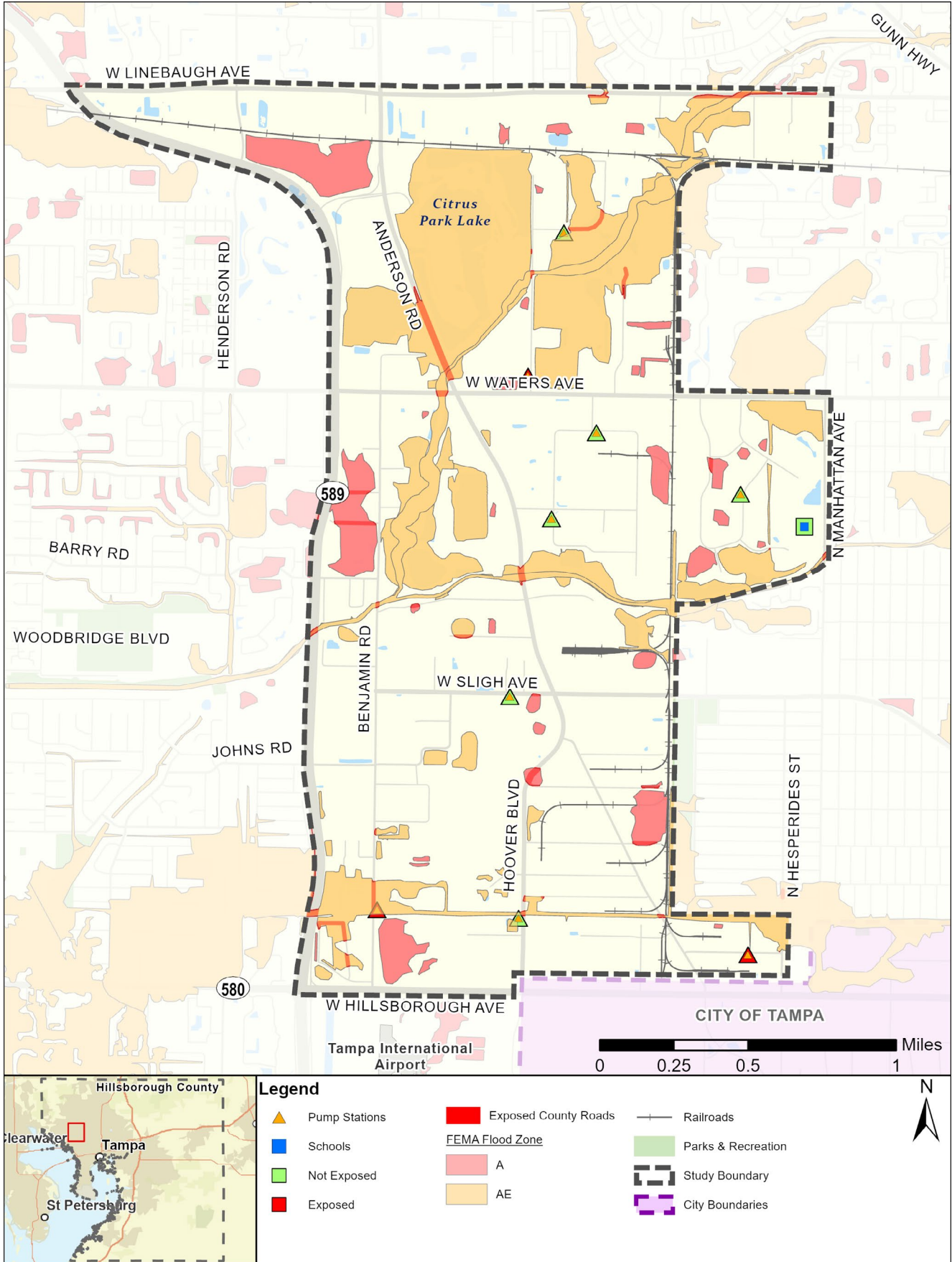
**Table 15. Fire Station Asset Threat Matrix**

