

CITY OF LARGO
**SUSTAINABILITY
& RESILIENCE
ACTION PLAN**



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Introduction

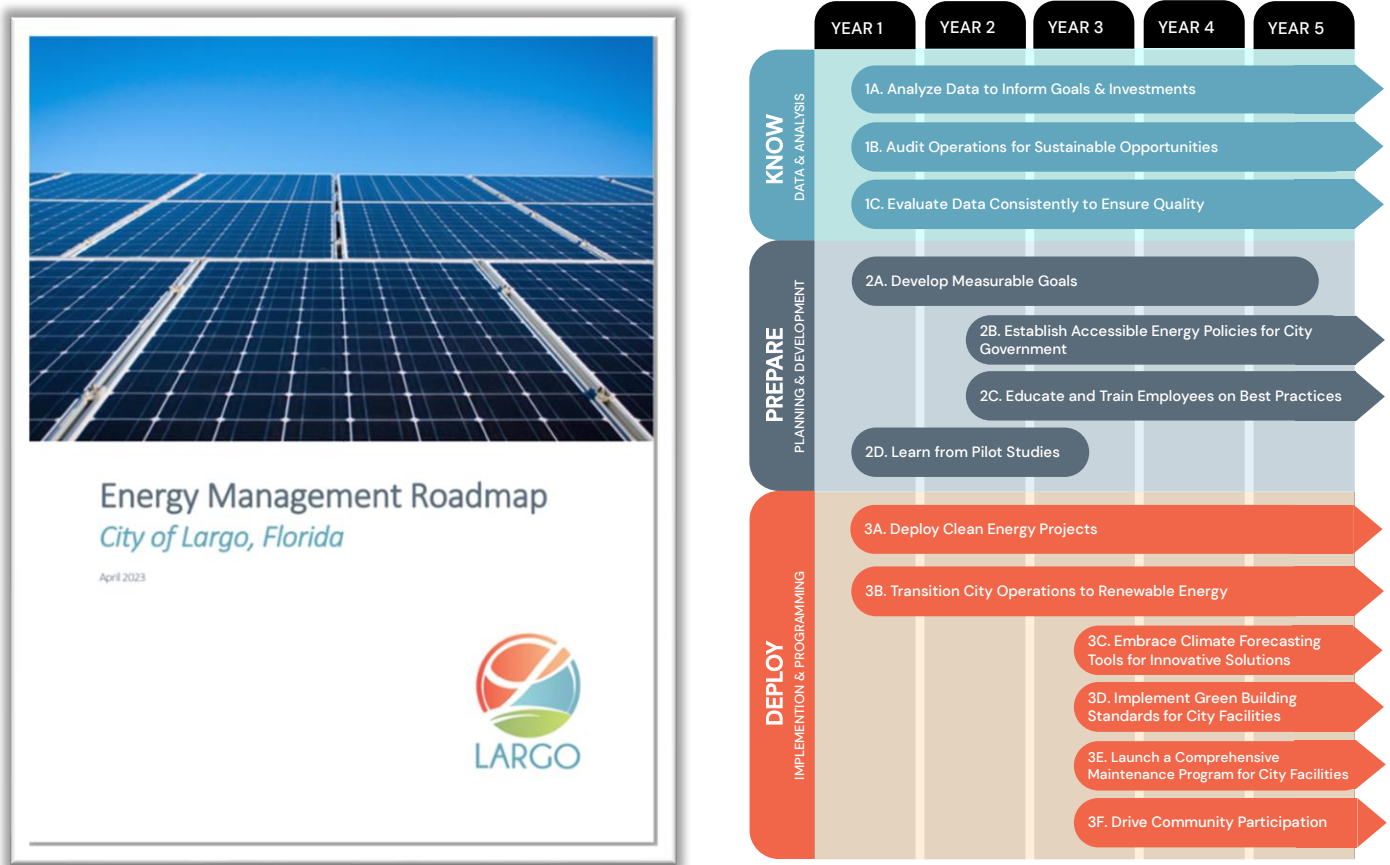
This Plan is the summation of years of work by citizens, stakeholders, and staff throughout the City of Largo. In 2018, we began this journey with the creation of our Largo Environmental Action Plan (LEAP). Around this time, many local governments throughout Florida created sustainability plans and any detailed planning by local governments, in terms of climate change, was in its infancy. When we began the LEAP update in 2020, we made the timely decision to merge it with our vulnerability assessment for climate change. **The belief that sustainability and resilience are linked is a guiding principle of this Plan.** These two principles together, form the basis of our 2023 Sustainability and Resilience Action Plan.

The SRAP includes three substantial elements:

1. Largo Energy Management Roadmap

The Largo Energy Management Roadmap (LEMR) introduces strategies that we can adopt to further integrate sustainability and energy management in municipal operations, for the benefit of the City, community, and future generations. The strategies provide a high-level structure that we can build upon to establish an energy management process. Several key aspects of the LEMR were adopted as part of the SRAP’s Adaptation Strategy 6: Energy Roadmap. The LEMR was a distinct step in the development of the SRAP and is referenced throughout this document.

FIGURE 1 – LARGO ENERGY MANAGEMENT ROADMAP



2. Vulnerability Assessment

We undertook a detailed and data-driven study of six climate threats to understand their effect on the city now and into the future. We studied one primary extreme heat threat, two primary flood threats, and three secondary environmental hazards as follows:

- Extreme heat
- Sea level rise/tidal flooding
- Storm surge
- Natural impacts due to increased air and water temperatures
- Ecological shifts due to changes in rainfall patterns
- Ecological impacts due to increases in atmospheric carbon dioxide

The methodology and the results of these analyses provided significant map-based and narrative information that drove the development of the Adaptation Roadmap.

As of 2023, Largo is already impacted by flooding and heat. Our City is particularly vulnerable to storm surge due to our location between two coasts to the east and west – as well as our network of creeks and canals. Our proximity to the equator and our largely developed region also make us highly susceptible to the impacts of extreme heat. Results of the Vulnerability Assessment clearly demonstrate that climate change impacts across Largo will continue to grow over time.

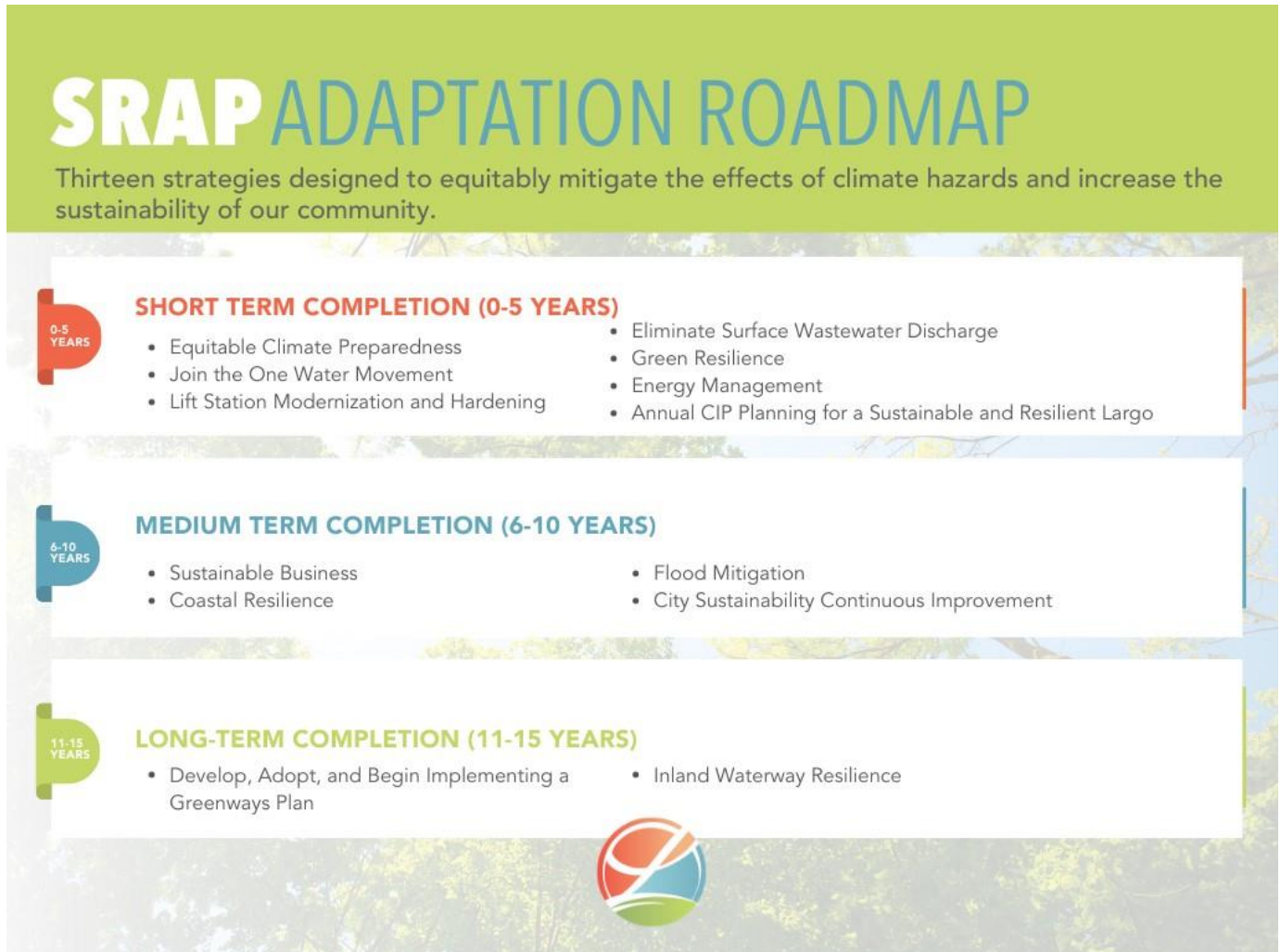
It is important to note that equity is a core component of the SRAP, as communities on the frontlines of climate change are already disproportionately affected and this impact will magnify in the future. For this assessment, we leveraged datasets that highlight various aspects of equity as part of every scientific task within the Vulnerability Assessment that are available via the Centers for Disease Control’s Social Vulnerability Index and the federal government’s recent [Climate and Economic Justice Screening Tool](#). Largo census tracts that this tool identifies as overburdened and underserved are referred to as “disadvantaged communities” throughout this document.



3. Adaptation Roadmap

The final step of the SRAP was the development of our Adaptation Roadmap to address both our climate change and sustainability concerns. These adaptation strategies have been organized into three completion timeframes: short term (0-5 years), medium term (6-10 years) and long term (11-15 years). Within each major strategy, multiple sub-strategies were developed to better guide our work. **Overall, 13 major strategies and 48 sub-strategies were developed.**

FIGURE 2 – ADAPTATION ROADMAP



Each of these thirteen adaptation strategies were evaluated for equity concerns and opportunities. This equitable assessment included the creation and use of our Equity Scorecard as well as engagement with vulnerable communities through our Community Connectors Program and three distinct phases of engagement.

This plan is another step in the City’s Sustainability and Resilience journey. Like cities around the world, we do not have all the answers. However, the SRAP document will remain a living plan that continues to guide Largo for the years ahead in the realms of equity, resilience, and sustainability.

Note to Reader: Terms appearing in bold blue text are defined in the Glossary on page 88.

Both a Sustainable and a Resilient City

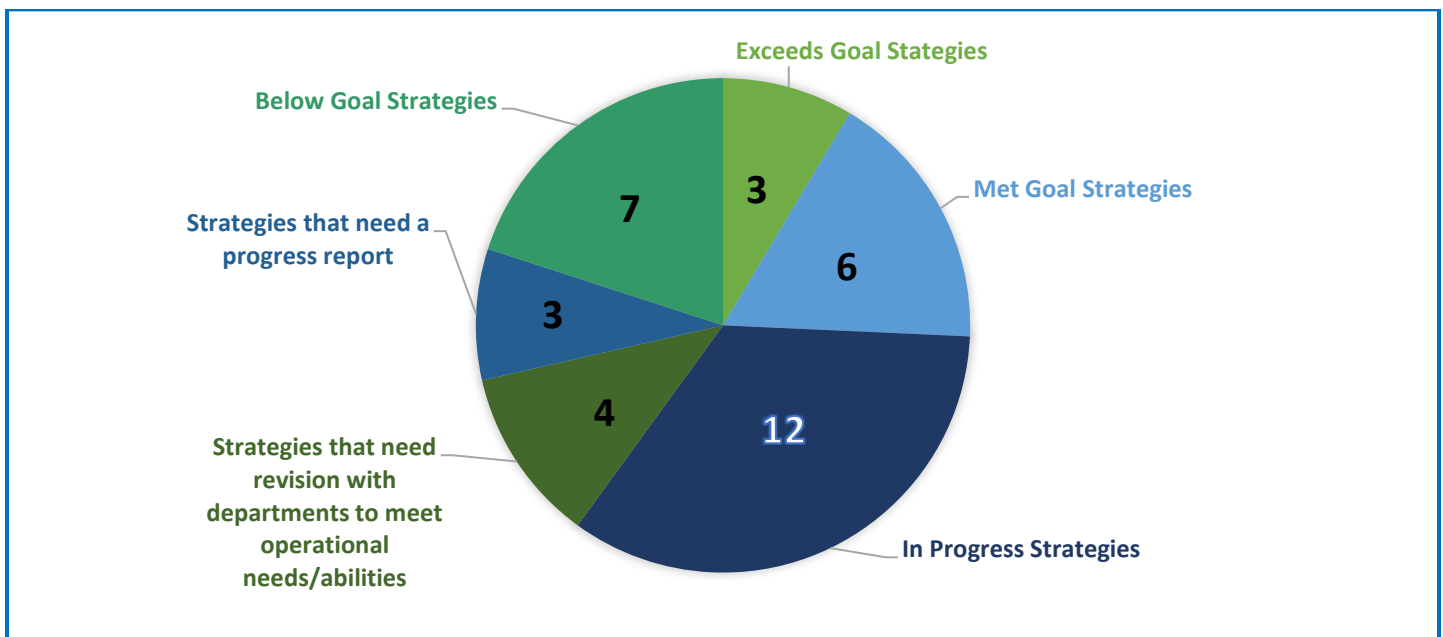
Without sustainability, we cannot build a resilient City. **Sustainability** is defined as “to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations.” **Resilience** is defined as “the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.” Both principles are linked and critical to Largo’s future. For example, some **adaptation strategies** – if not thoughtfully implemented – may pollute our waterways, increase **greenhouse gas** emissions, and/or reduce the quality of life in our communities. This linkage is why engineering alone cannot address climate change. Some of our traditional engineering techniques to address climate change are not sustainable. Therefore, our SRAP planning process includes considerations for both sustainability and resilience. Luckily, many Adaptation Strategies build both sustainability and resilience if carefully planned, designed, and implemented.

Largo Environmental Action Plan (LEAP) Progress Reporting

Much progress has been made since we adopted the Largo Environmental Action Plan (LEAP) in 2018. This plan included 35 strategies organized into the categories of infrastructure, natural resources, and people and services – all created to advance our efforts to renew Largo’s natural environment and ensure sustainability for generations. Of these 35 strategies, 69% have been achieved or are currently in progress. 20% of strategies are below their targets and 11% need to be revised with their respective departments due to a change in a City priority or a greater understanding of the issue and possible solutions.

In 2019, we adopted an ordinance limiting the distribution of certain single use plastics on City property, protecting both wildlife and community appeal. We also prioritized sustainability in new facilities, seen most recently in the exciting Horizon West Bay project, which includes solar energy and is pursuing a LEED platinum rating. Figure 3 provides a summary of our progress and Appendix 1 contains a detailed update of the LEAP Strategies as of 2023.

FIGURE 3 – SUMMARY OF LEAP STRATEGIES AS OF 2023

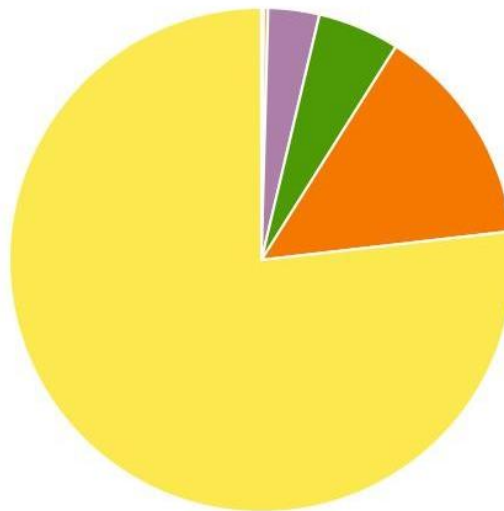


Government Operations GHG Inventory

We recognize that greenhouse gas (GHG) emissions from human activity are both causing and accelerating climate changes. These changes pose substantial risks to current and future Largo residents, ecosystems, and economies. To understand how the City of Largo is contributing to this acceleration, a baseline GHG inventory was conducted for the year 2019. This year was selected due to speculation that our facilities and overall operations in the years 2020 and 2021 were significantly different than our normal practices due to the impacts of COVID-19. Additionally, this project was completed with assistance from ICLEI – Local Governments for Sustainability USA and the Patel College of Global Sustainability at the University of South Florida.

Figure 4 shows the GHG emissions that result from the City of Largo’s 2019 municipal operations, totaling 28,547 metric tons of carbon dioxide equivalents (MTCO₂e). The Buildings sector, made up of the facilities the City owns and operates, accounts for a large majority (77%) of these emissions. It’s important to note this sector includes electricity consumed by our Wastewater Treatment Facility. The second largest contributor is our City fleet (14%) followed by the emissions that result from our team’s commute to and from work (5%). Because of this, actions to reduce emissions from these sectors are a key part of our Largo Energy Management Roadmap, detailed later in this plan. While the generation of waste does result in greenhouse gas emissions, the amount resulting from our municipal operations is so small in comparison to our Buildings and Fleet sectors that it does not appear on the pie chart below.

FIGURE 4 - CITY OF LARGO 2019 MUNICIPAL GREENHOUSE GAS EMISSIONS



- Solid Waste Facilities
- Street Lights & Traffic Signals
- Water & Wastewater Treatment Facilities
- Employee Commute
- Vehicle Fleet
- Buildings & Facilities

Ready for 100

We have concentrated heavily on our responsibility to change our energy behavior, focusing on conserving energy and finding alternative energy sources for City operations. In 2018, the City of Largo became the 75th City in the nation, and 4th in Florida, to commit to transition to 100% renewable energy, both for the organization and the community, by 2035 and 2050, respectively. For City operations, we set a target of at least 50% renewable energy by 2030 and 100% renewable energy by 2035. To advance this effort, we also enrolled in the Duke Energy Clean Energy Connection program, which enables us to receive 40% of our total municipal electricity consumption from Duke's solar arrays.

Green Fleet

We also focused heavily on reducing emissions throughout our vehicle fleet. This has manifested as a policy to transition all light-duty City vehicles to alternative fuels by 2030. We currently have 71 alternative fueled vehicles in our fleet, including the first all-electric police motorcycle put into service in 2021. Additionally, as of 2023, seven dual port charging stations are now available for both City vehicles and public usage. Our future City Hall project, Horizon West Bay, is set to be open in early 2025. This facility will include 11 dual-port charging stations, three of which will be available for public charging. We are planning on including charging stations at several other City-owned locations moving forward. This includes the upcoming construction of Fire Station 39, which will include two dual-port employee charging stations, one dual-port public charging station, and infrastructure inside the garage for future level three charging.

Going beyond our own fleet, we have also focused on expanding public access to charging stations. In 2022, Ordinance 2022-02 was passed, requiring new development projects to install charging stations in our activity centers and multi-modal corridors. Our Community Development Code also incentivizes property developers to include charging stations in their projects by allowing them to increase the number of units in their project if stations are included.

Continued Progress

Because focus has been given to renewable energy and alternative-fuel commitments, there are LEAP strategies outside of these topics that have not made as much progress, which is reflected in the 20% of targets that have not yet met their initial goal. Moving forward, we will create a framework to ensure that the future SRAP has check-in points built into its implementation. Additionally, our staff will create a list of employees who serve as leads for each strategy and will update the list to reflect any staff changes every six months, ensuring that new employees who fill the lead role are aware of the adopted targets. These actions will help ensure City staff have a continued awareness of the SRAP goals and progress expectations. The SRAP will replace LEAP as the City's strategic environmental plan, integrating the ongoing and below target LEAP strategies into its own work plan.

Diversity, Equity, and Inclusion

From the beginning of this journey at building resilience, we placed diversity, equity, and inclusion at the forefront. It is critical to engage all our communities if we are going to create a sustainable and resilient future here in the City of Largo. We've built these principles into every aspect of our SRAP – from our Community Connectors program to the datasets and the science we employed to create the SRAP. We also completed three phases of public engagement in the development of the SRAP and worked with City Commission to develop a standardized method of assessing each strategy for equity concerns. This Equity Scorecard and associated strategy scores can be found in the appendix of this document.

Community Engagement

The early planning process for the SRAP was heavily grounded in the Urban Sustainability Directors Network’s Guide to Equitable, Community-Led Climate Preparedness Planning. This document encompasses several elements but it’s main planning recommendations can be boiled down into two phases:

- Invoking community and government preparedness; and,
- Valuing community-led engagement.

Phase One – Community and Government Preparedness

We began by hiring five Community Connectors who represented a range of identities across race, ethnicity, income, and education. These individuals serve as intermediary connectors with the community at-large, particularly groups and individuals on the frontlines of climate change. Their purpose was to seek input from these stakeholders to help determine our priorities as part of the SRAP.

It was essential to ensure that staff and community members understood the purpose of the future of the SRAP as well as the basics of climate change, mitigation, adaptation, and equity. Multiple learning sessions were conducted for Commission members, our executive leadership team, staff subject matter experts, and the Community Connectors. Through the session exercises with Commission specifically, a policy statement was created to guide the SRAP project. It states:

“We commit to strengthening the interconnected systems (which are environmental, social, and economic) within our community through decision-making processes that prioritize diversity, equity, and inclusion. This will guide our efforts to create a more resilient, sustainable, and prosperous Largo for generations to come”.

This policy statement guided future outreach efforts and the development of the SRAP strategies and document.

Phase Two – Community-Led Engagement

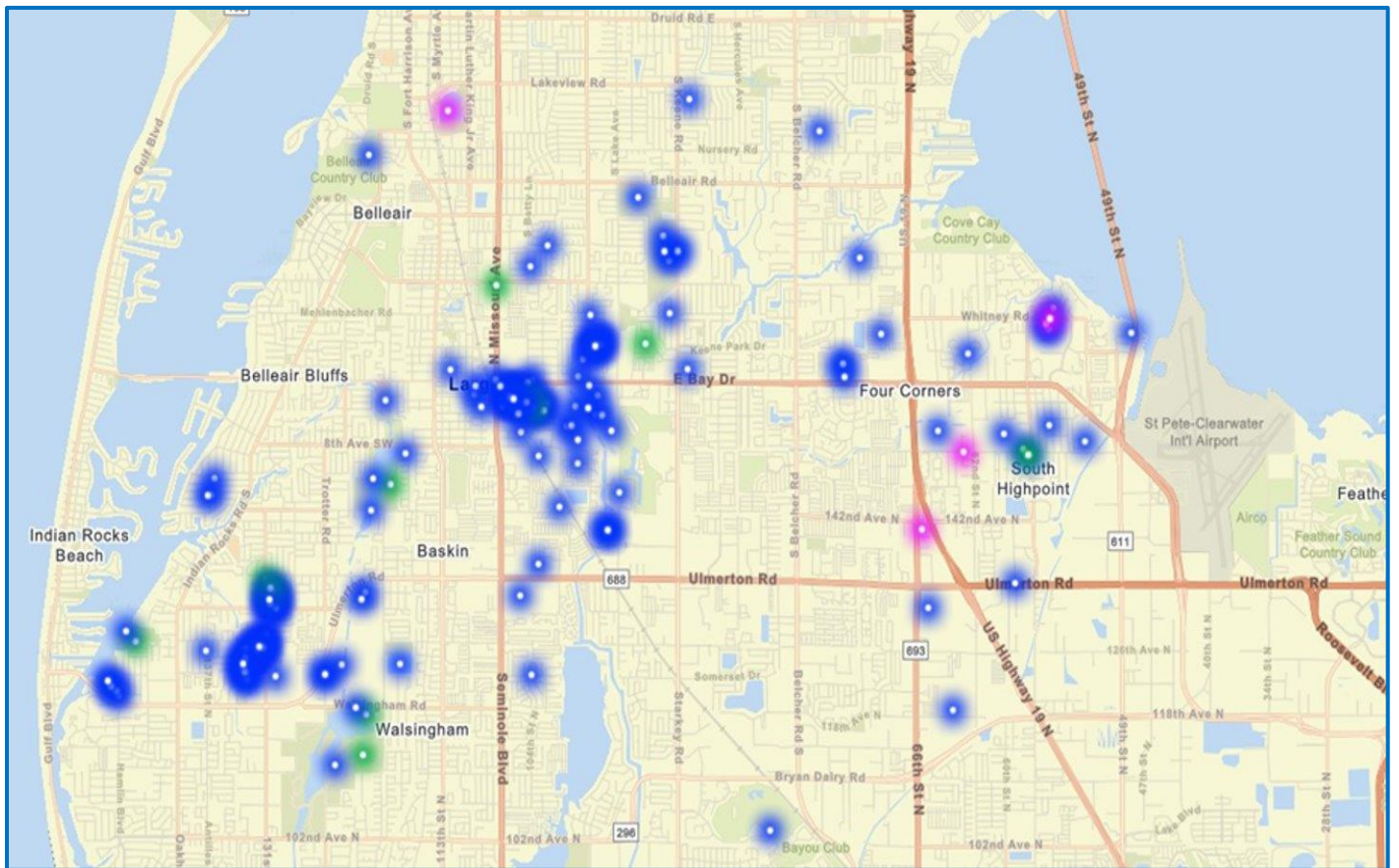
After brainstorming with the Community Connectors on the best ways to engage with the Largo community, we created a plan to maximize public input.

- To increase awareness of climate hazards and receive direction from the public on what topics they most wanted to see included in the SRAP, multiple “Community Climate Sessions” occurred in July of 2022. These sessions were offered both virtually and in-person, with the in-person sessions providing both food and childcare to participants. To ensure this event remained accessible to all residents of Largo, a session was also offered with a Spanish interpreter present. The top themes of highest interest for discussion during these sessions were clean energy and solar, affordable and efficient housing, and mental health & homelessness. We wanted to gather data regarding what areas across the City the public valued most and why. A survey was created and promoted on various online platforms from July through August 2022, and the sustainability and resilience team also fielded the survey at 12 locations across Largo from storefronts to open air markets, parks and community centers. The survey was available in English and Spanish. Survey results were incorporated into the vulnerability assessment of SRAP to consider climate hazard impacts on high community value locations.
- The Community Connectors and members of the Sustainability and Resilience Action Team also engaged with the public at several large events across Largo in fall 2022 by hosting a City table to gather additional feedback across the specific areas of community livability such as utilities, community design, safety, and health & wellness. The team connected with over 150 individuals at these events. Community input was specific and

nuanced across each topic area and should be referenced as a baseline to inform next steps of community engagement for related adaption strategies during strategy implementation.

Figure 5 depicts the results of the mapping survey, with support from the City’s GIS team, showing the locations across Largo that are seen as most important to community members, reflecting 191 responses. Most respondents were residents of Largo (indicated with a blue dot), with several others noting they work or own a business in Largo (indicated with a green and pink dot, respectively). These locations of high value to Largo community members were used to inform the adaptation strategies developed in the Adaptation Roadmap.

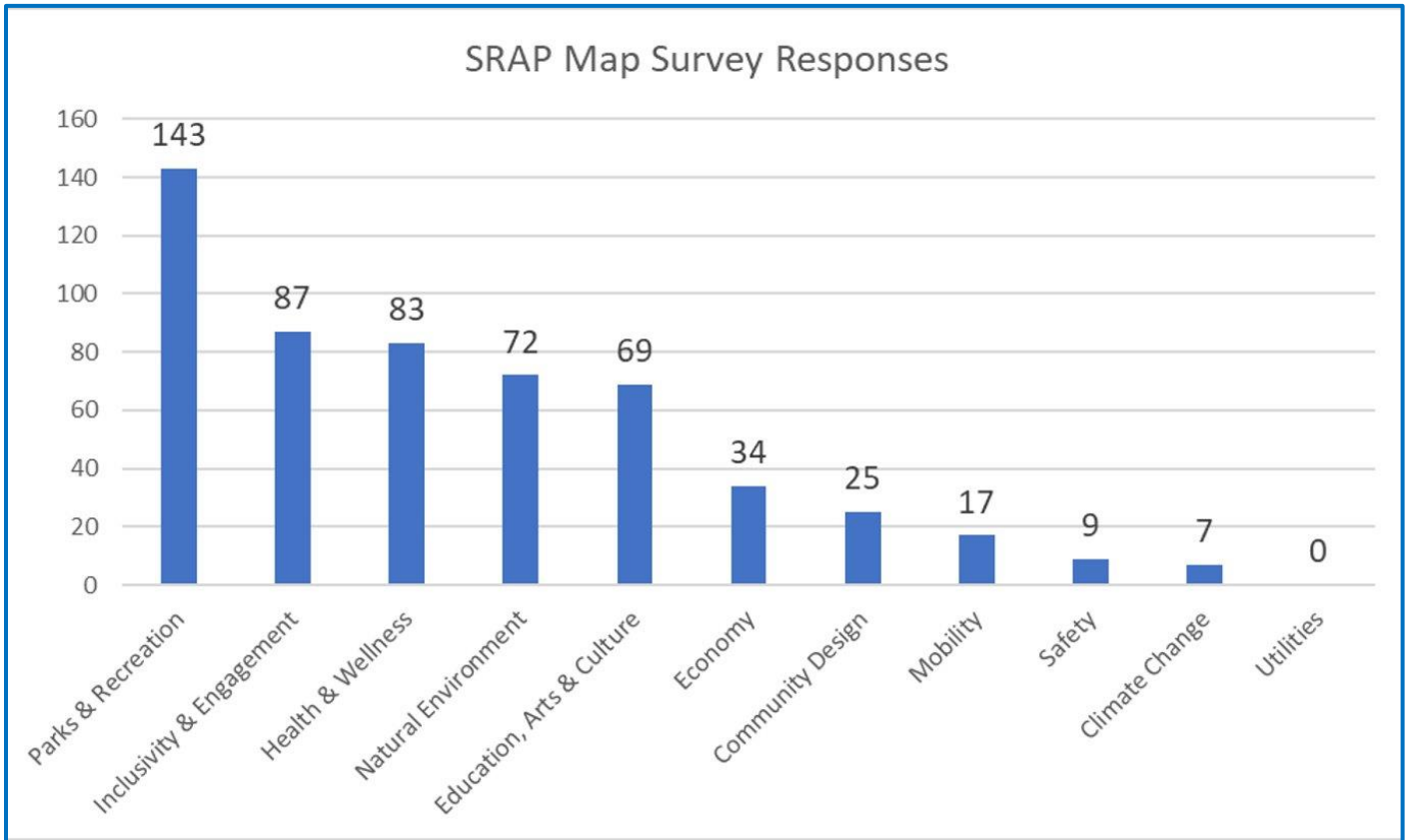
FIGURE 5 - COMMUNITY RESOURCES RESULTS (DATA GENERATED BY LARGO COMMUNITY MEMBERS, 2022).



When asked where in the community was important to them, respondents overwhelmingly identified Parks & Recreation as their highest priority (143 coded responses). Many of these responses named specific parks and either their ability to provide opportunities for Health & Wellness and/or the Natural Environment. Parks were mentioned 90 times across all responses, with Largo Central Park being named the most. Many of the responses that contributed to the high scores in Natural Resources, Health & Wellness, and Inclusivity & Engagement were in response to a park or recreation center.

Inclusivity & Engagement was referenced the second most of all categories throughout the survey responses (87 times). Many expressed their appreciation for public spaces because they provide opportunities to meet with and connect with others, they are accessible to various age groups, and they are almost always no cost to use. Figure 6 summarizes the results of the survey responses.

FIGURE 6 - SRAP MAP SURVEY RESPONSES FOR MOST VALUED COMMUNITY COMPONENT



Equity Evaluation

As part of Phase One: Community and Government Preparedness, an Equity Score Card was created with City Commission. This score card was used to evaluate each of the 13 adaptation strategies outlined in the Adaptation Roadmap phase of the SRAP outlined later in this document. These strategies and scores were brought to the city’s Community Development Advisory Board (CDAB) for review and feedback. Concerns and opportunities regarding equity were identified and many of the strategies were modified in response to this feedback. The Equity Score Card, scores, and CDAB feedback are included in the Appendix.

It is important to note that several of the adaptation strategies call for additional, project-specific community engagement components. We will continue to involve our community members in the planning and implementation phases of these projects, specifically focusing on connecting with disadvantaged communities and other community groups that are most impacted by specific climate hazards and the solutions identified in the SRAP.

Largo’s Energy Management Roadmap

We recognize that greenhouse gas (GHG) emissions from human activity are catalyzing profound climate change, the consequences of which pose substantial risks to the future health, wellbeing, and prosperity of all of us. The consumption of energy by government buildings and vehicles is the largest contributor to GHG emissions generated by the City. To address this growing concern, we created a detailed energy management plan that cost effectively improves energy efficiency, reduces GHG emissions, and addresses climate risk. Accordingly, as part of the creation of the SRAP, we

adopted a detailed Largo Energy Management Roadmap (LEMR) to further these efforts and secure a more sustainable future for all citizens and businesses of Largo.

In alignment with our Strategic Plan, where sustainability is a focus area, the LEMR introduces strategies that we can adopt to further integrate sustainability and energy management in municipal operations, for the benefit of the City, community, and future generations. The strategies provide a high-level structure that we can build upon to establish an energy management process. Strategies are action-oriented and interactive with other strategies to achieve our goals in an efficient and sustainable way. Several key aspects of the LEMR were adopted as part of Adaptation Strategy 6: Energy Roadmap.

Largo's 2023 Vulnerability Assessment

The City of Largo faces a variety of climate hazards. Unfortunately, we are not unique in this regard. To complete our planning process in a timely manner, we decided to focus on climate hazards that are obvious and required by the State of Florida, as well as some hazards that are more scientific and subtle in nature. The primary climate hazards that we studied in 2023 included:

- Extreme heat
- And two flood hazards, including:
 - [Sea level rise/tidal flooding](#)
 - [Storm surge](#)

It is important to note that the flood hazard analyses include data for future conditions (or scenarios). However, there are no considerable datasets for future conditions and extreme heat as of 2023. Thus, the analysis for extreme heat only included data for current conditions. This is a standard practice in the industry as of 2023 in terms of the study of extreme heat.

We also explored additional hazards that relate to the environment but that we also believe are critical to our future as a City. These hazards are only defined as secondary because they require scientific analyses beyond the basic analyses generally conducted for municipal vulnerability assessment in the State of Florida. However, in many ways, these secondary hazards are as critical or more critical to the future of the City of Largo. In terms of the cause, secondary environmental hazards can generally be linked back to one of the other primary climate hazards. Secondary environmental climate hazards are complex and create numerous issues in both the built and natural environment. And, in many cases, once these secondary hazards manifest, they can become very difficult to address. Secondary environmental and climate hazards included in our 2023 SRAP were:

- Increased air and water temperatures
- Changes in rainfall patterns
- Increases in atmospheric carbon dioxide

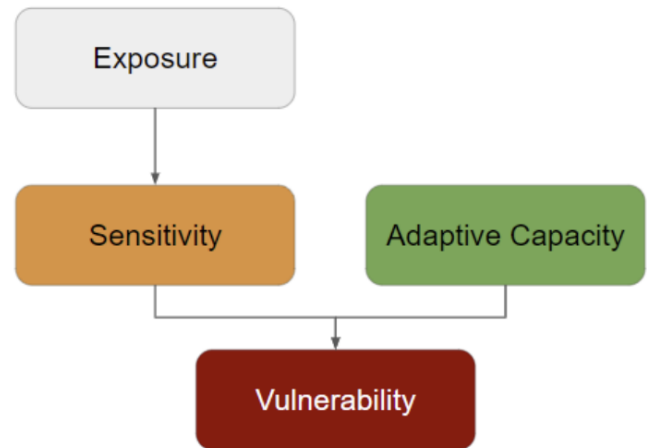
Moving forward, the City should consider including additional climate hazards into future vulnerability assessments. This may include excessive precipitation and wind events, due to the significant impacts both of these hazards have on communities across Florida. While data for both hazards is currently limited and costly to study, data will likely be easier to assess in the near future.

Assessment Framework

The SRAP is based on a **vulnerability** analysis framework that helps our community understand the vulnerability of built-environment **assets** to climate-related hazards or threats. Conceptually, the hazards to which community assets are exposed are influenced by both climate and non-climate **stressors**.

As shown in Figure 7, vulnerability describes the susceptibility of exposed assets based on two core concepts: (1) **sensitivity**—the degree to which an asset is affected; and (2) **adaptive capacity**—the degree to which an asset can cope with the negative effects of a hazard. These vulnerability concepts are applied through rules based on attributes of assets and hazards, hereafter termed “rulesets”, to classify community assets (or properties) as having “high, medium, or low” characteristics of vulnerability. A summary of these rulesets by hazards are displayed in Table 1.

FIGURE 7 - VULNERABILITY FRAMEWORK



To understand possible future exposure, multiple sea level rise scenarios were included in this assessment for tidal flooding and storm surge hazards. These scenarios are based the 2017 NOAA local intermediate-low and intermediate high sea level rise projections.

TABLE 1 - SUMMARY OF RULESETS BY HAZARDS USED IN THIS ASSESSMENT

| Hazard | Scenario | Exposure | Sensitivity | Adaptive Capacity |
|----------------|--------------------------------|------------------------------------|---|--|
| Storm Surge | Current (100-yr) | All assets exposed to flood extent | High: Structure in inundation extent and criticality of impact is high Medium: Structure in inundation extent Low: No structure in inundation extent (land only) | High: structure outside of floodplain OR in floodplain, built after BFE requirements were raised to 1-ft (2019) Med: structure in floodplain, built after BFE requirements were put in place (1972 - 2009) Low: structure in floodplain, built before BFE requirements were put in place (1971) |
| | 2040 Int. Low | | | |
| | 2040 Int. High | | | |
| | 2070 Int. Low | | | |
| | 2070 Int. High | | | |
| Tidal Flooding | Current & 2040 Int. Low | All assets exposed to flood extent | High: Structure in inundation extent and criticality of impact is high Medium: Structure in inundation extent Low: No structure in inundation extent (land only) | High: structure outside of floodplain OR in floodplain, built after BFE requirements were raised to 1-ft (2019) Med: structure in floodplain, built after BFE requirements were put in place (1972 - 2009) Low: structure in floodplain, built before BFE requirements were put in place (1971) |
| | 2040 Int. High & 2070 Int. Low | | | |
| | 2070 Int. High | | | |
| Extreme Heat | Current | N/A | High: >75th percentile Developed Land Cover Medium: > 50th percentile Developed Land Cover | Low: <25th percentile tree canopy coverage AND/OR <25th percentile median income Medium: 25th-75th percentile tree canopy coverage AND/OR 25th-75th percentile Median Income |

| Hazard | Scenario | Exposure | Sensitivity | Adaptive Capacity |
|--------|----------|----------|--|--|
| | | | Low: < 50th percentile Developed Land Cover | High: >75th percentile tree canopy coverage AND/OR >75th percentile Median Income |

For the purposes of this assessment, these hazards are considered using pre-existing flood hazard information at the individual property level. The geospatial (or map-based) assessment is conducted at the asset-level and the results are then aggregated to census block groups to visualize spatial patterns in concentration of vulnerability. Assessments were developed separately for different asset categories established as follows: 1) Critical Infrastructure 2) Critical Community and Emergency Facilities 3) Natural, Cultural, and Historic Resources 4) Housing 5) Commercial and Industrial. These asset categories are further described in Table 2.

TABLE 2 - SUMMARY OF ASSET TYPES BY THEME ASSESSED

| Asset Theme | Asset Types |
|--|---|
| Critical Infrastructure | Wastewater treatment facilities, pump stations , stormwater treatment facilities & ponds, electric production/supply facilities , solid & hazardous waste facilities, communications facilities, disaster debris management sites, staging sites |
| Critical Community and Emergency Facilities | Schools (public & private), higher education, community centers , correctional facilities, disaster recovery centers, disaster debris management sites, emergency medical services, fire stations, healthcare facilities, hospitals, law enforcement , local government facilities, affordable public housing/rental units, risk shelter inventory , state government facilities |
| Natural, Cultural, & Historic Resources | Conservation lands, religious properties , charities/nonprofits, cemetery/mortuary, parks, historical properties, cultural assets/properties, day care/child services |
| Housing | Single family homes, affordable housing, mobile homes, mobile home parks , condos & townhomes, group homes, multi-family homes, senior housing |
| Commercial & Industrial Properties | Offices, hotels/lodging , retail, commercial , restaurants, mixed use properties, industrial , manufacturing facilities, recreation, grocery, SNAP food stores |
| Transportation & Evacuation Routes | Heliports/helipads , major & minor roads, rail lines and facilities, evacuation routes |

Asset types in bold are considered to have higher criticality/sensitivity if impacted by flooding in property-based assessments.

Assessment Rulesets

The assessment begins with assessing **exposure**, defined as “the presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.”

Approach to Assessing Flood Hazards

The following describes the approach used for both (surge and tidal) flood hazards. For purposes of this assessment, “exposure” specifically means that an asset/property parcel is in a flood extent. Assets that are not exposed are not vulnerable to flooding.

When assessing levels of sensitivity (“high, medium, low”), the location of the structure and its criticality are considered together. The criticality of a structure is based on building footprints and type of asset use or nature of service provided. Properties with building structures spatially coincident with the flood extent, meaning those built in areas exposed to current or future flooding, have higher sensitivity compared to those with only land exposure. Additionally, a hospital, community center, or school that provides critical services, or a multi-family property with more people potentially affected have higher sensitivity compared to non-critical or single-family property. See Table 2 for a detailed list of all assets for this project, as well as those considered to have high criticality.