Schools	Exposure			
	NW5 Watershed 100-Year Event	FEMA Flood Maps	Category 1 Hurricane	Category 3 Hurricane
Crestwood Elementary	✓			

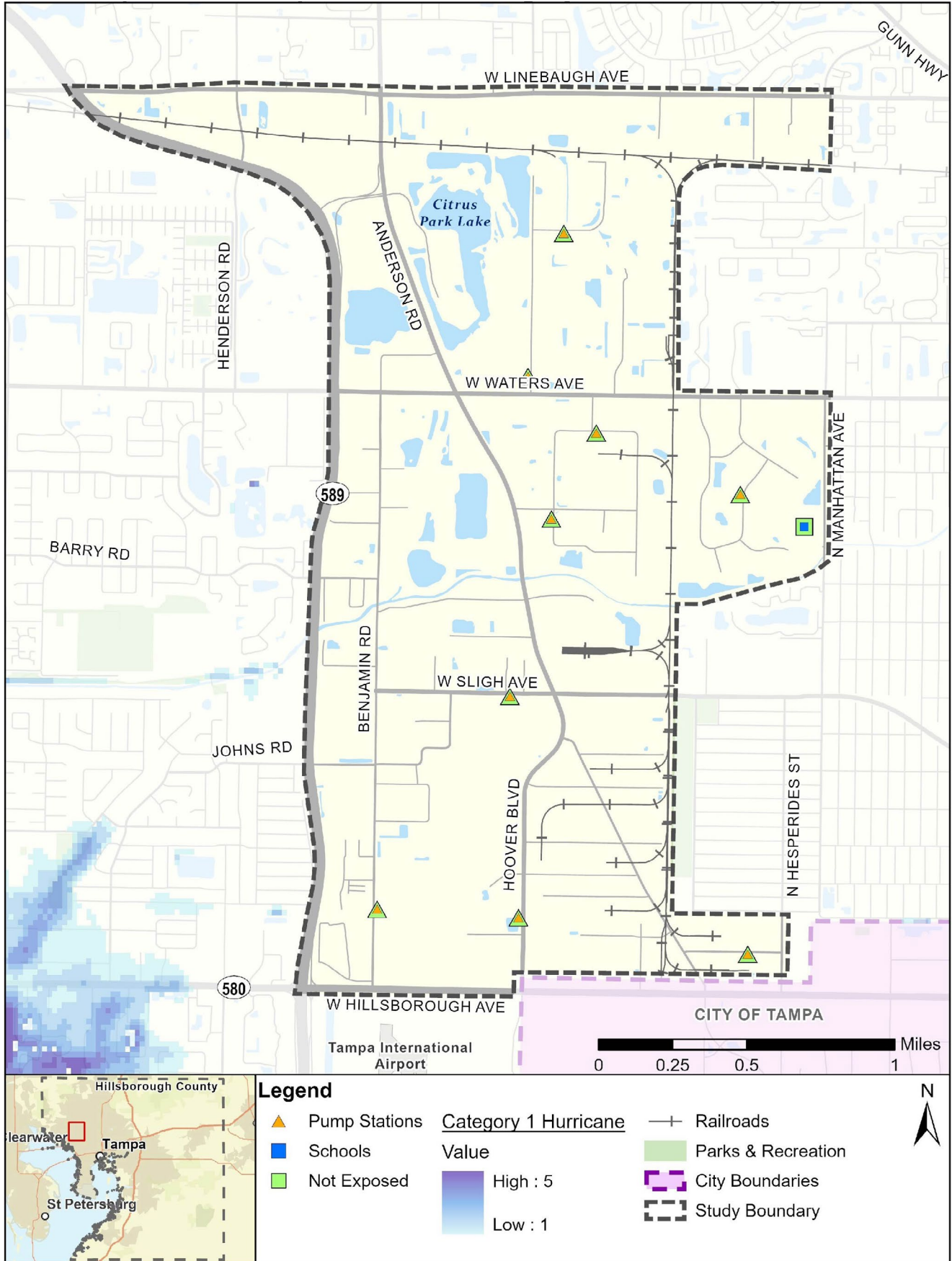
**Figure 18. 100-Year Flood Event Map**



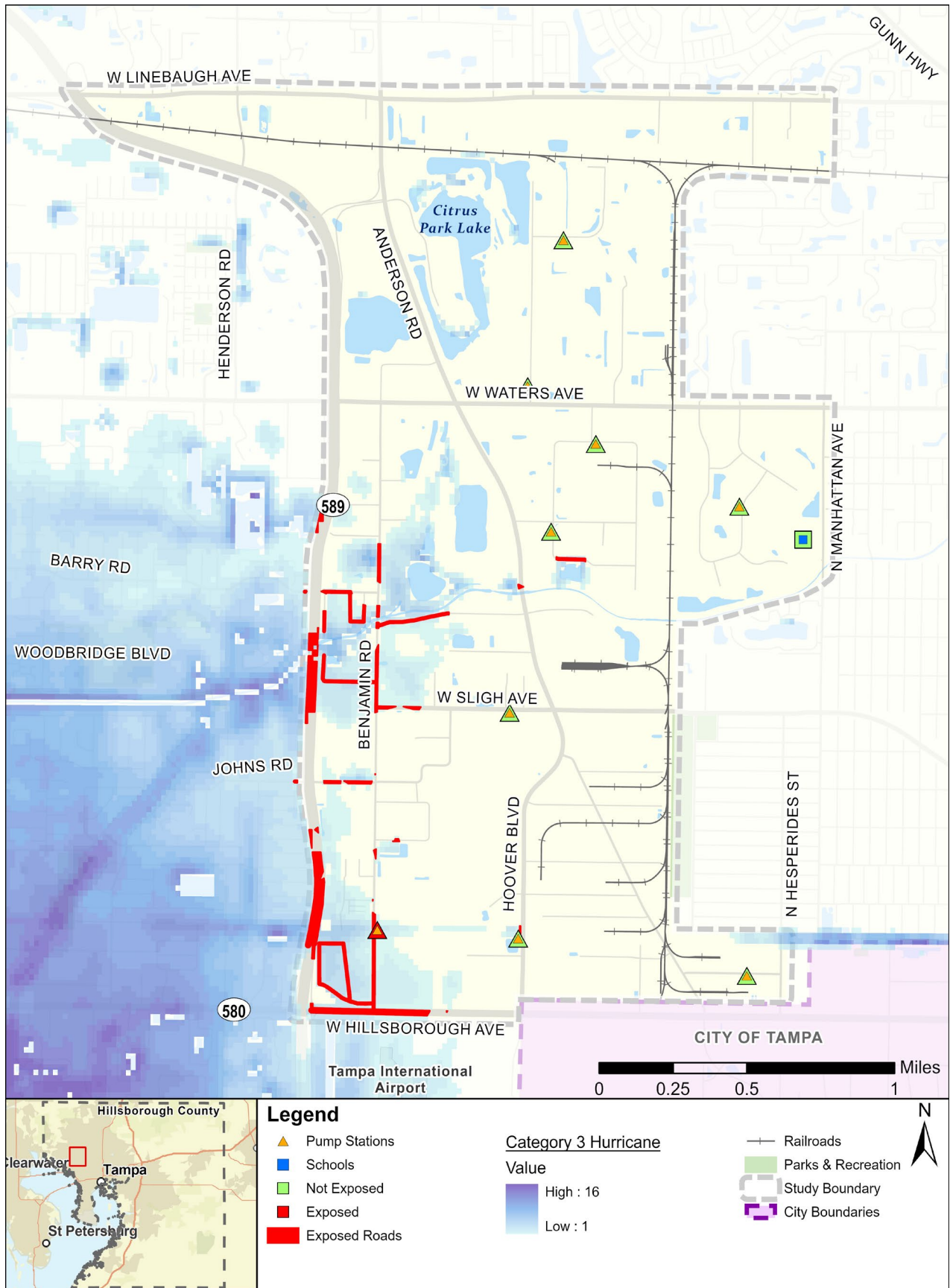
**Figure 19. FEMA Flood Map**



**Figure 20. Category 1 Hurricane Impacts**



**Figure 21. Category 3 Hurricane Impacts**



## Vulnerability Assessment Findings

The 100-Year Event and the FEMA Flood Maps expose the most assets within the North Airport Redevelopment Area. The 100-Year Event is not concentrated to one area of the redevelopment area and therefore impacts assets throughout the area.

Category 1 Hurricane extents are outside of the redevelopment boundary, but the Category 3 extents impact the southwest corner of the redevelopment area. The area near the intersection of W Hillsborough Avenue and Benjamin Road is the area of highest exposure in the North Airport Redevelopment Area due to the impacts from 100-Year Event, FEMA Flood Maps and Category 3 Hurricane. There are several County maintained roads and the Benjamin pump station which are exposed within this area.

Potential improvements for addressing flooding within the North Airport Redevelopment Area include a combination of gray, green and blue infrastructure such as raising roads and adding storage in local and regional stormwater ponds. Improvement strategies should seek to protect or extend the duration from which assets may be exposed. These adaptation strategies and examples are included in [Table 16](#).

**Table 16. Adaptation Strategies**

Intervention	Example
<b>Gray, Green &amp; Blue Infrastructure</b>	Gray <ul style="list-style-type: none"> <li>• Hardening or raising of infrastructure</li> <li>• Adding storage/capacity</li> <li>• Diverting flows</li> </ul> Green <ul style="list-style-type: none"> <li>• Living shorelines</li> <li>• Bioswales, upflow filters</li> <li>• Landscaping – green roofs, canopy coverage</li> </ul> Blue <ul style="list-style-type: none"> <li>• Passive water parks</li> </ul>
<b>Land-use Planning</b>	<ul style="list-style-type: none"> <li>• Development of adaptation action areas</li> <li>• Identification of resilience overlay zones</li> <li>• Resilience Comprehensive Plan Chapter – Peril of Flood</li> <li>• Dual use transportation systems</li> </ul>
<b>Disaster Planning</b>	<ul style="list-style-type: none"> <li>• Loss avoidance studies</li> <li>• Benefit-cost analyses (GIS based)</li> </ul>
<b>Asset Management</b>	<ul style="list-style-type: none"> <li>• Schema development/updates</li> <li>• Assigning condition codes</li> <li>• Assigning remaining useful life</li> </ul>
<b>Policy Updates</b>	<ul style="list-style-type: none"> <li>• Update of Stormwater Master Plans (frequency based – e.g. every five years)</li> <li>• Attenuation/treatment credits</li> <li>• Land Development Code updates</li> </ul>
<b>Social Equity</b>	<ul style="list-style-type: none"> <li>• Personal preparedness campaigns in highly vulnerable areas</li> <li>• Build-a-bucket event</li> <li>• Project prioritization that addresses projects in highly vulnerable areas with highly vulnerable populations</li> </ul>







## Section 5

# Recommended Improvements



# Recommended Improvements

Recommended improvements are identified for the study area based on the infrastructure assessments documented in this report. The assessment measures are used to identify locations for improvements and prioritize improvements based on an overlay of all measures to identify the highest areas of need. The recommended improvements are prioritized based on the following assessment measure categories to prioritize locations and prioritize improvements. A map of all projects is shown in **Figure 22** and the recommended improvement matrix is shown in **Appendix A**.

## Assessment Measures

- Congestion and mobility measures identify locations that should be prioritized based on high travel time index or volume to capacity ratio, fair to serious pavement condition, incomplete or missing user facilities based on the roadway's context classification, and locations on truck routes or HART routes.
- Safety measures identify locations that should be prioritized based on correctable crash patterns or severe crashes including fatal and injury crashes, and roadways with a posted speed greater than the context classification target speed.
- Utility measures identify locations where water or sewer mains should be replaced due to its useful life or locations where a new water or sewer connection would promote redevelopment.
- Flood Exposure measures identify locations where there is vulnerability to flooding due to storm events or sea level rise.
- Land Use measures identify locations that are or connect into Competitive Sites, Redevelopment Sites, or community amenities including schools, fire stations, and hospitals.