In this assessment, adaptive capacity is based on the year structures were built. Properties with low adaptive capacity are considered least able to cope with flooding because they are in the floodplain and were constructed before floodplain development ordinances were put in place (1971). Structures located within the floodplain with some adaptive capacity (moderate) were constructed after 1971 and before 2009. Structures with the highest adaptive capacity are either outside of the floodplain or within the floodplain but have the strictest floodplain development ordinances in place, built after 2009.

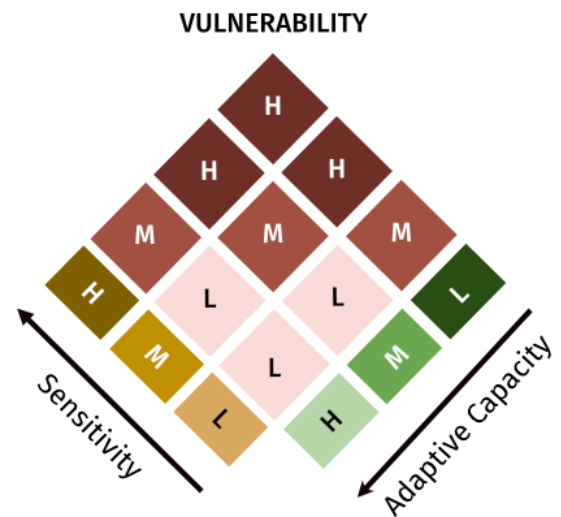
Levels of sensitivity and adaptive capacity are then combined to determine vulnerability. As shown in Figure 8, assets with low potential impact and high adaptive capacity are the least vulnerable. Assets with high potential impact and low adaptive capacity are the most vulnerable.

Approach to Assessing Extreme Heat

Extreme heat in the City was assessed at a screening level using census block groups to infer relative heat vulnerability by neighborhood. While projections exist for average daily temperatures and cooling degree days, future conditions for land cover and tree canopy data, as well as other datasets that are used for this analysis are not readily available, if at all. For this reason, only current extreme heat conditions are covered in the analysis.

For the purposes of this assessment, a person’s sensitivity to extreme heat is directly related to their exposure to higher levels of impervious surfaces. Adaptive capacity, the other component of vulnerability, is measured using levels of median income and the presence of higher percentages of tree canopy by neighborhood. Sensitivity and adaptive capacity indicators are combined to assign a relative vulnerability classification for each census block group. The results of this assessment are best used alongside census-based metrics to represent populations that are more sensitive to extreme temperatures, such as older people and outdoor workers. While this will reveal different patterns of vulnerability in our City, it will also help decision makers target different types of strategies and actions.

FIGURE 8 - ASSESSING VULNERABILITY



Aggregation of Vulnerability

To focus on areas that have the most concentration of physical vulnerability, the assets with either medium or high combined vulnerability are mapped at the census block groups scale. Due to varying sizes of census block groups, the percentage of assets with medium-high combined vulnerability is provided for a relative perspective of vulnerability within each neighborhood.

Primary Climate Hazards

Flood Hazards

Flooding receives a lot of attention as a primary hazard of climate change. The City of Largo is not unique in our vulnerability to various types of flooding. The 2023 Vulnerability Assessment aimed to understand our vulnerability to flooding using the best available data. We studied two specific water-related hazards as defined below:

- Tidal flooding due to sea level rise
- Storm surge

It was also important to examine how these hazards interact with various parts of the City and specifically, how flooding will make issues of equity more critical over time. There are many reasons why flooding tends to disproportionately affect different human populations, but among these are:

- When an area starts to experience recurrent flooding, those with more resources can more readily adapt or relocate.
- Those with more financial resources tend to have more ability, time, and resources to report flooding and obtain a remedy of some nature.
- Historically in the State of Florida, we located many of our larger stormwater storage and treatment facilities in areas that are relatively lower in elevation, developed earlier, and were less “engineered.” Much of this older infrastructure is now aged and intersects with areas with populations that are challenged via various socioeconomic issues.

Table 3 shows an overview of results from the assessment of current and future tidal flooding and storm surge in our City.

TABLE 3 - HIGH-LEVEL SUMMARY OF RESULTS FOR EACH ASSET-HAZARD PAIR & SCENARIOS

| Asset Theme | Total Assets | Storm Surge | | | | | Tidal Flooding | | |
|---|--------------|-------------|---------------|----------------|---------------|----------------|-------------------------|--------------------------------|----------------|
| | | Current | 2040 Int. Low | 2040 Int. High | 2070 Int. Low | 2070 Int. High | Current & 2040 Int. Low | 2040 Int. High & 2070 Int. Low | 2070 Int. High |
| Critical Infrastructure | 160 | 16 (10%) | 24 (15%) | 31 (19%) | 28 (18%) | 51 (32%) | N/A | 2 (1%) | 4 (2%) |
| Critical Community & Emergency Facilities | 178 | 17 (10%) | 27 (15%) | 29 (16%) | 28 (16%) | 40 (23%) | N/A | 2 (1%) | 2 (1%) |

| | | | | | | | | | |
|--|--------|-------------|---------------|---------------|---------------|----------------|------------|-------------|-------------|
| Natural, Cultural, & Historic Resources | 619 | 18 (3%) | 39 (6%) | 50 (8%) | 44 (7%) | 106 (17%) | N/A | 1 (<1%) | 6 (<1%) |
| Housing | 12,712 | 833 (6%) | 1,021 (8%) | 1,202 (9%) | 1,135 (9%) | 1,737 (14%) | 2 (<1%) | 21 (<1%) | 229 (2%) |
| Commercial & Industrial Properties | 861 | 46 (5%) | 63 (7%) | 90 (10%) | 82 (9%) | 149 (17%) | N/A | 1 (<1%) | 8 (2%) |
| Transportation & Evacuation Routes | 14 | 1 (7%) | 1 (7%) | 1 (7%) | 1 (7%) | 1 (7%) | N/A | 1 (7%) | 1 (7%) |

Percentages and total are shown for those assets with medium-high vulnerability.

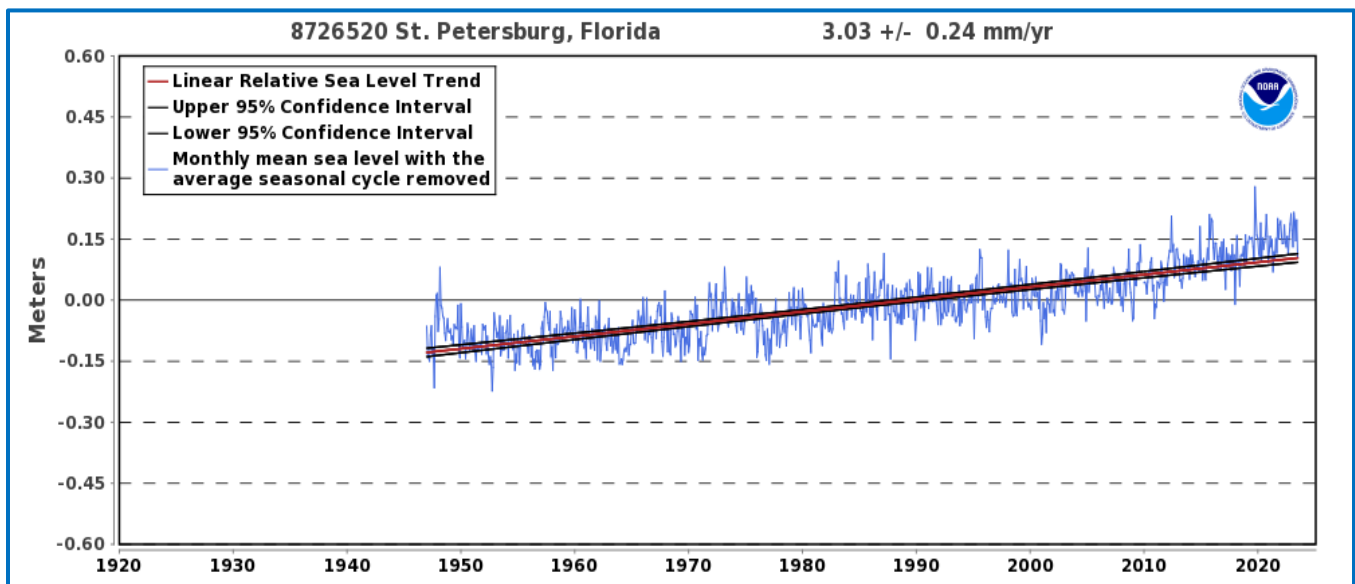
What does this mean for Largo?

The City of Largo is particularly vulnerable to flooding, even among Florida communities. This vulnerability exists now and into each of the future greenhouse gas emission scenarios, with vulnerability increasing as the emissions scenario increases. Scenario planning is a tool used for decision making under uncertainty and considering multiple possible outcomes. The results for multiple scenarios helped prioritize the resilience-building strategies and actions that can be seen in the Adaptation Roadmap section of this plan.

Sea Level Rise and Tidal Flooding

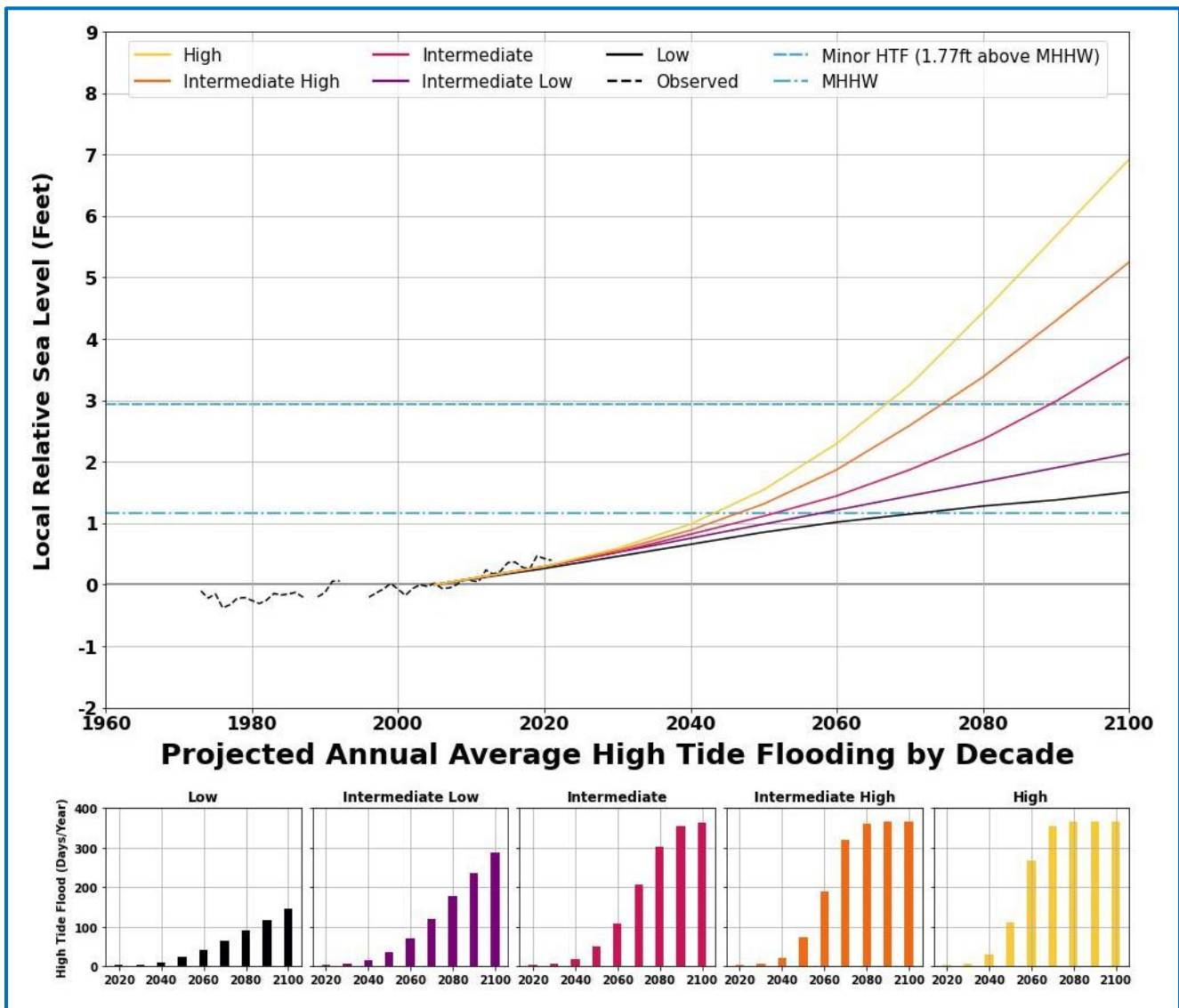
One of the earliest indicators of climate change has been the observed increases in sea levels. The average global sea level has risen about 7-8 inches since 1900, largely due to expansion of seawater caused by warming of the ocean and the added water from melting of land-based ice, such as ice sheets and glaciers. In addition to these global processes, sea levels are also affected by regional and local factors such as vertical land movement and ocean currents and circulations. Based on historical data, sea levels are rising in this area at 3.03 mm/year, which is approximately 1.2 inches/decade (see Figure 9).

FIGURE 9 - "RELATIVE SEA LEVEL TREND," CREDIT: NOAA NATIONAL OCEAN SERVICE, 2023.



The short-term impacts of sea level rise include increased **risk** of high tide flooding and storm surge. Tidal flooding is flooding of the low-lying land along the coastline from a high tide that is not associated with a severe storm. This type of flooding is also referred to as “high tide” or “sunny day” flooding. The height of a daily tide varies seasonally and from year-to-year depending on the relative position of the earth, sun, and moon (i.e., astronomical factors), ocean and wind currents, and changes in ocean circulation (El Niño/La Niña). Figure 10 shows the range of sea level rise scenarios at this tidal gauge based on emissions projections (top) and the resulting effect on the number of high tide flooding days the City may experience over time under different scenarios (bottom). As sea levels rise, the time periods when tidal flooding occurs will increase in frequency and duration. As show in Figure 11, the intermediate-high sea level rise projections suggest that, by 2050, our City could see around 75 days of high tide flooding.

FIGURE 10 - “PROJECTED INUNDATION EVENTS & SEA LEVEL RISE SCENARIOS AT 8726724, CLEARWATER BEACH FL,”
CREDIT: NOAA NATIONAL OCEAN SERVICE



Three tidal flooding conditions were assessed in the City: current and 2040 intermediate low conditions (2020), the 2040 intermediate high and 2070 intermediate low conditions, and the 2070 intermediate high conditions. See Figure 11 for an overview of this flood hazard in our City. Future impacts are visible in the Water View Estates and Largo Central Park Nature Preserve area of the City, as well as on the western and eastern edges of the City. While current tidal flooding impacts are visible on the western and eastern edges as well, the northern part of the City between Keene Rd and US-19 is also impacted.

FIGURE 11 - "PROJECTED INUNDATION EVENTS & SEA LEVEL RISE SCENARIOS,"

CREDIT: NOAA NATIONAL OCEAN SERVICE, 2023.

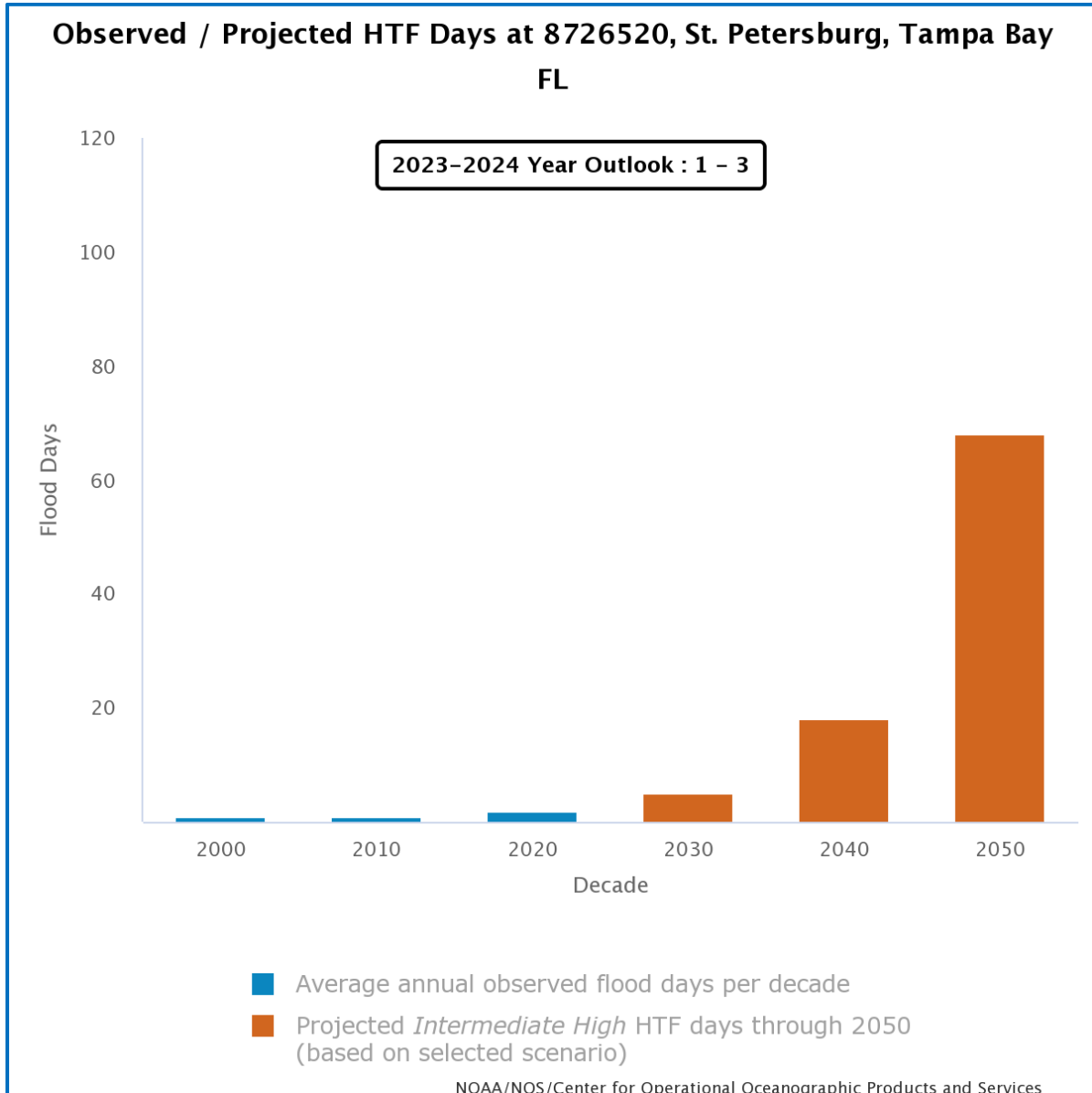
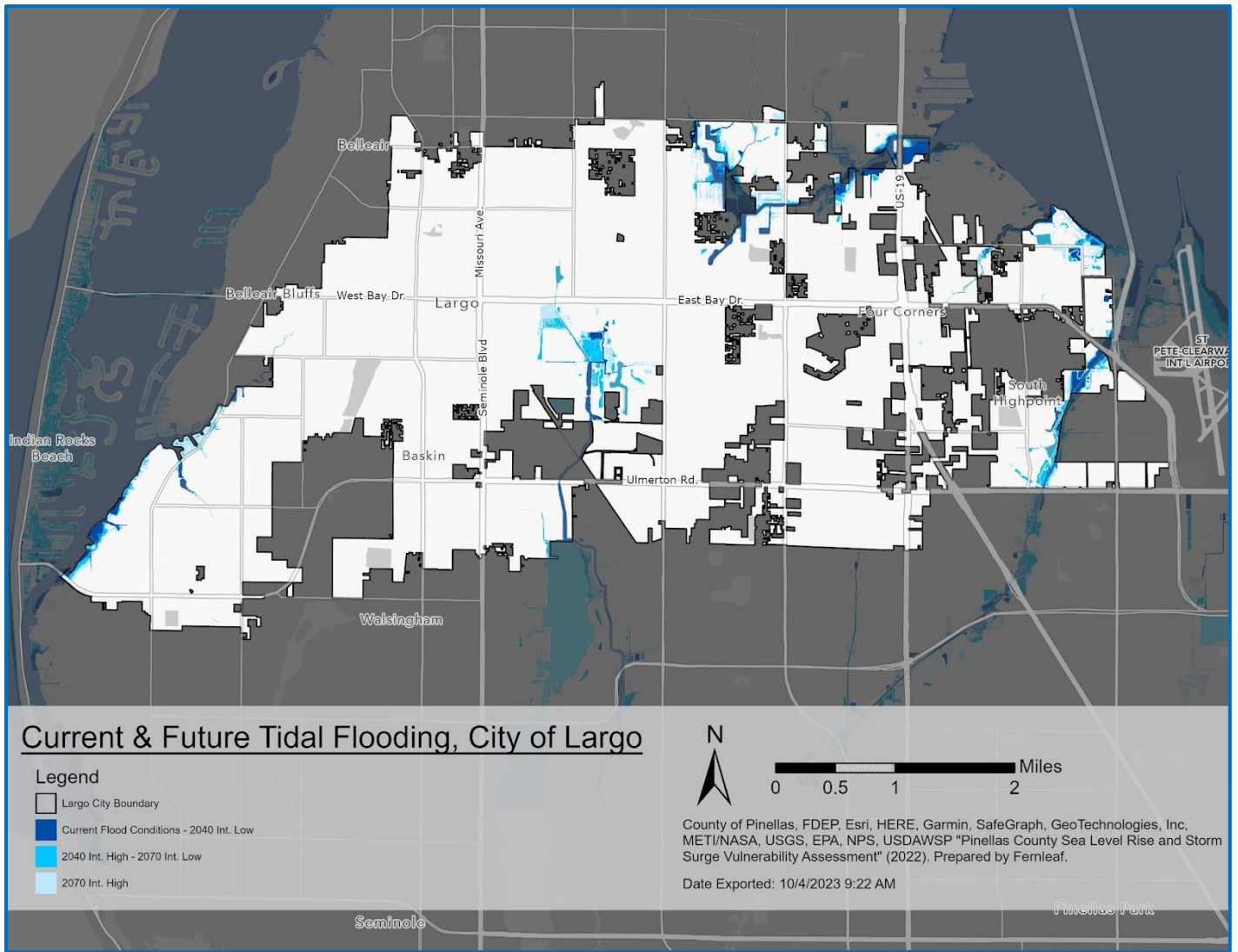


FIGURE 12 - POTENTIAL INUNDATION FROM TIDAL FLOODING UNDER CURRENT AND FUTURE CONDITIONS IN THE CITY OF LARGO

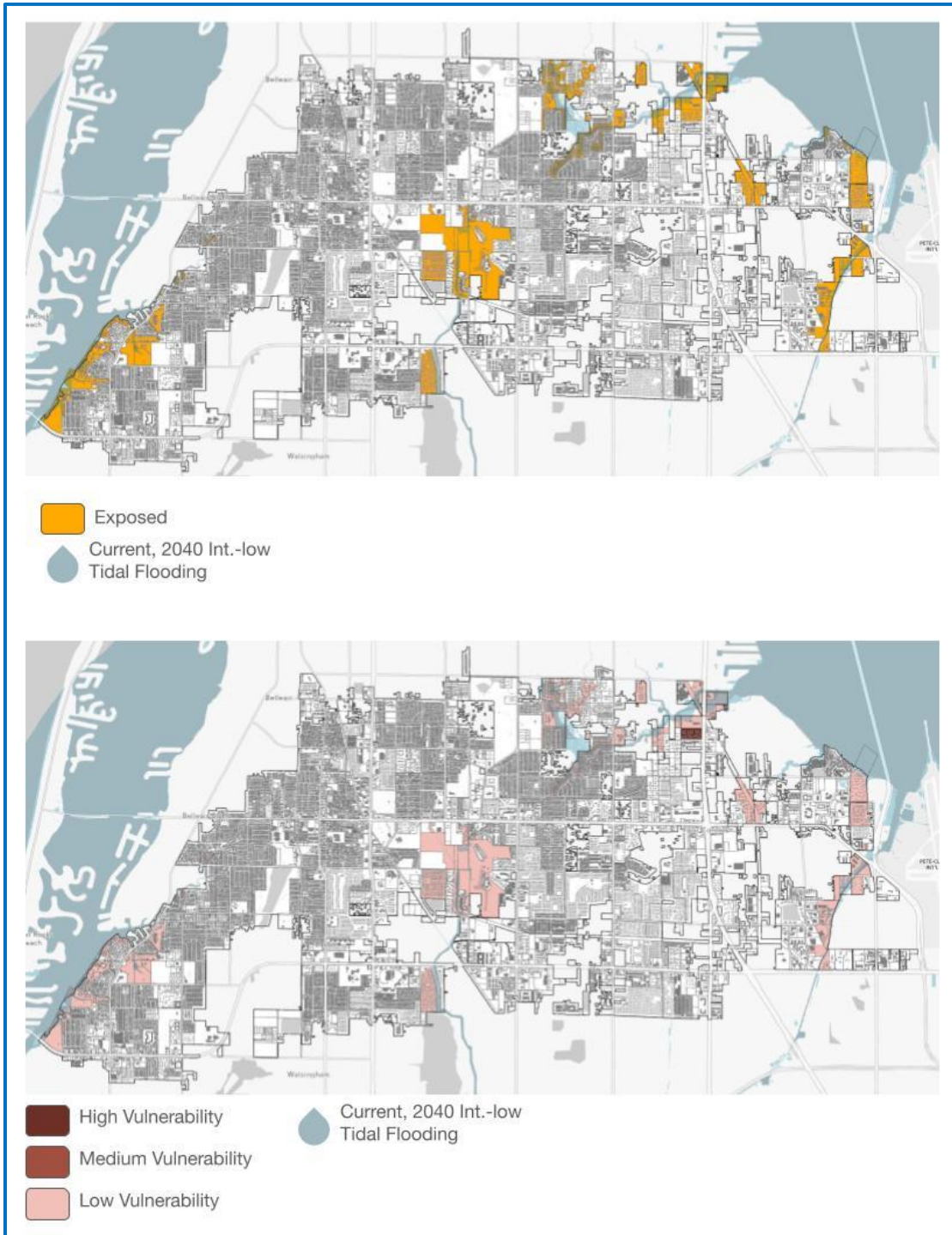


Key Vulnerability Insights

Greatest Impacts to Housing

Under current and the projected 2040 Intermediate-low (Int. low) conditions, almost all exposed properties have low vulnerability. Only two properties, both housing properties near Allens Creek, within the City are highly vulnerable. In Figure 13, the top map shows those properties that are *exposed*, where the tidal flood extent overlaps with the parcel. To be considered vulnerable, the structure on the parcel also needs to be *sensitive* and have lower *adaptive capacity*. This is the main driver of the bottom map, which shows all parcels vulnerable to current and projected 2040 Intermediate-low conditions.

FIGURE 13 - CURRENT AND 2040 INTERMEDIATE-LOW TIDAL FLOOD CONDITIONS, EXPOSURE (TOP) COMPARED TO ASSET VULNERABILITY (BOTTOM).

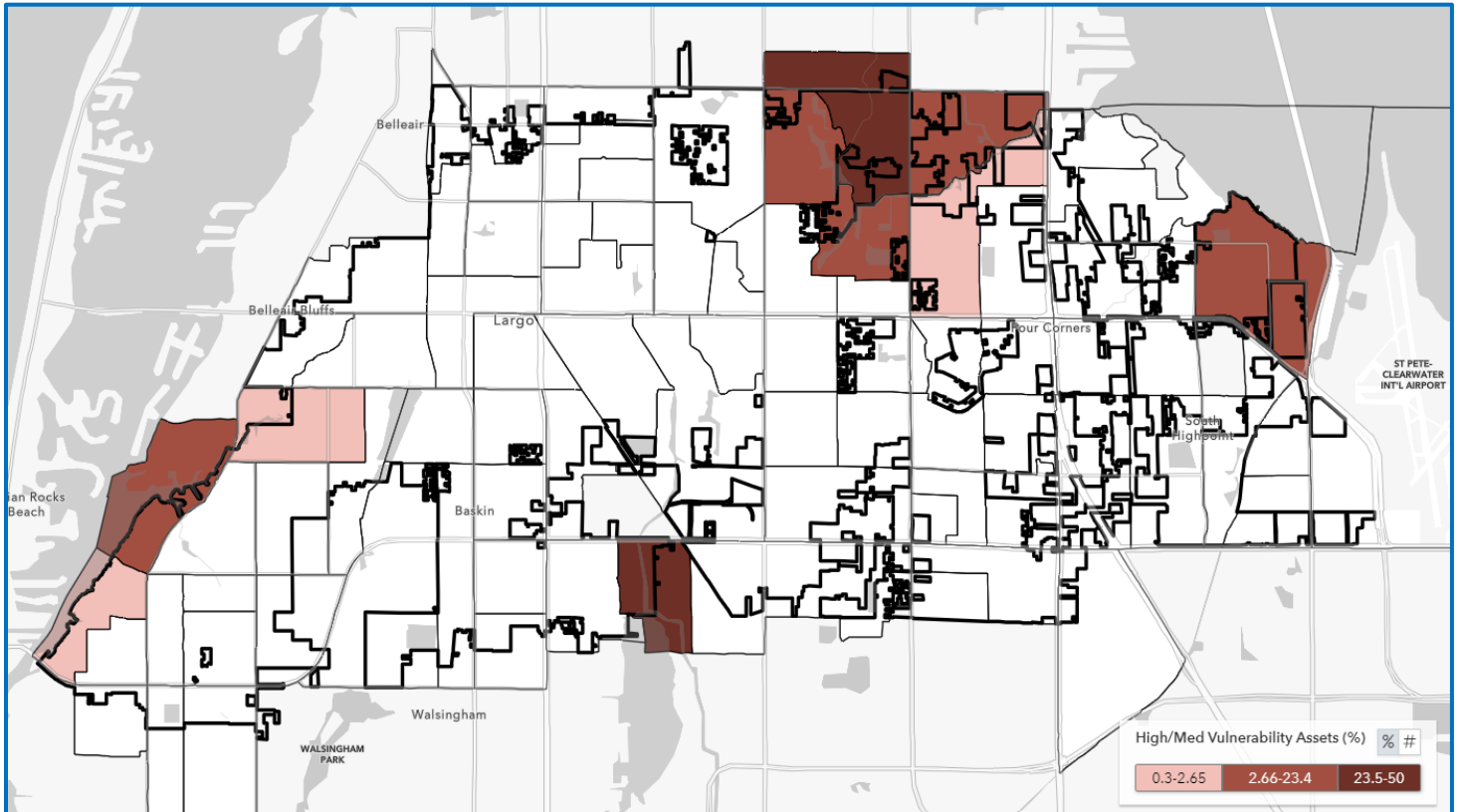


Under future conditions in the City, the vulnerability to tidal flooding for homes continues to increase. In the combined assessment of 2040 Intermediate-high (Int. high) and 2070 Intermediate-low (Int. low) tidal flood conditions, 21 of the 26

highly vulnerable properties are housing and two properties are schools. Throughout the City, around 3.4% (577) properties have any level of vulnerability to this tidal flooding projection.

The assessment results of the 2070 Int. high conditions show that around 95% of the highly vulnerable properties (229 of 241) in the City are housing. All except one of these highly vulnerable housing properties has moderate or low adaptive capacity, meaning they were built in a year with no or sub-par building regulations that would allow the structure to cope with the flood threat. The results of housing and 2070 Int. high tidal flooding conditions are aggregated to the census block group level in the figure below (Figure 14). This neighborhood-scale view shows the concentration of highly vulnerable areas (darkest red) in the City.

FIGURE 14 - AGGREGATED HOUSING VULNERABILITY TO 2070 INT. HIGH TIDAL FLOODING



The darkest red census block groups are where the concentration of vulnerability is highest in the city.

Impacts to Roadways & Evacuation Routes

Roadways throughout the City are more likely to be inaccessible to emergency services under future tidal flooding conditions. Table 4 summarizes results for evacuation routes throughout the City.

TABLE 4 - SUMMARY OF ALL ROADWAY LANE MILES AND THOSE IDENTIFIED AS EVACUATION ROUTES POTENTIALLY INACCESSIBLE TO CURRENT AND FUTURE TIDAL FLOODING CONDITIONS

| Roadways | Total Miles | Tidal Flooding | | |
|--|-------------|-------------------------|--------------------------------|----------------|
| | | Current & 2040 Int. Low | 2040 Int. High & 2070 Int. Low | 2070 Int. High |
| All Roadways | 4,344 | 63 (1.5%) | 145 (3%) | 343 (8%) |
| Roadways Identified as Evacuation Routes | 745 | 6 (<1%) | 11 (1.5%) | 31 (4%) |

Evacuation routes are minimally impacted during current tidal flooding conditions with a slight increase over future conditions. This may become a consideration if these routes are also considered primary emergency services routes. The maps below highlight a count of parcels by census block group that are potentially isolated because of roadway inundation that may occur, as well as at least one social indicator that might suggest areas where roadway projects could have multiple benefits and address equity concerns. Figures 15 and 16 examine the results for isolated parcels throughout the City against households with income below the poverty level for current and future conditions, respectively.

FIGURE 15 - AGGREGATED POTENTIALLY ISOLATED PARCELS DUE TO CURRENT TIDAL FLOODING CONDITIONS AND PERCENTAGE OF HOUSEHOLDS WITH INCOME BELOW POVERTY

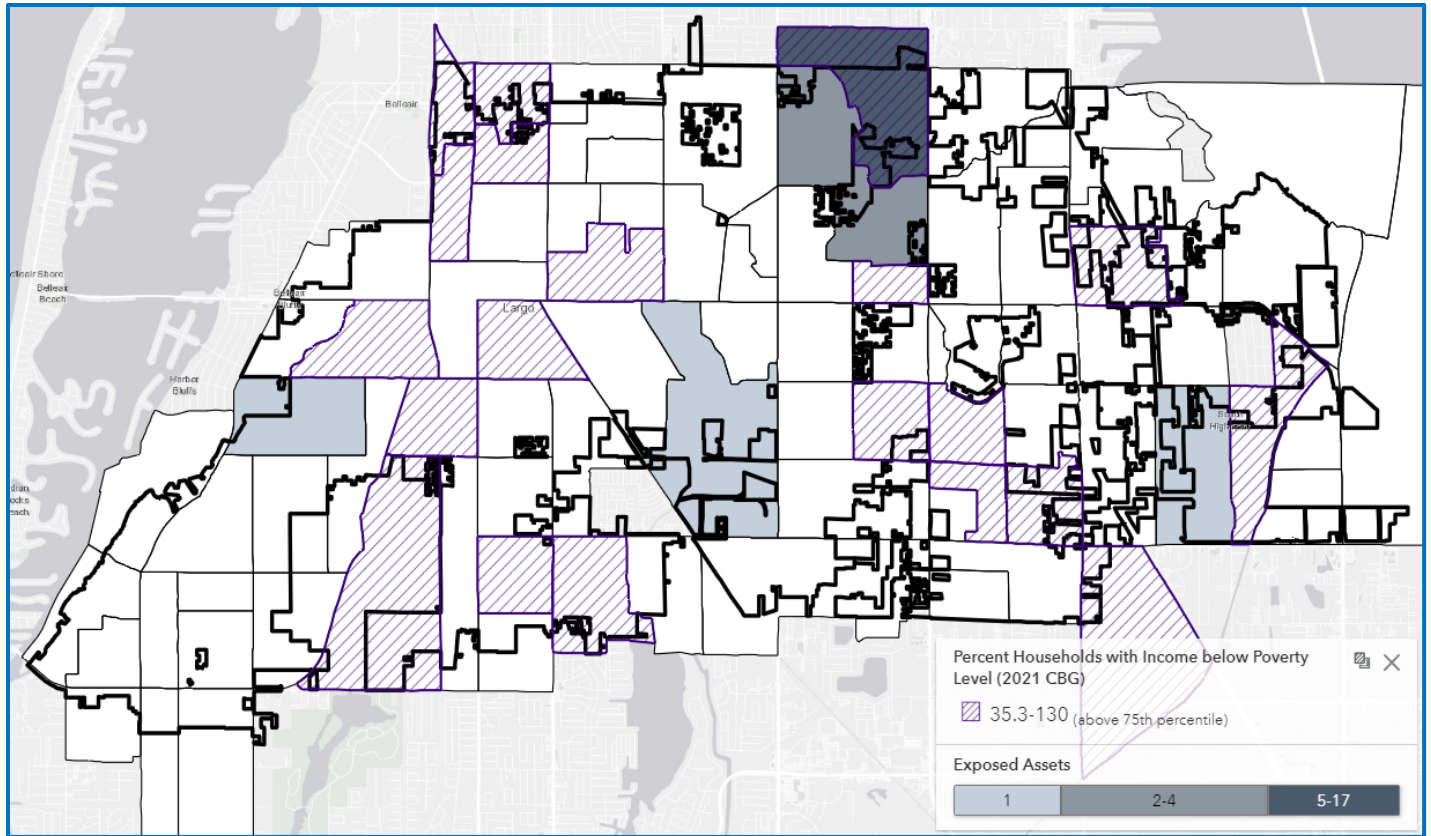
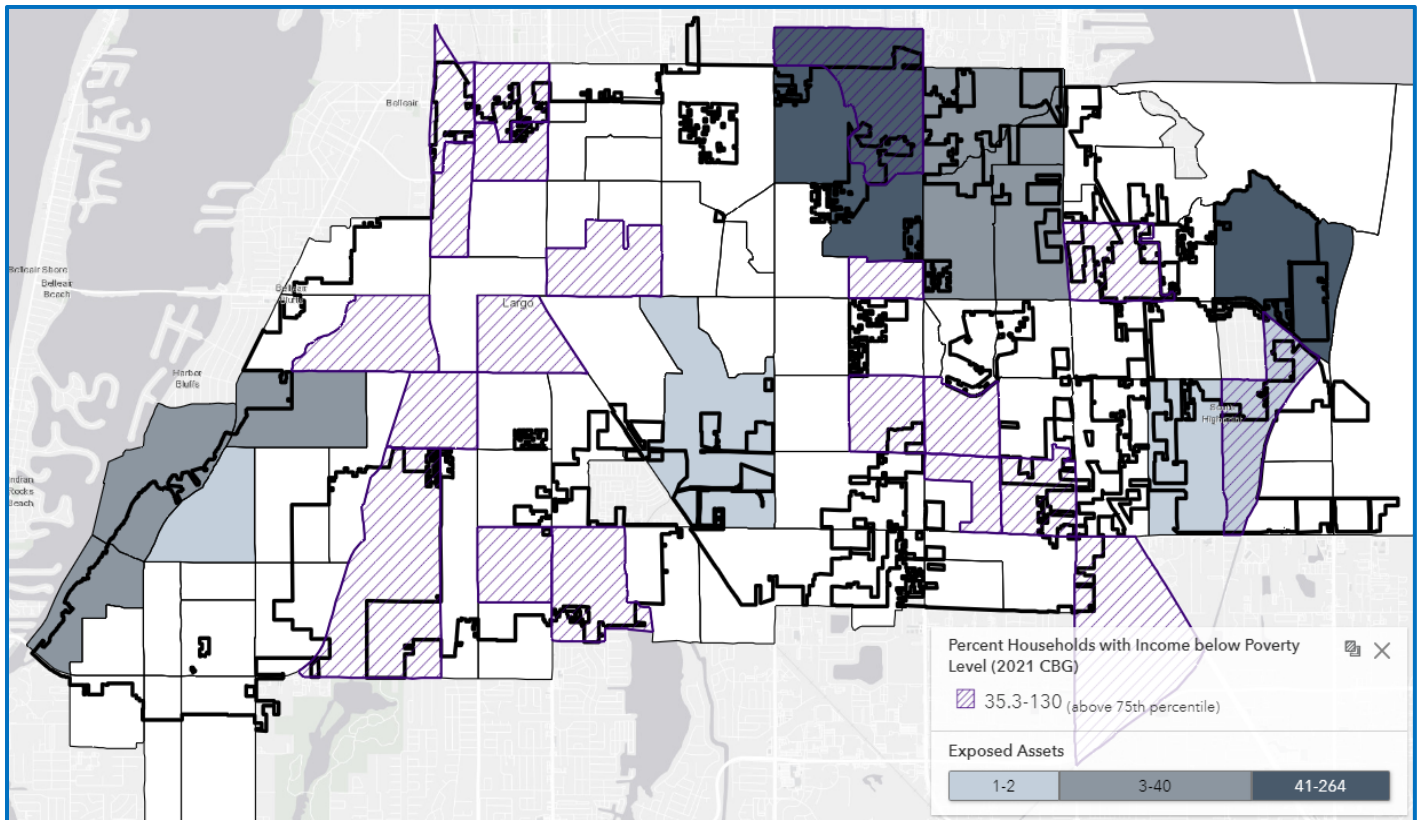


FIGURE 16 - AGGREGATED POTENTIALLY ISOLATED PARCELS DUE TO FUTURE, 2070 INT. HIGH, TIDAL FLOODING CONDITIONS AND PERCENTAGE OF HOUSEHOLDS WITH INCOME BELOW POVERTY



What does this mean for Largo?

While the city generally has low vulnerability to current impacts from tidal flooding, this vulnerability increases with the effects of future sea level rise. In every scenario, Housing is the asset group that is most vulnerable to the negative impacts of this climate hazard, although there are also two schools that may experience impacts in the future. Additionally, future projections show numerous roads will become inundated, preventing access to properties across the city.

In addition to the many losses related to tidal flooding, the effects of sea level rise within the City of Largo also includes **salt-water intrusion** into groundwater, coastal wetland expansion landward, and seagrass loss (Florida Oceans and Coastal Council, 2009). Loss of seagrass habitat is of particular importance as many of the recreational and commercial fisheries spend some part of their lives in seagrasses.