## Improvement Benefit

Improvement Benefit factors are indicated for each recommended improvement based on the project's ability to improve Mobility, Safety, Resiliency, or Site Redevelopment.

- **Mobility:** project improves conditions for pedestrians, cyclists, passenger cars, or trucks on roadway facilities
- **Safety:** project improves conditions for vulnerable users accessing community amenities including schools or using roadway facilities
- **Resiliency:** project improves potential flooding conditions at community amenities, utility connections, or roadways
- **Site Redevelopment:** project improves redevelopment opportunities at Competitive Sites or Redevelopment Sites identified by the county, or provides opportunity for new development due to new infrastructure connections

## Recommended Actions

Based on the infrastructure assessment and an overlay of all measures, improvements and the highest areas of need are identified. The following locations are recommended focus areas to improve existing critical infrastructure based on the current conditions. The improvements are recommended to serve community amenities and encourage redevelopment of competitive sites, redevelopment sites, and existing industrial and vacant properties.

	Transportation Improvements	Utility Improvements	Vulnerability Improvements
<b>Anderson Road Area</b>	<ul style="list-style-type: none"> <li>• <b>Linebaugh Avenue to Sligh Avenue</b> – Complete street improvements including speed reduction and shared-use path (pg. 30-31), intersection safety improvements at Sligh Avenue (pg. 28-29), and pavement repair (preventative treatment) (pg. 22-23)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Waters Avenue to Hillsborough Avenue</b> – Sewer system extension (septic to sewer conversion) (pg. 36-38)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Comanche #1 and Tampa West Pump Stations</b> – Area flood exposure improvements (pg. 44)</li> <li>• <b>Corporate Lake Drive to Tampa W Boulevard, and Hoover Boulevard to Hillsborough Avenue</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>
<b>Benjamin Road Area</b>	<ul style="list-style-type: none"> <li>• <b>Waters Avenue to Hillsborough Avenue</b> – Complete street improvements including capacity improvements and shared use path (pg. 30-31)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Waters Avenue to Johns Road</b> – Sewer system extension (septic to sewer conversion) (pg. 36-38)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Benjamin Pump Station</b> – Area flood exposure improvements (pg. 44)</li> <li>• <b>Ann Ballard Road to Hillsborough Avenue</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>
<b>Hoover Road Area</b>	<ul style="list-style-type: none"> <li>• <b>Hillsborough Avenue to Sligh Avenue</b> – Complete street improvements including speed reduction and shared use path (pg. 30-31), pavement repair (preventative treatment) (pg. 22-23)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hanna Avenue to Anderson Road</b> – Water system extension (pg. 36-38)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hangar Court to Knox Street</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>
<b>Linebaugh Avenue Area</b>	<ul style="list-style-type: none"> <li>• <b>Veterans Expressway to Mullis City Way</b> – Complete street improvements including speed reduction and shared use path (pg. 30-31), intersection safety improvements at Anderson Road (pg. 28-29), and pavement repair (preventative treatment) (pg. 22-23)</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Plantation Boulevard to Mullis City Way</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>
<b>Manhattan Avenue Area</b>	<ul style="list-style-type: none"> <li>• <b>Waters Avenue to Broad Street</b> – Complete street improvements including speed reduction and dedicated pedestrian and bike facilities (pg. 30-31)</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Crestwood Elementary</b> – Area flood exposure improvements (pg. 44)</li> <li>• <b>Waters Avenue to Broad Street</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>

## Recommended Actions

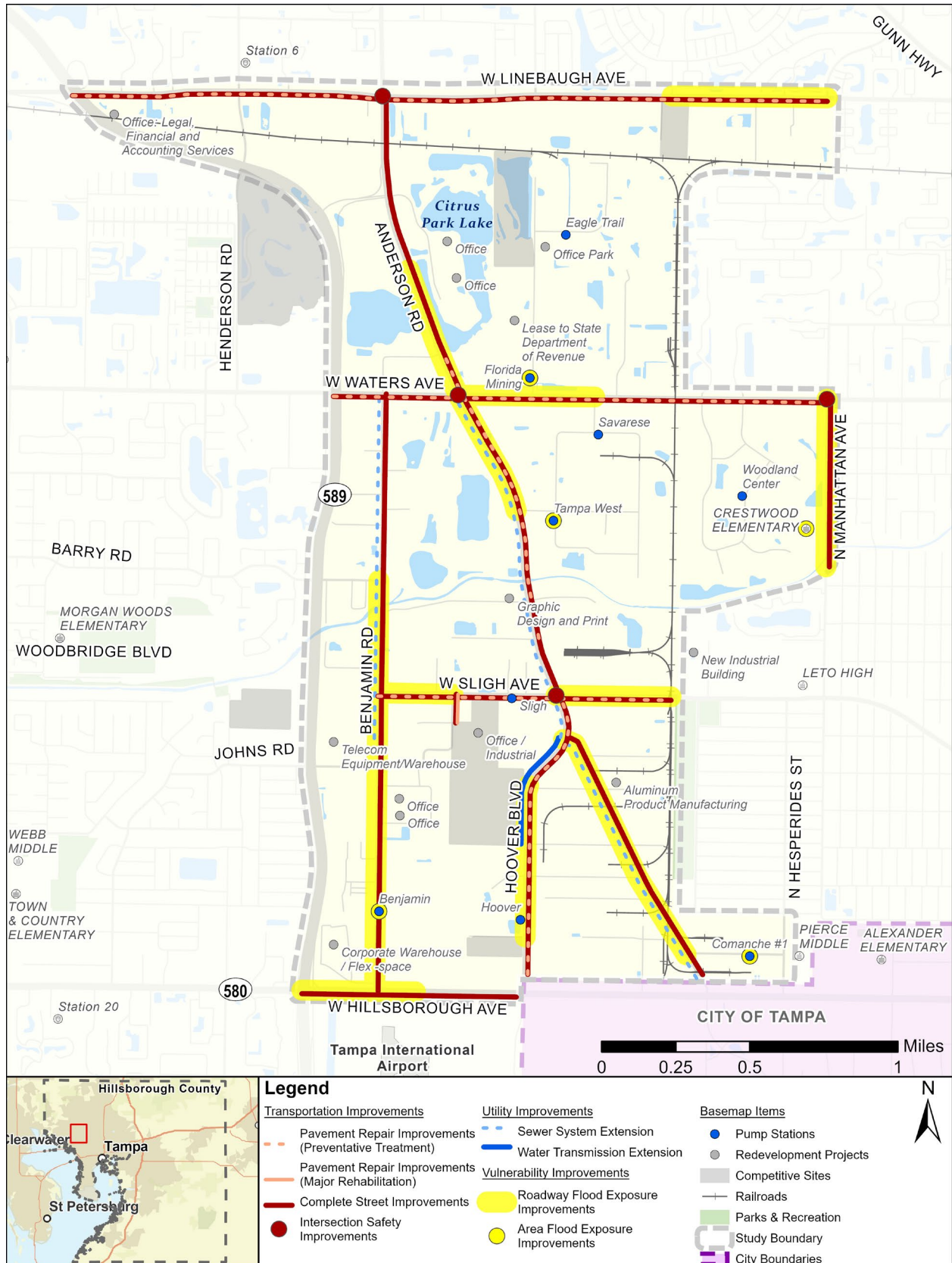
	Transportation Improvements	Utility Improvements	Vulnerability Improvements
<b>Sligh Avenue Area</b>	<ul style="list-style-type: none"> <li>• <b>Benjamin Road to railroad crossing</b> – Complete street improvements including shared use path (pg. 30-31), and pavement repair (preventative treatment) (pg. 22-23)</li> <li>• <b>Johns Road from Thompson Center Court to Sligh Avenue</b> – Major pavement rehabilitation (pg. 22-23)</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Benjamin Road to Johns Road, and Hoover Boulevard to railroad</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>
<b>Waters Avenue Area</b>	<ul style="list-style-type: none"> <li>• <b>Veterans Expressway to Manhattan Avenue</b> – Complete street improvements including speed reduction and dedicated pedestrian and bike facilities (pg. 30-31), intersection safety improvements at Anderson Road and Manhattan Avenue (28-29), and pavement repair (preventative treatment) (pg. 22-23)</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Florida Mining Pump Station</b> – Area flood exposure improvements (pg. 44)</li> <li>• <b>Anderson Road to Savarese Circle</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>
<b>Hillsborough Avenue Area*</b>	<ul style="list-style-type: none"> <li>• <b>Veterans Expressway to Hoover Road</b> – Complete street improvements including capacity improvements (pg. 30-31)</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Veterans Expressway to Skipper Palms Shopping Center</b> – Roadway flood exposure improvements (pg. 45-49)</li> </ul>