Many residents move to the City for the quality of our waterways. A loss of seagrass habitat would be a tremendous loss as they provide services that maintain the quality of Old Tampa Bay. Seagrass traps sediment, thus reducing cloudiness. Seagrass also provides habitat for many of the recreational and commercial fish that spend some portion of their lives in this habitat (Yarbro and Carlson, 2016). Seagrasses are also a food source for manatees, whose populations have rapidly declined across Florida in recent years.

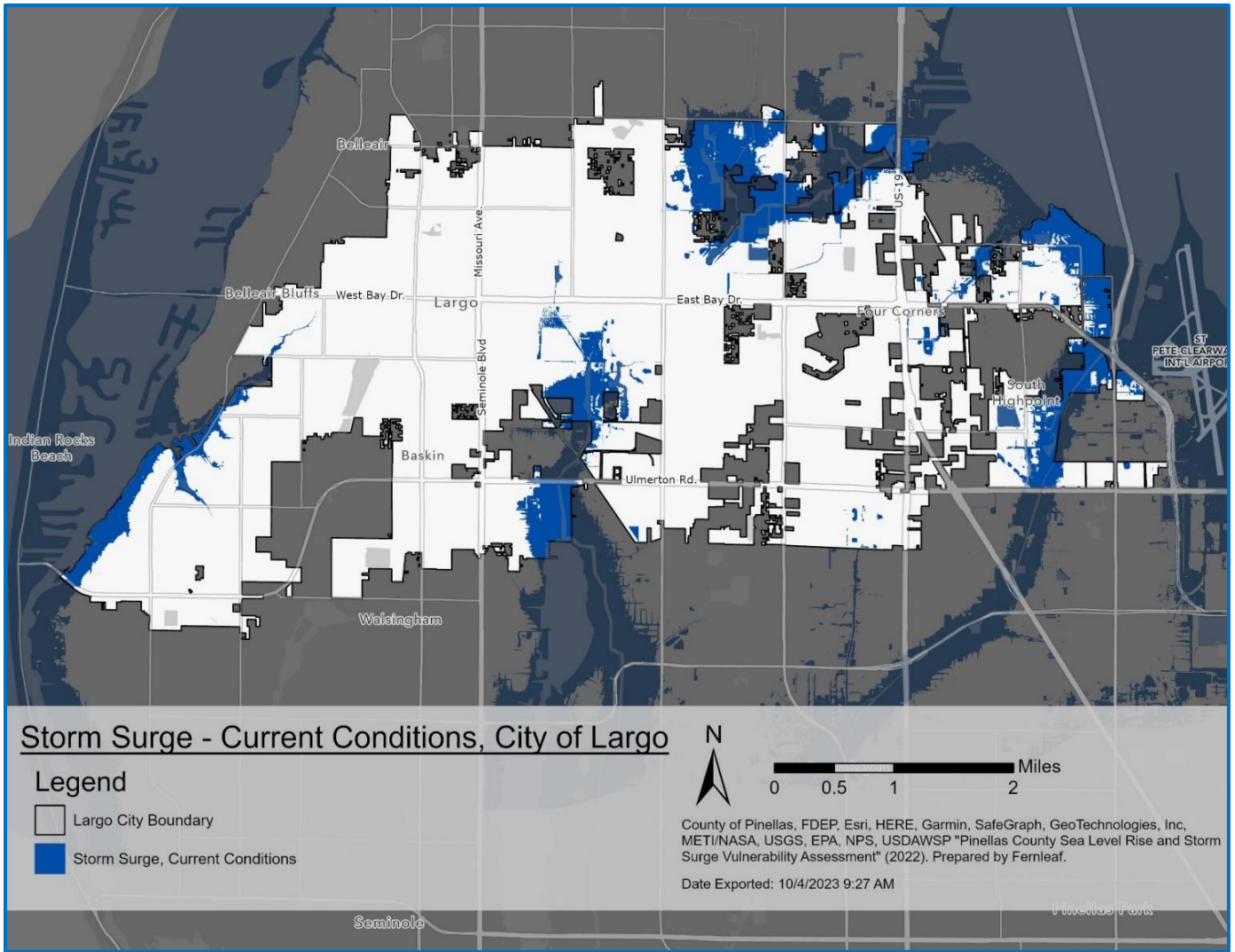
Storm Surge

Storm surge is the abnormal rise in sea level during a storm, measured as the height of the water above the normal predicted astronomical tide. This rise in tide above the usual levels is caused by high winds and low air pressure that pushes the ocean water towards the shore. The height of storm surge depends on the intensity of the storm, how fast the storm is moving, the size of the storm, the direction it is coming from and the shape of the [shoreline](#).

Storm tide is the total observed seawater level during a storm, resulting from the combination of storm surge and the astronomical tide. As a result, the highest storm tides are often observed during storms that coincide with a new or full moon, and during a high tide.

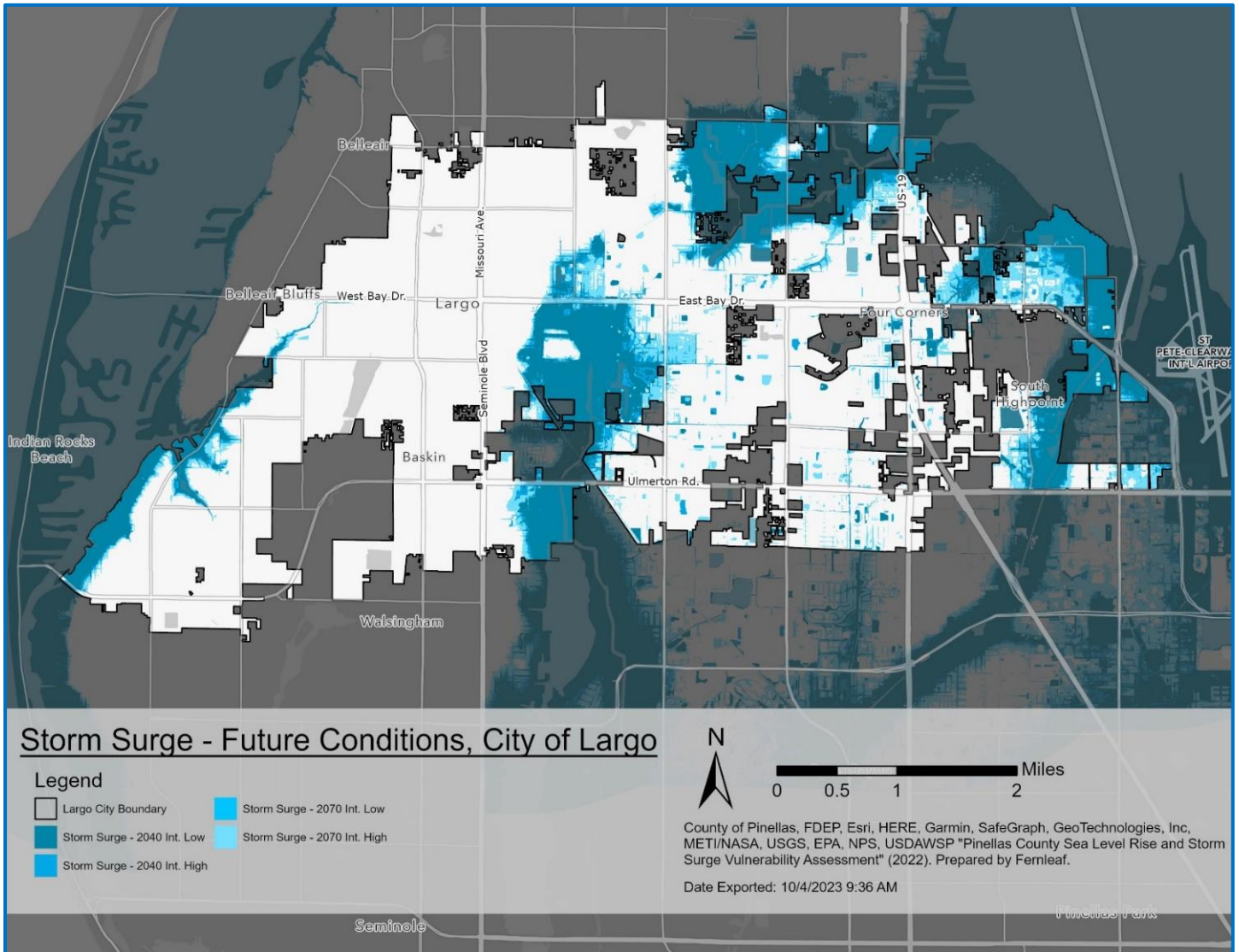
The risk under a storm surge event is also exacerbated by local wave conditions, which can amplify the overall risk level through wave set-up (additional rise in the mean water level due to the energy transfer from the waves) and wave height. Figure 17 below shows storm surge under current climate conditions in the City. The map depicts the potential for widespread flooding from a 100-year storm, which is a storm event with a 1% chance of happening in any given year. Significant exposure can be seen on the western and eastern edges of the City, the Midway AM/CAM and Water View Estates neighborhoods and stretching between Keene Rd and US-19. Additionally, some community members may be surprised to see how exposed inland locations in the city are to storm surge, like areas along the Seminole Canal and Largo Central Park Nature Preserve. During a hurricane event with considerable surge, water rushes into creeks and canals, causing significant flood exposure to adjacent properties, despite them being far from a coastline. Excessive rainfall from a storm can further magnify these inland flood impacts as well.

FIGURE 17 - THE POTENTIAL INUNDATION FROM STORM SURGE UNDER CURRENT CONDITIONS IN THE CITY OF LARGO



When considering future conditions, sea level rise would be combined with the above conditions to get a final projected water level and impact area during a storm. Figure 18 shows the future conditions for storm surge inundation in the City. In addition to the same areas that are impacted today, the projected flooding for a 100-year surge event becomes more widespread throughout the City.

FIGURE 18 - THE POTENTIAL INUNDATION FROM STORM SURGE UNDER FUTURE CONDITIONS IN THE CITY OF LARGO



Key Vulnerability Insights

Storm surge, current and future conditions, is the greatest vulnerability to the City. Under current conditions, Critical Infrastructure and Critical Community and Emergency Facilities asset themes have the highest percentages of their respective properties highly vulnerable. Housing properties have the highest *total number* of properties highly vulnerable.

Critical Community & Emergency Facilities

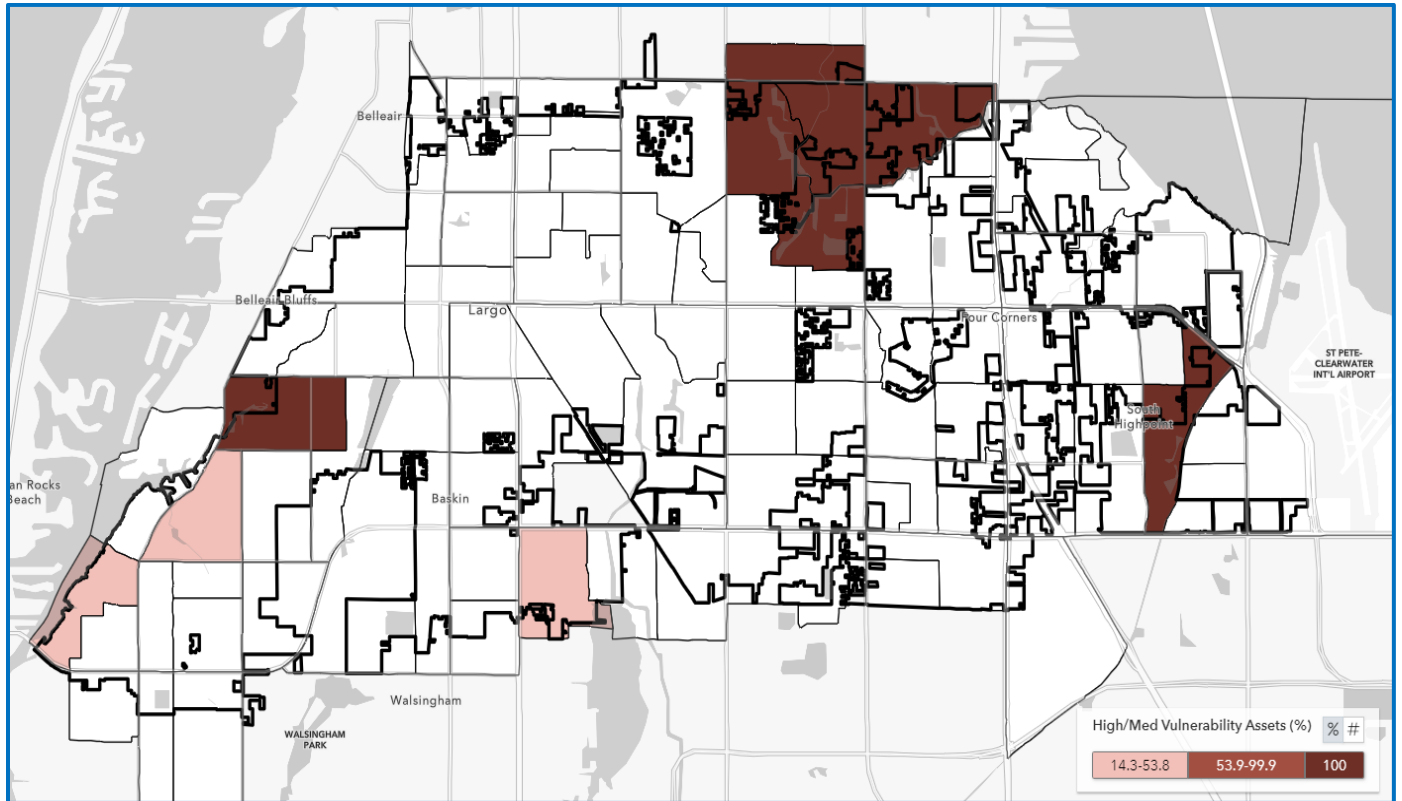
Critical Community and Emergency Facilities includes asset types such as schools, community centers, emergency medical services, fire stations, healthcare facilities and hospitals, and others. When looking at some of the asset types within this asset theme, Table 5 highlights the increasing or even sustained vulnerability over time.

TABLE 5 – SUMMARY OF INDIVIDUAL ASSET TYPES WITHIN THE CRITICAL COMMUNITY AND EMERGENCY FACILITY ASSET THEM THAT ARE HIGHLY VULNERABLE TO CURRENT AND FUTURE STORM SURGE

| Critical Community & Emergency Facility Asset Type | Total Assets | Current Storm Surge | Storm Surge, 2040 Int. Low Conditions | Storm Surge, 2040 Int. High Conditions | Storm Surge, 2070 Int. Low Conditions | Storm Surge, 2070 Int. High Conditions |
|---|---------------------|----------------------------|--|---|--|---|
| Schools (combined private/public) | 15 | 3 | 4 | 4 | 4 | 4 |
| Higher Education Facilities | 6 | 3 | 4 | 4 | 4 | 5 |
| Disaster Recovery Centers | 3 | 1 | 1 | 1 | 1 | 1 |
| EMS | 1 | -- | 1 | 1 | 1 | 1 |
| Healthcare Facilities | 29 | 3 | 5 | 5 | 5 | 7 |
| Assisted Care Facilities | 26 | 3 | 5 | 5 | 5 | 7 |
| Hospitals | 3 | 1 | 1 | 1 | 1 | 1 |
| Law Enforcement | 4 | -- | 1 | 1 | 1 | 1 |

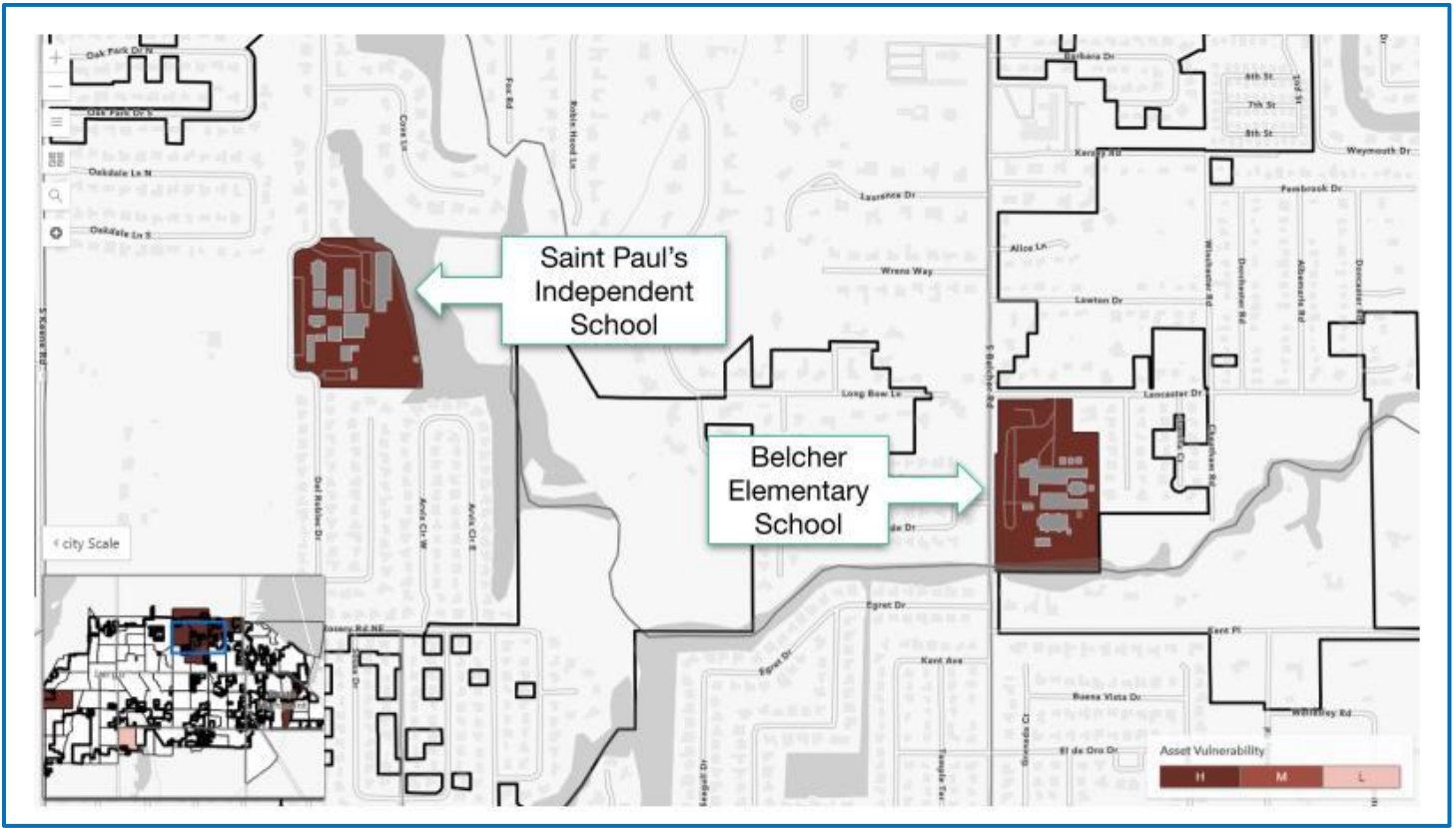
Under current and future storm surge conditions, this asset theme has the highest percentages of highly vulnerable assets when compared to other asset themes, although it has one of the lowest number of total assets (160) within the City. Figure 19 shows the census block groups in dark red where the concentration of vulnerability to storm surge is highest for critical community and emergency facilities.

FIGURE 19 - AGGREGATED CRITICAL COMMUNITY & EMERGENCY FACILITY VULNERABILITY TO CURRENT STORM SURGE CONDITIONS



Of note is the vulnerability of three school buildings to both current and future storm surge conditions. One of the drivers to their vulnerability is likely lower adaptive capacity resulting from the age of the buildings and their location within the flood threat. In Figure 20, the map highlights two of those properties in the northern part of the City, both of which are schools. Saint Paul’s Independent School has moderate adaptive capacity, while Belcher Elementary School has low adaptive capacity.

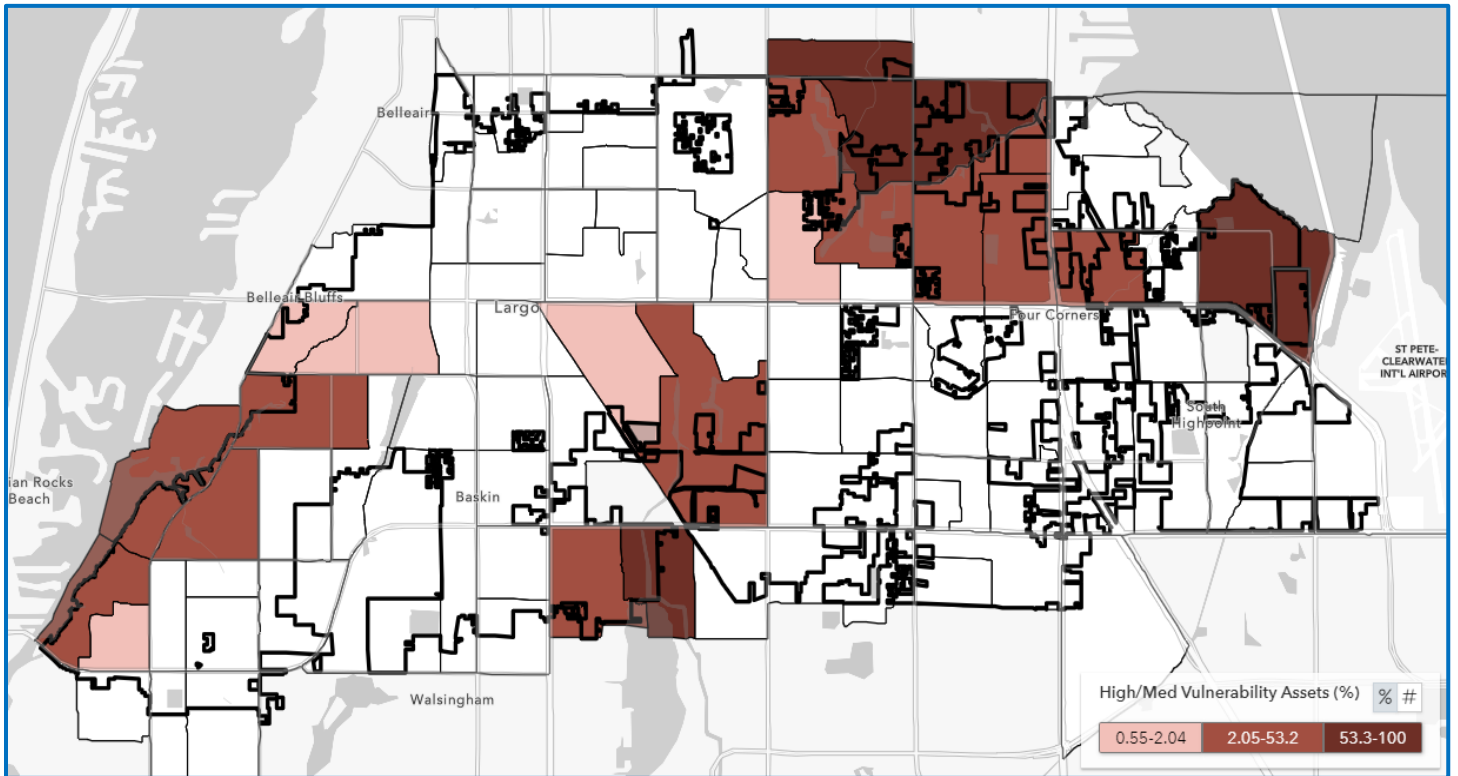
FIGURE 20 - TWO SCHOOL BUILDINGS HIGHLY VULNERABLE TO BOTH CURRENT AND FUTURE STORM SURGE CONDITIONS IN THE NORTHERN PART OF THE CITY



Housing

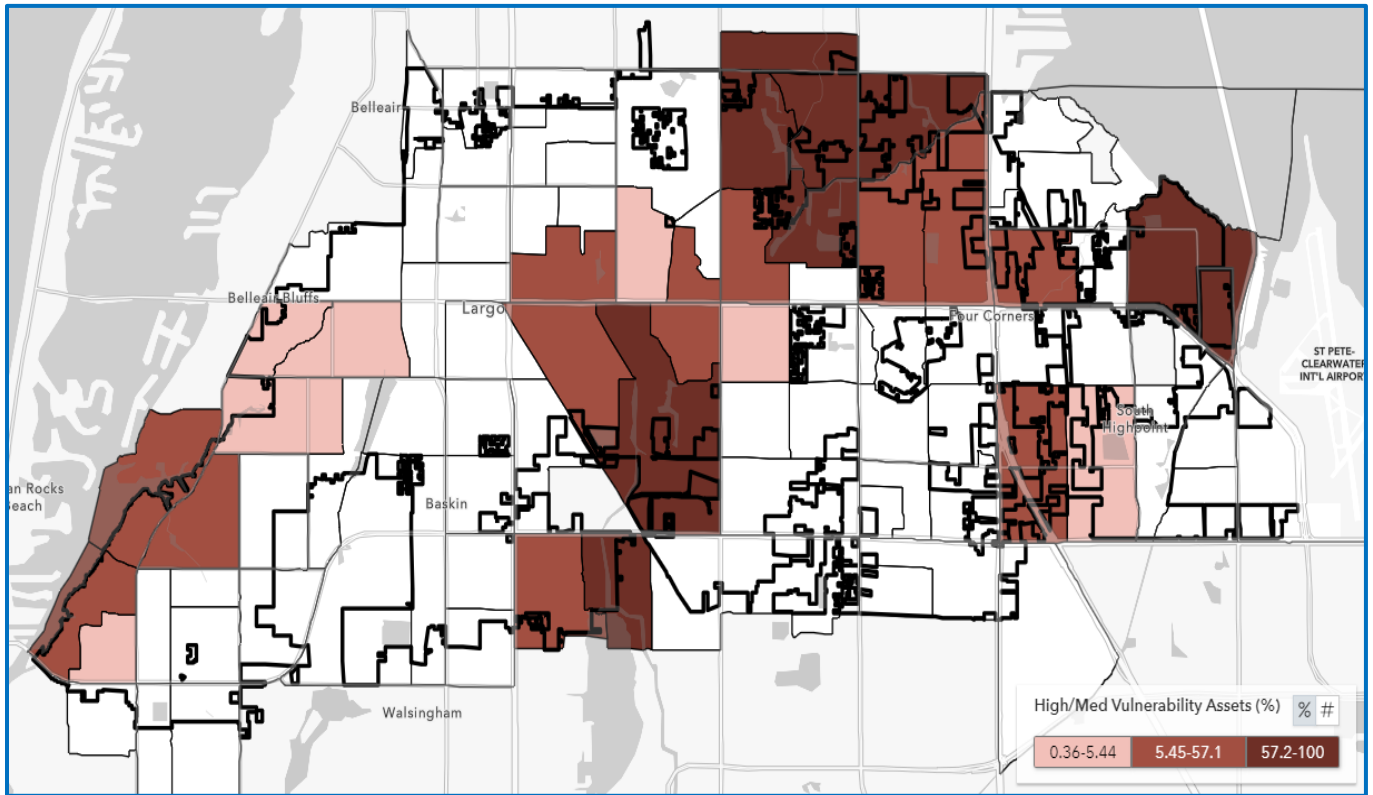
Given the number of housing properties assessed within the City (12,712), it is not surprising that this asset theme has the highest *total* properties highly vulnerable under both current and future storm surge conditions. The two maps in Figure 21 and Figure 22 provide a comparison of the increased vulnerability to housing properties over time. Highly concentrated vulnerability grows in the central portion of the City between the two conditions. Also, under future conditions, the South Highpoint area (southeast section on the map) starts to experience medium to high vulnerability.

FIGURE 21 - AGGREGATE MAP OF HOUSING VULNERABILITY TO CURRENT STORM SURGE CONDITIONS



Dark red indicates the highest concentration of vulnerability per census block group.

FIGURE 22 - AGGREGATE MAP OF HOUSING VULNERABILITY TO 2040 INT. HIGH STORM SURGE CONDITIONS



Dark red indicates the highest concentration of vulnerability per census block group.

Table 6 provides a summary of each individual asset type assessed within the Housing asset theme. This shows the total individual asset types that are highly vulnerable to current and future storm surge.

TABLE 6 - SUMMARY OF INDIVIDUAL ASSET TYPES WITHIN THE HOUSING ASSET THEME THAT ARE HIGHLY VULNERABLE TO CURRENT AND FUTURE STORM SURGE

| Housing Asset Type | Total Assets | Current Storm Surge | Storm Surge, 2040 Int. Low Conditions | Storm Surge, 2040 Int. High Conditions | Storm Surge, 2070 Int. Low Conditions | Storm Surge, 2070 Int. High Conditions |
|---------------------|--------------|---------------------|---------------------------------------|--|---------------------------------------|--|
| Single Family Homes | 11420 | 776 | 906 | 1054 | 999 | 1523 |
| Affordable Housing | 7 | -- | -- | -- | -- | -- |
| Mobile Homes/Parks | 204 | 35 | 35 | 41 | 52 | 47 |
| Condos | 229 | 10 | 50 | 63 | 60 | 76 |
| Multi-family Homes | 830 | 8 | 18 | 27 | 23 | 51 |

| | | | | | | |
|-------------------------|----|----|----|----|----|----|
| Assisted Housing | 26 | 3 | 5 | 5 | 5 | 7 |
| Group Housing | 9 | -- | -- | -- | -- | -- |
| Senior Housing | 37 | 7 | 10 | 12 | 12 | 16 |

Impacts to Roadways & Evacuation Routes

Current and future storm surge has a greater impact on the road network than current and future tidal flooding conditions. Table 7 highlights the increasing impacts over time to all roads in the road network as well as those identified as evacuation routes. Under current and future storm surge conditions, a moderate percentage of roads identified as evacuation routes could be impacted or inaccessible.

TABLE 7 - SUMMARY OF ALL ROADWAY LANE MILES AND THOSE IDENTIFIED AS EVACUATION ROUTES POTENTIALLY INACCESSIBLE TO CURRENT AND FUTURE STORM SURGE CONDITIONS

| Roadways | Total Miles | Storm Surge | | | | |
|---|-------------|--------------|----------------|----------------|----------------|----------------|
| | | Current | 2040 Int. Low | 2040 Int. High | 2070 Int. Low | 2070 Int. High |
| All Roadways | 4,344 | 979 (22%) | 1,060 (24%) | 1,162 (27%) | 1,123 (26%) | 1,513 (35%) |
| Roadways Identified as Evacuation Routes | 745 | 132 (17%) | 134 (18%) | 147 (20%) | 144 (19%) | 185 (25%) |

What does this mean for the City of Largo?

Storm surge remains a very challenging climate hazard for all coastal communities throughout Florida and elsewhere. Among climate hazards, storm surge is particularly difficult to mitigate because it is unpredictable in both timing and scope. Since Largo is susceptible to storm surge on both the eastern and western sides of the City, and via wave runup in various creeks, this is perhaps the most significant climate hazard facing the City. The spatial extent of this hazard, as demonstrated by this assessment, suggests that we must prioritize the Adaptation Strategies that involve coastal hardening and preservation of creek buffers. Infrastructure projects within these current and future surge zones should also consider the results of this assessment. And finally, and most importantly, we will re-double our efforts to work with affected frontline communities located within these surge zones.

The impact of storm surge, both current and future conditions, is inequitable across our City. Black and minority individuals, low-income households, immigrants with limited English proficiency, and unhoused individuals are among the groups that are disproportionately impacted by environmental hazards and climate change (Marino et al., 2023). Adaptation strategies can target these inequities by making decisions now that will benefit future residents as well. For example, according to the 2022 1-year American Community Survey, 11% of the City’s population is Hispanic. The Hispanic population above the 75th percentile can be visualized with housing and current and future storm surge assessment results at the census block group scale to understand current and project future impacts. Figures 23 and 24 provide a summary of this portion of the assessment.

FIGURE 23 - AGGREGATE-LEVEL RESULTS FOR HOUSING AND CURRENT STORM SURGE CONDITIONS WITH THE PERCENT POPULATION HISPANIC OVERLAYED

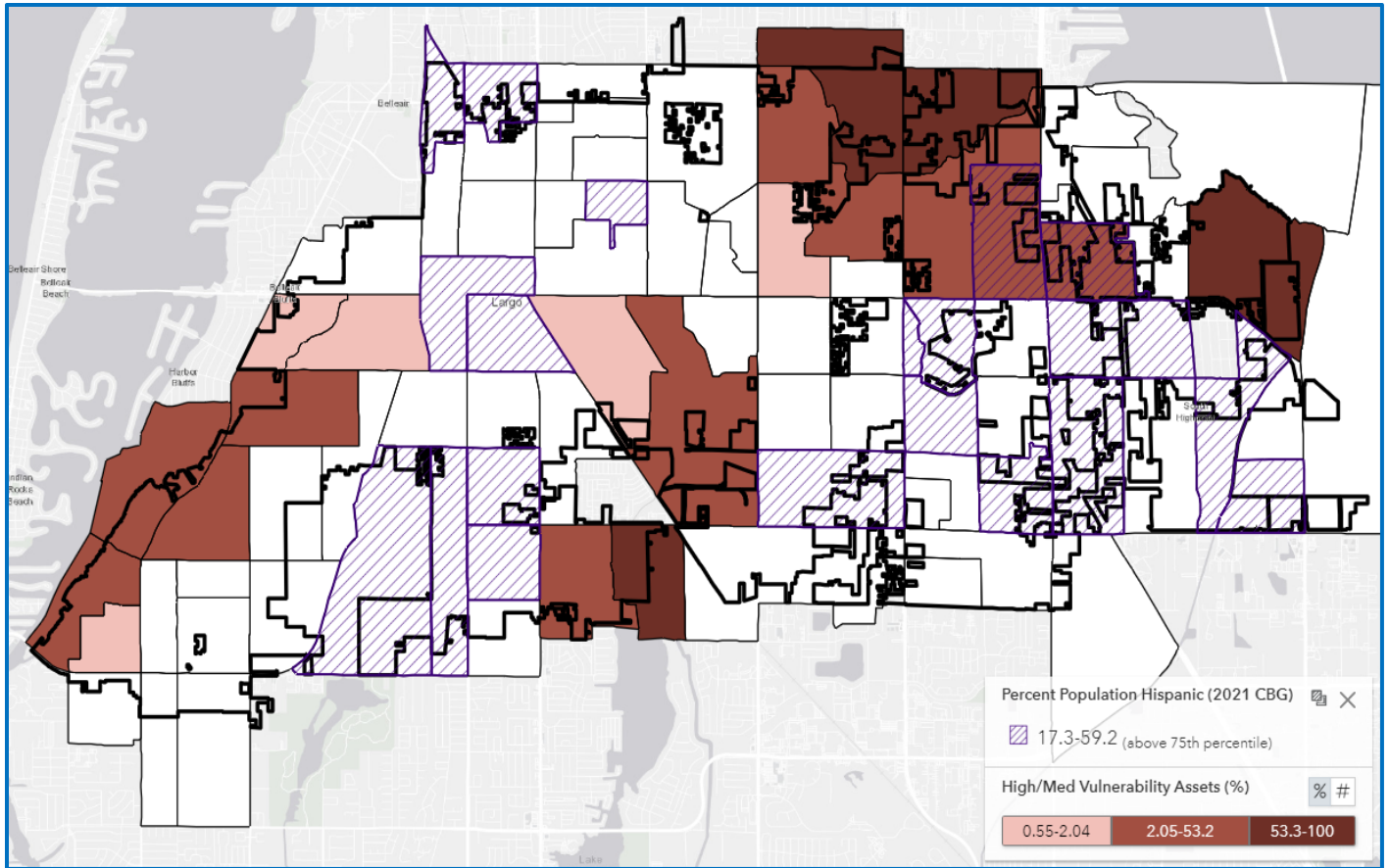
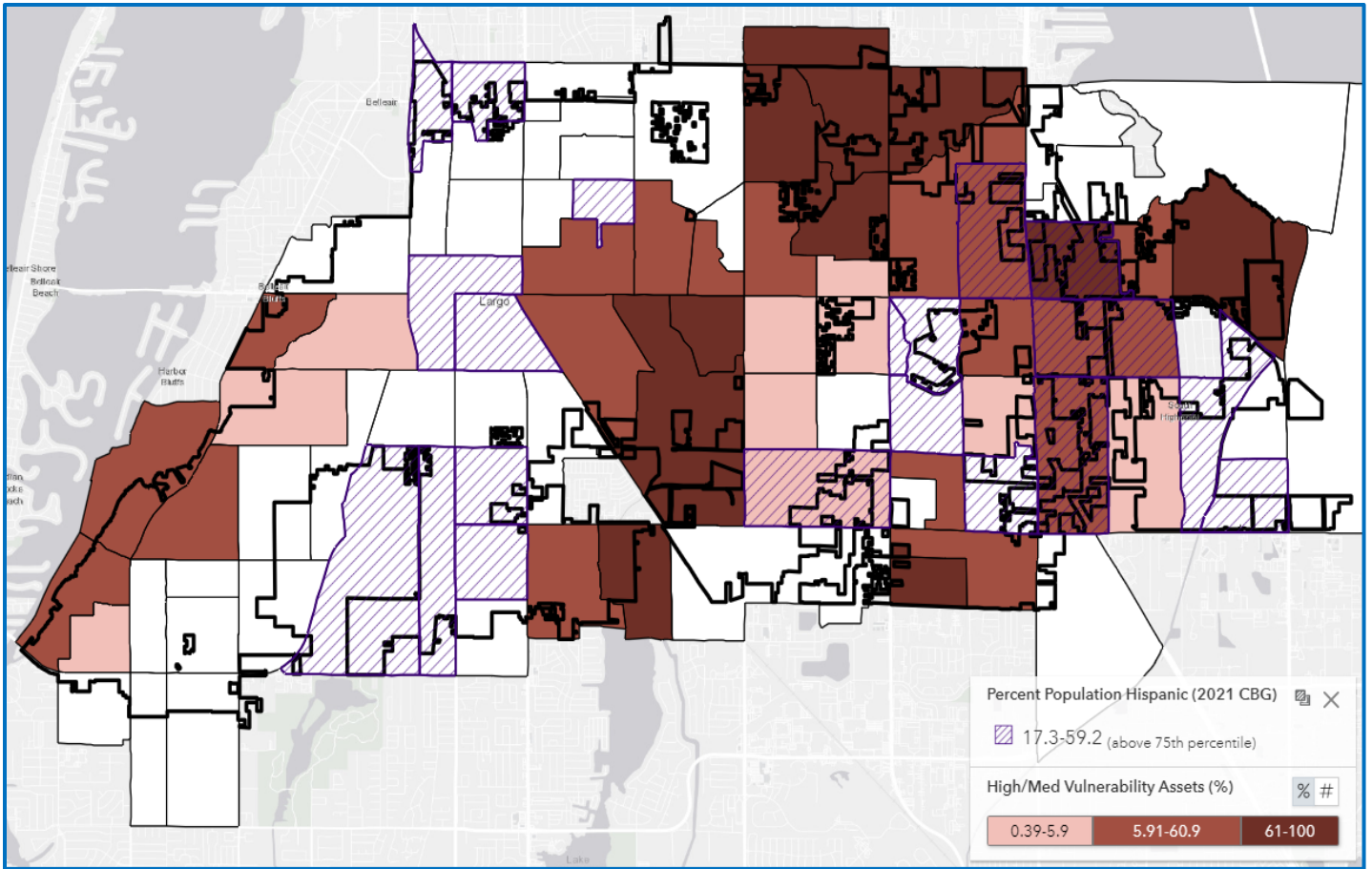


FIGURE 24 - AGGREGATE-LEVEL RESULTS FOR HOUSING AND FUTURE, 2070 INT. HIGH STORM SURGE CONDITIONS WITH THE PERCENT POPULATION HISPANIC OVERLAYED

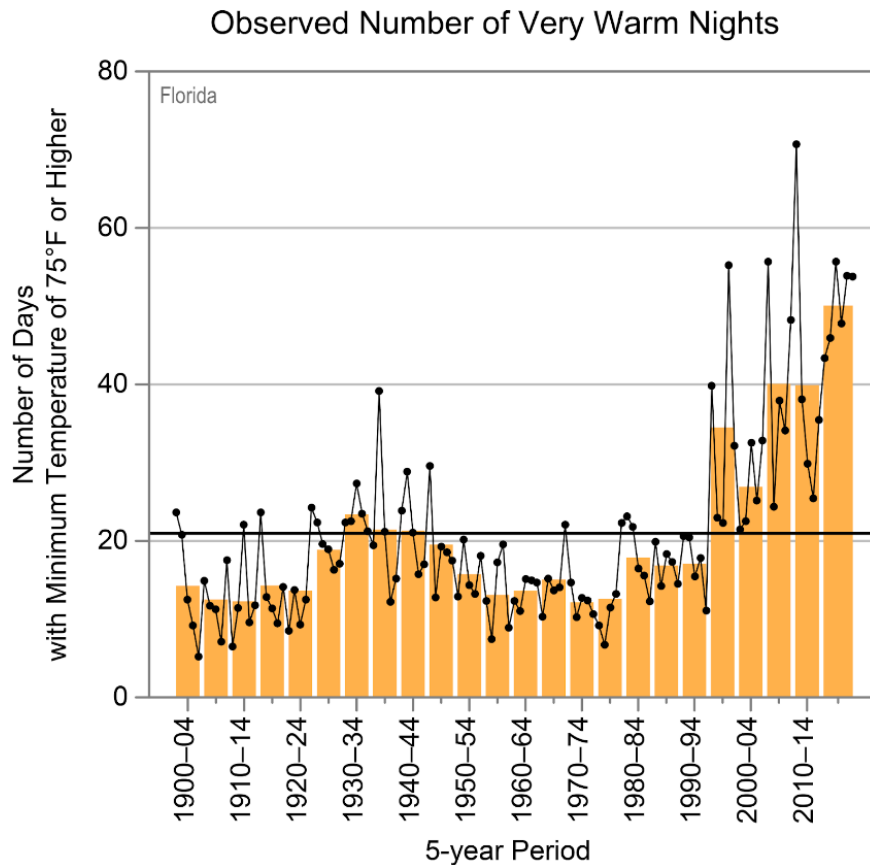


Extreme Heat

Extreme heat events are periods of excessively hot and/or humid weather that can last for multiple days. Extreme heat is a pressing public health risk, particularly for specific groups living in developed areas with limited options for relief from heat. Research shows that children under 5 and adults over 65 years of age, people who are pregnant, and those who have chronic lung, heart, and kidney conditions have higher sensitivity to extreme heat (Hoffman et al., 2023). In addition, outdoor workers, or indoor workers in certain settings, those living in mobile homes, or individuals experiencing homelessness, renters in substandard housing, and student athletes are also likely to have increased exposure and/or decreased adaptive capacity to extreme heat. Together, these are often referred to as “high risk” groups in the context of public impacts of extreme heat.