\*Evacuation Route

### Next Steps

- Complete detailed safety analysis of high crash areas identified in matrix
- Complete hydraulic capacity analysis of water/sewer transmission mains, including coordination with City of Tampa based on collection and transmission systems ownership
- Evaluate a combination of gray, green and blue infrastructure techniques to mitigate flood exposure
- Coordinate with County departments, including Public Works, to identified ongoing projects and plans in the area
- Further identify infrastructure project scopes and related funding sources, including public engagement and coordination with leading and coordinating agencies based on infrastructure and right-of-way ownership including:
  - Florida Department of Transportation
  - City of Tampa
  - CSX
  - Tampa International Airport

**Figure 22. Recommended Improvements Map**







Appendix A

**Assessment Matrix**



**Table 17. Assessment Matrix**

Location	Recommended Improvement	Improvement Benefit				Ongoing Project or Planned Improvement
		Mobility	Safety	Resiliency	Site Redevelopment	
<b>Anderson Road</b>						
Anderson Road from Tampa W Boulevard to Corporate Lake Drive	Flood exposure improvements	✓		✓	✓	
Anderson Road from Waters Avenue to Hillsborough Avenue	Sewer collection/transmission system extension (septic to sewer conversion)				✓	
Anderson Road & Sligh Avenue	Intersection safety improvements	✓	✓			CIP 69679046 - realigning eastbound and westbound movements, northbound right-turn lane, new or replaced sidewalks
Anderson Road from Hoover Boulevard to Hillsborough Avenue	Flood exposure improvements	✓		✓	✓	
Tampa West Pump Station	Flood exposure improvements			✓		
Anderson Road from Linebaugh Avenue to Sligh Avenue	Speed reduction and shared use path	✓			✓	
Anderson Road from Pioneer Park Boulevard to Benjamin Road	Pavement repair - preventative treatment	✓				
Comanche #1 Pump Station	Flood exposure improvements			✓		
<b>Benjamin Road</b>						
Benjamin Road from Waters Avenue to Sligh Avenue	Roadway capacity and congestion improvements	✓	✓		✓	CIP 69600096 - Signal intersection improvement at Barry Road & Benjamin Road with milling and resurfacing
Benjamin Road from Hillsborough Avenue to Ann Ballard Road	Flood exposure improvements	✓		✓	✓	
Benjamin Road from Hillsborough Avenue to Waters Avenue	Shared use path	✓	✓		✓	
Benjamin Road from Waters Avenue to Johns Road	Sewer collection/transmission system extension (septic to sewer conversion)				✓	
Benjamin Pump Station	Flood exposure improvements			✓	✓	