The observed annual number of very warm nights (minimum temperature of 75°F or higher) from 1900 to 2020 for Florida is shown in Figure 25. In the figure, the orange bars represent the average number for each five-year period and the dots along the line represent the annual average for every year within that period. The horizontal trendline shows the long-term (entire period) average is 21 days. The overall takeaway is that the number of very warm nights has risen substantially since 1995.

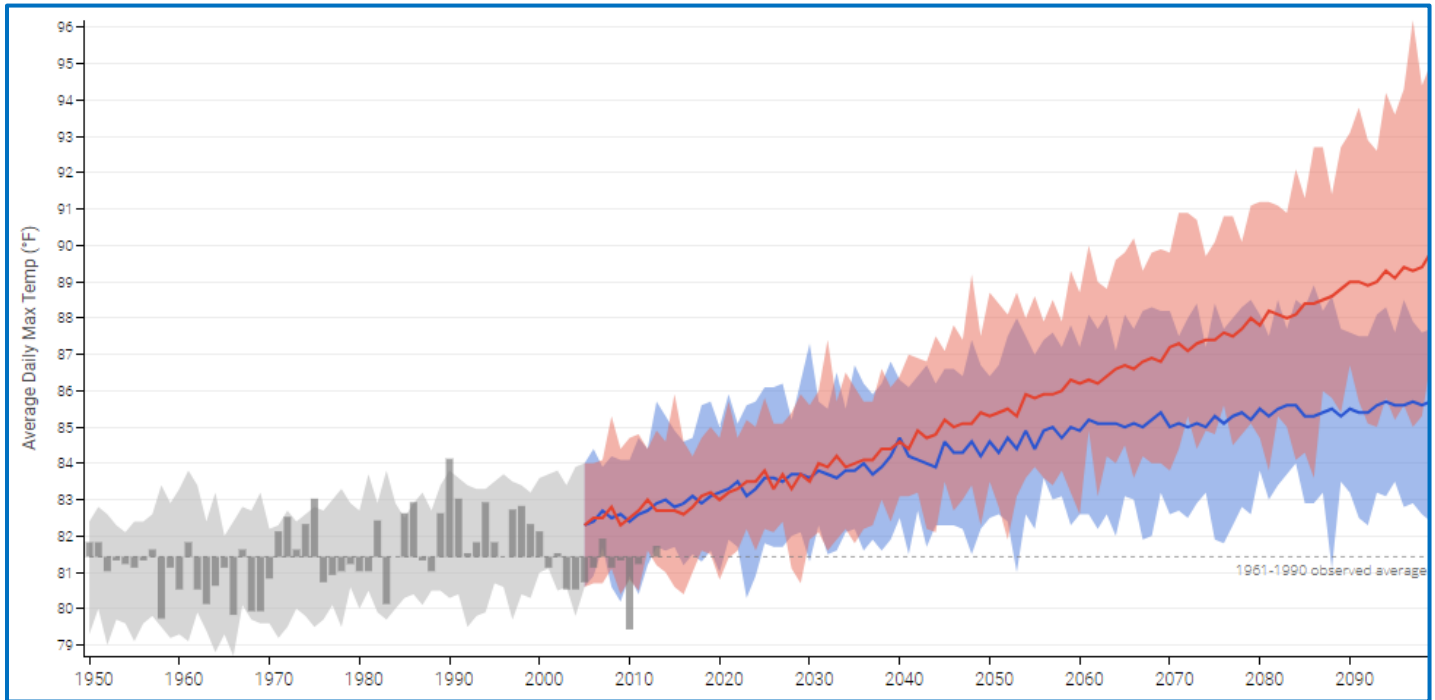
FIGURE 25 - STATE CLIMATE SUMMARIES, FLORIDA, 2022, CREDIT: NOAA NCEI



Although only current extreme heat conditions in our City were considered in the analysis, the projected future conditions cannot be ignored. By highlighting and addressing vulnerabilities now, our City will be more resilient to this hazard in the future. Examining future projections of mean daily minimum temperature for Largo, the lower-emissions

and higher-emissions climate scenarios indicate that a warming trend will continue (see Figure 26). We should expect to see an increase in the number of hotter days, warmer nights, and higher average temperatures. Warmer summer nights will impact not only vulnerable populations who may not be able to afford to cool their homes, but also put an increased demand on electricity providers.

FIGURE 26 - "AVERAGE DAILY MINIMUM TEMPERATURE (CITY OF LARGO)," 2023, U.S. CLIMATE RESILIENCE TOOLKIT

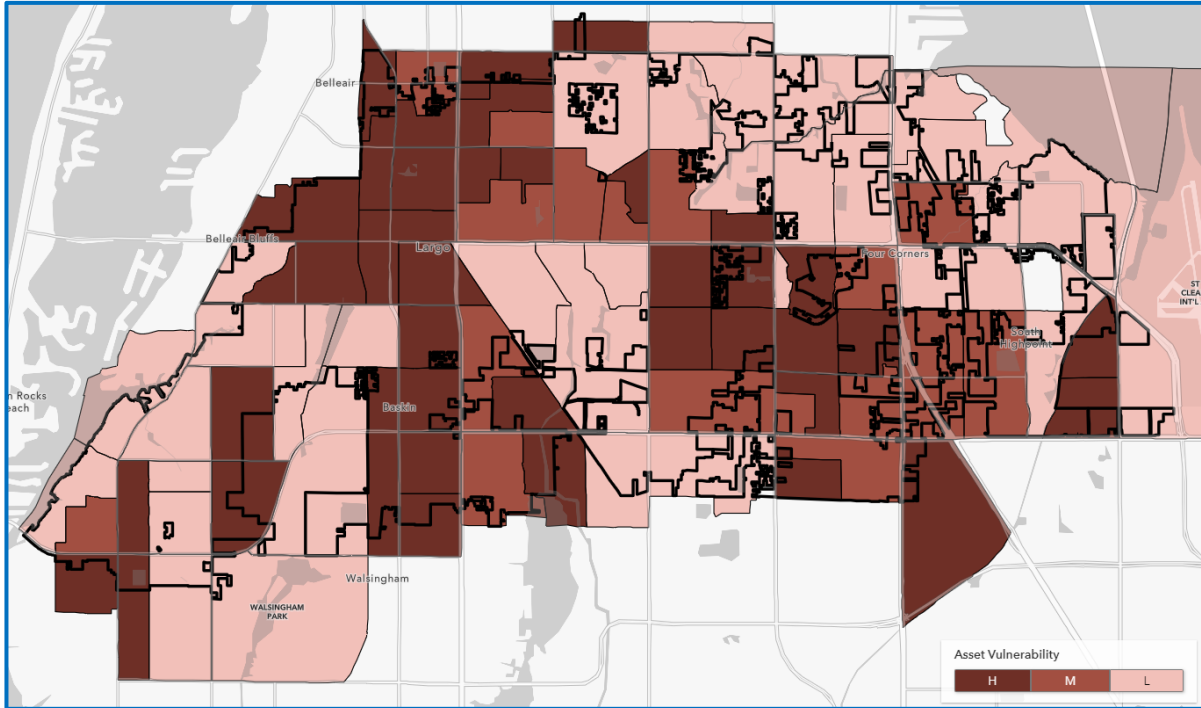


The blue color indicates the mean and spread of lower emissions scenarios and the red likewise for high emissions scenarios.

Key Vulnerability Insights

High heat vulnerability areas occur throughout Largo but are concentrated along the Seminole Blvd/N Missouri Ave corridor on the western side of the City and southwest of the Four Corners area closer to the center of the City. Almost half of the census block groups that fall within the City are highly vulnerable to extreme heat. Figure 27 summarizes the results of the study with regards to extreme heat.

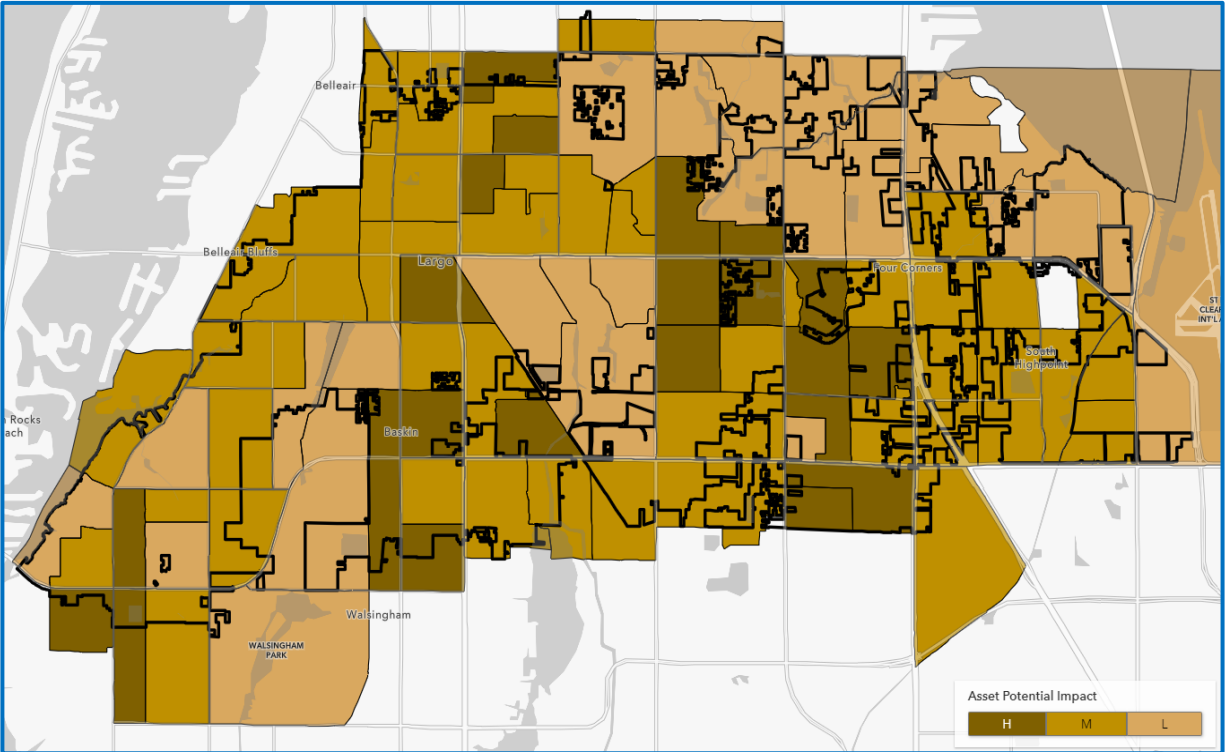
FIGURE 27- EXTREME HEAT VULNERABILITY BY CENSUS BLOCK GROUP IN THE CITY



Darkest red indicates census block groups with the highest vulnerability.

Developed land cover is one of the indicators used to assess Extreme Heat Vulnerability. In Figure 28, areas in darkest yellow have greater than 96% developed land cover, which represents ‘exposure’ in the vulnerability analysis. The most concentrated cluster of census block groups with high sensitivity is in the Four Corners area, with more moderate values along the Seminole Blvd/North Missouri Ave corridor.

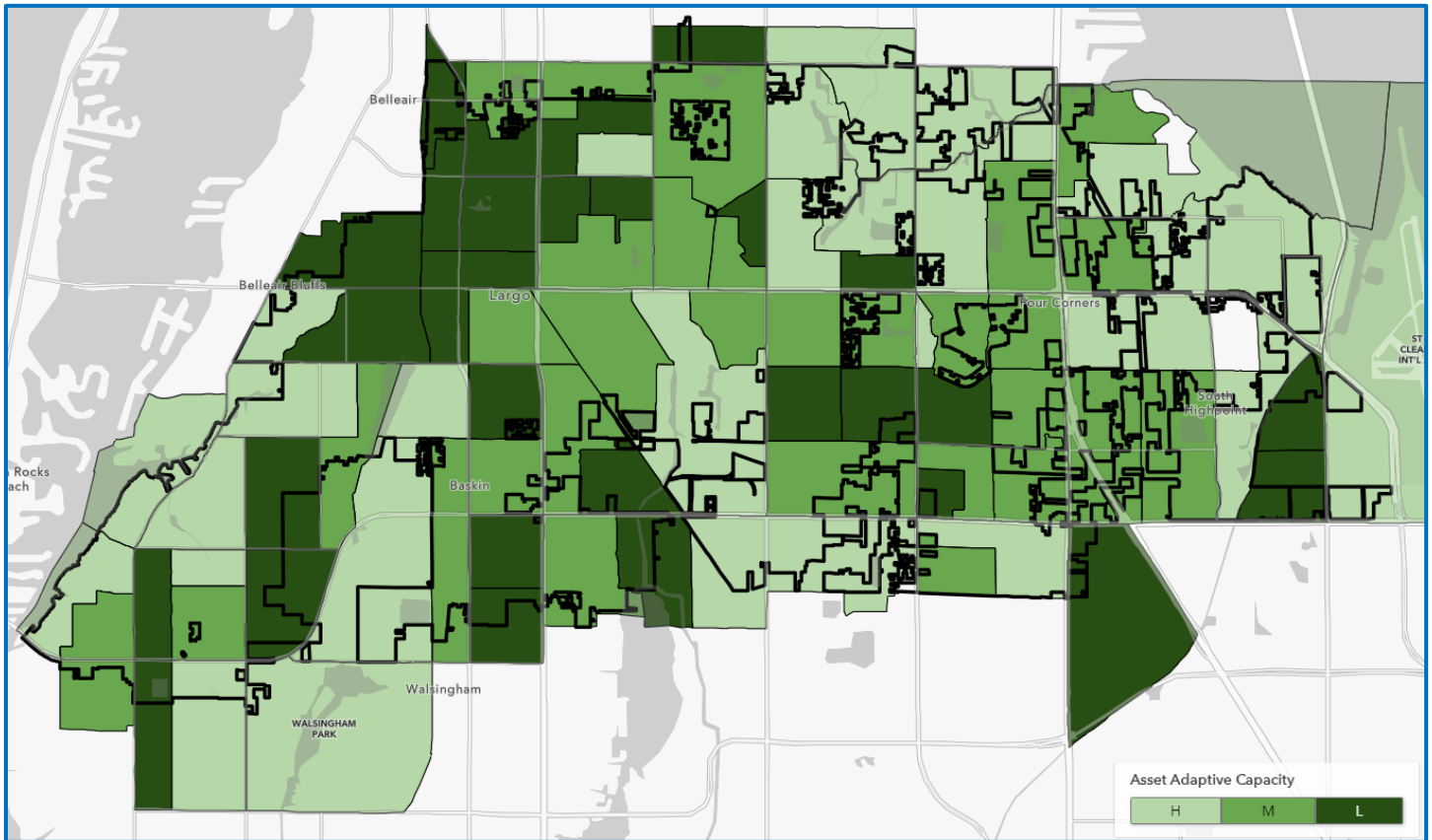
FIGURE 28 - SENSITIVITY COMPONENT OF THE EXTREME HEAT VULNERABILITY ANALYSIS



Darkest yellow census block groups are those with the greatest amount of developed land cover within the City, exacerbating the urban heat island effect.

Figure 29 shows areas in darkest green that have less than 0.8% of tree canopy and/or less than \$43,165 household median income. Together, tree canopy and median income represent adaptive capacity, which measures both the environmental adaptability and the social and financial indicators of an area. There is a concentrated area of low adaptive capacity in the northwestern part of the City, as well as the Four Corners area.

FIGURE 29 - ADAPTIVE CAPACITY COMPONENT OF THE EXTREME HEAT VULNERABILITY ANALYSIS

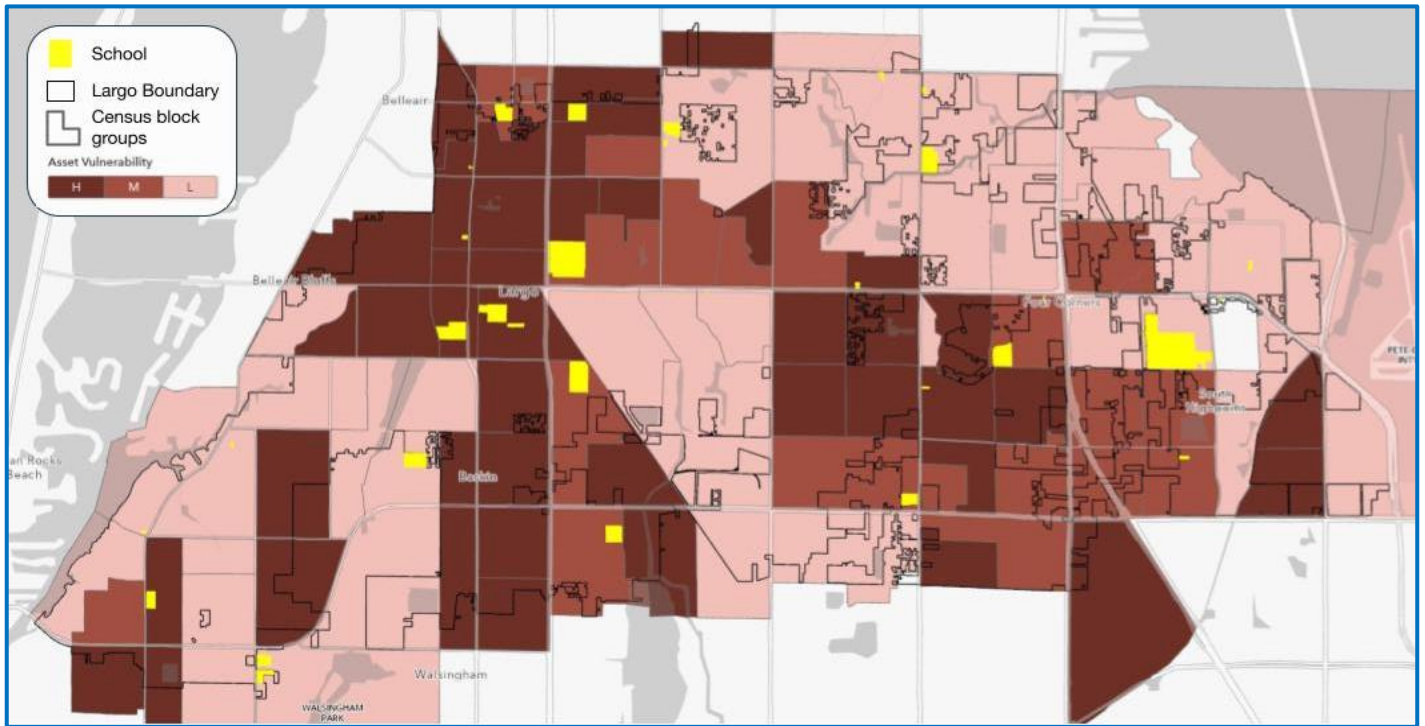


Darkest green census block groups are those with the lowest amount of tree canopy and/or median household income within the City.

Extreme Heat and Schools

Student athletes are susceptible to dehydration and heat-related illness from exposure during outdoor practice in an unshaded environment. Figure 30 shows locations of schools with respect to 12 of 34 schools (include preschools) that are in block groups with high heat vulnerability. Another 17 schools are located within moderate heat vulnerability areas.

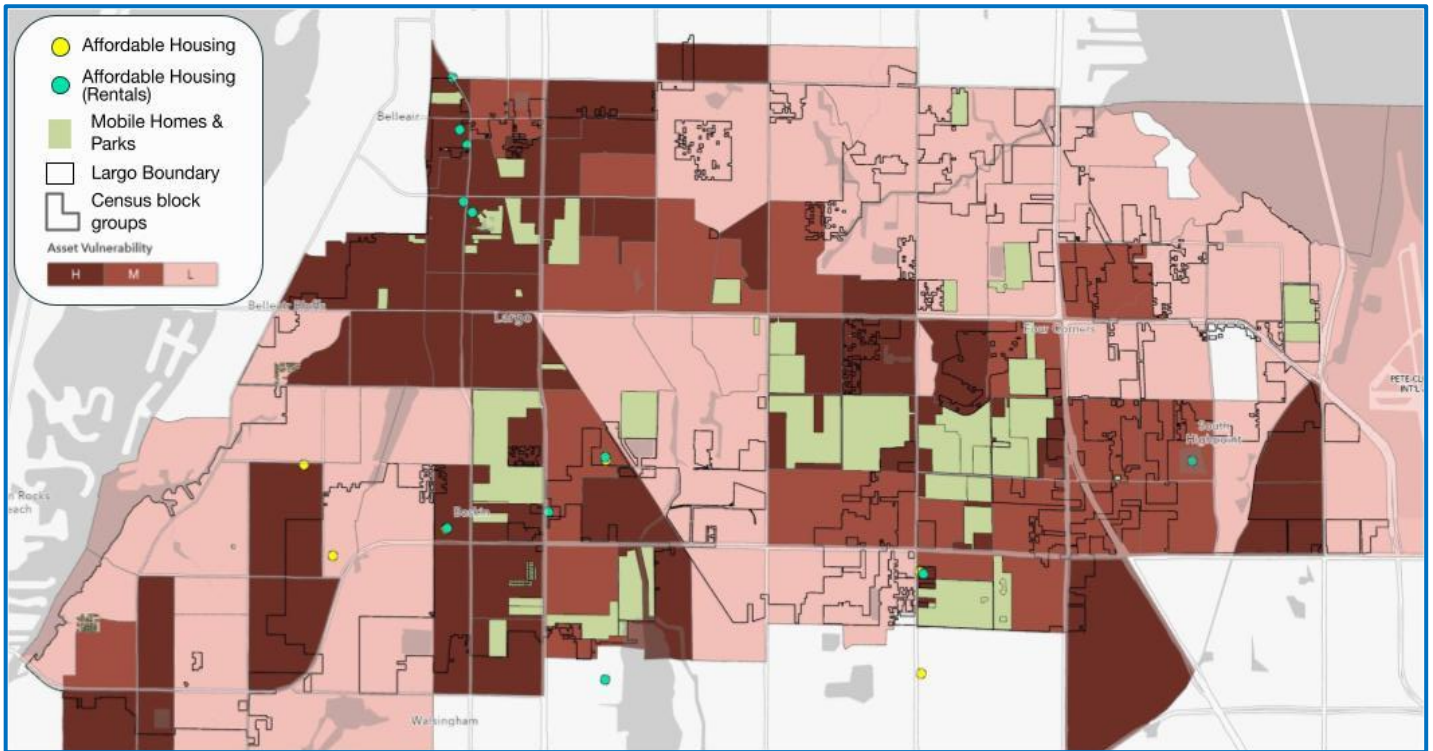
FIGURE 30 - SCHOOL LOCATIONS WITH RESPECT TO EXTREME HEAT VULNERABILITY IN THE CITY



Extreme Heat, Mobile Homes, and Affordable Housing

Additional considerations are the presence of mobile/manufactured homes, as well as affordable housing and affordable rental units in high heat vulnerability areas. With respect to affordable housing, low-income populations and renters often have less resources available. Mobile and manufactured homes increase the likelihood of illness from extreme heat for several reasons, such as being built with poor insulation and being concentrated in areas where impervious surfaces are more dominant than tree canopy. Figure 31 summarizes the results of these analyses for the City of Largo.

FIGURE 31 - AFFORDABLE HOUSING, MOBILE HOMES & PARK LOCATIONS WITH RESPECT TO EXTREME HEAT VULNERABILITY IN THE CITY



What does this mean for the City of Largo?

Developed land cover, little to no tree canopy cover, and low household incomes combine to make nearly half of our census block groups highly vulnerable to current extreme heat conditions. More people will be vulnerable to extreme heat conditions as temperatures continue to rise in the future. Community members with existing health concerns, who are very young or old, and who have prolonged exposure to heat (such as outdoor workers) are of high concern.

If unaddressed, extreme heat will become a major public health hazard and will have negative economic impacts. People may be less able or inclined to spend time outdoors, impacting both physical and mental health as well as the high value that is currently placed on our public parks. Greater reliance will be placed on air conditioning systems, increasing the cost of utilities and our dependence on electricity. Additionally, people will be more reliant on passenger vehicles to travel, as the heat will discourage other modes of transportation like walking, biking, and waiting for public transit in the heat. This will increase individual transportation costs, vehicle congestion on our roads, and community-wide greenhouse gas emissions.

Secondary Environmental Climate Hazards

Environmental hazards due to climate change are likely to significantly influence the quality and sustainability of the natural environments throughout the City of Largo. The 2023 SRAP determined that secondary environmental hazards include:

1. Natural impacts due to Increased air and water temperatures;
2. Ecological shifts due to changes in rainfall patterns; and,
3. Increase in atmospheric carbon dioxide (CO₂).

These secondary climate hazards were chosen as the most urgent for the City of Largo as of 2023, but many more exist. These hazards were selected due to their connections to primary hazards selected for the SRAP, as well as scientific review by City staff and our consultants.

1. Increased Air and Water Temperatures

Increased temperatures have long been understood to result from climate change (Arias et al., 2021). Plants and animals, whether on land or in the water, typically do better when the temperatures fall within a certain range. As discussed in our primary discussion of extreme heat, the timing of the seasons within a year are expected to change, particularly longer warm seasons.

What does this mean for the City of Largo?

These increases in temperature will affect what plant and animal species are able to live in the city, as well as where in the city they live. Wetland and upland plant types depend upon the temperatures in their surrounding environments. In lakes and bays, the likelihood of algal blooms will also increase. We should anticipate significant changes in species numbers, both in size and diversity, as well as changes in the locations that they have historically been present.

2. Changes in Rainfall Patterns

Our rainy season, in which we generally receive the greatest amount of rain, typically occurs between June and September each year. Climate scientists have predicted significant changes to the rainfall patterns (Papacek et al, 2020). Recently, May rainfall in our area has been increasing in a month that historically has been markedly dry. Climate scientists have also suggested that the frequency and intensity of tropical cyclones is expected to increase (NOAA, 2023).

What does this mean for the City of Largo?

Many lifecycles of plants and animals are tied to seasonal rainfall patterns. Therefore, changes in these patterns can be very disruptive and may limit things like food production (TBRPC, 2021) as well as impact several of the green infrastructure solutions (such as trees and greenspace) identified in the Adaptation Roadmap section of this plan.

Increased frequency and intensity of tropical cyclones has drastic implications for our city. In recent years, we have seen category five hurricanes such as Michael (2018) and Ian (2022) decimate the infrastructure, ecosystems, and economies of Florida cities.

Increasing rainfall also leads to increased stormwater runoff. This runoff carries with it pollutants like nutrients that can cause toxic algal blooms and lower dissolved in oxygen in lakes and bays, thus creating a habitat unsuitable for fish and unpleasant to live nearby.

FIGURE 32 – A LOCAL PHOTO OF A TOXIC ALGAL BLOOM



CREDIT: JON PERRY

3. Increase in Atmospheric Carbon Dioxide (CO₂)

The burning of fossil fuels has resulted in increases in the amount of carbon dioxide, potent greenhouse gas, in the Earth's atmosphere (Arias et al., 2021). Carbon dioxide has also increased in the oceans resulting in increased acidity, or lower pHs. As with temperature, plants and animals typically have a range of favorable acidity that can be found in their environment. Shellfish such as oysters and clams are very sensitive to increases in acidity as their shells can be seriously injured when acidity levels increase (Guinotte and Fabry, 2008).

What does this mean to the City of Largo?

Oyster bars and mangroves provide barriers of protection from storm surges. Without these protective barriers, and the hazard of continued sea level rise, we will be under increased threat from tropical systems. This issue is particularly of concern to the City of Largo given the significant findings that were previously discussed related to storm surge.

Our Future Largo

This section considers some of the interconnected aspects of the findings of this plan and creates a foundation for the Adaptation Roadmap that follows. We value these interconnections, and we want to revisit the themes of resilience and sustainability before final strategies are presented.

Largo's Future Communities

Throughout this plan and throughout our overall journey to a more resilient and sustainable Largo, we placed equity at the forefront. Our SRAP leveraged the talents and perspectives of many of our communities along the way. It will be important in the coming years for us to continue to deepen and expand our network of engaged stakeholders and for this key component to adapt as our City changes. The City should stay tuned in to any changing demographics including age, income levels, homeownership, race and ethnicity, languages spoken, and other factors that may require more intentional resilience strategies or communication approaches. Maintaining strong partnerships with formal and informal community groups and regional organizations will be critical to the success of many of the adaptation strategies. Some of these conversations may be challenging but we want to continue listening and growing together. We do not believe we can create this future without the meaningful leadership and engagement of all our communities.

Largo's Future Waters

Our dual focus on sustainability and resilience are key to the future of the City's water resources. Resilience planning is relatively young when compared to other municipal initiatives. Currently, throughout the State of Florida, most resilience planning focuses primarily on flood mitigation. However, both now and in the future, water quality and ecology are likely to create significant challenges for us and throughout the State of Florida. Flooding is linked to traditional civil engineering and is currently pressing and more straightforward to address. So, it is reasonable that local governments generally start there in terms of resilience planning. However, the scientific aspects of water quality are also key to the City's future and the greater Tampa Bay area has already experienced significant and memorable red tide events. All these issues are tied together in the City's watersheds. We are also dedicated to not increasing greenhouse gas production or energy consumption as part of our needs to address flooding. Thus, we will instead choose to employ synergistic and complex combinations of strategies to address water challenges in future years.

Smart technology, like adaptable structures and monitoring are likely to become more prevalent throughout Largo (and Florida) in the coming years. Many of these technologies also use less energy than traditional civil engineering techniques (like traditional pump stations). Also, due to its ability to respond to a wider range of hydrologic conditions, green infrastructure as a flood mitigation and prevention measure, is also advantageous to the City. These green infrastructure techniques include both structural and nonstructural practices. Some examples of structural practices are bioswales, greenways, and trees where nonstructural practices include changes to the City's codes and regulations and planning practices. Because of Largo's complex hydraulic network of creeks, it will be worthwhile to support and protect coastlines and to prevent storm surge and inland wave action as much as possible. As always, holding on to the quality shoreline, creeks, and natural areas that currently exist are also key to our future.

Like many other Florida communities, we face appreciable challenges related to discharge of wastewater effluent. Wastewater is one of the less appealing (and understandably so) aspects of water management in terms of public perception, so this is a significant challenge for the City. No single measure will allow us to meet all objectives for water, so combinations of strategies and changes will need to be used along the way. The SRAP spells out a first wave of measures but is just part of the first phase of planning that we will need to undertake. We are also dedicated to remaining plugged into regional measures and supporting our neighboring communities that connect to our watersheds.

Many times, regional coordination is much more cost effective than “going it alone” in terms of water resources management.

Largo’s Future Greenways and Green Spaces

This planning effort showed we have considerable interest in the creation of various greenways and green spaces. This interest was present in both City and stakeholder meetings - and for good reason. Greenways provide a variety of benefits across virtually all the themes of this planning effort. And, if well designed and maintained, could become a core part of the City’s adaptation planning efforts. Greenways address both sustainability and resilience while also providing practical and immediate benefits to the communities they serve. Grant funding is also available to support these efforts, particularly if they include stormwater treatment or benefits to underserved communities. The primary challenge related to implementation of large greenways and green space projects in Largo will be related to the availability of land, and particularly in eastern Largo. The traditional patterns of development in the United States focused primarily on traditional roads and discrete neighborhoods and as such, establishing connectivity for greenways is challenging. The findings of this study suggest that a concerted effort in eastern Largo is needed to better address current and future climate hazards and build sustainability. This project provides a depth of data regarding current coverages, equity, land use, and our exposure to current and future various climate hazards. Thus, we can then use this data as a foundation for future planning efforts.

Our Adaptation Roadmap

The final step of the SRAP included the development of specific Adaptation Strategies. The format of the strategies creates flexibility within the process of achieving the end-goal by identifying sub-strategies and allowing decision makers to make progress based on staff or financial capacity and react to changes and challenges. These strategies in this Adaptation Roadmap encompass all the themes of the project and are intended to be both Citywide and in some instances, site specific.

A summary of the final City of Largo Adaptation Strategies is provided in Table 8 alongside the completion timeframe (short, medium, or long-term) and an estimated cost range.

TABLE 8 - SUMMARY OF FINAL CITY OF LARGO ADAPTATION STRATEGIES

| Completion Timeframe* | Strategy Name | Brief Description | Cost Range** |
|-----------------------|--|--|-----------------|
| Short Term | Adaptation Strategy 1: Equitable Climate Preparedness | Increasing engagement within the City through informed liaisons, additional studies, and public participation. | \$ (Annually) |
| Short Term | Adaptation Strategy 2: Join The One Water Movement | Joining the One Water Movement as part of our Resiliency Journey. | \$\$ (Annually) |
| Short Term | Adaptation Strategy 3: Lift Station Modernization and Hardening | Modernization and hardening of lift stations, so they are more resilient to both current and future conditions. | \$\$\$\$ (each) |
| Short Term | Adaptation Strategy 4: Eliminate Surface Wastewater Discharge | Eliminating reclaimed water discharge into surface bodies of water and providing transparent reporting on operations. | \$\$\$\$\$ |
| Short Term | Adaptation Strategy 5: Green Resilience | Assisting with the recovery of the City after extreme climate events, specifically greenspaces and areas of high value to our communities. | \$-\$\$\$\$\$ |
| Short Term | Adaptation Strategy 6: Energy Management | Implementation of key aspects of the Largo Energy Management Roadmap (LEMR) from 2023. | \$\$\$\$ |
| Short Term | Adaptation Strategy 7: Annual CIP Planning for A Sustainable and Resilient Largo | Enhance the Annual Capital Improvement Project (CIP) Planning process using the data and tools generated by this study. | \$ (Annually) |

| | | | |
|--------------------|--|---|-------------------------------|
| Medium Term | Adaptation Strategy 8: Sustainable Business | Key strategies to incentivize businesses to increase their activities related to sustainability and community resilience. | \$\$ (Annually) |
| Medium Term | Adaptation Strategy 9: Coastal Resilience | Strategically increasing the resilience of coastal assets and ecosystems. | \$\$-\$\$\$ |
| Medium Term | Adaptation Strategy 10: Flood Mitigation | Creating a proactive and comprehensive approach to water resources planning for the City. | \$\$\$\$ (Per Planning Cycle) |
| Medium Term | Adaptation Strategy 11: City Sustainability Continuous Improvement | Key strategies to refine our goals related to sustainability. | \$\$ |
| Long Term | Adaptation Strategy 12: Develop, Adopt, and Begin Implementing a Greenways Plan | Developing a City Greenways Plan, with a focus on equity and nature-based solutions, to provide strategic trails and greenways throughout the City. | \$\$ (Planning Phase Only) |
| Long Term | Adaptation Strategy 13: Inland Waterways Resilience | Convening a stakeholder group to discuss the results of this study and potentially work on resilience measures for the city's creek communities. | \$\$\$ |

*The completion timeframe ranges are as follows: Short Term = 0 to 5 years, Medium Term = 6 to 10 years, Long Term = 11 to 15 years

**The Strategy cost ranges (in 2023 Dollars) are as follows: \$ = up to \$100,000, \$\$ = up to \$500,000, \$\$\$ = up to \$1 million, \$\$\$\$ up to \$5 million, \$\$\$\$\$ greater than \$10 million.

In the following pages, each strategy is presented in detail with a general description, specific action items, and implementation details. The general description highlights the main purpose of the strategy as well as the community support for the strategy. Community support is based on the feedback received at three types of outreach occurrences – mapping sessions, listening sessions, and fall tabling events. Additionally, team members worked with our Community Development Advisory Board to review each strategy for equity concerns and opportunities. The results of the project's community outreach and equity assessment can be found in the Appendix of this document. The implementation details include the completion timeframe (short, medium, or long term), the team lead and supporting team members, estimated relative costs, funding and grant opportunities, primary hazards and secondary hazards addressed, and areas to advance implementation based on community feedback.

Adaptation Strategy 1:

Equitable Climate Preparedness

Overview of Strategy

We place equity as a key theme of this project and as such, have dedicated an entire strategy to deepening equity as the SRAP is implemented across the City.

Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

Strategy Specifics

1.1: Climate Gentrification Study – Despite our best intentions, the following strategies in the SRAP could impact cost of living negatively and result in more rapid gentrification in some areas. For instance, reducing the heat impact on residential properties by increasing the number of trees and greenspace in the surrounding neighborhood can increase property value. While this increase in value may be beneficial to some homeowners, it can also increase the cost of living for others, especially renters. Therefore, we need to be strategic in aligning these strategies with other efforts that will mitigate those negative impacts. For example, we could establish a target percent increase of homeownership in disadvantaged communities, particularly among non-white populations (e.g., Black/African American and Hispanic populations) which statistically have lower homeownership. To identify such opportunities, we will work with community groups to fund and commission a credible third-party study assessing the risk and extent of climate gentrification, and possible solutions. This study and its findings will be coordinated alongside the [Housing for All initiative](#) that aims to encourage and expand a wide variety of housing types throughout the City.

1.2: Climate Liaisons - A network of climate liaisons in vulnerable communities and neighborhoods will be recruited to connect with residents and better understand how climate hazards affect vulnerable populations and to disseminate information to their community. Liaisons should be advocates and communicators that live/work in Largo and that are tied to each community. To be truly equitable, these liaisons will be compensated by us for their time and expertise. This Sub-strategy should be integrated into the annual City budget and can follow the various liaison types outlined in the Metropolitan Area Planning Council's [Community Liaison Model](#).

1.3: Multi-Lingual Resilience – We will ensure frontline communities are a priority and engaged in an approachable way by offering information in other languages and through a variety of outreach opportunities. This includes continuing to proactively prepare our community for climate hazards by sharing state and county information on how to best prepare for extreme heat events and hurricanes, as well as providing resources for public safety during and after those events. Feedback from our most vulnerable populations about their safety concerns and needs during period of extreme heat and hurricanes will be collected annually to better prepare our community.

1.4: Resilience Art – Many of the adaptation strategies in this roadmap call for public arts components. We can utilize visual arts, signage, installations, and participatory events to creatively communicate to residents and visitors the localized impacts of climate change and avenues for community action. Public art also adds to community resilience by assisting our appreciation and shared responsibility for our community. As a result, the city will strongly consider adding

a public art program to its services. The team member leading this program would be responsible for assisting the incorporation of art components into the strategies that follow.

1.5: Access and Options – To remain equitable in all of its services, we will aim to host public meetings that are easily accessible to vulnerable populations: (a) Physically accessible (near public transport) (b) Safe to all members (c) Located in places communities’ value as gathering spaces (e.g., community centers and cultural centers) (d) Led in, or translated into, the primary language(s) of the community (e) Scheduled at various times to accommodate different schedules and when public transportation or bus services are most accessible.

Implementation Details

Short Term Completion (0-5 years)

Team Lead: Sustainability and Resilience Administrator

Supporting Team: Community Engagement Administrator, Housing Manager, Emergency Manager

Estimated Relative Cost: \$ (Annual Cost)

Areas to Advance During Implementation: As mentioned, this Strategy will be coordinated alongside the work of the Housing for All initiative as both plans address diversifying housing and making it more affordable. Additionally, community feedback suggested that residents want more information on healthcare services and opportunities that can help them with physical or mental health before, during, or after climate hazards occur. It is suggested that the team works on providing a list of resources related to home healthcare, mental health, and preventative services that can help people be more resilient. This may require community partnerships to know about these options or distribute these resources. Moreover, the sharing of these resources should be focused both digitally and in places where people feel most safe, which according to feedback includes shelters, churches, schools, and community centers. Lastly, several people during the community feedback sessions commented on lacking transportation to events and the service limitations to local public transit options. The team should work with climate liaisons to coordinate event times when transportation is most accessible and consider options to fund people that may not be able to afford these options.

This Strategy is closely related to mitigation of climate change and our overall sustainability goals.

Adaptation Strategy 2:

Join the One Water Movement

Overview of Strategy

The One Water Movement is a way of managing, valuing, and viewing water as part of one interconnected and critical system – regardless of location or origin. Some elements of the 2018 LEAP included One Water considerations and these can be further refined by the SRAP. More about One Water can be read about in the US Water Alliance’s [“One Water Roadmap.”](#)

Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

Strategy Specifics

This is a complex strategy geared towards a variety of interrelated water resources and water quality challenges throughout Largo and the greater Tampa Bay region. Primary elements of this strategy include:

2.1: Reclaimed Water Goal – Reclaimed water is wastewater that has undergone treatment to remove harmful qualities so that it may be reused for specific, non-drinking purposes. While the use of reclaimed water is a beneficial water conservation tactic, we face capacity constraints within the system when it comes to vastly increasing the amount of reclaimed water available to the community. In addition to these operational constraints, system extensions are very expensive. Currently, both commercial and municipal projects are considered for reclaimed usage if a connection point to the system is nearby. Using reclaimed water will continue to be an integral consideration on City projects and the elements of this plan where advantageous. For example, reclaimed water should be used to irrigate any new projects considered in the SRAP (such as Adaptation Strategy 12: Develop, Adopt, and Begin Implementing a Greenways Plan). Additionally, there are roughly 1,000 residential properties located on streets with existing reclaimed water access, but these properties are not currently connected to the system. We will prioritize these locations in future expansions to the program with an overall goal of 50% (about six million gallons per day) reclaimed water usage.

2.2: Water Conservation – Because of the constraints of reclaimed water expansion and the amount of energy it requires to transport and treat water, conservation of water is a necessity for our communities. To address this, we will develop a customized plan to encourage water conservation throughout the City’s operations and use *WaterSense* fixtures where they will not cause any issues related to water pressure, plumbing, or the City’s collection system. We will assist with piloting different conservation techniques (i.e. dual flush toilets and conversion kits) when possible on City properties (such as dual flush toilets and conversion kits). We will also establish programs that enable high water usage areas of the City and low-income communities to participate in water conservation practices. Examples include a rebate program for single-family residential stormwater utility customers when they install rainwater catchment devices and indoor conservation kits that include a low-flow showerhead, toilet leak detection dye tabs, and faucet aerators. Additionally, we will partner with local organizations to increase public awareness of the importance of water, such as connecting residents to the Pinellas County UF/IFAS extension’s Water Stewards Program and Tampa Bay Water.

2.3: Resilience Through Data – We will continue to incorporate the best available data into capital projects that involve water, including future projections. For example, we will consider future rainfall projections as part of the design

parameters for sizing stormwater facilities, including the treatment of that stormwater. We will also continue to make data collection a priority in terms of water resources planning so that as climate change progresses, we have an accurate record of localized changes in the recent and eventually, more distant past. For example, we can use these considerations in our maintenance and improvement plans to our city's parks and nature areas. This sub-strategy is closely linked to Adaptation Strategy 3: Lift Station Modernization and Hardening, Adaptation Strategy 10: Flood Mitigation, and Adaptation Strategy 7: Annual CIP Planning for a Sustainable and Resilience Largo.

2.4: Continued Active Communication and Participation in Regional Planning - Continue to participate in regional water planning efforts. This includes not just participating, but actively communicating to regional agencies regarding the issues, needs, and concerns of the City and in turn, assisting when possible. These agencies include Pinellas County, the Tampa Bay Regional Planning Council, Tampa Bay Water, and more. For example, assisting Pinellas County in the creation of flood scenarios that can then be leveraged by us in the implementation of Adaptation Strategy 7: Annual CIP Planning for A Sustainability and Resilient Largo.

Implementation Details

Short Term Completion (0-5 years)

Team Lead: Sustainability and Resilience Administrator

Supporting Team: Facilities Manager, Reclaimed Water Supervisor, Stormwater Program Administrator, Community Engagement Administrator, Irrigation Technician

Estimated Relative Cost: \$\$ (annual cost, including fees for improvements to datasets as part of CC-203).

Funding and Grant Opportunities:

- **WaterSMART Grants** – This program is offered through the United States Department of the Interior Bureau of Reclamation and is generally offered on an annual basis. Funding would be based on the initiative but may apply to some of the sub-strategies listed above (Particularly Sub-strategy 2.2).
- **Clean Water State Revolving Fund** – These are low interest loans offered to local governments from the Florida Department of Environmental Protection for a number of different types of water projects (wastewater, stormwater, or nonpoint source pollution prevention). More information can be obtained here: <https://floridadep.gov/wra/srf>
- **Drinking Water State Revolving Fund** – Similar to the Clean Water State Revolving Fund, this is a low-interest loan program geared towards helping local governments plan, design, build, or update drinking water systems. More information can be obtained here: <https://floridadep.gov/wra/srf>

Areas to Advance During Implementation: Community feedback highlighted the importance of parks in Largo, many of which contain or are near water bodies. Therefore, the team will coordinate with the appropriate city employees on the operations and plans for irrigation, maintenance, and pollution control of these natural assets. Similarly, the community is highly supportive of the Largo Golf Course. Due to the quantity of water typically used to irrigate and maintain golf course properties, the team should prioritize this asset for piloting the use of conservation techniques as well as reclaimed water when possible. Moreover, the team will try to sponsor public awareness outreach and events at places where the community feels safe or connected, such as the Library, and in alignment with Sub-strategy 1.5: Access and Options. Additionally, in line with Sub-strategy 1.4 Resilience Art, the City will work to incorporate art about the one

water movement in public spaces that are relevant or near city facilities that contribute to water resilience planning, such as Public Works, Environmental Services, and the Engineering Department.

Primary Hazards Addressed Through This Strategy: Storm Surge and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

Adaptation Strategy 3:

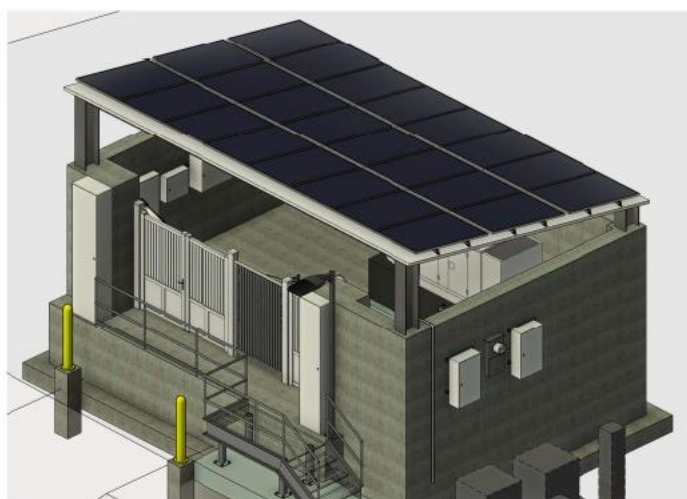
Lift Station Modernization and Hardening

Overview of Strategy

Like other Florida communities, ensuring the integrity of Largo's Wastewater Collection System has become an urgent issue. Lift stations are pumps that move wastewater across the City for treatment at the Wastewater Treatment Plant. The proper function of these lift stations and the elimination of sanitary sewer overflows are vital for upholding both public and environmental health. Many lift stations in the City are in urgent need of modernization and hardening (modifications), so they are more resilient to both current and future conditions. Many of the City's lift stations are located at relatively lower elevations and are therefore impacted by the flood hazards studied as part of the Vulnerability Assessment. Proper function of the City's lift stations in future years also further protects the waterbodies located throughout the City from any future discharge of wastewater during storm surge or larger storm events.

In 2023, we were awarded \$850,000 in matching grant funding from the Florida Department of Environmental Protection's Resilient Florida Program to improve the resilience of Lift Station 47, located in the Feather Sound community. To lessen the impacts of future flooding from sea level rise and extreme weather events, the lift station's concrete slab area and control panels will be elevated 3.25 feet, and a waterproof hatch will be installed. A generator will be added as a contingent power source. The station and generator will be enclosed and protected from flood waters by constructing a 10.4 feet vertical reinforced concrete wall (to elevation 15.4 feet). Additionally, a shade canopy with solar panels will protect the equipment from the elements and produce an estimated 50 percent of the total daily electrical demand for the station. An image of what these potential improvements could look like are shown in Figure 33. These improvements will improve public and environmental health by preventing sanitary sewer overflows caused by a lift station failure during extreme weather events.

FIGURE 23 - A MODEL OF FUTURE LIFT STATION 47



This strategy recommends incorporating the sustainability and resilience components of Lift Station 47 into future lift station improvements.

Community Support: Support for themes in this strategy were evident in 2 out of 3 community outreach categories.

Strategy Specifics

3.1: Resilience Planning for Vulnerable Lift Stations

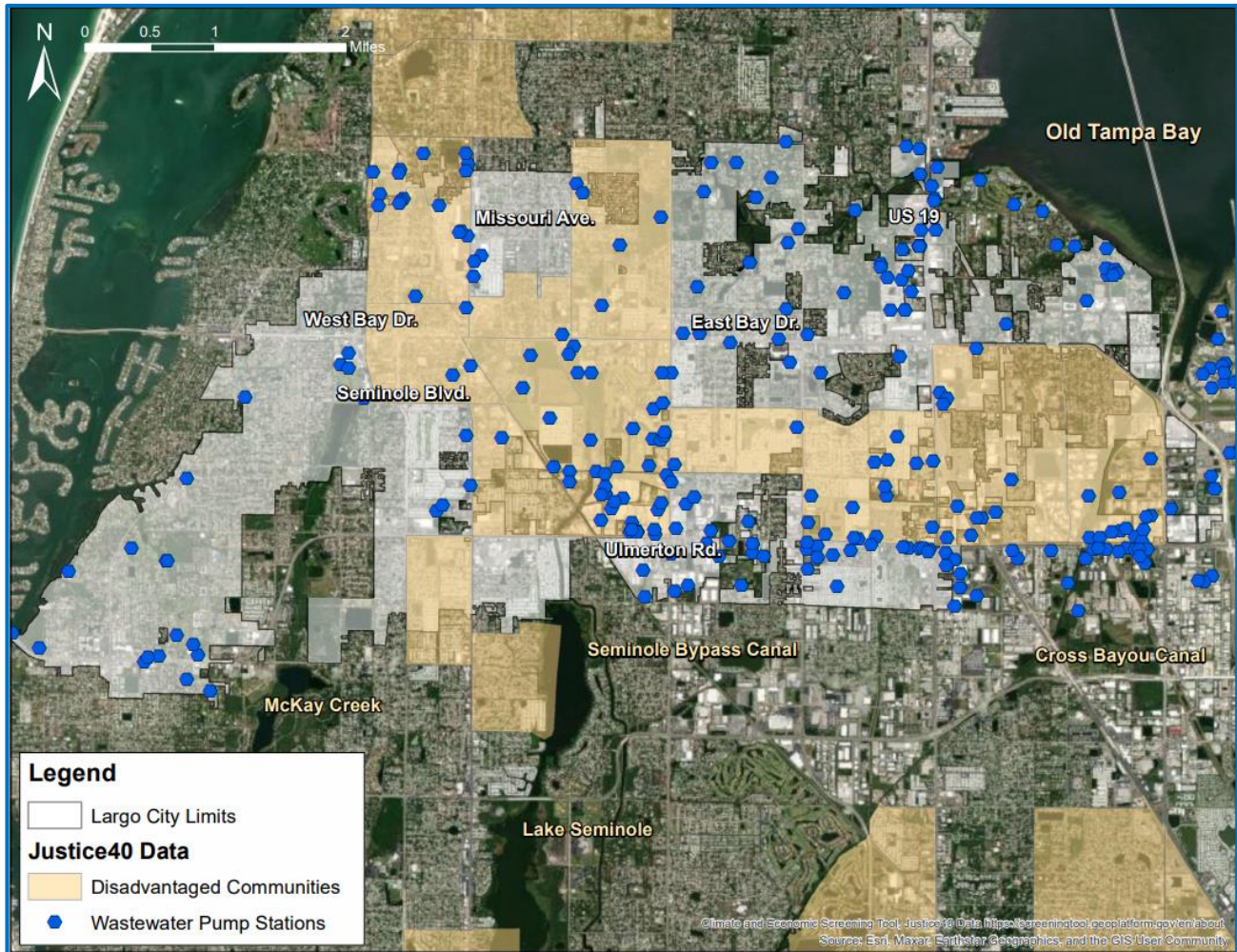
According to an engineering study, four sanitary sewer lift stations provide critical services to the Largo community and are highly vulnerable. Based on the study, city engineers have prioritized modernizing and hardening the following lift station projects as follows:

1. Lift Station 19 – This station is located immediately adjacent to Clearwater Harbor, a marine ecosystem found to have harmful and excessive levels of nitrogen by the FDEP. This project impact area spans along the western coastline of the City of Largo. The City’s 2023 vulnerability assessment determined that this lift station is currently vulnerable to storm surge and that it will be increasingly vulnerable to tidal flooding in the future.
2. Lift Station 26 – This station is located on Allen Creek, which is directly connected to Old Tampa Bay. The City’s 2023 vulnerability assessment determined that the lift station is highly vulnerable to tidal flooding, storm surge, rainfall induced flooding, and its resilience is key to reducing the many climate-related environmental hazards present in this section of Pinellas County.
3. Lift Station 41 - This lift station is located at Feather Sound Drive, adjacent to 2913 La Concha Drive is farther inland than the other stations, but in a low elevation area. The lift station’s elevation was found to be below FEMA’s base flood elevation (BFE), and Feather Sound’s future SLR conditions could add to the vulnerability of the lift station’s electrical equipment.
4. Lift Station 38 – This lift station has been added to the Fiscal Year 2025 – 2029 Capital Improvements Program (CIP) update. Lift Station 38 is located at 2169 Egret Drive adjacent to Allen Creek. It went under six inches of water during Hurricane Idalia. It will be relocated 600 feet to the south along Valencia Way in the 500-year flood plain.

3.2: Equitable Lift Station Resilience Planning – As part of the vulnerability assessment, we have studied the location of all our lift stations against the flood hazards in question and disadvantaged community data (provided by the Climate and Economic Justice Screening Tool). Figure 34 shows the wastewater lift station locations as well as the designated disadvantaged communities. In future years, we will be prioritizing the hardening of the lift stations that are also moderately or highly vulnerable to flood hazards and are located within these disadvantaged communities to ensure continued service to these communities.

3.3: Improve Lift Station Sustainability – Where applicable, we will aim to model Lift Station 47 in its improvements with other lift stations. A solar feasibility study will be conducted for all lift stations within the City’s service area to see what locations would benefit from a solar canopy. Additionally, we will create a public art mural program for lift stations that are hardened with concrete walls to improve public acceptance and add to a sense of place. The surrounding community should help select the design for each respective lift station. Murals with environmental, climate, and social justice themes will be recommended.

FIGURE 34- WASTEWATER LIFT STATION LOCATIONS AND DISADVANTAGED COMMUNITY COMPARISON



Implementation Details

Short Term Completion (0-5 years)

Team Lead: Engineering Project Manager

Supporting Team: Flow Monitoring Specialist, Energy Program Administrator, Collection System Manager, Community Engagement Administrator.

Estimated Relative Cost: \$\$\$\$\$ (greater than \$10 million for implementation of all projects).

Funding and Grant Opportunities (beyond the Resilient Florida funding previously mentioned):

- **Building Resilient Infrastructure and Communities (BRIC) Funding** – This program is offered through the Department of Homeland Security and Federal Emergency Management Agency. Funding relies on some formal analyses that must be FEMA-compliant, so some engineering-level analyses are critical to successful submittal of a grant application.

-
- **Clean Water State Revolving Fund** – These are low interest loans offered to local governments from the Florida Department of Environmental Protection for several different types of water projects (wastewater, stormwater, or nonpoint source pollution prevention). More information can be obtained [here](#).
 - **Resilient Florida Grant Program** - The Resilient Florida Program includes a selection of grants that are available to counties, municipalities, water management districts, flood control districts and regional resilience entities. To effectively address the impacts of flooding and sea level rise that the state faces, eligible applicants may receive funding assistance to analyze and plan for vulnerabilities, as well as implement projects for adaptation and mitigation.

Areas to Advance During Implementation: While this strategy focuses on lift station modernization and hardening, community members expressed wanting a few other programs for sewer system operations. One idea is to provide a financial rebate or grant program to support private sewer lift station maintenance. Another idea is to increase education on grease and debris impacts and what can go down the sewer drains for residents and commercial properties. The team should investigate the possibility of these options when implementing the above strategy. Additionally, this initiative will help improve the efficiency and resiliency of housing in Largo. The team should coordinate with the Planning and Building Divisions to prioritize or incentivize development or repairs near lift stations that have been modernized and adapted. This will help in addressing the community’s concern for climate resilient housing.

Primary Hazards Addressed Through This Strategy: Storm Surge and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

Adaptation Strategy 4:

Eliminate Surface Wastewater Discharge

Overview of Strategy

To be compliant with Florida Senate Bill 64 and eliminate the discharge of effluent into surface waters, we are constructing two Deep Injection Wells (DIW) at the Largo Wastewater Reclamation Facility (WWRF). The intended outcomes from this project include:

- **Improved Water Quality** - The Tampa Bay Estuary Program's 2022 Reasonable Assurance Update covering the 2017-2021 period, noted significant declines in the Bay's seagrass resources. Declines in water quality, particularly in the Old Tampa Bay segment, coincided with large losses of seagrass coverage during this period. Furthermore, other **stressors** were correlated to the declines in water quality and seagrasses within Tampa Bay. These include increasing water temperatures, hydrologic inputs, poor tidal circulation, and discrete red tide and wastewater discharge events. By constructing two Class 1 Underground Injection Control (UIC) wells, this project aims to eliminate surface water discharge apart from emergency uses and prevent up to 19 tons of nitrogen from entering Old Tampa Bay each year. Figure 35 shows a depiction of these wells from the surface.
- **Increased Pump Energy Efficiency and Effluent System Resilience** - The project will realign existing effluent station pumps within the WWRF to provide more efficient power usage. The ponds and current effluent discharge location will also experience improved resilience against the negative impacts of future sea level rise.

FIGURE 35 – VISUAL OF CLASS 1 INJECTION WELL



This strategy focuses on increasing community awareness and identifying long term solutions for the city's effluent.

Community Support: Support for themes in this strategy were evident in 2 out of 3 community outreach categories. In the equity assessment phase of this project, this strategy was marked as concerning by the Community Development Advisory Board for potential impacts of DIWs to the drinking water aquifer and public health.

Image Credit: Ohio Environmental Protection Agency, [Underground Injection Control \(UIC\) Program](#) | [Ohio Environmental Protection Agency](#)

Strategy Specifics

4.1: Transparent Reporting and Community Education - Deep Injections Wells are a controversial project for the Largo community. As a result, there is a need for continuous education and transparent reporting. Prior to construction, the community will be invited to meet with our team members involved in the project to learn more and ask questions. Residents and business owners located in the areas closest to the Wastewater Reclamation Facility will be specifically targeted for these outreach opportunities. Information on the benefits and implications of DIW should be provided to the community in both English and Spanish. Any evaluation from regulatory authorities will be routinely provided on the City's website. Additionally, any fiscal impacts on taxpayers or service areas from the construction and maintenance of these DIWs should be communicated clearly with the public.

4.2: Develop Long Term Solutions Beyond DIW - While they will enable the City to become compliant with state mandates, the City understand DIWs are a short-term necessity and not a long-term solution. The City will commit to pursue innovative and alternative solutions for its wastewater effluent beyond DIW. This effort will need to occur with the work outlined in Adaptation Strategy 2: Join The One Water Movement.

Implementation Details

Short Term Completion (0-5 years)

Team Lead: Engineering Senior Project Manager

Supporting Team: Wastewater Manager, Communications Manager.

Estimated Relative Cost: \$\$\$\$\$ (estimated construction related cost in 2026 dollars)

Funding and Grant Opportunities:

- **Florida Water Quality Improvement Grant Program** - Provides funding to address wastewater (including septic to sewer), stormwater and agricultural sources of nutrients in waterbodies that are not attaining nutrient or nutrient-related standards, have an established total maximum daily load or are located within a basin management action plan area, a reasonable assurance plan area, an accepted alternative restoration plan area, or a rural area of opportunity under s. 288.0656.

Areas to Advance During Implementation: To address concerns about water pollution and public health from community feedback, our team will ensure that the community education component in Sub-strategy 4.1 includes the best available scientific information on public health effects from deep well injections. Additionally, the city will continue to monitor its reclaimed water for any potential contaminants and will be transparent about any potential issues that may arise during its operations. Moreover, as our team identifies long-term solutions for this effluent, we will focus on ideas that can be accomplished within our jurisdictional authority and capacity, as to align with feedback given during the SRAP development process. In other words, we will try to avoid solutions that are too large-scale and for which we do not solely effect regarding water quality issues in the Tampa Bay.

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

Adaptation Strategy 5:

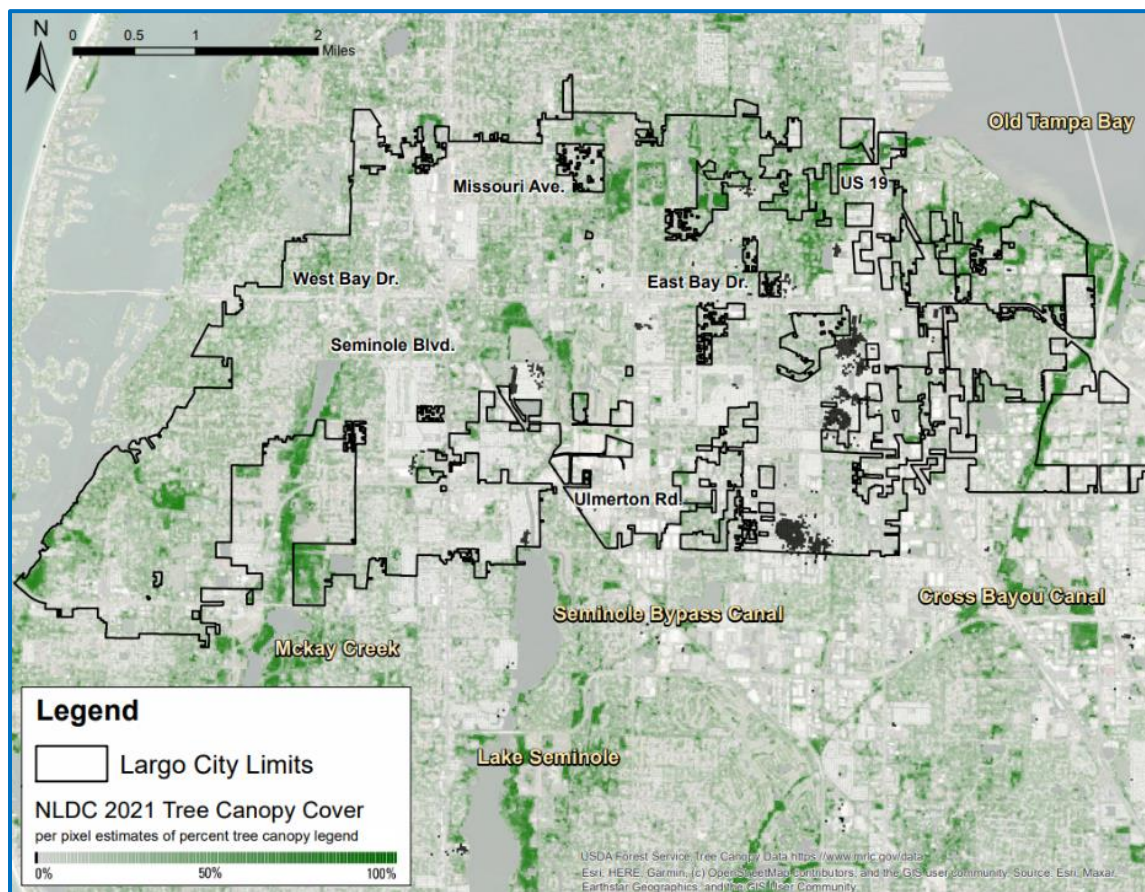
Green Resilience

Overview of Strategy

This strategy includes specifics to assist with the recovery of the City after extreme climate events, specifically greenspaces and areas of high value to our communities. The strategy also outlines opportunities to reduce negative impacts of extreme heat by expanding the City's current tree canopy and greenspace locations.

Trees and some similar vegetative types provide a variety of benefits to the City in terms of primary climate hazards through evapotranspiration and by providing shade and uptake of nutrients. Preserving and then increasing tree canopy and vegetation throughout the City over time is an important strategy, particularly in eastern Largo and where tree canopy is not dense. Figure 36 summarizes tree canopy cover data for the City from the USDA Forest Service.

FIGURE 36 - PERCENT TREE CANOPY FOR THE CITY OF LARGO

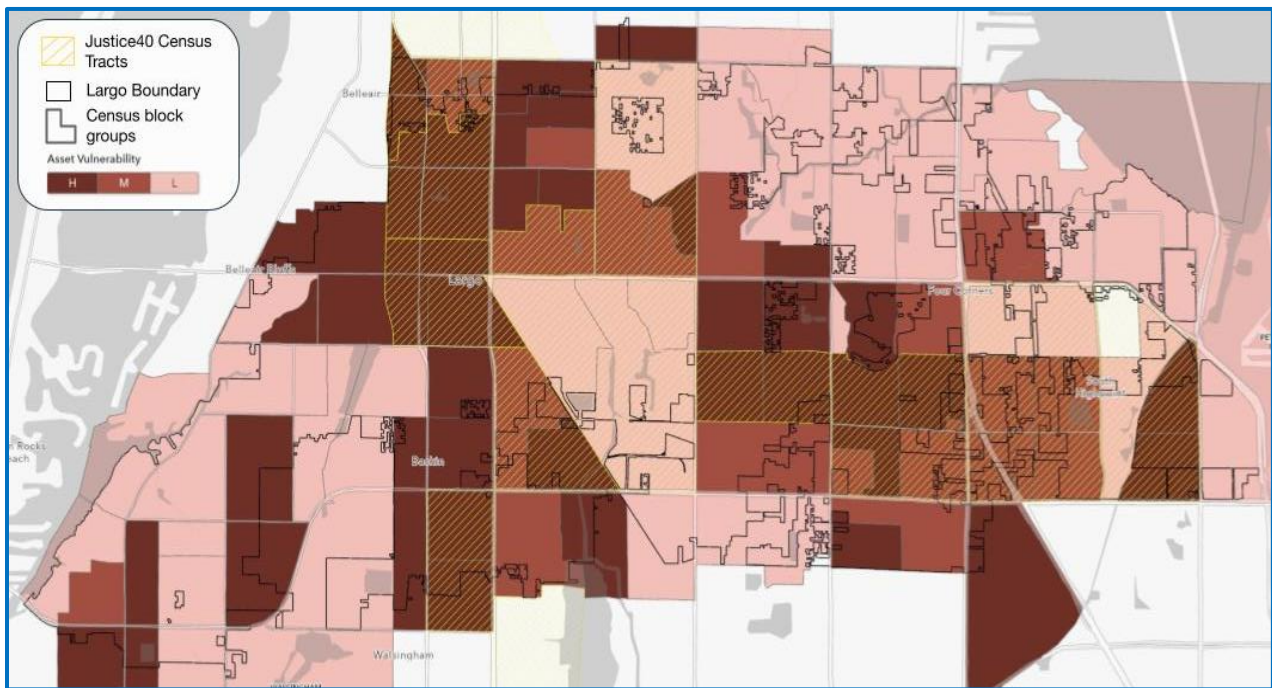


Community Support: Support for the themes in this strategy were evident in 3 out of 3 community outreach categories.

Strategy Specifics

5.1: Re-Green – We will create a community fund to replant established canopy after wind or extreme drought events. We will also expand the City’s tree canopy in areas that currently lack cover. Priority planting locations will be reserved for frontline communities that currently experience high levels of heat, shown in Figure 37 below. In alignment with Sub-strategy 1.3: Multi-Lingual Resilience, information on the public health, property, and ecosystem benefits of trees as well as the specific native trees recommended for Largo will be made available to residents in multiple languages. Where applicable, we will invite the public to participate in tree plantings to increase awareness of proper planting methods as well as increase community ownership.

FIGURE 37- CENSUS BLOCK GROUPS & EXTREME HEAT VULNERABILITY



5.2: Beyond Lawns – We will reduce use of conventional lawns and establish more urban trees and native vegetation on City properties. Large installations with public access will include educational signage that provides the species names and explains the benefits of native trees and vegetation. We will also create programs that encourage and enable residents and businesses to replace turf grass with native landscaping and urban agriculture opportunities, like vegetable gardening. We will identify any code requirements that could restrict the expansion of native landscaping and urban agriculture in residential, commercial, and institutional zones.

5.3: The Value of Street Trees: We currently have a small tree tagging program to increase awareness of trees and their benefits. We will expand this campaign to public locations across the City and include the economic benefits of each tree. Several communities across the United States have found a tree price tag program to be a fun way to capture the public’s attention and increase awareness of the economic benefits of street trees. Multiple examples can be found online, such as the template provided by the [Urban Natural Resources Institute](#).

5.4: Address Climate Gentrification – Increasing trees and greenspace have numerous benefits, including benefits to property value. Unfortunately, this can also result in unintended negative effects of increasing property tax or rental costs for the surrounding properties. With affordable housing options already at a crisis point for the Tampa Bay area, we need to investigate the ways to limit climate gentrification for this strategy, among others. This sub strategy will connect with the work performed to achieve Adaptation Strategy 1: Equitable Climate Preparedness as well as the work in the Housing for All initiative.

Implementation Details

Short Term Completion (0-5 years)

Team Lead: Sustainability and Resilience Administrator

Supporting Team: Parks Superintendent, Parks Supervisor, Landscape Planner, Communication Manager, Housing Manager, Program Engineer

Estimated Relative Cost: **\$-\$\$\$\$\$** (*highly variable based on deployment*)

Funding and Grant Opportunities:

- **FEMA Pre-Disaster Mitigation Grant Program** -- The Pre-Disaster Mitigation (PDM) grant program makes federal funds available to state, local, tribal and territorial governments to plan for and implement sustainable cost-effective measures designed to reduce the risk to individuals and property from future natural hazards, while also reducing reliance on federal funding from future disasters.
- **Florida Urban and Community Forestry Grants** – This program provides funding to remove invasive trees and replace them with native trees in areas where they will provide direct benefit to Floridians through energy reduction, mitigating urban heat, water or air quality improvement, stormwater runoff avoidance, or increasing greenspace accessibility.

Areas to Advance During Implementation: The City will consider completing a community-wide tree canopy assessment or rely on tools developed by regional partners and private companies to help in the prioritization process for Sub-strategy 5.1: Re-Green. Additionally, when implementing this strategy, the team will prioritize safety and utility considerations in the decision of where to prioritize and place trees. This will address community feedback concerns for safety as trees and understory vegetation can block views and street lighting as well as disrupt sidewalk and utility functions. Also, the team will coordinate the maintenance of street trees and park trees to promote safety for both the public, infrastructure, and the tree itself. The work outlined in this strategy will also align with other strategies such as Sub-strategy 8.2 Put Trees to Work, which will provide resources for businesses to plant native trees on private property.

Primary Hazards Addressed Through This Strategy: Extreme Heat, Storm Surge, and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

Adaptation Strategy 6:

Energy Management

FIGURE 38 - ENERGY MANAGEMENT ROADMAP REPORT

Overview of Strategy

As part of the SRAP, we worked collaboratively with our team members to develop a Largo Energy Management Roadmap (LEMR) for the City's operations. The strategy serves to better tie the SRAP to the LEMR. Fulfilling this plan will drastically improve the City's GHG emission from electricity and fuel consumption while also providing great energy independence. The purpose of LEMR is the following:

"The purpose of this roadmap is to support the establishment of an energy management program for the City of Largo, led by its government in alliance with the community and regional partners, that advances infrastructure, equity, and data-driven decision-making for a more sustainable future."

Community Support: Support for themes in this strategy were evident in 3 out of 3 outreach categories.

Strategy Specifics

Specifically, this adaptation strategy adopts the following five aspects of the Energy Roadmap:

6.1: Data and Analysis – This first phase of the LEMR focuses on gathering and organizing accessible, verifiable data that we can use to understand the City's energy consumption and efficiency opportunities. This data collection and verification process will be a continuous process that we must regularly cycle back to so that the energy management program is informed by accurate, up-to-date data (see Items 1A, 1B, and 1C in the LEMR).

6.2: Goal and Policy Development – A major focal point for the early implementation of the LEMR is the development of accessible internal energy policies, coupled with the education and training for employees on best practices. These policies will improve the City's energy management and encourage adoption of energy conservation behavioral changes and leadership among City staff and external stakeholders (see items 2A, 2B, and 2C in the LEMR).

6.3: The Deployment of Clean Energy Projects – This sub-strategy is geared towards improving energy efficiency in City operations through investments in sustainability within buildings to lower GHG emissions and energy demand (see Item 3A in the LEMR).



6.4: Transitioning City Operations to Renewable Energy – We will continue utilizing more renewable energy by increasing generation through solar arrays on City buildings and through energy procurement strategies (see Item 3B in the LEMR).

6.5: Drive Community Participation - Both the residential and commercial sectors are key stakeholders that must adopt energy management strategies to achieve the City’s Ready For 100 goal of 100% renewable energy use in the Largo community. As a result, we will work with community groups, including businesses, nonprofits, faith organizations, and social clubs, to educate citizens on energy management best practices and financial opportunities for clean energy investments. Furthermore, we already have an established role in connecting Largo’s residential, business, non-profit, and industrial sectors to funding opportunities through grants, and can continue that legacy. Grants can be extended to the public and private sectors to promote the pursuit of energy efficient infrastructure, electric vehicle and their charging stations, and renewable energy deployment. Focus should be placed on dispersing educational and financial resources to frontline communities to ensure that all citizens have equitable access to the financial, health, and environmental benefits of energy management strategies. These efforts are outlined to be started in year three of the LEMR implementation.

Implementation Details:

Short Term Completion (0-5 years)

Team Lead: Energy Program Administrator

Supporting Team: Sustainability and Resilience Administrator, Facilities Manager, Fleet Manager, Construction Manager, Housing Manager

This strategy is estimated at a relative cost of \$\$\$\$ and engages multiple types of synergistic strategies.

Funding and Grant Opportunities are outlined in the LEMR document.

Areas to Advance During Implementation: The community feedback shows strong support for renewable and clean energy. Since Sub-strategy 6.5: Driving Community Participation is not directly addressed in the LEMR, a municipal focused plan, the implementation team should make a concentrated effort to ensure this sub-strategy progresses. The team should aim to work with the Housing Division on community participation in current or new solar and energy efficiency grants and education programs. Furthermore, as green and clean energy businesses expand in the City, the team will coordinate with public safety departments to act more diligently to help residents report and handle fraudulent sales tactics. This reporting mechanism should be available on a public site to help protect other consumers from potential issues when adopting clean energy.

Secondary Environmental Hazards Addressed Through This Strategy: Increase in Atmospheric Carbon Dioxide

Adaptation Strategy 7:

Annual CIP Planning for A Sustainable and Resilient Largo

Overview of Strategy

The Annual Capital Improvement Program (CIP) Planning process is a budgeting process for high-cost projects that the city plans on implementing over a 5-year time scale. The CIP involves a multitude of city-wide projects related to natural and manmade asset management and community design ideas. We will use the data and tools developed by the SRAP and other key partners to enhance the Annual Capital Improvement Project (CIP) Planning process in the future.

Community Support: Because the process involves mostly internal conversations about city operations, the community was not directly gauged on giving feedback related to the process. Therefore, we are unable to say that support was evident in the community feedback opportunities. However, the projects that are proposed for the CIP would align with the goals and actions of many of the previously identified SRAP strategies. As a result, this strategy is important and relevant to the Adaptation Roadmap.

Strategy Specifics

7.1: Use of Future Forecasts and Long-Term Planning – To improve the CIP planning process, vulnerability assessment data and long-term planning considerations will be incorporated into the ideation and evaluation of every project. This includes the project scope, alignment with City strategic goals, and estimated useful life. In the CIP planning process, project managers will be provided tools and resources to incorporate the SRAP findings and recommendations into project proposals. These same tools will also be used to analyze projects for decision making considerations, such as climate hazard exposure, adjacent disadvantaged communities, and ways to mitigate impacts to both assets and the surrounding communities. Additionally, we will formalize the use of long-term planning perspectives (50+ years) for estimated useful life information so that the risk of failure or potential accelerated failure of infrastructure is identified early in the project development.

7.2: Equity in The CIP Process – We will identify potential ways to truly consider the impacts and importance of CIP projects that service vulnerable or underserved populations during prioritization conversations. We will superimpose the planning process against the data generated for this study on social vulnerability, exposure, and risk as well as the boundaries of the Climate and Economic Justice Planning Tool and disadvantaged community datasets. We will also consider the usage of the Equity Scorecard that was developed for the SRAP as part of the CIP planning process. This strategy will require clear and consistent support from City management over a long period of time to result in intended community benefits.

Implementation Details

Short Term Implementation (0-5 years)

Team Lead: Performance and Budget Manager

Supporting Team: Sustainability and Resilience Administrator, Community Engagement Administrator

Estimated Relative Cost (per Annual CIP Update): \$ (annual cost to integrate these measures).

Areas to Advance During Implementation: While this strategy identifies two potential ways to incorporate the SRAP strategies into the CIP process, the team will continue to keep updated on new techniques and tools being developed to continuously improve the project overtime. Additionally, with an emphasis on equity in Sub-strategy 7.2, it is key that the city investigates ways to make this planning process more open to public input and prioritization. This way people have a say in what is approved for funding and its initial design elements early on, especially if they live adjacent to the project.

Primary Hazards Addressed Through This Strategy: Storm Surge and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures, Changes in Rainfall Patterns, and Increase in Atmospheric Carbon Dioxide

Adaptation Strategy 8:

Sustainable Business

Overview of Strategy

This strategy includes key initiatives to incentivize businesses to increase their activities related to sustainability and community resilience.

Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

Strategy Specifics

8.1: Business Incentives – We will identify and expand incentives for sustainable businesses to locate within the area, such as those that research and add capacity to strategic workforce initiatives like the development of green jobs. Additional incentives will be provided to businesses that benefit underserved populations. The city will support existing green job programs at the local educational institutions and align them alongside these incentive programs.

8.2: Put Trees to Work – Connecting with Sub-strategy 5.1: Re-Green, we will provide resources for businesses to plant native trees on private property that have significant carbon sequestration and stormwater retention values. To implement this strategy, we can work with existing expert partners such as the UF/IFAS Pinellas County Extension.

8.3: Green Business Certification Benchmarking Exercise – Our team will conduct outreach with local businesses to determine if a Green Business Certification program is of interest. The certification program could center around some or all business sectors (restaurant and food businesses, hotel and lodging, construction, mobility, among others). Some Florida governments with similar programs include Pinellas County, Clearwater, Coral Gables, Delray Beach, Sarasota County, Winter Park, Alachua County, and Miami-Dade County – among others. The programs vary in scope and focus across the State of Florida so there are many options.

Additionally, to support our community-wide greenhouse gas reduction goals (outlined in Adaptation Strategy 11: City Sustainability Continuous Improvement) we will encourage businesses to achieve the [Electric Vehicle Adoption Leadership \(EVAL\) certification](#). This national workplace charging certification provides recognition and technical assistance to organizations that promote clean transportation options at their places of work.

8.4: Reduce Business Food Waste – To prevent excess food from becoming waste, we will strengthen our relationships with local food donation organizations to connect food-based businesses with ways to donate excess food. Example organizations include Tampa-based food recovery nonprofit 360 Eats. Participation could improve businesses brand and potentially reduce their waste disposal costs.

Implementation Details

Medium Term Completion (5-10 years)

Team Lead: Economic Development Manager

Supporting Team: Community Engagement Administrator, Intergovernmental Relations Coordinator, Environmental Control Supervisor, Landscape Planner

Estimated Relative Cost: \$\$ *(this program includes extensive program expansion; this strategy will vary widely in cost based on the details of each sub-strategy).*

Areas to Advance During Implementation: Additionally, in alignment with Sub-strategy 1.4 Resilience Art, the team will work with businesses who are part of any of these programs to see if they can incorporate this art in their design or building.

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

This strategy is also closely related to mitigation of climate change and the City's overall sustainability goals.

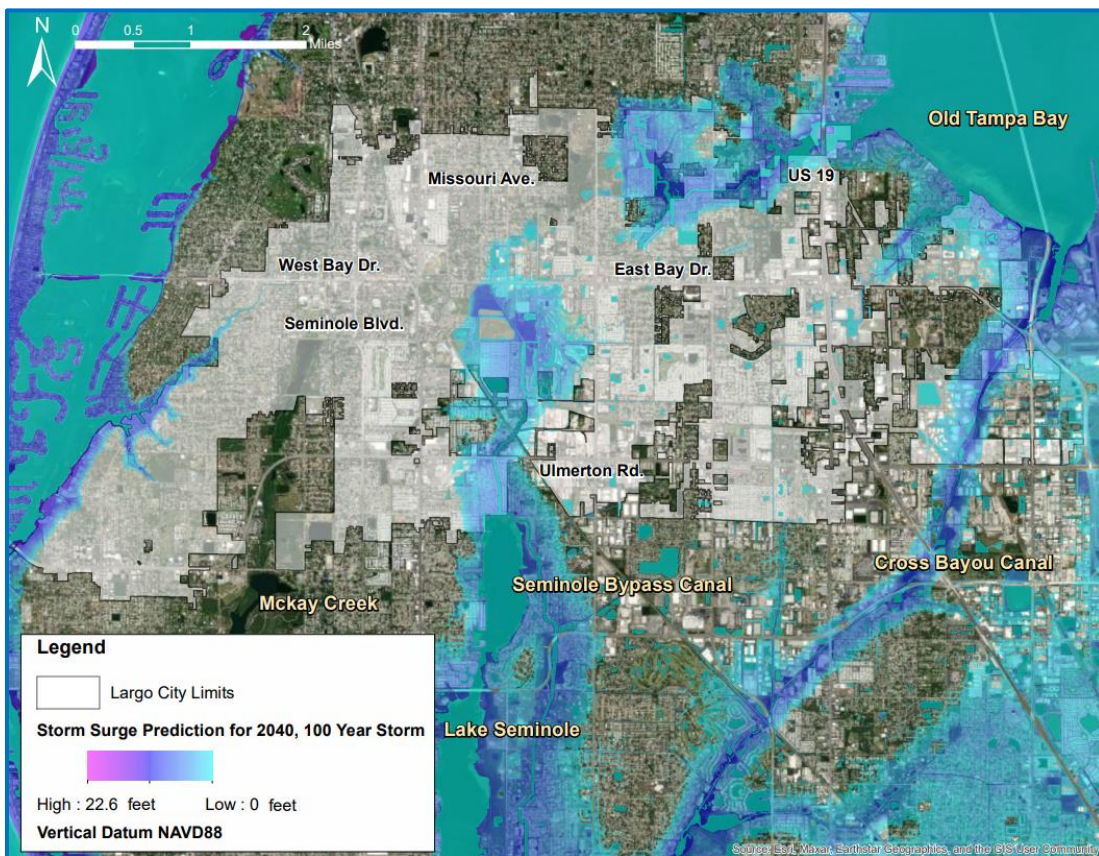
Adaptation Strategy 9: Coastal Resilience

Overview of Strategy

This strategy aims to increase the resilience of coastal assets and ecosystems – and the creeks that are directly connected to them – based on the storm surge results of the SRAP. This strategy focuses on the use of both hardened and nature-based infrastructure to reduce negative impacts from surge events. Vulnerability assessment results suggest that significant portions of the City are highly vulnerable to storm surge both now (2023) and into the future. Figure 39 provides a sample of the future storm surge hazard data throughout the City. As shown, there are several parts of the community that will be at high risk of storm surge impacts by 2040.

Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

FIGURE 39 - PROJECTED STORM SURGE FOR 2040, 100 YEAR STORM



Strategy Specifics

9.1: Coastal Preservation - When possible, we will maintain and restore existing coastal habitats, such as mangroves and maritime hammock. We will also develop incentives and strategies to expand these systems on developed properties to

reduce the force of storm surge waves and to prevent **shoreline recession**. These incentives and strategies will be coordinated with the Housing for All initiative to encourage new developments, especially residential, near coastal hazard areas to increase resilience to flooding and sea level rise impacts through nature-based solutions. Resilience improvements for coastal habitats will be prioritized for locations adjacent to frontline communities in the special flood hazard and coastal hazard areas.

9.2: Shoreline Assessment and Prioritization – We will assess the vulnerability of existing shorelines and identify needs and opportunity for improvements to protect public infrastructure and mitigate erosion. Once assessed, strategic restoration projects can be prioritized, using nature-based solutions such as natural shorelines or living seawalls whenever possible.

9.3: Living Shoreline Education and Programs - Where privately owned, we will engage private developments on the benefits of living shorelines and the methods of installing and maintaining these multi-faceted solutions. We will also invite members of the public to participate in living shoreline installations on City property to increase awareness and community ownership.

Implementation Details

Medium Term Completion (5-10 years)

Team Lead: Stormwater Program Administrator

Supporting Team: Principal Planner, Building Official, Community Engagement Administrator, Communications Manager.

Estimated Relative Cost: \$\$-\$\$\$ (depending on scope, highly variable cost depending on implementation).

Funding and Grant Opportunities (beyond the Resilient Florida funding previously mentioned):

- **Building Resilient Infrastructure and Communities (BRIC) Funding** – This program is offered through the Department of Homeland Security and Federal Emergency Management Agency. Funding relies on some formal analyses that must be FEMA-compliant, engineering-level analyses are critical to successful grant submittal.
- **National Estuaries Program (NEP) Watersheds Grant** - The Program is a nationally competitive grants program designed to support projects that address urgent, emerging, and challenging issues threatening the well-being of estuaries within the 28 NEP boundary areas.

Areas to Advance During Implementation: This strategy will be coordinated with several other strategies to ensure other community feedback is addressed. For instance, the team will consider public art opportunities when identifying opportunities for coastal preservation and living shoreline education, as aligned with Sub-strategy 1.4: Resilience Art. Additionally, this strategy will align with the work accomplished through Adaptation Strategy 3: Lift Station Modernization and Hardening to ensure that public infrastructure near these coastal hazards is also protected.

Primary Hazards Addressed Through This Strategy: Storm Surge and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures, Changes in Rainfall Patterns, and Increase in Atmospheric Carbon Dioxide

Adaptation Strategy 10:

Flood Mitigation

Overview of Strategy

Improved data collection and water resources planning is a relatively inexpensive - yet very effective - tool in the mitigation of climate change. This strategy provides both a proactive and comprehensive approach to water resources planning for the City.

Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

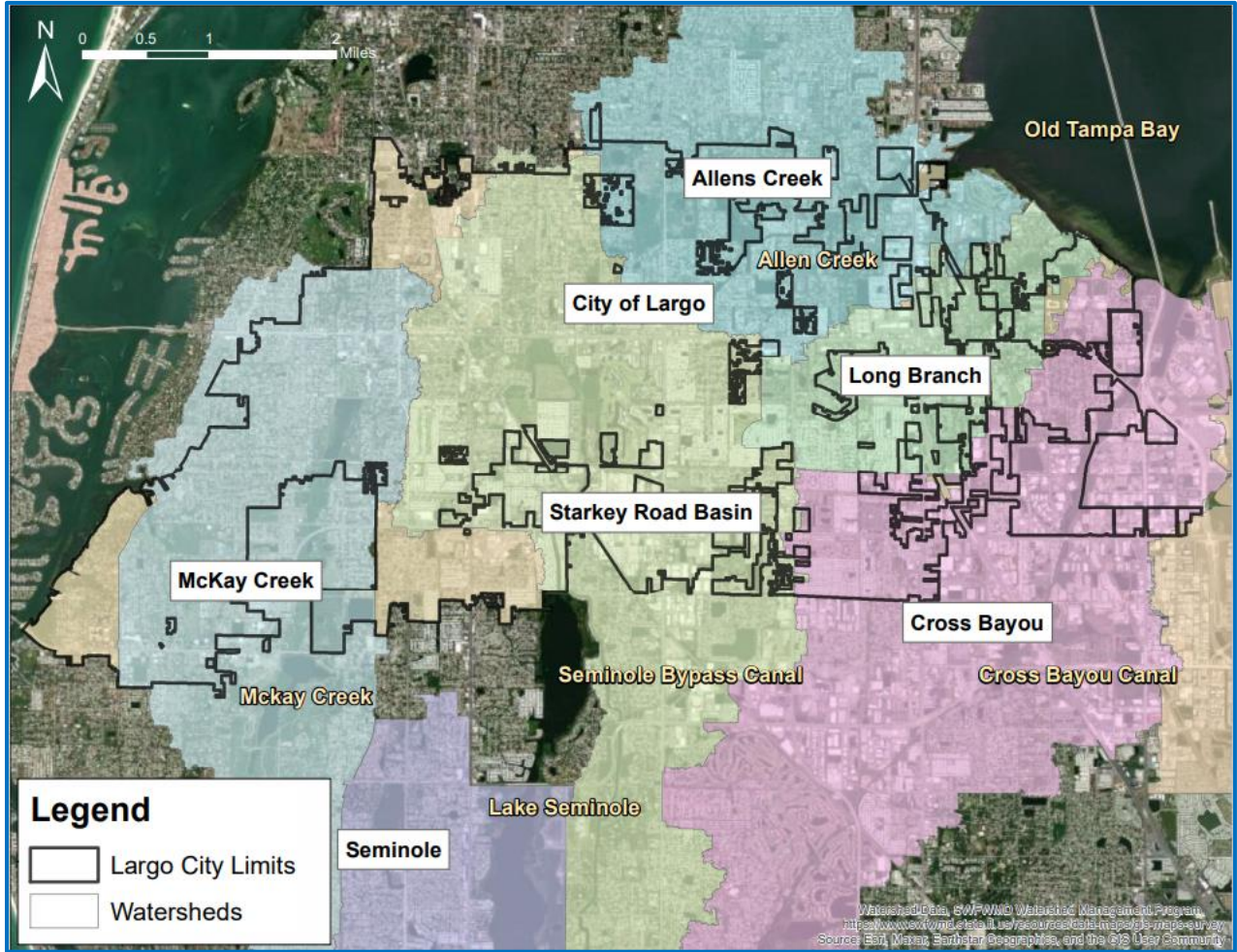
Strategy Specifics

10.1: Resilient Watershed Planning – A watershed is an area of land that drains into a specific waterbody. The major watersheds within our City are depicted in Figure 40 below. To advance our water resource planning, we will conduct recurrent watershed and stormwater planning (at a minimum of every three years) to include the following considerations:

- a. Nature based solutions with adaptable elements that can be modified as climate change progresses. These may include - but are not limited to - adjustable stormwater ponds, living shorelines, and low impact development techniques such as bioswales and rain gardens. We will employ these elements on projects and encourage residents, businesses, and developers to include these solutions on their properties. Pinellas County is a national leader in these technologies and is an excellent partner in this endeavor (see the [Pinellas County Low Impact Development Manual](#))
- b. The City will communicate data needs for coastal future conditions and rainfall data to Pinellas County and other parties, as needed, to aid in City planning efforts.
- c. Elements of flood analyses superimposed against social vulnerability. This analysis should incorporate flood reports and data collected from citizens (see Sub-strategy 10.2 Community Data below).
- d. Considerations for refinement of the collection of both water quantity (flows and levels) and water quality data.
- e. Re-evaluation of the stormwater level of service City-wide for both current and future conditions.
- f. Updates to hydrologic and hydraulic models and subsequent flood data.

Additionally, in alignment with Adaptation Strategy 2: Join the One Water Movement, the implementation of this strategy will consider water as one unified resource and will consider how other aspects of water management (like potable water conservation, reclaimed water usage, deep injection wells, water quality concerns, and more) all interact and impact watershed planning.

FIGURE 40 - MAJOR WATERSHED BOUNDARIES WITHIN THE CITY OF LARGO



10.2: Community Data - Working with community leaders, we will create a high-quality network to report flooding. The communication process will focus on equity and accessibility. We currently have a spreadsheet and reporting system for flooding. Through this strategy we will work to integrate equity data from the SRAP as part of the current reporting system. Additionally, when asking the community for input, it is important to show the result of their contributions. As a result, we will create an online platform that actively reports on the community collected data and includes information on flood resilience, water quality issues, how community members can help, and resources for residents to improve the flood resilience of their properties.

Implementation Details

Medium Term Completion (5-10 years)

Team Lead: Stormwater Program Administrator

Supporting Team: Communications Manager, GIS Administrator, Economic Development Manager, Flow Monitoring Specialist, Streets and Stormwater Manager

Estimated Annual Relative Cost (per Watershed Plan/Update): \$\$\$\$ (per planning cycle)

Funding and Grant Opportunities:

- **Annual Stormwater Utility Check-In** - Re-consider evaluating our dedicated funding source for stormwater. This is a critical funding source for resilience since it currently provides most of the funding to abate flooding for most local governments in Florida. This is a rapidly changing funding mechanism for local governments in terms of addressing flooding and resilience.
- **Building Resilient Infrastructure and Communities (BRIC) Funding** – This program is offered through the Department of Homeland Security and Federal Emergency Management Agency. Funding relies on some formal analyses that must be FEMA-compliant, so some engineering-level analyses are critical to successful submittal of a grant application.
- **Tampa Bay Environmental Restoration Fund** – This is a competitive grants program that supports projects which implement the water quality improvement, habitat restoration, applied research, and education priorities of the Tampa Bay Estuary Program and its partners.
- Depending on project details, some of the initiatives that arise out of this strategy may qualify for Cooperative Funding from the Southwest Florida Water Management District.

Areas to Advance During Implementation: This strategy will be implemented alongside Adaptation Strategy 1: Equitable Climate Preparedness to make sure that impacts of flooding and water resource planning do not worsen climate gentrification. Additionally, the team will work to share the results of the watershed and stormwater planning efforts with other city divisions to integrate the findings into other operations and plans. For instance, the planning efforts should inform residential and commercial development projects in the Housing, Planning, and Building Divisions. Similarly, the planning should be used to update emergency operation plans accordingly with public safety officials in the Police, Fire, Environmental Services, and Public Works Departments. Lastly, the team will share the results of this planning effort with community partners who own vulnerable critical infrastructure (i.e., Hospitals, Electric Utilities) in flood zones so that it can inform their operations as well.

Primary Hazards Addressed Through This Strategy: Extreme Heat, Storm Surge, and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

Adaptation Strategy 11:

City Sustainability Continuous Improvement

Overview of Strategy

We have focused heavily on improving the emissions of our own operations. Most notably, we have a Ready for 100 goal of achieving 100% renewable energy for City operations by 2035 and set a target of achieving 100% transition to alternative fuels for its light duty fleet by 2030. This strategy focuses on the additional ways we can continue reducing emissions and improving the quality of life for Largo community members.

Community Support: Support for themes in this strategy were evident in 3 out of 3 outreach categories.

Strategy Specifics

11.1: Greenhouse Gas Inventories and Net-Zero Goal – We have worked with regional partners to calculate the emissions of its own operations for the year 2019. We will commit to completing a community-wide inventory of emissions by 2026. Both a community-wide and municipal greenhouse gas inventory should be completed every three years at a minimum. Future emission reduction targets for the entire community should be set based off those inventories, with the end goal being that all of Largo reaches a net-zero emission status by the year 2050. This net zero carbon goal is recommended by the scientific community in order to maintain livable conditions globally for future generations.

11.2: Safe Multi-modal Transportation – While we have concentrated on making improvements in overall energy use and our own fleet, the Largo community would greatly benefit from the expansion of safe alternative transportation methods. A recent study found that Largo residents spend roughly 20% of their income on transportation and this sector is also a huge source of greenhouse gas emissions. We will work with the Pinellas Suncoast Transit Authority (PSTA) to expand transit service routes in low income, low-access Largo communities. We will also pursue innovative approaches to encourage non-automobile transportation, such as creatively repurposing unused public parking spaces for bike storage, green infrastructure, or other active street programs. This sub-strategy will be coordinated with the work in Adaptation Strategy 12: Develop, Adopt, and Begin Implementing a Greenways Plan and [Advantage Pinellas Investment Corridor Transition Plan](#). When implementing these innovative approaches, the focus on safety infrastructure features will be a key priority.

11.3: Resilient Local Food Systems – Across Pinellas County, residents are dependent on other counties, states, and countries for a vast majority of their food. This is partially due to the built-out, urban, and suburban nature of the area. As a result, food travels from faraway places to reach Largo residents and businesses, carrying a large carbon footprint and making food availability vulnerable to supply issues. To improve both the resilience and sustainability of our food options, we will incorporate recommendations from the 2017 report commissioned by [The Rockefeller Foundation, titled The Resilience of America’s Urban Food Systems: Evidence from Five Cities](#).

Specifically, we will:

- a. Conduct a food systems resilience assessment.
- b. Incorporate food systems planning into resilience planning initiatives.

-
- c. Develop neighborhood and business food resilience plans.
 - d. Establish policies and practices that help food businesses quickly return to normal operations after a hazard event.
 - e. Develop an Urban Agriculture Task Force to identify opportunities to expand produce growing in Largo.

11.4: City Waste Reduction – This goal focuses on reducing our total tonnage of waste, including both garbage and recycling, by 10% over the next 10 years. Specifically, we will:

- a. Address electronic waste - Specific attention will be given to electronic waste, as it is a significant contributor to groundwater pollution. Various methods of recycling and reuse of these electronics will be identified, including the donation of usable City-owned electronics to non-profits.
- b. Create Waste Reduction Events and Partnerships - We will continue to build community partnerships that encourage the reduction or reuse of waste. For instance, through the Largo Library’s annual Freecycle Event, residents donate gently used household items that are free for community members to take. We will also include discussions of waste reduction and reuse in public forums. One community partnership will be established per year over the next 5 years to accomplish this goal. These events and community partnership locations will be in frontline communities because of the benefit that waste reduction and reuse can have on reducing the cost of living.
- c. Advocate for Commercial Composting Opportunities - Methane generated from the breakdown of organic material in landfill environments is also a large contributor to global greenhouse gas emissions. We already offer a backyard composting program to residents who would like to reduce the amount of their disposed food waste. We will continue to work with regional partners, like the Tampa Bay Regional Planning Council, to identify opportunities to increase food waste diversion as a regional effort, such as the creation of a commercial composting facility for businesses and municipalities.

Implementation Details:

Medium Term Completion (5-10 years)

Team Lead: Sustainability and Resilience Administrator

Supporting Team: Solid Waste Manager, Energy Program Administrator, Program Engineer, Long Range Principal Planner

Estimated Relative Cost: \$\$

Funding and Grant Opportunities:

- **Solid Waste Infrastructure for Recycling Grant Program** - This provides grants to implement the National Recycling Strategy to improve post-consumer materials management and infrastructure; support improvements to local post-consumer materials management and recycling programs; and assist local waste management authorities in making improvements to local waste management systems.

Areas to Advance During Implementation: When implementing these various sub-strategies, the team will work to integrate creative educational and art components. For instance, some of Largo’s public spaces can show case art from recycled materials. Similarly, finding different ways to continue to educate on recycling will be of priority for Sub-strategy 11.4 City Waste Reduction. Additionally, since all the sub-strategies relate to aspects for affordable and efficient housing, the team should work with the Housing and Planning Divisions to coordinate these strategies alongside development or

redevelopment projects. Lastly, since this strategy is focused on community wide sustainability, the team will concentrate on following inclusive community engagement guidelines identified in Adaptation Strategy 1: Equitable Climate Preparedness.

Secondary Environmental Hazards Addressed Through This Strategy: Increase in Atmospheric Carbon Dioxide

Adaptation Strategy 12:

Develop, Adopt, and Begin Implementing a Greenways Plan

Overview of Strategy

This strategy includes developing a city plan, with a focus on equity and nature-based solutions, to provide strategic trails and greenways throughout the City.

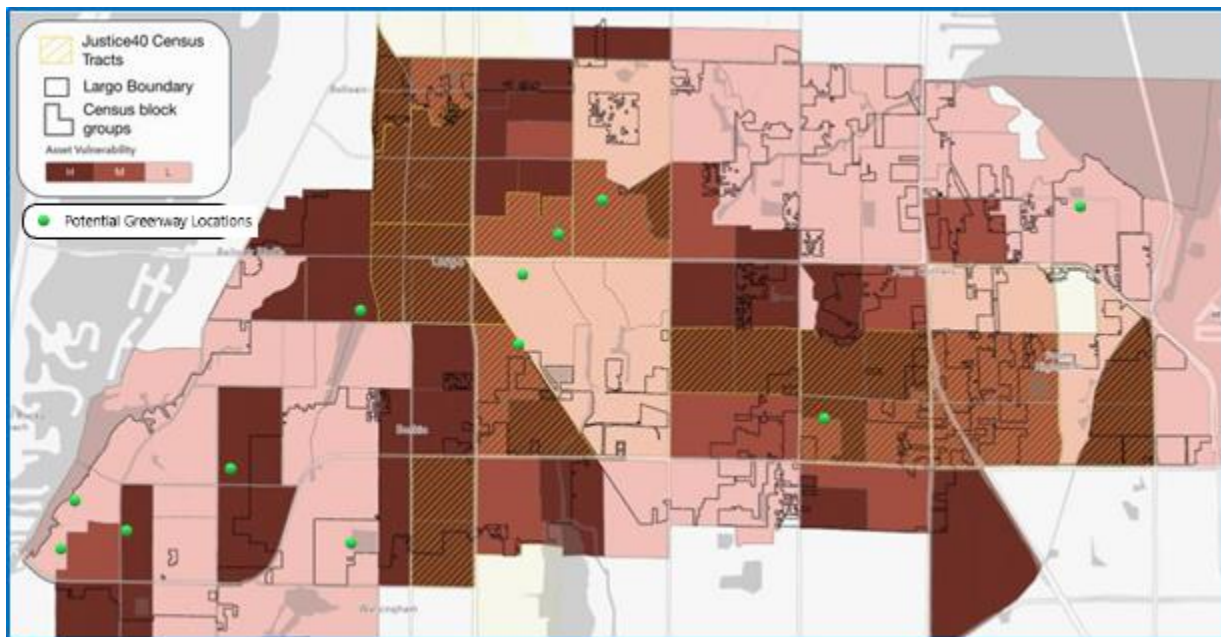
Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

Strategy Specifics

This goal was originally mentioned in the 2018 LEAP and is ongoing. This goal was noted in the LEAP as linear feet of bike lanes and sidewalks. The SRAP strategy will refine this LEAP goal to include the following:

12.1: Smart Use of Vulnerability Assessment Data - A greenways planning process should identify and prioritize underserved areas for related projects by engaging various communities and leaders throughout the City and that incorporating the hazard data collected as part of the SRAP on social vulnerability, extreme heat, and flooding. Figure 41 provides a summary of vulnerability to extreme heat throughout the City based on disadvantaged community (Justice40) census tracts. This data could be used in the greenway planning process as described above. Lastly, the City will attempt to partner with other jurisdictions to make connections between other greenways that are near our boundaries.

FIGURE 41- CENSUS BLOCK GROUPS, EXTREME HEAT VULNERABILITY, AND OPPORTUNITIES FOR GREENWAYS



Locations for greenways planning and implementation will be prioritized as follows:

East Largo – As shown in Figure 41, potential greenway locations in East Largo are currently limited by the amount of City-owned property in this area. To provide more equitable access to greenspace and its benefits, the City should look to acquiring more land in East Largo to achieve this adaptation strategy.

Frontline Communities and communities with existing affordable housing options

All other locations

12.2: Align with Safe Multimodal Transportation - In deciding the placement of these greenways, considerations will be made so that they attempt to align with current sidewalk systems, avoid major roadway crossings, become more pedestrian and bike-friendly, and include minimal but suitable lighting as well as wayfinding signs. Safety has been expressed as an important concern for the community especially concerning crosswalks, sidewalks, lighting, and signage. To address gaps in public transit, consideration should be given to those areas where there are gaps in service or between stations.

The design of these greenways will consider several factors that are highlighted as important to the community, such as heat resilience during summers, water resilience, community gardens and food access, and safety considerations. The designs will incorporate urban tree canopy, pervious pavements, cooling pavements, bioswales, and other similar heat and water resilience features when possible and best fit. The planning process will also consider opportunities to include community gardens, working with surrounding neighborhoods that desire to maintain these gardens along the trail when possible.

12.3: Florida Native Greenways – Florida native vegetation will be used as part of this project’s implementation. With this vegetation, water and fertilizer usage will be minimized and the projects will also be more resilient to a changing climate. Sections of the greenway should prioritize native plants that serve as food sources or habitat for pollinating insects and birds. These “pollinator pockets” should be distributed across the greenway system. We will also provide information to the public regarding the native species used as part of this project. Publicly accessible areas of the greenway should include signage so it can be enjoyed as an interpretive trail. Figure 42 shows an example of what these greenways could look like with native plantings, a passive trail, green infrastructure, and street trees.

12.4: City Resilience Hub Exploration – Aligning the greenways locations with resilience “hubs” that provide multiple benefits (cooling centers, stormwater treatment, clean drinking water/bottle refill, environmental education, heat island disruption, etc.) will be considered and prioritized when possible. Community partnerships will be pursued in the creation and operation of these “hubs”.

12.5: Greenways Public Art – To increase community pride and a sense of place, opportunities for public art will be identified for each greenway. This art should come from the community or involve the community’s selection of the art installation. Environmental, social, and climate related themes will be recommended. This sub-strategy should be coordinated with Sub-strategy 1.4: Resilience Art.

FIGURE 42 - GREENWAYS VISUAL FROM MYSTIC RIVER WATER ASSOCIATION



Image Credit: Offshoots Productive Landscapes, LLC produced this image for the Mystic River Watershed Association, [Mystic Greenways | Mystic River Reservation — Mystic River Watershed Association](#)

Implementation Details

Long Term Completion (10-15 years)

Team Lead: Parks Superintendent

Supporting Team: Long Range Principal Planner, Landscape Planner, Senior Engineer, Sustainability and Resilience Administrator, Parks Supervisor, Communications Manager, Community Engagement Administrator

Estimated Relative Cost: \$\$ (the planning phase would likely be around \$500,000, depending on the scope and number of sub-strategies involved).

Funding and Grant Opportunities:

- Depending on the implementation details and location, the City may qualify for Cooperative funding from the Southwest Florida Water Management District or Nonpoint Source Funds from the Florida Department of Environmental Protection for projects in this category. To qualify, projects should have a significant stormwater treatment element.
- The Florida Department of Environmental Protection offers a variety of Greenways and Trails Funding opportunities. Details differ for each grant opportunity so it will be important for the City to be strategic in the

application process for these grants. Various grant opportunities are summarized here:

<https://floridadep.gov/parks/ogt/content/grants>

Areas to Advance During Implementation: During the implementation of this Strategy, the team will continue to prioritize and include community engagement and feedback as a necessary action item. It is key that this greenways plan provides a space for which the community feels proud, safe, and resilient.

Primary Hazards Addressed Through This Strategy: Extreme Heat, Storm Surge, and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures and Changes in Rainfall Patterns

Adaptation Strategy 13:

Inland Waterway Resilience

Overview of Strategy

Largo's inland waterway ecosystems are and will remain very sensitive to water quality degradation, storm surge, and sea level rise impacts. This strategy is geared towards increasing the resilience of these watersheds both now and into the future. The City's streams are directly connected to coastal environments during storm surge. So, improving their condition and maintaining the creeks we do have is of significant benefit. Furthermore, our creeks provide important benefits in terms of mitigating extreme heat and uptake of nutrients. We want to maintain the creeks we have, improve on their quality, and convene high quality citizen groups to mobilize for climate change in these key portions of the City. Figures 43, 44, and 45 show detailed storm surge results for Allen Creek, Cross Bayou Canal, and the Seminole Bypass Canal, respectively. McKay Creek is not affected by storm surge per the results of the 2023 SRAP but is included here as part of the consideration for other climate threats.

FIGURE 43 – PROJECTED STORM SURGE WITHIN ALLEN CREEK (2040)

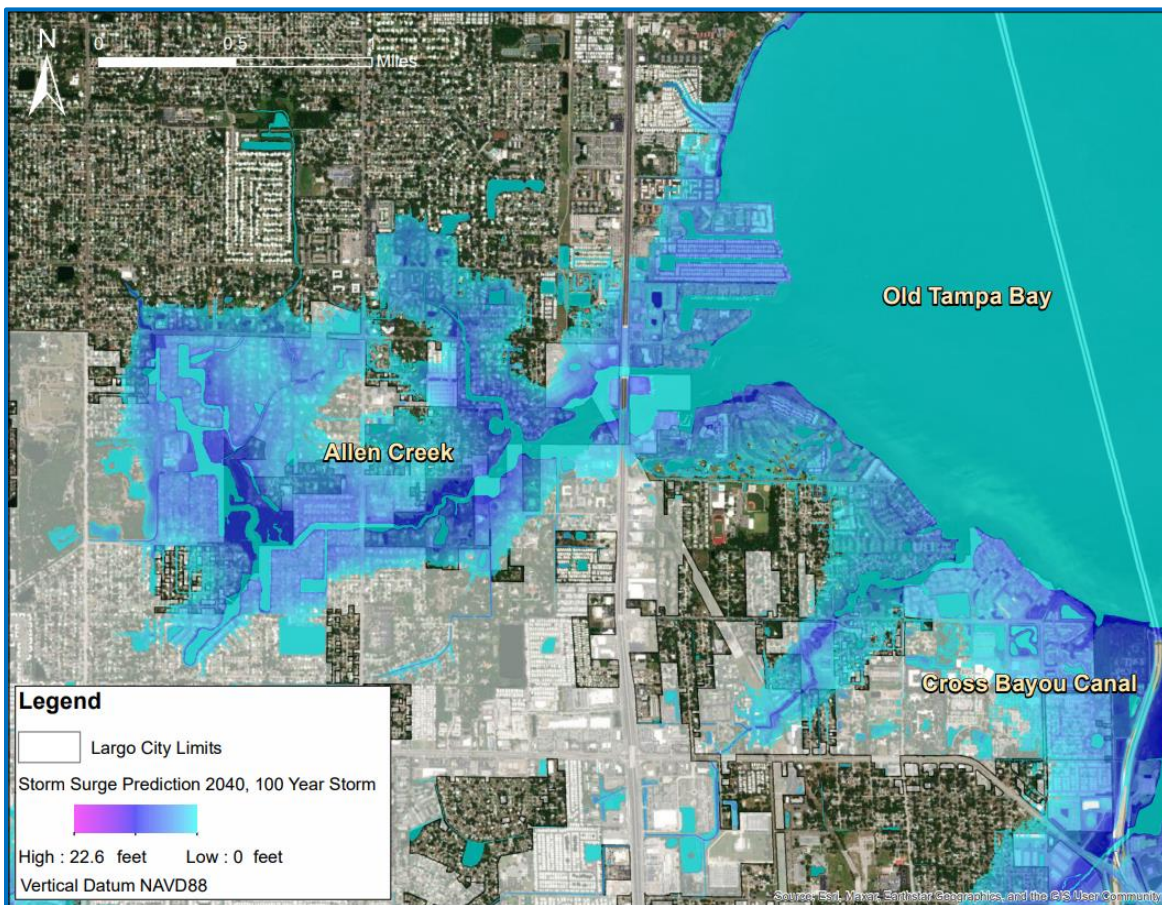


FIGURE 44- PROJECTED STORM SURGE WITHIN THE CROSS BAYOU CANAL (2040)

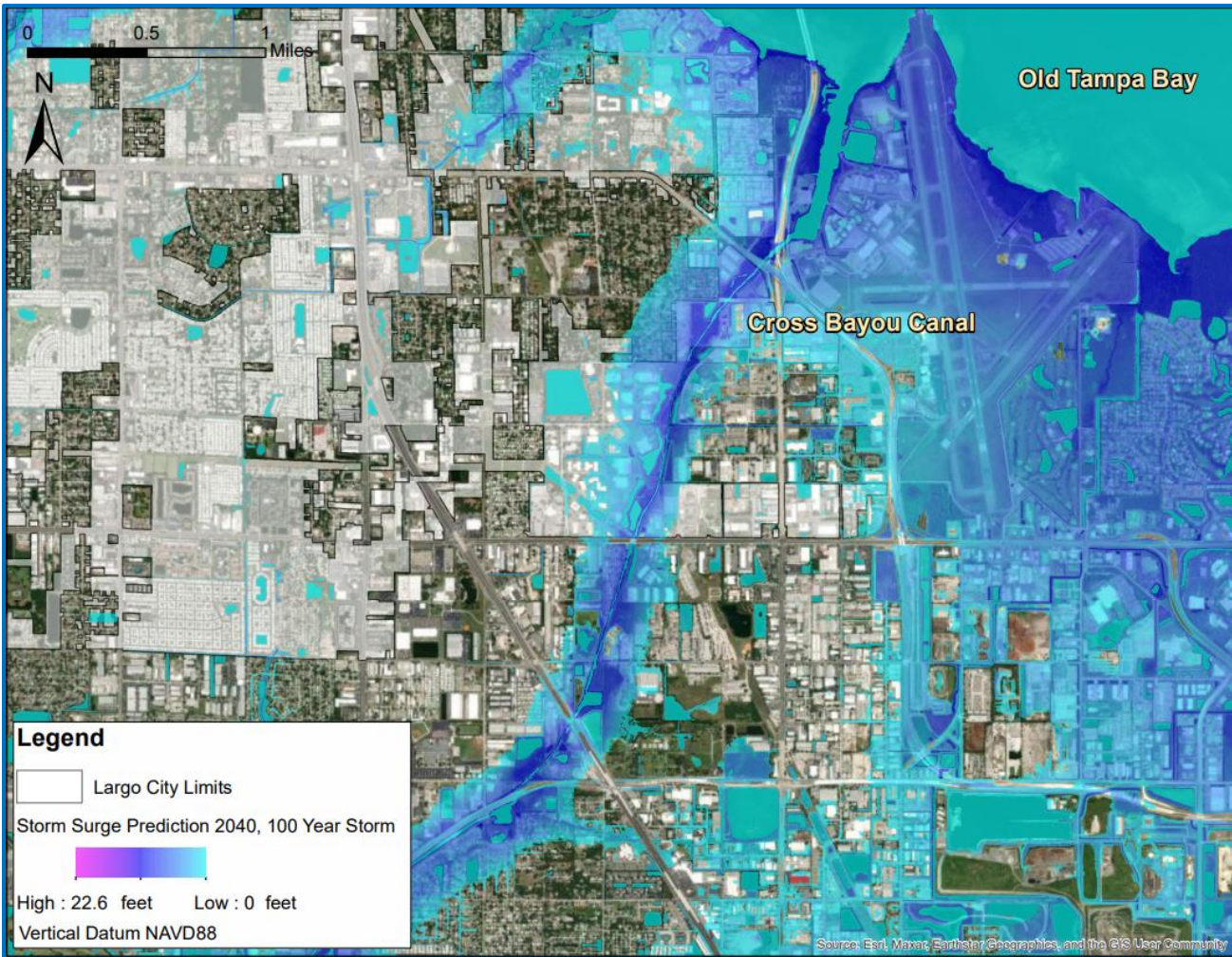
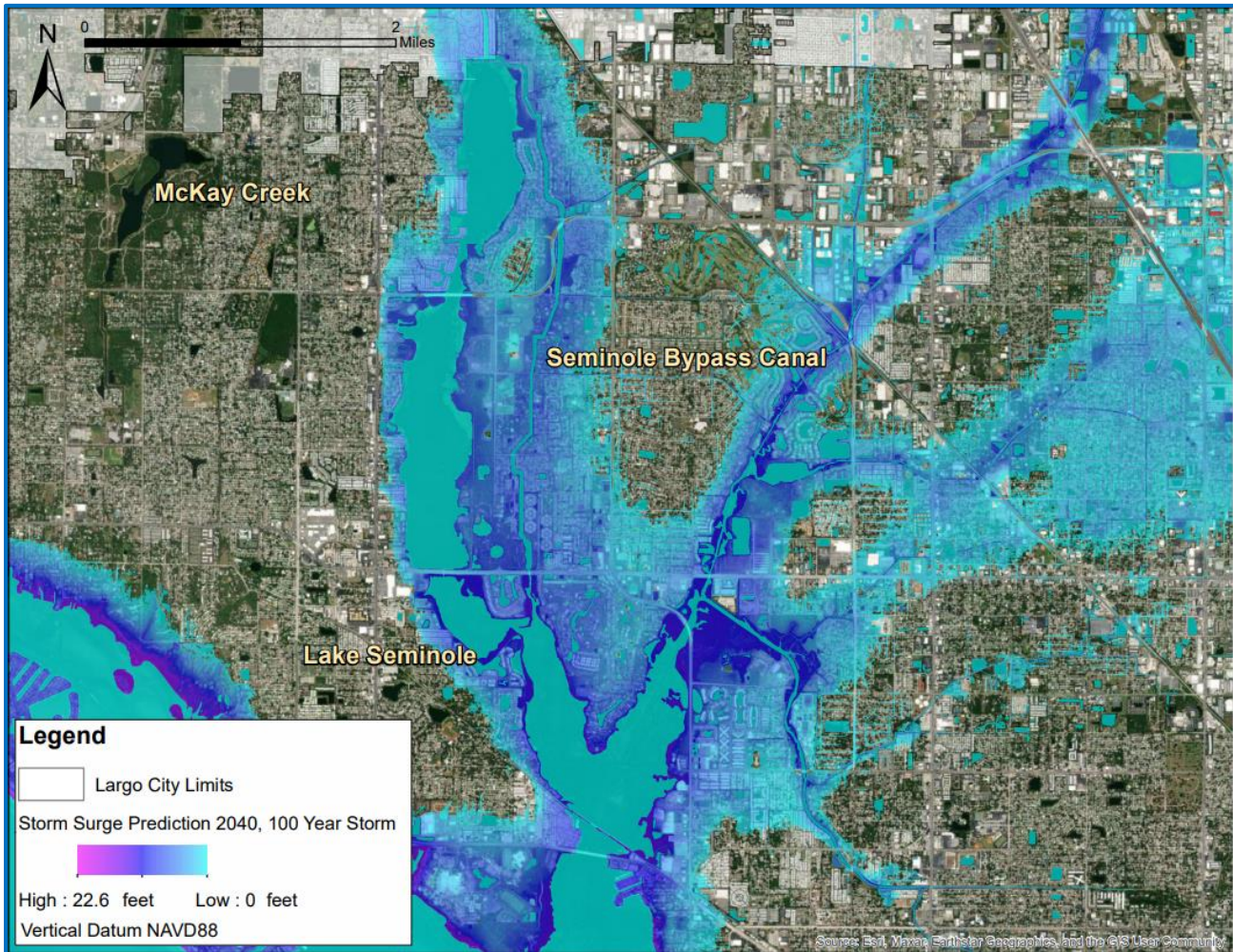


FIGURE 45- PROJECTED STORM SURGE WITHIN THE SEMINOLE BYPASS CANAL (2040)



Community Support: Support for themes in this strategy were evident in 3 out of 3 community outreach categories.

Strategy Specifics

13.1: Convene Stakeholder Working Groups – We will convene stakeholder groups to discuss the results of the vulnerability assessment study and to collaborate on potential mitigation measures. The stakeholder group should include Pinellas County, City of Clearwater, Florida Department of Transportation, Southwest Florida Water Management District, Pinellas County Florida Friendly Advisory Board, Tampa Bay Water, and various residents and community leaders located within the watershed. Four separate stakeholder groups will be created to reflect the distinct challenges and specific solutions to increase the resilience of the Seminole Bypass Canal, McKay Creek, Cross Bayou and Allen Creek communities and ecosystems.

13.2: Protection and Creation of Creek Buffers – In collaboration with private landowners, we will prioritize preserving and creating additional vegetated, native buffers near these four waterways. Nature-based solutions will be prioritized to provide habitat and protection from surge conditions. Mangroves and vegetated islands absorb surge energy, provide habitat, and improve water quality. Where possible, the city will establish “no-mow” zones around all bodies of water to prevent erosion and improve water quality. A detailed field study, in cooperation with stakeholder partners, can assist

with locating potential project sites for these buffers. We will also consider modifying local land use policies and codes to provide vegetative buffer for land development on coastlines or other waterbodies.

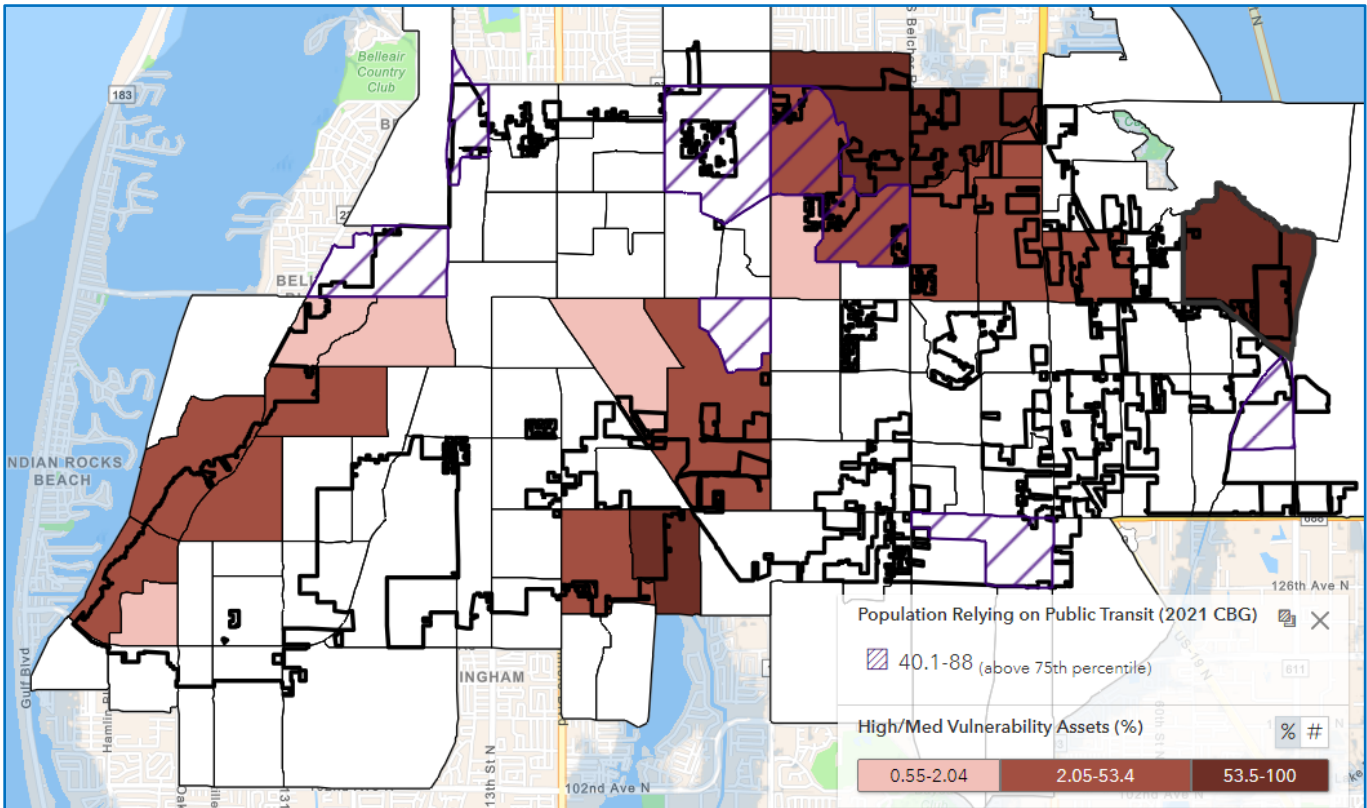
13.3: Native Buffers Education and Programs – Similar to Sub-strategy 9.3: Living Shoreline Education and Programs, we will engage private developments in these inland waterway communities on the benefits of native buffers and the methods of installing and maintaining these multi-faceted solutions.

13.4: Stormwater Park – If there are areas in these communities that currently lack access to greenspace, we will investigate the acquisition of properties that continuously flood or are expected to continuously flood with future sea level rise and storm surge impacts. In coordination with Sub-strategy 7: Annual CIP Planning for a Sustainable and Resilient Largo, funding should be allocated for these properties to be purchased and developed into publicly accessible stormwater parks. Additionally, to integrate Sub-strategy 1.4: Resilience Art, public art displays will be considered in the design of these stormwater parks.

A recent example of this was our purchase of the Pinecrest Golf Course in 2022. This Sub-strategy also recommends that we fulfil the identified seven phases remaining for the Pinecrest Stormwater Conservation Area project to improve flood resilience, water quality, native species habitat, and public access to passive recreation opportunities. The achievement of this project would greatly benefit the ecosystems and communities in the McKay Creek watershed.

13.5 Ensure Access to Transportation – Figure 46 below identifies the census block groups with housing properties that are currently vulnerable to surge events (in shades of red) and those with a significant portion of their population who depend on public transit (in purple stripes). Two neighborhoods near Allens Creek have medium vulnerability to surge and also largely rely on public transit. These individuals may have limited ability to evacuate and return to their homes. In future conditions, this lack of transportation access during storm events is expected to increase as storm surge vulnerability increases. As a result, we will work with mobility businesses before, during, and after storm surge events to expand access to transportation options.