	Assessment Measure															
	Congestion and Mobility					Safety		Utilities		Exposure			Adjacent Land Use			
	High TTI or V/C	Serious/Poor Pavement Condition	Fair Pavement Condition	Incomplete User Facility	Truck Routes	HART Route	Crash Pattern or Severe Crash	Above Target Speed	Water Connection	Sewer Connection	100-Year Flood	FEMA Flood Zone	CAT 1 or 3 Hurricane	Competitive Site	Redevelopment Project Site	Community Amenity
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Location	Recommended Improvement	Improvement Benefit				Ongoing Project or Planned Improvement
		Mobility	Safety	Resiliency	Site Redevelopment	
<b>Hoover Road</b>						
Hoover Boulevard from Hillsborough Avenue to Sligh Avenue	Pavement repair - preventative treatment	✓			✓	
Hoover Boulevard from Hillsborough Avenue to Sligh Avenue	Speed reduction and shared use path	✓	✓		✓	
Hoover Boulevard from Hangar Court to Knox Street	Flood exposure improvements	✓		✓	✓	
Hoover Boulevard from W Hanna Avenue to Anderson Road	Water Transmission Extension				✓	
<b>Linebaugh Avenue</b>						
Linebaugh Avenue from Veterans Expressway to Mullis City Way	Pavement repair - preventative treatment	✓			✓	
Linebaugh Avenue from Veterans Expressway to Mullis City Way	Speed reduction and shared use path	✓	✓		✓	
Linebaugh Avenue from Plantation Boulevard to Mullis City Way	Flood exposure improvements	✓		✓	✓	
Linebaugh Avenue & Anderson Road	Intersection safety improvements	✓	✓			
<b>Manhattan Avenue</b>						
Manhattan Avenue from Waters Avenue to Broad Street	Speed reduction and dedicated pedestrian and bike facility	✓	✓			
Manhattan Avenue from Waters Avenue to Broad Street	Flood exposure improvements	✓		✓		
Crestwood Elementary	Flood exposure improvements		✓	✓		
<b>Sligh Avenue</b>						
Sligh Avenue from Benjamin Road to railroad	Pavement repair - preventive treatment	✓			✓	Unfunded - Resurfacing from Benjamin Road to Manhattan Road
South of Sligh Avenue, Johns Road from Thompson Center Court to Sligh Avenue	Pavement repair - major rehabilitation	✓			✓	Unfunded - Resurfacing from Benjamin Road to Manhattan Road
Sligh Avenue from Benjamin Road to railroad	Shared use path	✓	✓		✓	
Sligh Avenue from Benjamin Road to Johns Road	Flood exposure improvements	✓		✓	✓	
Sligh Avenue from Hoover Boulevard to railroad	Flood exposure improvements	✓		✓	✓	

	Assessment Measure															
	Congestion and Mobility						Safety		Utilities		Exposure			Adjacent Land Use		
	High TTI or V/C	Serious/Poor Pavement Condition	Fair Pavement Condition	Incomplete User Facility	Truck Routes	HART Route	Crash Pattern or Severe Crash	Above Target Speed	Water Connection	Sewer Connection	100-Year Flood	FEMA Flood Zone	CAT 1 or 3 Hurricane	Competitive Site	Redevelopment Project Site	Community Amenity
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Location	Recommended Improvement	Improvement Benefit				Ongoing Project or Planned Improvement
		Mobility	Safety	Resiliency	Site Redevelopment	
<b>Waters Avenue</b>						
Waters Avenue from Veterans Expressway to Manhattan Avenue	Pavement repair - preventative treatment	✓				FDOT Corridor Planning Study from Fletcher Avenue to Selmon Expressway
Waters Avenue & Anderson Road	Intersection safety improvements	✓	✓			
Florida Mining Pump Station	Flood exposure improvements			✓		
Waters Avenue & N Manhattan Avenue	Intersection safety improvements	✓	✓			
Waters Avenue from Veterans Expressway to Manhattan Avenue	Speed reduction and dedicated pedestrian and bike facilities	✓	✓			
Waters Avenue from Anderson Road to Savarese Circle	Flood exposure improvements	✓		✓		
<b>Hillsborough Avenue</b>						
Hillsborough Avenue from Veterans Expressway to Skipper Palms Shopping Center	Flood exposure improvements	✓		✓		
Hillsborough Avenue from Veterans Expressway to Hoover Road	Roadway capacity and complete street improvements	✓	✓			

	Assessment Measure															
	Congestion and Mobility						Safety		Utilities		Exposure			Adjacent Land Use		
	High TTI or V/C	Serious/Poor Pavement Condition	Fair Pavement Condition	Incomplete User Facility	Truck Routes	HART Route	Crash Pattern or Severe Crash	Above Target Speed	Water Connection	Sewer Connection	100-Year Flood	FEMA Flood Zone	CAT 1 or 3 Hurricane	Competitive Site	Redevelopment Project Site	Community Amenity
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