FIGURE 46 – CENSUS BLOCK GROUPS WITH HOUSING ASSET VULNERABILITY TO CURRENT STORM SURGE EVENTS & HIGH PERCENTAGES OF PUBLIC TRANSIT RELIANCE



Implementation Details

Long Term Completion (10-15 years)

Team Lead: Stormwater Program Administrator

Supporting Team: Community Engagement Administrator, Long Range Principal Planner, Streets and Stormwater Manager, Program Engineer, Parks Superintendent

Estimated Relative Cost: \$\$\$ (highly variable based on deployment)

Funding and Grant Opportunities:

- **Annual Stormwater Utility Check-In** - Re-consider evaluating our dedicated funding source for stormwater. This is a critical funding source for resilience since it currently provides most of the funding to abate flooding for most local governments in Florida. This is a rapidly changing funding mechanism for local governments in terms of addressing flooding and resilience.
- **Building Resilient Infrastructure and Communities (BRIC) Funding** – This program is offered through the Department of Homeland Security and Federal Emergency Management Agency. Funding relies on some formal analyses that must be FEMA-compliant, so some engineering-level analyses are critical to successful submittal of a grant application.

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- **National Estuaries Program (NEP) Watersheds Grant** - The Program is a nationally competitive grants program designed to support projects that address urgent, emerging, and challenging issues threatening the well-being of estuaries within the 28 NEP boundary areas.
 - Depending on project details, some of the initiatives that arise out of this strategy may qualify for Cooperative Funding from the Southwest Florida Water Management District (in particular, Sub-strategy 13.4 Stormwater Park).

Areas to Advance During Implementation: This strategy will align with the work accomplished through Adaptation Strategy 3: Lift Station Modernization and Hardening to ensure that public infrastructure near these flood hazards are also protected. We will also connect the importance of housing affordability as an aspect of flood resilience and align this strategy with the City's housing initiatives.

Primary Hazards Addressed Through This Strategy: Extreme Heat, Storm Surge, and Tidal Flooding

Secondary Environmental Hazards Addressed Through This Strategy: Increased Air and Water Temperatures, Changes in Rainfall Patterns, and Increase in Atmospheric Carbon Dioxide

Glossary

Adaptive Capacity: The ability the asset has to cope with a potential impact with minimal disruption or cost.

Adaptation: “Adjusting to actual or expected future climate”²⁹

Asset: The people, resources, infrastructure, and services that people and communities rely on, value, and expect their leaders to manage and protect.²⁶

Drought: A period of unusually persistent dry weather that occurs long enough to cause serious problems such as crop damage and/or water supply shortages.⁵ See <https://www.drought.gov/drought/> for more information.

Extreme Heat: A series of days where the weather is hotter and/or more humid than average for an area and time of year.⁶

Exposure: “The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.”²⁵

Greenhouse Gases: Gases that trap heat in the atmosphere.³³

Green Infrastructure: “Refers to systems and practices that use or mimic natural processes to infiltrate, evapotranspire (the return of water to the atmosphere either through evaporation or by plants), or reuse stormwater or runoff on the site where it is generated. Green infrastructure can be used at a wide range of landscape scales in place of, or in addition to, more traditional stormwater control elements to support the principles of low impact development (LID).”⁸ Green infrastructure also includes leaving natural systems intact since healthy ecosystems provide significant benefits in addressing climate change.

Hazard: This study includes 4 primary climate threats or hazards. Threats are major hazard events or chronic disruptions that negatively impact community assets.

Low Impact Development: “An approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. A key element of LID is to mimic a site’s pre-development hydrology as closely as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product”⁸

Mitigation: Reducing the causes of climate change to avoid significant human interference with the climate system.²⁹

Rainfall-Induced Flooding: Flooding due to the accumulation of rainwater on normally dry land. This can occur in various ways including when a river/lake/pond overflows its banks or when urban drainage systems fail or are overwhelmed by the water trying to enter the system. Rainfall-induced flooding can happen when it rains for an extended time period, when it rains heavily in a short amount of time, or both. Rainfall-induced flooding is often characterized by how likely that level, or extent, of flooding is to reoccur or be exceeded.¹⁷

Red Tide: A Harmful Algal Bloom (HAB) caused by *Karenia brevis*, a type of algae that produces potent neurotoxins. Blooms discolor the water and cause widespread mortality of fish, turtles, birds, and marine mammals. The toxins can be suspended in the air, causing human respiratory illness, or accumulated in shellfish, causing Neurotoxic Shellfish Poisoning in humans.¹⁸

Resilience: The ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.³¹

Risk: The probability (likelihood) and the consequence, or negative outcome, of a hazard occurring.

Saltwater Intrusion: Occurs when saltwater infiltrates freshwater aquifers and raises the groundwater tables below the soil surface.³⁴

Sea Level Rise: Relative rise of the mean sea level over time. While the local tides vary daily, seasonally, and from year to year, the average of all measurements over a specified time period is called Mean Sea Level.¹⁷

Sensitivity: The level at which an exposed asset is negatively affected (also called Potential Impact).

Shoreline: The intersection of the land with the water surface.³²

Shoreline Recession: Occurs when waves and currents, usually from a storm, remove sand from the beach system by carrying it offshore. The sand removal causes the beach to become narrower and lower in elevation leaving coastal properties and infrastructure vulnerable to future storms.¹⁸

Storm Surge: Coastal flooding caused by an abnormal rise in tide from a storm (e.g., hurricane) over and above the usual, astronomical tide. The wind and air pressure from a storm push the water towards the shore which causes an increase in water level above the natural tide. The height of the storm surge depends on the intensity of the storm, how fast the storm is moving, the size of the storm, the direction it's coming from, and the shape of the shoreline.¹⁶

Stressor: A condition, event, or trend that can exacerbate hazards. Stressors can be either climate or non-climate related. For more information see <https://toolkit.climate.gov/content/glossary>

Sustainability: To create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations.³⁰

Sustainable Infrastructure: Systems of energy generation/distribution, water/wastewater control, stormwater management and flood control, airports, roads, bridges, dams, parks and recreational amenities, transit and transportation, or information/communication networks that are resilient and equitable.²⁷

Tidal Flooding: Indicates above normal high-tide events, unrelated to a storm, where water levels flow over the tops of sea walls and onto streets or force water into stormwater outfalls. The flooding may disrupt traffic and damage infrastructure. The height of the daily tides can vary seasonally and from year to year due to the position of the earth, sun and moon, ocean currents, wind currents, and changes in ocean circulation (such as El Niño/La Niña).¹⁷ As sea levels rise, so too will the tides, increasing the frequency of tidal flooding. Also described as “high tide” or “sunny day” flooding.

Threat: This study includes 4 climate threats or hazards. Threats are major hazard events or chronic disruptions that negatively impact community assets.

Vulnerability: The susceptibility of exposed assets based on the two core concepts: (1) potential impact – the degree to which an asset is affected due to its sensitivity; and (2) adaptive capacity – the ability the asset has to cope with a potential impact with minimal disruption or cost.

Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.³²

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Appendices

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DETAILED SUMMARY OF LEAP STRATEGIES AS OF 2023

| Major Category | Minor Category | LEAP Strategy | 2018 Grade | 2023 Update | 2023 Update Notes |
|----------------|--------------------|---|-------------|--------------------------------|---|
| Infrastructure | Buildings & Energy | Total Energy Reduction by Complex | In Progress | In Progress | Prior to the newly established position of Energy Program Administrator, energy use had not been regularly tracked. Baselines are currently being established and funding opportunities for retrofits and renewable energy are being pursued to reduce energy use across city properties. The largest users per square foot are prioritized first for auditing and funding for retrofits and renewable energy. |
| | | Average Building Environmental Scorecard Rating | In Progress | Below Goal/ Change Goal | The existing LEAP Building Environmental Scorecard was developed from LEED metrics and the scoring and was determined to be ineffective. The metrics left our city priorities that should be tracked, and tracked metrics that are not priorities but LEED standards. The scoring system was determined to be arbitrary and requires research into LEED guidelines to interpret final scores. The Energy Program Administrator is working with division managers and integrating LEAP, the SRAP goals, policies and preferred standards into a new Existing Building Environmental Scorecard that is easy to use and understand. The development of this scorecard will include a building profile that will make the building data accessible in accordance with the Data and Asset Management Initiative. |
| | | CIP Recommendation List | Met Goal | Met Goal AND In Progress | We have incorporated sustainability evaluators into the CIP process. Staff is currently discussing opportunities to improve and expand upon these components. |
| | | Solar and Alternative Energy | Met Goal | In Progress | We have installed solar on the Community Center and will soon |

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| | | Recommendation List | | | install solar on the Environmental Services Warehouse, Library, and new City Hall. A more formal process and policy is in the beginning stages of discussion among staff members. |
| Transportation | | Percentage of Vehicles with Alternative Fuels | Below Goal | In Progress | As of May 2023, we have 71 alternative-fueled vehicles. Roughly 20% of the light-duty fleet is hybrid or electric. A formal policy has been adopted to achieve a 100% transition of the light-duty fleet to alternative fuels by 2030. Despite market delays and availability constraints of the last few years, Staff believes we are still on track to meet that target. |
| | | Linear Feet of Bike Lanes and Sidewalks | In Progress | | In progress |
| | | Ride-Share and Motor-Pool Recommendation List | Below Goal | Below Goal | No such program has been created. |
| | | Electric Vehicle (EV) Charging Stations | Below Goal | Met Goal | We currently have five EVs and two electric motorcycles while it has six level 2 charging stations and one level 3 (for both City and public use). This is a 1:1 ratio. |
| Horizontal Infrastructure | | <i>Envision</i> TM Rating of Project or System | In Progress | In Progress | We incorporate some <i>Envision</i> TM standards in our horizontal infrastructure and are currently exploring the idea of a formal policy to better align with the certification. |
| | | Horizontal Infrastructure Inspection Rates | Exceeds Goal | Met Goal AND Below Goal | Stormwater met the goal except during COVID, with their reporting period from 7/1/20 through 6/30/21 just short of the goal. Reclaimed water met except during COVID, FY20. Wastewater line inspections are below goal and fluctuated between 12 and 15% from FY18 to FY22. The stormwater reporting period will correspond to their MS4 |

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| | | | | | <p>permit instead of the fiscal year because we want the reporting to match the permit. Permit runs July 1 to the following June 30.</p> <p>The wastewater crew has been short-staffed for the entire reporting period and therefore unable to meet their goals.</p> |
| | | Sanitary Sewer Overflows (SSO) | Below Goal | In Progress | Largo's SSO have been steadily decreasing over the last five years. Since 2018, the yearly totals of SSOs decreased 30%. |
| Natural Resources | Water | Annual Gallons of Water Used | In Progress | Below Goal | 16,796,000 gallons of potable water were consumed by City Operations in 2022. This is roughly 140,000 gallons higher than 2018 levels. |
| | | Percentage of <i>WaterSense</i> Fixtures | Below Goal | Below Goal/Update Goal | Facilities confirmed that low-flow toilets were previously tested but were causing issues with plumbing and had to be replaced with higher-pressure options to prevent significant disruptions and plumbing costs. Aerators have been replaced to code, but not to efficiency standards which are suitable for handwashing sinks. The SRAP will work directly with facilities to identify solutions like dual-flush toilets or conversion kits to pilot and standardize flow GPM to policy for fixtures. |
| | | Percentage of Reclaimed Water Used | Below Goal | Change in Goal/Below Goal/No Longer a Priority | <p>Largo creates 12.2 million gallons of reclaimed water daily, of which only 6.2 million gallons are utilized. The availability of reclaimed water in the dry season is currently the largest deterrence to expansion, as availability significantly drops throughout this half of the year.</p> <p>Staff has found that a utilization rate of 50% is an ideal spot for the City's reclaimed water to ensure availability throughout the year, and it currently exceeds that at a 51% utilization rate.</p> |

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|--|-------|--|-------------|-------------------------|---|
| | | | | | As a result, this goal is recommended to change to from 70% annual usage to 50%. |
| | | Pounds of Nutrients Removed from Streets | Met Goal | Met Goal | The goal was to increase the % of nutrients removed from the streets from the previous year. 2021: Phosphate – 1680 / Nitrogen – 3807 Increase from 2020: Phosphate – 1559 / Nitrogen – 2432 |
| | Waste | Annual City Paper Usage | In Progress | Exceeds Goal | <p>Most of the City’s Commission members use laptops to view agenda packets, and all have the option to do so.</p> <p>The Community Development department was awarded \$1,500 from the internal sustainability grant to purchase three iPads for use at various board meetings. This purchase led to a significant reduction in printing for the Department and helped fulfill our Strategic Plan initiative to advance a flexible and resilient organization.</p> <p>All processing of monthly statements, invoices, and purchase orders is done electronically. Most of the city's documents are electronically signed and nearly all are electronically edited and sent. Furthermore, all printing preferences are set to PDF by default.</p> |
| | | Recycling Containers on City Property | Below Goal | Need to revisit | <p>Goal needs to be updated. Needs to focus on % of waste streamed recycled.</p> <p>Recycling Tonnage Total: 2020 – 5717 2021 – 5468 2022 – 5431</p> |
| | | Bulk Waste Disposal Recommendation List | Met Goal | Below Goal/ Change Goal | LEAP 2018 goal aspired for a bulk waste warehouse or website. Limited employee capacity and available storage property will require the strategies to be reevaluated – the SRAP is |

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|--|--|---------------------------|-------------|------------|--|
| | | | | | discussing alternative solutions to meet this goal - such as partnering with a non-profit thrift store or other community-based solutions. |
| | | Zero Waste Special Events | In Progress | Below Goal | <p>Largo's first and only formally Certified Zero-Waste event was in November 2018.</p> <p>Largo's RPA Special Events has been actively and increasingly working to adapt to Low-Waste events for special events (zero-waste events, particularly for large events are logistically complex and resource intensive). Efforts include reusable water bottles for staff and volunteers, increase reusable signage (wayfinding, etc.), recycle and trash bins, increase digital surveys, maps, etc., online vs. paper vendor correspondence and documents, higher-quality decorations to re-use for multiple events, direct communication with vendors about waste practices, etc. Identified challenges include food-waste recovery, recycling contamination, and plastic water bottle alternatives in stock.</p> <p>Our Single-Use Plastics Policy (Ordinance 2019-19) that went into effect on July 1, 2019, advances efforts toward Low- to Zero-Waste events on city property.</p> <p>Pinellas County launched a Low-Waste Event Guide Workgroup in April 2023 with the goal of creating a regional guide for low waste or zero waste events and to support the county's goal of zero waste to landfill by 2050 and Solid Waste Master Plan. A City of Largo representative participates in this workgroup which meets monthly.</p> |

| | | | | | |
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| | Green Spaces | Canopy Cover on City Property | Below Goal | In Progress | We estimate its tree canopy continues to sit at around 37%. Multiple tree giveaways are offered to residents each year, with us providing roughly 300 trees to the public annually. Additionally, City staff plant between 100-150 street trees each year. To continue progress, RPA staff receive continuous educational opportunities, with City Arborists receiving CEU training and all grounds crew members training in Green Industries Best Management Practices. Unfortunately, the State's 2019 HB 1555 greatly limits the ability of the city to strengthen tree protection standards and enforce tree ordinances on residential property. |
| | | Green Space on City Property | Below Goal | Need to Revisit | Recent estimates show we own roughly 3,000 acres, more than 570 acres of these being actively maintained. |
| | | Native & Florida Friendly Species | Below Goal | Need to Revisit | Staff are currently working to develop a GIS map that will contain more accurate estimates of trees and landscaping numbers/species. Staff continuously replace failing landscapes with native and Florida-friendly species across the city. More than 70 plans are currently established to plant pollinator habitats in the future. Our Community Development department is working on drafting an ordinance that would increase native Florida species offerings and installation requirements on redeveloped sites. Efforts to increase the adopt-a-tree opportunities and resident education should be prioritized. |
| | | Greenhouse Gas (GHG) Emissions | In Progress | Below Goal | In 2021, we partnered with USF and Audubon Florida to measure the greenhouse gas emissions of its operations. We have not calculated our community-wide |

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|-------------------|--------------|---|-------------|-----------------|---|
| | | | | | greenhouse gas inventory but are currently in the process. Conducting an inventory is an intensive process, and staff believe this goal should be revised to conduct a community-wide inventory every five years at a minimum. |
| | Resiliency | Impervious Surface on City Property | In Progress | Need to revisit | City projects comply with CDC ISR requirements (by land zoning use). Requiring them to meet an additional set of City-only impervious standards would be a large burden and could possibly conflict with CDC ISR standards. |
| | | Linear Feet of Shoreline | In Progress | In progress | Metrics for evaluation need to be determine |
| | | Resiliency Plan Progress | In Progress | Met Goal | |
| People & Services | Technologies | Technology Implementation Recommendation List | Met Goal | Met Goal | Since 2018, we have implemented Enterprise Asset Management (EAM) software, Data Warehouse, Wireless Networks, and installed wastewater flow monitoring sensors in the collection system. This meets the goal of one method annually. Other Smart City projects are on-going. |
| | | Project Data Standards | In Progress | In Progress | A Draft Geospatial Technical Standard has been developed that contains a list of supported file formats and provides standards for how GIS data deliverables should be structured. Projects to implement ArcGIS Enterprise and develop a FME workflow to convert CAD data to GIS are ongoing. |
| | Workforce | Staff Engagement in Sustainability Practices | Below Goal | In Progress | (note): Sustainability Grant Application: # of completed grants (3?) SRAP Team Members: # of active team members (RPA Special Events: # of team members |

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|--|---------------------------------|--|--------------|--------------|--|
| | | | | | <p>Team Webinars Available to All Staff (topic focused on sustainability): 3 webinars since 2020-2023 (topics included: dark sky week, sustainability grant, recycling do's and don'ts)</p> <p>Plastic Free Policy Promotion to City team members (Citizen's Academy teams): shared with 10 department representative groups</p> |
| | | Enrollment in Emergency Notification System | Exceeds Goal | Exceeds Goal | |
| | | Alternative Work Schedule Recommendation List | Met Goal | Exceeds Goal | A remote work policy has been adopted and many employees are able to work from home for part of their roles. |
| | | Sustainability Review Panel | In Progress | In Progress | A Sustainability and Resilience Action Team was created to review certain projects and provide a sustainability analysis of potential City decisions. The team also lead the creation of the SRAP plan. However, it does not currently provide a review of CIP projects. |
| | Codes & Procurement Policies | Local and Environmental Purchasing Policy | In Progress | In Progress | We adopted an ordinance that restricts the distribution of single-use plastics on city property and at City events. Further research is needed to expand on other purchasing practices. |
| | | Bulk and Shared Purchasing Policy | In Progress | In Progress | There is limited bulk or shared purchasing City-wide, but more progress could be made. |
| | Ready for 100% Renewable Energy | The City of Largo is committed to transition municipal operations for 100% renewable energy by 2035 and transition the community to 100% renewable energy. | In Progress | In Progress | In 2020, we enrolled in the Duke Clean Energy Connection program. As part of this program, off-sight solar arrays provide energy to offset 40% of the City's total municipal electricity consumption. We are currently moving forward with plans to install roof-top solar on two city facilities. Additionally, we are focused on reducing the total amount of electricity it consumes to make its renewable energy goals more attainable. Most |

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| | | | | | recently, we have partnered with Duke Energy to transition all its streetlights to LED bulbs, cutting the electricity Largo streetlights consume in half. Moving forward, we will work closely with nonprofit partners to create energy efficiency and renewable energy programs for its residents and businesses. |
|--|--|--|--|--|--|

Sustainability & Resilience Action Plan (SRAP)

Outreach & Engagement Report



December 2023

Contents

Phase 1: Community and Government Preparedness

As defined by the Urban Sustainability Director’s Network (USDN) [Guide to Equitable, Community-Led Climate Preparedness Planning](#), the purpose of this Phase is to “Develop community and local government readiness. Build social cohesion, greater understanding of the topic, and power within the community before the project begins. Public agencies should also examine organizational readiness and commit time and resources towards building trust with the community. Strategies include establishing transparent government processes and embedding racial equity into broader organizational practices.”

This was a critical aspect of the project and required additional time and planning beyond the scope of a traditional Sustainability & Resilience Action Plan. These efforts were executed from Summer 2021-Spring 2022.

Phase 1.1: Community Connectors

The City solicited applications to the community to become Community Connectors. These individuals serve as intermediary connectors with the community at-large, particularly groups and individuals on the frontlines of climate change. Their purpose was to seek input from targeted stakeholders to help determine the city’s priorities as part of the SRAP.

Initially, the City sought to identify eight Connectors, one from each of the [Outreach Areas](#) within the community, to ensure equal distribution of these additional members of the Project Team. Ultimately, five Connectors were chosen from a total of 11 applicants, and though they did not represent each or all the Outreach Areas, they expressed a broad range of identities across race, ethnicity, income, and education. The Connectors were paid \$250 each quarter for their time, expertise, and efforts each quarter during the project, totaling \$1,500 each.

During Phase 1.1, efforts directed towards the Connectors focused on training and educating the group on climate change, community risks, and the importance and function of the SRAP within the organization. This was done through two workshops, the first of which focused on creating genuine connections between SRAT and the Connectors. It was conducted on Thursday, April 14th, 2022, at 6p at the EmpowHERment Center (13555 Automobile Blvd Suite 300, Clearwater, FL 33762). Connectors were provided an overview of the project goals and activities, as well as given opportunities to share personal interests and backgrounds as it relates to sustainability and resilience.

The second workshop was held at the McGough Nature Park (11901 146th St N, Largo, FL 33774) on Thursday, May 26, 2022. This session provided a more in-depth look at the impacts of climate change on the City of Largo both at present and in the future. Connectors were then given examples of ways to support the project (interviews, community walking tours, event promotion, etc.) where they developed individualized Engagement Pledges overviewing their proposed activities.

Overall, the Connectors were enthusiastic about the opportunity to support the SRAP and wanted to continue to engage in-person, and to identify ways that they could work together as well as independently. Connectors continued to be engaged throughout the project, as identified in sections below.

| What Went Well? | What Could be Improved? |
|---|--|
| <ul style="list-style-type: none">Connectors were highly engaged with the project and each otherHigh level of project buy-in | <ul style="list-style-type: none">Low number of Connector applicationsNot all applicants seemed to understand the purpose of the roleDifficulty in scheduling many individuals |

| | |
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| <ul style="list-style-type: none"> • High level of comfortability and openness with each other and SRAT • Payments seemed to increase engagement | <ul style="list-style-type: none"> • Connectors wanted additional and more tangible ways to be involved with the SRAP |
|--|--|

Phase 1.2: Government Preparedness

This Phase of the project focused on presenting the overarching goals of the SRAP as well detailing what an “equitable, community-led” project might look like. The Executive Leadership Team and a group of Team Members who might be particularly impacted by the SRAP held separate trainings related to these efforts which also included an overview of the [AccelAdapt](#) tool.

A separate publicly-noticed meeting was held on Wednesday, December 8, 2021, at 3p with the City Commission in order to share the purpose of the SRAP and to develop an Equity Scorecard. This scorecard was later used to score action items that were to be included in the final draft of the SRAP.

The following were the top themes noted during this meeting:

- NEED – Strong need for a prosperous and long-lasting future in the face of increasing hazards.
- COMMUNITY - Desire to strengthen the entire community and assure decisions have a positive impact on all residents, workers and businesses, now and in the future.
- DIVERSITY & INCLUSION – Acknowledge, understand and actively support all aspects of community identities.
- EQUITY- Equity is centralized in systems, strategies and policies.

Additionally, the City Commission developed this collective policy statement on the organization’s sustainability and resilience strategy:

“We commit to strengthening the interconnected systems (i.e. environmental, social, and economic) within our community through decision-making processes that prioritize diversity, equity and inclusion. This will guide our efforts to create a more resilient, sustainable, and prosperous Largo for generations to come.”

| What Went Well? | What Could be Improved? |
|--|--|
| <ul style="list-style-type: none"> • Final Scorecard was effectively developed for use later in the project • Commission developed a strong policy statement for the Sustainability & Resilience Program | <ul style="list-style-type: none"> • Difficulty creating a unique, qualitative equity-focused scorecard • Facilitation requires internal organizational knowledge to be successful |

Phase 2: Community-Led Engagement

The intent of establishing a method for community-led engagement is to transition decision making power towards the community throughout the planning process. The goal of this shift is to empower the individuals who are most impacted, either positively or negatively, by traditional government planning processes. It was also important the Community Connectors had the ability to design engagement around the project in a way that they saw fit, and that they helped to inform the project planning process itself.

According to USDN, the characteristics of an equitable, community-led planning process include:

-
- Identifies Inequities
 - Engages with Communities Most Impacted
 - Promotes Democracy and Transparency in Local Government
 - Addresses Inequities
 - Supports Integrative Government
 - Fosters Sustainability

The project team, both SRAT and the Connectors, reflected on the authenticity of the community-led engagement process at the end of each subphase listed below.

Phase 2.1: Community Climate Sessions and Mapping Pop-Ins

The Community Climate Sessions and Mapping Pop-Ins were conducted to learn more about community priorities, including responses to previous surveys and locations of importance to residents, business owners, and workers in Largo. Information collected during this phase of the project will be combined with the results of the Vulnerability Assessment, Policy Review, and other project activities to inform the outcomes of the project.

Phase 2.1.1 Mapping Pop-Ins: [Largo.com/SRAPmap](https://largo.com/SRAPmap)

In order to collect responses regarding where in the community is important to residents, business owners, and workers, SRAT created the ArcGIS Survey [Largo.com/SRAPmap](https://largo.com/SRAPmap) with support from the GIS and Community Engagement Teams. This survey was created in both English and Spanish and was promoted to the community in the following ways:

- At the Community Climate Sessions (Multiple Events: August 2022)
- Through the SRAP Community Connectors
- Via Social Media (\$50 paid Facebook post)
- During the Team Largo Webinar (08/03/2022)
- Via Largo Today and the Monday Morning Briefing
- In the July, 2022 Edition of Largo Living
- T.G.I.F. Teen Event at Highland Recreation (08/05/2022)

In addition to these efforts, the Sustainability and Resilience Action Team (SRAT) also conducted “pop-ins” designed to engage community members across all areas of the City. This was done to help ensure that all eight of the [City’s Outreach Areas](#) were represented in the analysis with an intentional effort to engage with community members on the frontlines of climate change. Summaries of these pop-in activities are listed below.

The results of the survey are incorporated into the Vulnerability Assessment completed by NEMAC Fernleaf, the contracted subconsultant for this aspect of the SRAP. This Assessment will analyze the exposure and sensitivity of community-identified assets to both climate hazards (heat island impact, sea level rise, flooding, etc.) and various environmental conditions (low air/water quality, proximity to industrial waste, etc.). These results were compared to socio-economic factors of the surrounding communities to understand how areas identified by historically underserved groups might be disproportionately impacted. This information will be compared to the results of a more traditional Vulnerability and Risk Assessment, consistent with ‘Always Ready’ legislation (SB1954), to include the following spatial data categories: Transportation assets and evacuation routes, Critical infrastructure, Critical community and emergency facilities, Natural, cultural, and historical resources, Residential properties, and Commercial and industrial properties.

In total, 191 responses were collected between July 15, 2022, and August 08, 2022. The map is still available, and responses can be collected in an ongoing basis, however responses submitted after this date were not incorporated into the SRAP Vulnerability Analysis.

Key Themes from SRAP Map Pop-in Sessions:

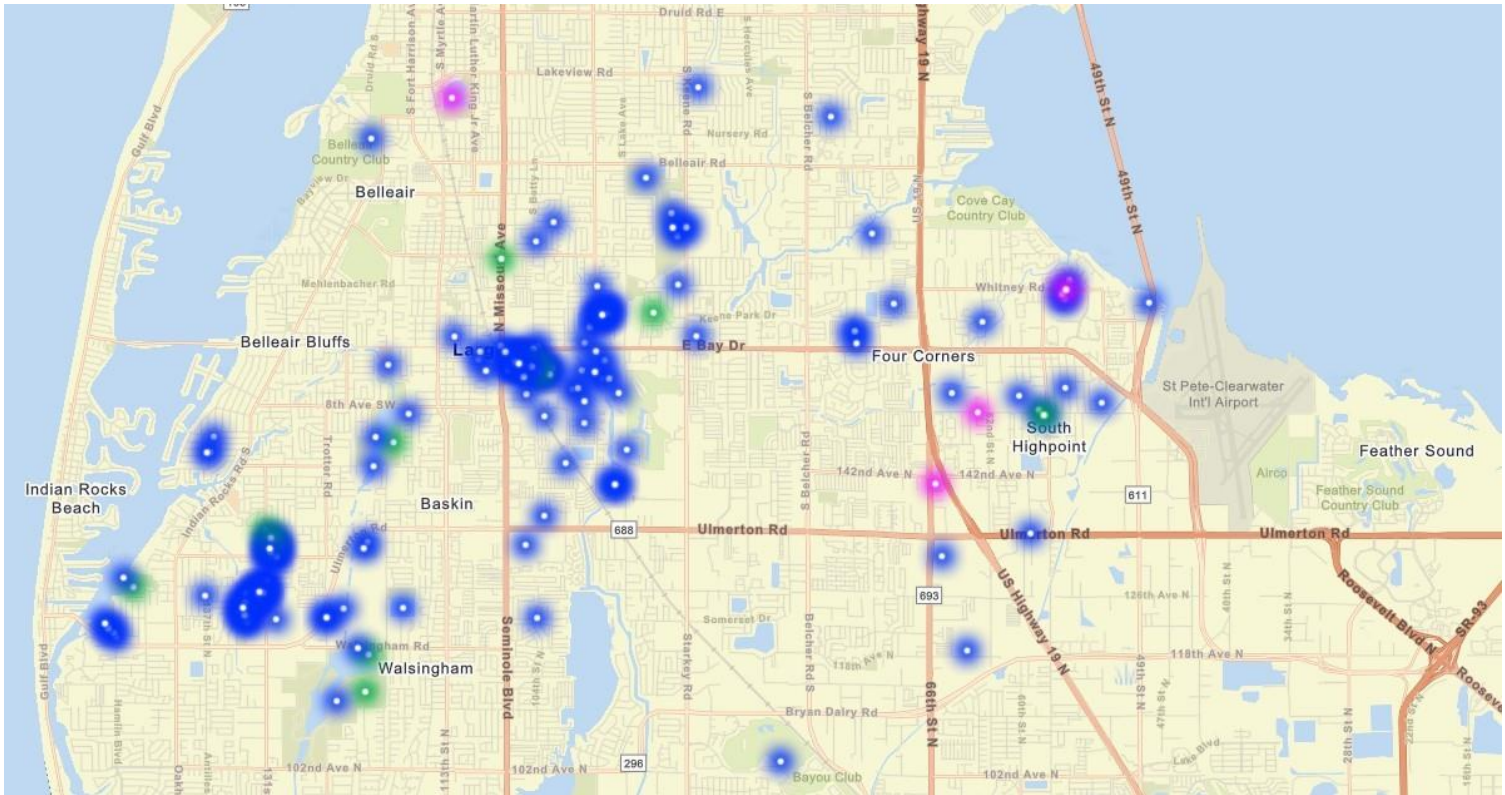
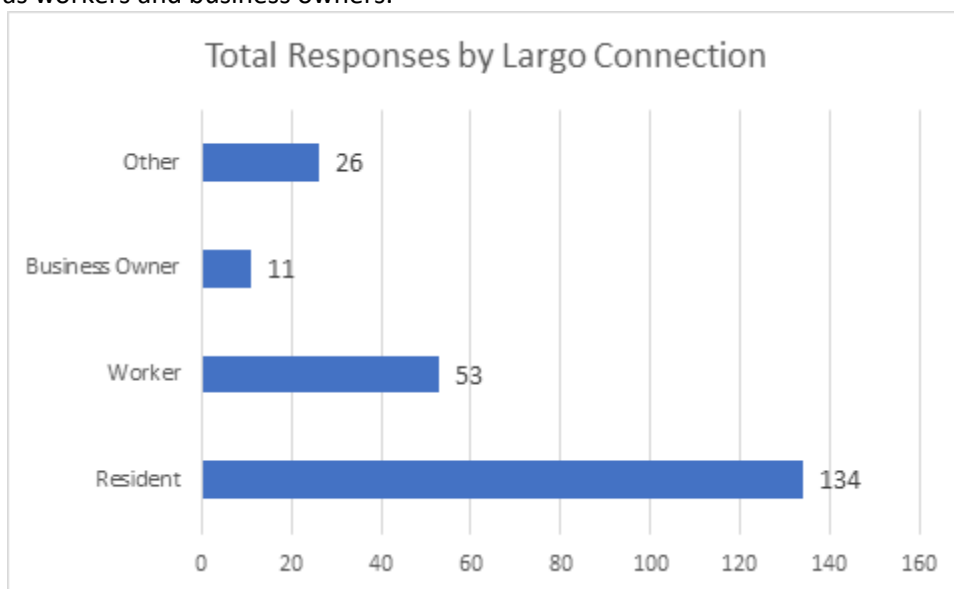


Figure 1. SRAP Map Response Locations

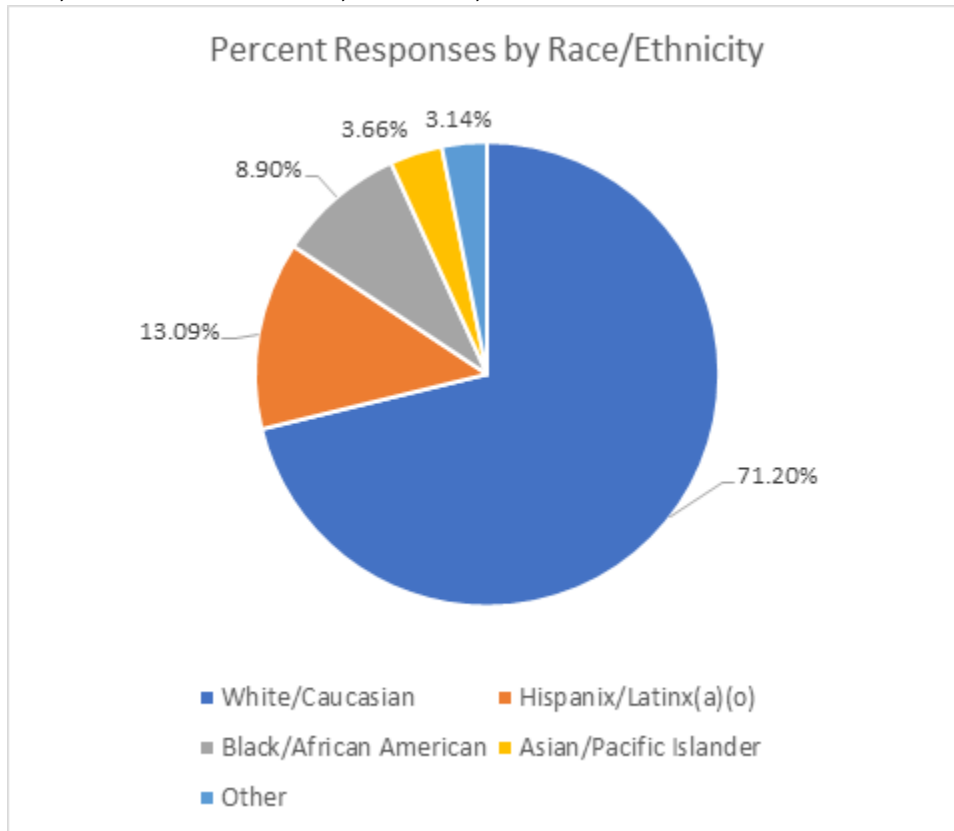
General Demographic Information:

Full demographic responses can be found in [Appendix A](#).

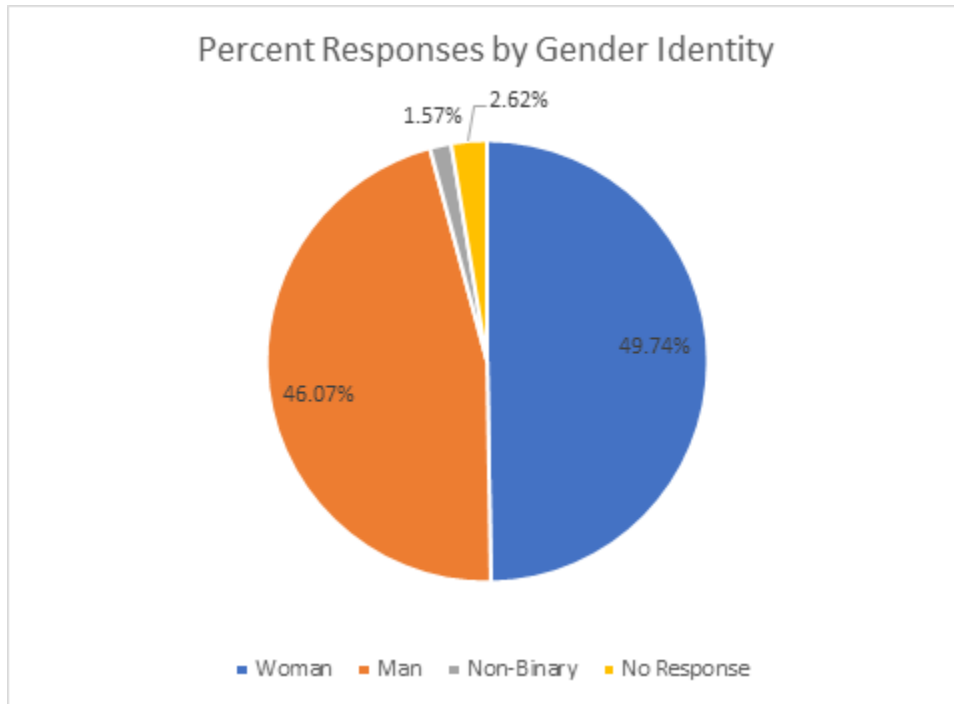
Overall, the majority of respondents indicated that they were residents of the City of Largo, with several indicating that they also identified as workers and business owners.



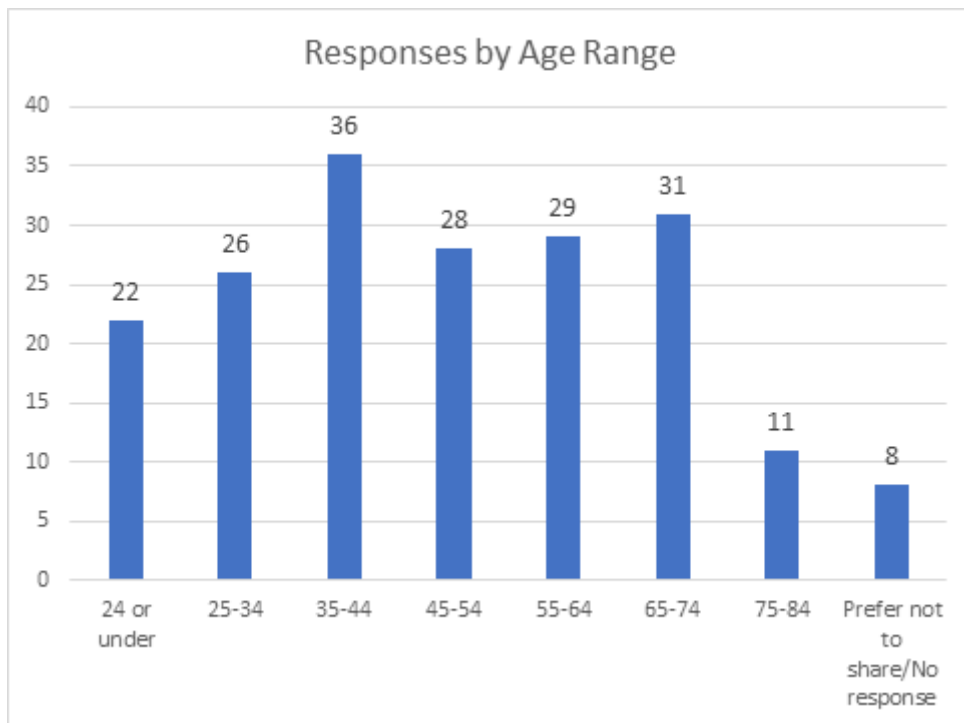
A majority of respondents identified as white (71.20%) followed by Hispanic/Latinx(a)(o) (13.09%) Black/African American (8.9%), Asian American/Pacific Islander (3.66%), and other, which includes mixed race (3.14%). For comparison, the overall population of Largo identifies at the following rates: White: 83%; Hispanic: 12%, African American: 6%, Asian: 3%, American Indian: 0.4%; Other: 4%; Two or More: 3%.¹



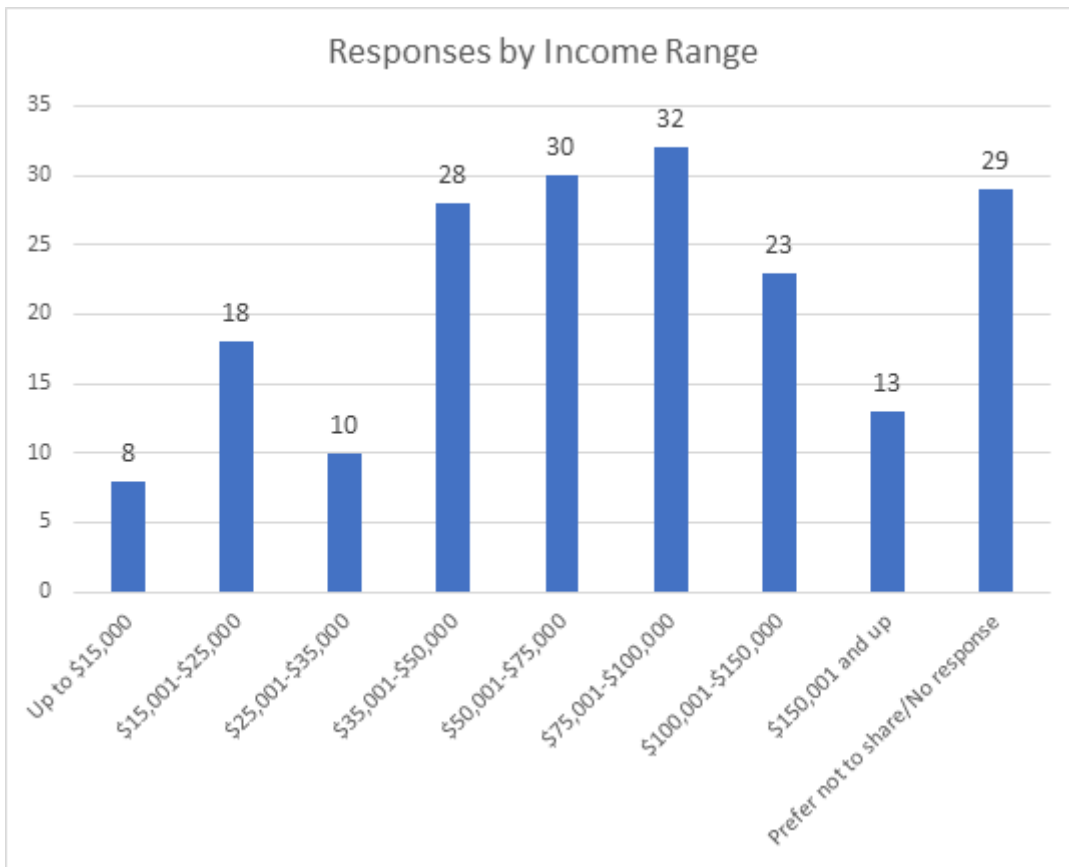
Responses were split relatively evenly across gender identify between male (46.07%) and female (49.74%), with an additional 1.57% identifying as non-binary.



The ages of respondents was relatively evenly split across all ranges, with the most responses from those between the ages of 35-44 (36 responses), followed by 65-74 (31 responses). The least represented age range was 75-84 with 11 responses.



The income range of respondents varied, with the majority of responses coming from those who earn less than \$75,000 per year (94 responses), compared to those who earn \$75,001 or more (68 responses).

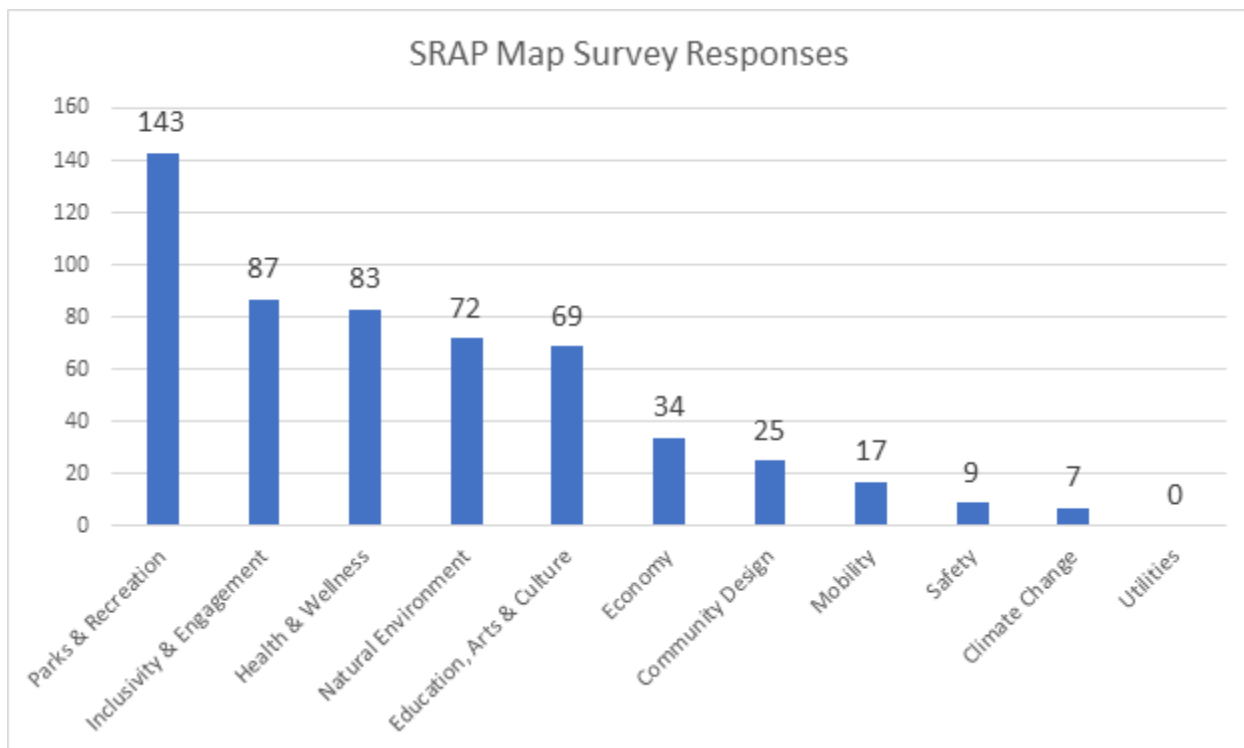


Overview of Survey Responses:

The survey responses were analyzed for their inclusion of key themes related to the ten National Community Survey categories, plus Climate Change, to remain consistent with the SRAP Equity Scorecard.



Word Cloud Representation of SRAP Map Responses



Parks & Recreation- When asked where in the community was important to them, respondents overwhelmingly identified Parks & Recreation as their highest priority (143 coded responses). Many of these responses named specific parks and either their ability to provide opportunities for Health & Wellness and/or the Natural Environment. Parks were mentioned 90 times across all responses, with Largo Central Park being named the most. Parks within City limits, as well as those in the Planning area and adjacent to the community were identified by community members. Highland and Southwest Recreation centers were also mentioned many times throughout responses and several comments referenced the ability to exercise as well as receive childcare services. The Largo Golf Course was also a very popular response and was highlighted for its affordability, the ability to exercise, and intergenerational play. A large number of the responses that contributed to the high scores in Natural Resources, Health & Wellness, and Inclusivity & Engagement were in response to a park or Recreation Center.

“It is a great place to hold celebrations, exercise, ride the little train, celebrate holidays with neighbors.” (Largo Central Park)

“The railroad has been a fixture in my family’s life for 14 years” (Largo Central Park)

“Perfect for walking, open field for running for the kids, play ground, train on the weekends and events for holidays. Really the only thing missing is a little splash pad for the hot summer days” - (Largo Central Park)

“It’s In my city and it’s in really good shape. Course user fees are a great. Love this course. They offer both golf and footgolf for people of all ages. My kids can play footgolf while I play golf.” (Largo Golf Course)

“Affordable, child summer camp, child after care, and amazing staff” (Recreation Center)

Inclusivity & Engagement- Inclusivity & Engagement was referenced the second most of all categories throughout the survey responses (87 times). Many expressed their affinity for the ability of public spaces to provide opportunities to meet with and connect with others as well as natural spaces. Several responses

included the desire for more inclusivity and to promote areas and community partners that help provided resources for individuals in need, such as services at the Largo Library and in the Highpoint area. Additionally, several responses included references to spaces that provide opportunities to engage across generations.

"The migrant community lives in this area" (Highpoint Area)

"Because it helps people of all walks of life gather information and improve their intelligence"
(Library)

"This unutilized green space has a lot of potential to enrich the lives of a lot of community members."

(The potential future park between Pinellas Technical College and High Point Elementary School)

"Exercise, fellowship" (Southwest Pool)

Health & Wellness- With the third highest rate of reference (83 coded responses), Health & Wellness was referenced in a number of ways, including to the natural environment and recreational opportunities. The term "play" was mentioned a total of 24 times in the survey and included comments related to playgrounds, golf, basketball courts, open spaces for recreation, and areas for dogs.

"I come play everyday here" (Basketball Court)

"Gives kids and adults to have pick up games and play. The fields now are locked up or rented out and can not use on random." (Open Soccer and Sports Fields)

"Because my family plays there 2-3 times a week. And this course is perfect for all ages between 5-95 years old. Walkable and the only executive course worth playing." (Largo Golf Course)

"I can relax, take my kids to play" (Largo Parks, Library, Rec Centers)

Natural Environment- Greenspace was mentioned frequently (49 coded responses), both independently and in reference to Parks & Recreation. Respondents noted the need to maintain or increase the number of trees in the community and access to spaces with wildlife. Several responses expressed concern for the lack of available natural areas, especially in a dense, urban setting. Many respondents expressed the desire to preserve small or large vacant lots and avoid future development in these areas.

"Priority access [to these spaces] is going to the elderly and white." (Fishing Areas)

"Green spaces and nature areas are important in a densely populated county/city" (Green Space between Library and Nature Preserve)

"Trae mucha alegria y tranquilidad." [It brings a lot of joy and tranquility] (Parks in general)

Education, Arts & Culture- Many responses in the Education, Arts & Culture category were in reference to the Largo Public Library and the various resources that the facility provides. Another key aspect of this category was in reference to the culture that local spaces and events provide to the community, often also in reference to specific community parks.

"It gave me such happiness during a difficult time and still does! The infinite resources, adult classes and study rooms...the list goes on! It is my happy place" (Largo Public Library)

"It provides much needed green space, plus includes great community resources like the library and performing arts center." (Largo Central Park and Nature Preserve)

Economy- The economic impact of spaces around the community was referenced 34 times throughout the responses and included mentions of workplaces as well as affordability in various services provided by the City and other organizations. The Largo Library, recreation centers, Largo Golf Course, and parks were specifically identified as being an affordable resource for community members.

"Great spot for the community, provides needed services like daycare to working parents" (Highpoint Neighborhood Family Center)

"No charge, always open, so nice" (McGough Nature Park)

Community Design- When mentioning community design (25 coded responses) responses primarily focused on having natural spaces close to home or easily accessible. Both specific parks, such as Largo Central Park, and general open spaces were referenced in this manner.

“It’s a large body of water, conveniently located, if I can’t make it to the beach. It’s important to have nature close by for mental and physical health.” (Walsingham Park)

“Wanted greenspace but now they are going to build on it. It could have been a nice space” (Former Greenspace)

Mobility- Several areas (17 coded responses) were identified as being important to mobility throughout the community, including the Downtown area and various sidewalk and roadways for access to necessary services. Other community resources, including the Largo Golf Course, were identified as easy to access within the community.

“Helps transportation for less fortunate” (Bus stops)

“Because I commute daily throughout the city using the sidewalks and those along Rosery Road between Highland Avenue and Betty Lane are overgrown with grass and cascading tree branches that make it a tripping hazard” (Public Sidewalks)

Safety- Safety was referenced (9 coded responses) as part of other facilities within the survey, including recreation centers and educational centers. Most of the responses referenced a positive feeling of safety brought by these locations.

“My son has a place he can go and be safe and have fun” (Rec Center)

“Kids leaving Largo Middle school heading to Library when school lets out, throw rocks from RR, at people and property on both sides of Central Park Dr. Waiting for the day someone is hurt, needs a fence put up between the two.” (Sidewalk and RR Tracks)

Climate Change- Climate Change was not mentioned directly as a space important to the community, however, responses that referenced aspects related to climate change, such as heat and flooding, were included in the coded responses (7 coded).

“We need trees!” (Every Parkway)

“Calm, relaxing public park with shade, trails and shaded dog parks that are fenced in for off-leash dog play.” (Eagle Lake Park)

“Energy efficient/gardening” (Community Design)

Utilities- Utility spaces were not mentioned in the survey responses. These services may not typically be thought of as “spaces” in the community, though they may occupy or be part of other areas such as parks or other urban development.

Methodology:

It is important to note that this information was primarily conducted on City-owned properties, many of which are public parks. This collection method does tend to result in a response-bias towards the specific location or general property type (i.e., parks, Largo Golf Course, specific businesses, etc.) where the survey is being conducted. This is a common experience with in-person surveying for local governments and should be considered when interpreting results. It is important to note, however, that while a majority of responses were collected on public property, particularly parks and recreation spaces, many responses collected on private property also indicated similar responses. For example, several responses collected at both Family Dollar (2860 Roosevelt Blvd, Clearwater, FL 33760) and Los Hernandez Market (6263 150th Ave N, Clearwater, FL 33760) also indicated that access to parks and greenspace was a priority.

To analyze the responses, a deductive coding method was utilized to categorize and score responses by the ten NCS Categories, plus Climate Change. Key words of themes from verbal responses were given a score of one for each instance they referenced one of these themes. If a single response referenced multiple categories, or additional services or themes within a single category, an additional point was added to that given category. For example, for the response “Eagle Lake Park: Bike riding, walking, playground, wildlife” the following scores were provided:

- Natural Environment: 1 (wildlife)
- Parks & Recreation: 1 (Eagle Lake Park)
- Health & Wellness: 2 (walking, playground)

The response “Parks: To preserve green spaces” received the following scores:

- Natural Environment: 1 (green spaces)
- Parks & Recreation: 1 (Parks)

This methodology shows that higher scores in a category represent an additional number of activities, services or other resources available, rather than a higher level of quality of these items. To verify the accuracy of this method, responses were also scored using single counts, where they received a maximum score of one for any given category, regardless of the number of activities referenced. When comparing the multiple scores to single scores, the categories remained in the same order of highest to lowest, with Parks & Recreation receiving the highest number of responses, followed by Inclusivity & Engagement, etc.

In order to ensure consistency across the project, the NCS+1 category definitions created by City Commission for use in the [SRAP Equity Scorecard](#) were used when analyzing responses. For example, when analyzing responses for the category “Inclusivity & Engagement” the following definition was used:

Sense of Ownership & Community- Creating a sense of place for all community members to feel ownership of the projects within the City.

SRAT Pop-In Descriptions:

Northeast

- Datsko Park (07/25/2022, 5-6p): The park received a steady flow of community members during this time, including families and individuals from diverse groups in terms of race, ethnicity, and ages. Parks and greenspaces were a common theme among respondents, even if it was in a broad sense, rather than a specific park.
- Family Dollar (07/30/2022 10-11a): There was a slow but steady flow of community members, with an increase in customers closer to 11am. The majority of respondents were non-white, many of whom did not identify the area as Largo, but rather unincorporated or Clearwater. Parks and greenspaces were a common theme among respondents, even if it was in a broad sense rather than a specific park, as well as residential areas of friends and family.

Southeast

- Los Hernandez Market (07/25/2022, 6-7p): There was a steady flow of community members during this time, mostly men either individually or in pairs. A majority of the individuals identified as Hispanic, many of whom only spoke Spanish or preferred to speak in Spanish. Parks and greenspaces were a common theme among respondents, even if it was in a broad sense, rather than a specific park. Many individuals did not identify the area as Largo, but rather unincorporated or Clearwater.
- Pinellas Farmers and Flea Market (07/30/2022; 9-10a): There was a large crowd numbering in the hundreds, including vendors and families of various ages. There were diverse groups in terms of race, ethnicity, and

ages, with a high percentage of Asian American/Pacific Islanders. Many individuals were hesitant to participate in the survey saying they were not from the area of familiar with Largo. Many individuals did not identify the area as Largo, but rather unincorporated or Clearwater.

Central Northeast

- Highland Recreation Teen Event (08/05/2022, 8:30-9:30p): Approximately 75 teens arrived within the first 20-30 mins of the event with several more trickling in after 9pm. Teens were initially hesitant to participate/engage with the activity and slowly started to engage, especially around the giveaways. Several teens did not have access to a phone and did not want to use the provided laptop. Perhaps a board with stickers would have received more active responses from the group.

Central Southeast

- 2200 S Block of Belcher Rd (Commercial Corridor 8/5/22 middle of the day): A variety of business owners and customers were in the area that were provided information about a Largo Police Department training exercise. Folks seemed very receptive to participating. Due to a lack of technology resources, participants relied on the QR code and their own technology so it is unknown how many folks followed through and completed the survey.

Central Northwest

- Largo Central Park Nature Preserve, sporadically with no specifically dedicated time: So I cheated a bit here, but I didn't fundamentally see any difference geographically between this park and across the road. Was able to speak to many of the park regulars about participating; while nearly all of them mentioned our parks, not all of them mentioned that park in particular.

Central Southwest

- Largo Central Park (Intermittent, July, 2022): Individuals participated at different times of day and different days of the week. Received the greatest number of responses the Sunday of a train weekend as that is usually one of the busiest days at the park (07/01/2022). Almost universally people indicated that Largo Central Park as their favorite location in the City, which is both true and likely locational bias.
- Largo Public Library (0716/2022, 9a-12p): The City of Largo hosted its annual Hurricane Expo at the Largo Public Library which had hundreds of attendees. A table was in the lobby of the library at this time so that individuals could interact with the map as they were entering/exiting. There were a variety of groups in attendance, including a mix of ages, families both large and small, and individuals.

Northwest

- Northwest Park (07/29/2022, 8-9a): Arrived at Northwest Park in the morning and there was no one at the park. We waited for some time and had no one coming to visit the park.
- Lake Villa Park (07/29/2022, 9-9:30a): Decided to try Lake Villa Park after no luck at Northwest Park. It was the same case at Lake Villa Park and there was no one at the park. We waited a little here as well and had no foot traffic coming through.

Southwest

- Southwest Rec (08/04/2022, 3-5p): Each day from 3-6p, parents arrive at Southwest Rec for curbside pickup for the kids enrolled in summer camp. Each parent picking up was given the QR code to scan and asked to complete the survey. Some parents chose not to participate. Not all these parents regularly visit the rec center but utilize their childcare services, so we were able to reach a diverse group of people.

| What Went Well? | What Could be Improved? |
|---|---|
| <ul style="list-style-type: none"> • Demographic responses include a higher number of individuals on the frontlines of climate change when compared to the overall community | <ul style="list-style-type: none"> • Providing more/easier access to technology for "in the moment" responses • Responses are likely skewed towards the locations where they were |

| | |
|--|--|
| <ul style="list-style-type: none"> • Community Connectors assisted with promoting the survey in the community • Responses were collected from across the entire community, as opposed to being highly concentrated in one area | <p>collected (Parks, Largo Golf Course, Recreation Centers, etc.). Additional time could have been spent at private locations such as businesses</p> |
|--|--|

Phase 2.1.2 Community Climate Sessions

The Community Climate Sessions were designed to help inform the community about SRAP and hear more details about views they had expressed in previous surveys- both Largo’s ARPA Polco Survey (January 2022) as well as the Pinellas County Sustainability Plan Survey (Fall 2021). During the sessions, presenters explored the concepts of sustainability, resilience, and equity, conducted the Community Mapping exercise, and facilitated a conversation around a topic(s) that had been prioritized in previous surveys. Food and childcare were offered for both in-person events, though childcare was not utilized at either.

Generally, the sessions had low turnout, though the conversations that attendees engaged in were meaningful and robust. The information gained through these sessions helped to inform the solutions designed for the Solutions Workshops (Phase 2.2).

SRAT held two in-person Community Climate Sessions, one in English and one in Spanish, as well as a virtual session. The presentations that were delivered were nearly identical, with adjustments made for language and timing ([English, in-person session PPT as initial template](#)). In general, the content delivered included:

- An overview of the concepts of sustainability, resilience, and equity
- Future climate conditions within the community (heat and sea level rise)
- SRAP Map activity
- Review of previous surveys (ARPA Polco and Pinellas County Sustainability Plan Survey- Largo responses) including six key common themes prevalent in both surveys:
 - Recycling (and composting)
 - Clean Energy and Solar
 - Mental Health & Homelessness
 - Transportation (EVs, Sidewalks, Accessibility)
 - Community Gardens and Food Access
 - Affordable and Efficient Housing
- Facilitated discussion of one or more of the six themes, as identified by attendees

In-Person English Session: Tuesday, July 19th at 5:30 pm | Southwest Recreation Facility (13120 Vonn Rd, Largo, FL 33774)

- Attendees were most interested in having group discussion on the following topics: Clean Energy and Solar (4 votes), Affordable and Efficient Housing (4 votes), Mental Health & Homelessness (3 votes), Transportation (3 votes), and Community Gardens and Food Access (3 votes). Added themes included Natural Resources and Community Connections and Identity.
- Clean Energy and Solar Discussion:
 - Cost is one of the largest barriers to adoption
 - The process is confusing and does not seem well regulated for residents
 - City should provide legitimate clean energy resources including trusted organizations
 - City could incentivize solar adoption via expedited permitting and cash/rebate incentive
 - Importance of voting to ensure State level support of clean energy adoption
- Affordable and Efficient Housing Discussion:

- Sea level, flooding, and other coastal related hazards are not being included in new development, affordable housing initiatives, etc.
- The cost and availability of flood insurance is a concern
- Flood zones are not fully reflective of risk
- Desire for developers to expand portfolio of climate resilient housing that incorporates energy efficiency, renewable energy, flood risk, sea level rise risk
- Desire for more types of affordable housing, i.e., developers to offer small, affordable single-family homes, similar to Habitat for Humanity

Virtual English Session: Thursday, July 21st at 6:30p | Via Zoom

- Initial focus on urban tree canopy, including concerns about the ability for residents and developers to cut trees down and the need for more parks and trees
- Attendees added the themes of Water Usage, Water Quality, and Greenhouse Gas Emissions
- Priority themes for discussion were Mental Health & Homelessness (4 votes), Recycling (and Composting) (1 vote), and Clean Energy and Solar (1 vote)
- Mental Health & Homelessness Discussion:
 - Stigma around this issue seems lower than in the past
 - Veteran community spans both interrelated topics
 - Teenagers and adults are struggling with this issue
 - Expressed the need for greater navigation services to help individuals engage with support resources (telemedicine, assist with limited time, etc.)
 - Desire to focus more on actions that can have more immediate direct impact on the local community rather than solely focus on large-scale topics that can't be solved by one community

In-Person Spanish Session: Friday, July 19th at 3pm | Highpoint Neighborhood Family Center (5812 150th Ave N, Clearwater, FL 33760)

- Clean Energy and Solar was identified as the top priority for group conversation
- State legislature is seen as a barrier to solar adoption and the City could serve as a stronger advocate for the community
- Expressed a desire for the City to incentivize solar adoption via expedited permitting and cash/rebate incentive
- Pollutant regulation was a key concern, including those currently unregulated and related to telecommunications and energy
- Community member identified non-white community groups as being most impacted by pollutants, and referenced the City of Lakeland as exemplary at protecting residents from telecommunications pollutants
- Pollutant regulation list has not been expanded greatly since around the 60's and does not include the potential impacts of new technologies
- Concern was expressed regarding solar companies and the way they advertise to the community, including knocking on doors, providing misleading sales tactics, and other efforts that are leading to community distrust

Key themes across Climate Sessions:

- Common Survey Themes of high interest selected for group discussion: Clean Energy and Solar (x2), Affordable and Efficient Housing, Mental Health & Homelessness
- City should provide legitimate clean energy resources including trusted organizations
- Solar companies are creating community distrust through current sales tactics
- Need for the City to provide stronger incentives for solar adoption
- Need for affordable housing to be more diverse (housing types), efficient, and inclusive of flooding and sea level rise
- Community members of all types, including veterans are experiencing issues with mental health & homelessness

- The City should be focusing on immediate actions to improve outcomes for the community, including mental health resource navigation, protections against fraudulent sales tactics, and protection against unregulated pollutants
- Other priority topics discussed: water, trees, natural resources, and parks

| What Went Well? | What Could be Improved? |
|---|---|
| <ul style="list-style-type: none"> • Events were executed well with successful support from SRAT and Connectors • Childcare was able to be offered at events • Successful conversations were facilitated based on previous community input | <ul style="list-style-type: none"> • Low turn-out • Time intensive to prepare and execute • Spanish-speaking session was limited in facilitation resources due to lack of team members able to support the effort (Spanish speaking) • Connectors could have been invited to play a larger role in session design |

SRAT Reflection on Equitable, Community-Led Engagement

During reflection on Phase 2.1, SRAT identified the following:

- The project team feels confident that their intentions remain committed to being equitable and community-led
- There is significant room for improvement to be made in connecting to frontline community groups, though SRAP Map survey results were, on the whole, more representative of these groups than many previous City surveys
- There may be a correlation between the Community Connectors promotion of the SRAP map survey to the demographics of respondents
- While there were a strong number of survey responses and the information collected from the Climate Sessions was meaningful, it still appears we are only hearing from the voices with leisure time (i.e., those at parks, with time to attend Climate Sessions, etc.)
- Need to build stronger relationships with the Community Connectors and continue to build them up and provide them with more tools and resources
- The Connectors generally identified that outreach efforts should be done where the community is already located
- Connectors identified *larger* capacity to support the project during the Fall compared to the Summer
- Consider how to create a more sustainable community connector network that includes long-term residents

Phase 2.2 Fall Engagement Pop-Ins

In the Fall of 2022, the Sustainability and Resilience Action Team (SRAT) attended a series of scheduled community events across the city to continue to refine understanding of community priorities and engage in more individual dialogue with community members.

At least one SRAT member and one Community Connector were scheduled to attend each event. Community members were invited to spin a prize wheel labeled with the NCS Categories with the addition of Climate Change, and then share

their experiences and perspective about the item they landed on. SRAT/Connector team members asked individuals to “Please share your experiences as they relate to [TOPIC FROM PRIZE WHEEL] in the City of Largo. What is important to you about this topic and what should the City consider when planning for the future?”, recorded their response, including noting if they were a Largo resident, live in the Tampa Bay Area, or Largo visitor.

Team members attended the following events:

| Date | Event | Number of Respondents | Outreach Area Location |
|---------------|---|-----------------------|------------------------|
| 10/22/22 | Trick or Treat at Heritage Village | 24 | Southwest |
| 10/23/22 | Pumpkin Fest at Pinellas Botanical Gardens | 49 | Southwest |
| 11/03/22 | Chomp & Chat at Royal Palms Assisted Living Facility | 20 | Central Northwest |
| 11/04/22 | Chomp & Chat at Fairway Village MHP | 8 | Central Southeast |
| 11/05/22 | Indoor Garage Sale at Largo Community Center | 9 | Central Northwest |
| 11/09/22 | Chomp & Chat Lincolnshire MHP | 34 | Central Southwest |
| 11/13/22 | Anona United Methodist Church 150-year Anniversary Neighborhood Block Party | 8 | Southwest |
| TOTALS | 7 events | 152 individuals | |

Key Themes:

- Economy:
 - Seven (07) individuals, all Largo residents, provided input about the “economy”. Three people shared positive notes about the economy that there are a variety of businesses in the area and Largo is “better than” neighboring communities. The majority shared specific ideas for improvements such as concern about inflation, wanting lower pricing, more jobs for youth, local indoor vendor market or tea house in the downtown area.
- Education, Arts, & Culture:
 - Eight (08) individuals, mostly Largo residents, provided input on the topic of “education, arts, & culture”. Three people mentioned wanting to see more art-related programs and investment in the community including public art. Three people wanted better public communication specifically with seniors, promoting programs across all facilities within each facility, and on the topic of recycling. One individual said, “each building only advertises its own stuff it seems like.” Several individuals also mentioned wanting more services and communication of available services for seniors such as computer and phone tutorial classes, promotion of library and community center programs, and broader events for all ages and abilities.
- Health & Wellness:
 - Ten (10) individuals, mostly Largo residents and a few neighboring county residents provided input on the topic of “health & wellness”. A majority of respondents commented on needing a variety of health services available including in-person, walk-in clinics, and home healthcare programs and wanted to see more of a focus on low-income health care options, reimbursement programs for wellness, and seeing the city support preventative health care (free testing, exercise, prevention services, easy checklist of available services, etc.). Several people mentioned green space and the

-
- importance of different exercise options such as sports programs and indoor walking paths such as highland. One person suggested providing sunscreen at city parks.
- Inclusivity & Engagement:
 - Eight (08) people, mostly Largo residents and a few neighboring city residents provided input on the topic of “inclusivity & engagement”. Most respondents shared positive comments about the city’s engagement with several people commenting that city Facebook pages are run well and are effective at promoting events and programs. A few people also commented that they find out good information on city, library, and parks websites. A few people also shared suggestions for how to be more inclusive such as “listen better” and “involving everyone - not just certain people - having things open for everyone that wants to be”.
 - Mobility:
 - Nineteen (19) people, mostly Largo residents and several neighboring city residents, shared comments about “mobility” in the City of Largo.
 - Six (06) individuals commented on traffic congestion, speeding, and inefficient timing of lights.
 - Six (06) individuals commented on needing more pedestrian and bike-friendly paths and sidewalks including near schools, Ulmerton, and Donnegan Rd as well as wider sidewalks for more accessibility for wheelchairs and overall mobility options for seniors.
 - Six (06) people commented on improving public transit options such as better bus schedules especially on weekends, ferry and high-speed rail options, as well as van and e-bike options.
 - A few specific comments unrelated to mobility included wanting more restaurant and clothing options on Missouri and appreciating Largo parks and green spaces.
 - Natural Environment:
 - Fourteen (14) people, nearly all Largo residents, commented on the “Natural Environment” in Largo.
 - Nine (09) people commented about appreciating and wanting more “green space” specifically appreciating Largo parks, landscaping in medians, and preference for green space and walking paths and playgrounds over built infrastructure.
 - Several people shared individual suggestions including wanting to keep Largo more family-friendly rather than a tourist attraction, wanting to see more Florida native landscaping and promoting recycling. One individual suggested “better signage for east of Missouri”.
 - Parks & Recreation:
 - Twenty-nine (29) people, half Largo residents and half visitors mostly from neighboring cities, commented on “Parks & Recreation” in Largo.
 - Fourteen (14) individuals commented on liking parks in Largo and noted specific elements they appreciate such as kid-friendly, pet-friendly, walking paths, clean, train, walking paths, big open spaces and baseball field.
 - Six (06) people commented on specific types of programming that they currently enjoy including “dance classes for those with disabilities”, programming for seniors and kids, and community centers overall; a few individuals mentioned interest in more teen recreation and arts programs for kids.
 - Five (05) people commented on wanting to see more conservation and preservation of green spaces by the City, specific comments included “worried about the city selling park land” and “Keeping natural is so important. Plants and trees need to be preserved. Largo is doing a good job at it.”
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- A few people noted specific improvements they'd like to see in Largo area parks and recreation including keeping botanical gardens open longer, using alternatives to wood to reduce splinters in parks, and considering adult-size changing tables at park restrooms for caregivers supporting adults with disabilities.
 - Safety:
 - Eighteen (18) people, mostly Largo residents, commented on "Safety" in the City of Largo.
 - Six (06) people commented on police and fire department support. Several people commented that PD across the region is good, quick response, and they feel safe. Some suggested improvements such as more police presence in school zones, addressing frauds and scams, wanting PD to have more authority and support from legal system (DAs, lawyers).
 - Five (05) people shared the types of locations where they feel safe including areas that are well-lit and with good cameras, Largo school, closed communities, churches, and shelters.
 - Four (04) people commented on roadway improvements to improve safety such as better roads and lighting, more signage, reducing signage that blocks drivers' views, and wanting private roads into neighborhoods.
 - Three (03) people described various concerns related to people experiencing homelessness. A few people noted feeling unsafe and upset seeing people gathering in Largo Central Park and "living in park shelters". Another resident noted they have "had some encounters with angry homeless persons near Rosery Rd and Missouri Ave" and want to see the city support more mental health, workforce, and housing support for these individuals.
 - Utilities:
 - Fourteen (14) individuals commented on "utilities", half were Largo residents and most others were visitors from a neighboring city. There was a wide variety of comments and suggestions related to utilities including interest in solar power, more affordable utilities and education on services to public and seniors, desire to see more underground utilities, positive experiences with compost and recycling programs, and importance of water quality. A few individuals commented on importance of maintaining sewer systems, more education for the public on grease and debris impacts and wanting grant programs to support private sewer lift station maintenance.
 - Community Design:
 - Eighteen (18) people shared their perspective on "Community Design" in the City of Largo, most were Largo residents, and some were visitors from neighboring cities and counties.
 - Ten (10) individuals shared various opinions about local development including positive comments on liking local design (street crossings, parks, etc.) and development projects, and wanting to see more affordable housing for seniors, less strip malls, and shade for sun over parking lots. Related to downtown development one individual shared, "feels that West Bay Drive is too much of a big road to have a main street on. Would like to see downtown developed on some of the smaller streets in that area". Another individual shared that they appreciate Largo as "family-friendly and animal friendly".
 - Eight (08) people commented on wanting to see preservation of green space and trees, the importance of green space and the impact of overbuilding with comments including "too much hardscape for water runoff", "Overbuilding will put a strain on all resources", "more green space and pocket parks", and a focus on more trees and native plants.
 - Climate Change:
 - Seven (7) people commented on "Climate Change" local impacts and focus areas, nearly all were Largo residents. Nearly all comments focused on wanting to see the City prevent pollution including air (circulation, fossil fuels), land, and noise pollution.
-

- Several people wanted to see green space (trees, preserves, natural habitats and wildlife) preserved and expanded. One individual shared they “don’t believe [climate change]. I don’t see any changes.”

| What Went Well? | What Could be Improved? |
|--|---|
| <ul style="list-style-type: none"> • The scheduled community events were well-attended and a great opportunity to connect with many residents. • The team attended a variety of events, in terms of topic of the event, location, and general demographics of the audience. • The prize wheel worked well to focus in on one area of sustainability and focus the conversation on that topic. • After the first few events, we added a reference sheet with definitions of the NCS Categories. | <ul style="list-style-type: none"> • Some events were more successful than others. For example, the trick or treat trail event was not a good fit because parents and kids were moving very quickly through several community resource tables and the prize wheel approach and dialogue took too long and created a long line. • The team recorded responses on paper and some team members expressed it was difficult to keep up with quick responses and write clearly for a long period of time. • We needed a more consistent process to note if an individual was a Largo resident, County resident, or visitor. • All except one event was on the west side of town, however some of the events are often attended by a more regional audience (heritage village, garage sale, etc.). |

Phase 2.3 SRAP Draft Review

From April to December of 2023, staff worked with members of the Community Development Advisory Board (CDAB) at the boards monthly meetings to introduce the elements of the SRAP document and vulnerability assessment. Additionally, staff sought CDAB’s expertise as diverse representatives of Largo community members to review the internal equity assessment that the Sustainability and Resilience Action Team conducted on each of the 13 adaptation strategies. Those scores can be found in the Equity Score Card and Assessment section that follows in this Appendix.

Key takeaways from these discussions are listed below:

- Overall, the board is not in favor of Deep Injection Wells (DIWs) and the city’s decision to construct two DIWs to be compliant with the requirements of Senate Bill 64. Understanding the controversial nature of this project for the community, the SRAP adaptation strategy was revised to direct the city to provide public education in multiple language regarding the benefits and implications of DIWs as well as actively and transparently report the results of all inspections by the Florida Department of Environmental Protection. Despite these changes, a majority of board members expressed continued concern about DIWs and could not support a strategy that

involved the practice. Thus, the “Wastewater Deep Injection Well Reporting and Beyond” is the only one of the 13 adaptation strategies that is not approved by CDAB.

- There was a desire to see greater focus of water conservation in the plan, especially with the large amount of energy the city consumes to pump and treat wastewater and the rising burden of utility costs on Largo residents.
- For the launch phase of the plan, it was stressed that city needs to continuously seek feedback and direction from frontline community members. This outreach needs to happen throughout the plan’s implementation over the next 15 years in order to be truly equitable.
- It was expressed that any certification created or recommended under the Sustainable Business adaptation strategy should be something businesses need to considerably strive for. As a result of this effort, the city should reward and/or continuously highlight the businesses that adopt recommended sustainable practices.

SRAP Equity Scorecard Instructions

This scorecard supports members of Team Largo as they consider equity and inclusion in their planning and decision-making processes. We recognize this is a very complex undertaking that requires numerous stages and stakeholders, often has competing priorities, and is an ongoing process. This tool is one opportunity to reflect on potential relationship(s) between government plans, policies, and services, and the most vulnerable members of our community.

In order to create consistency and unison across various City efforts, this scorecard is structured around the ten (10) National Community Survey (NCS) categories, with the addition of Climate Change.

HOW TO FILL OUT THE SCORECARD:

- 1. Creating Sub-categories:** Spend time reflecting on a potential subcategory for each of the NCS categories that is most relevant or important to the effort you are supporting.
- 2. Defining Sub-categories:** Utilizing the "Sub-Category Definitions" tab, please provide a representative definition of the sub-category as it relates to your effort(s). [\(Completed\)](#)
- 3. Select a Score:** Reference the "Score Definitions" tab to assign a value (1-5) to each sub-category using the drop down menu.
- 4. Score Evaluation:** Reflect on which individual categories received a score of 3 or lower and determine what efforts, if any, can help improve that score. Review the total score for your effort which will range from 12 (lowest) to 60 (highest). A total score of 36 or less indicates that further considerations are needed prior to proceeding.
- 5. Share:** Provide the opportunity to a diverse set of stakeholders to assist in scoring this effort. Share the results broadly.

Suggested Considerations:

The following questions are illustrative of considerations when examining the relationship(s) between an effort and its impacts on vulnerable communities.

- Does this effort enhance economic resilience in an equitable manner?
- How might this action enhance environmental resilience and protect natural environments?
- Is this effort data-driven and based on previous community input and prioritization?
- Were the potential unintended consequences of this effort considered, particularly for vulnerable and frontline communities?
- Are there ways to acknowledge and celebrate the place, culture, and history of the surrounding community?
- How were future conditions considered as part of this process (rising seas, increased heat, increasing costs, etc.)?
- What method(s) will be used to evaluate outcomes and ensure accountability?

SRAP EQUITY SCORECARD

| | |
|------------------|--|
| Proposed Action: | |
| Staff Contact: | |
| Date: | |

| ECONOMY | MOBILITY | COMMUNITY DESIGN | UTILITIES | SAFETY | NATURAL ENVIRONMENT | PARKS & RECREATION | HEALTH & WELLNESS | EDUCATION, ARTS & CULTURE | INCLUSIVITY & ENGAGEMENT | CLIMATE CHANGE |
|---------|----------|------------------|-----------|--------|---------------------|--------------------|-------------------|---------------------------|--------------------------|----------------|
| | | | | | | | | | | |
| #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |

EQUITY SCORE #N/A

COMMENTS & DISCUSSION

Using the table below, fill in the definition of the chosen sub-category for each of the ten (10) NCS categories, plus climate change

| NCS Category | Chosen Sub-Category | Chosen Definition |
|---------------------|--|---|
| Economy | Cost of Living | The amount of money required to maintain a standard level of basic necessities, such as housing, food, transportation, and healthcare, in a particular geographic region or country. It is often used to compare the economic well-being of individuals or the affordability of different locations. |
| Mobility | Transportation Availability | The accessibility and range of transportation options present in a particular area or region. It encompasses the presence, reliability, and efficiency of various modes such as public transit, roads, walkways, and other means of moving people and goods. |
| Community Design | 1) Land Use & Zoning 2) Housing Affordability | "Land use and zoning" refer to the regulations and policies governing the purposes for which parcels of land in a specific area can improve or harm equity. "Housing affordability" refers to the relationship between household income and the cost of housing, indicating how easily individuals or families can secure suitable shelter within their financial means. |
| Utilities | Utility Cost | The expenses associated with essential services such as electricity, water, gas, sewage, and sometimes telecommunications. |
| Safety | Resident Health and Wellbeing | the physical, mental, and social health status of residents. It encompasses factors like access to healthcare, quality of life, and the presence of environmental or social determinants that impact health outcomes. |
| Natural Environment | Water and Air Quality | The levels of pollutants, contaminants, and other harmful substances present in our natural resources. Monitoring and maintaining good water and air quality is essential for the health of ecosystems, human health, and overall environmental sustainability. |
| Parks & Recreation | Accessibility | The ease with which residents can reach and utilize public green spaces, recreational facilities, and outdoor amenities. This encompasses the proximity, design, and inclusiveness of these areas to cater to people of all ages and abilities. |
| Health & Wellness | Food Security | The situation when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. It encompasses the pillars of availability, access, utilization, and stability of food supplies. |

| | | |
|--------------------------------------|--------------------------|---|
| Education, Arts & Culture | Diversity of Opportunity | The variety and breadth of options available to individuals for learning, artistic expression, and cultural engagement. It emphasizes inclusive access to educational institutions, cultural events, and artistic platforms for all, regardless of background or means. |
| Inclusivity & Engagement | Sense of Ownership | The feeling among community members that they have a stake in, and responsibility for, their local environment, institutions, and shared resources. This sense fosters active participation, pride, and collective decision-making, leading to more sustainable and cohesive communities. |
| Climate Change | Greenhouse Gases | The decrease in emissions of gases, primarily carbon dioxide, methane, and nitrous oxide, that contribute to the greenhouse effect and global warming. |

| Ranking | Score | Definition |
|-----------------------|--------------|---|
| Extremely Desirable | 5 | Action creates opportunities for collaboration and innovation, has a positive impact on social equity, and strengthens the community's environmental and social resilience. |
| Desirable | 4 | Action positively addresses social equity, and strengthens the community's environmental and social resilience. |
| Neutral | 3 | Action neither creates opportunities nor inhibits environmental and social resilience and is unlikely to impact social equity. |
| Undesirable | 2 | Action does not positively address environmental and social resilience and has adverse impacts on social equity. |
| Extremely Undesirable | 1 | Action does not positively address environmental and social resilience, has negative impacts on social equity, and directly or indirectly enables the continuation of historical inequalities |

SRAP Adaptation Strategies and Equity Assessment Results

This assessment was conducted by members of the Sustainability and Resilience Action Team and the final score were reviewed by members of the Community Development Advisory Board.

| Adaptation Strategy | Equity Score | CDAB Approval |
|--|--------------|---------------|
| Equitable Climate Preparedness | 46 | ✓ |
| Join the One Water Movement | 42.3 | ✓ |
| Sustainable Business | 44.5 | ✓ |
| Lift Station Modernization and Hardening | 41.6 | ✓ |

| | | |
|---|------|---|
| Develop, Adopt, and Begin Implementing a Greenways Plan | 48.9 | ✓ |
| Wastewater Deep Injection Well Reporting and Beyond | 37.3 | X |
| Coastal Resilience | 42.3 | ✓ |
| Green Resilience | 43.7 | ✓ |
| Inland Waterway Resilience | 43.6 | ✓ |
| Energy Management | 45.6 | ✓ |
| Flood Mitigation | 43 | ✓ |
| City Sustainability Continuous Improvement | 46 | ✓ |
| Annual CIP Planning for a Sustainable and Resilient Largo | 44.6 | ✓ |