U.S. Department of Transportation
Federal Highway Administration

FHWA and FDOT Peer Exchange:

Using the MPO Planning Process to Increase Transportation System Resilience

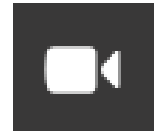
August 27-31, 2020

HOUSEKEEPING

- Keep your lines muted unless speaking

- To ask a question, type into the **chat pod** or “**raise your hand**” using the hand icon in the toolbar to be called on

- Video optional (recommended when speaking)



- Sessions will be recorded

U.S. Department of Transportation
Federal Highway Administration

Session 1: State of the Practice in Florida

August 27, 2020
10 am – 12 pm ET

WELCOMING REMARKS

Alison Stettner, FDOT

Heather Holsinger, FHWA

Mike Sherman, FHWA

GOALS AND OBJECTIVES

- **Share approaches** for using the MPO planning process to increase natural hazard resilience.
- Ensure all MPOs in the state share an **understanding of approaches and best practices**.
- Create an opportunity for **peer-to-peer collaboration** on how to integrate resilience into planning at individual agencies.

Today: Understand the "state of practice" in Florida

KEY QUESTIONS

- How can MPO planners **inform what projects are developed**? How they are designed? How they are prioritized?
- What information is needed to **justify resilience investments**?
- How can MPOs **best coordinate with other partners** to address vulnerabilities through land use development and other mechanisms?
- How can/have you **operationalized vulnerability assessment results**?
- How can resilience processes **improve equity**?
- How can resilience processes **support economic development**?
- How can MPOs access different **funding sources** like CDBG or FEMA?
- What is the role of MPOs in **state-wide resilience planning**?

Poll Everywhere

QUESTIONS

- What do you hope to learn or gain from the peer exchange?

TRANSPORTATION RESILIENCE

presented to

Florida MPO Resilience Peer Exchange

presented by

Jennifer Z. Carver, AICP
Florida Department of Transportation
Office of Policy Planning

August 27, 2020

FTP Florida Transportation Plan

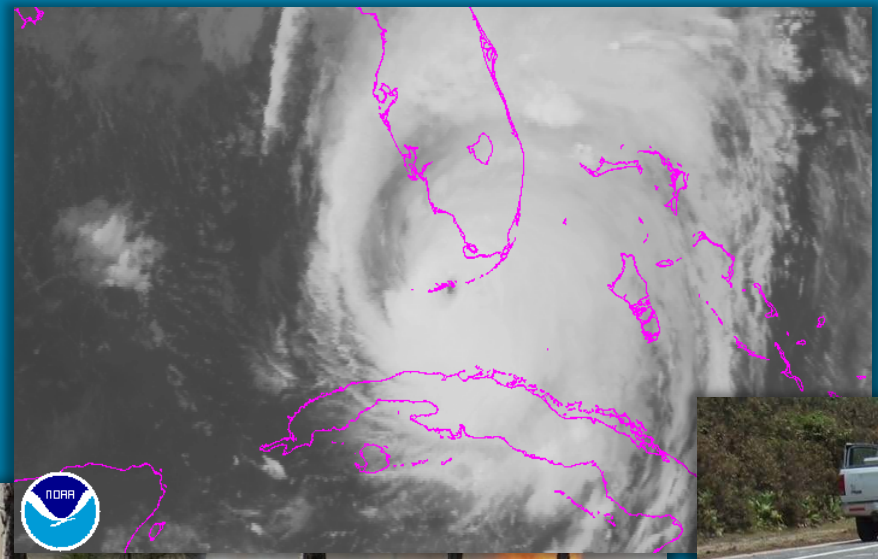
SIS Strategic Intermodal System

FDOT

NATURAL HAZARDS IMPACTING FLORIDA

- **Hurricane Storm Events**
- **Precipitation Events**
- **Sea Level Rise**
- **Wildfires**
- **Drought**
- **Sinkholes**

Irma making landfall in the Florida Keys
Credit: NOAA



A law enforcement vehicle patrols a flooded street in Everglades City, Florida, U.S., September 11, 2017. REUTERS/Bryan Woolston

US 98 in Franklin County. FDOT

Credit: Florida Forest Service

FDOT

WHY RESILIENCY?

Resiliency -- The ability of the transportation system to adapt to changing conditions and prepare for, withstand, and recover from disruptions.

Why? Mitigate risk, make wiser investment decisions, and provide more reliable transportation.

Fixing America's Surface Transportation (FAST) Act

- Resiliency/reliability; reduce stormwater impacts; reduce vulnerability

FDOT 23 Code of Federal Regulations (CFR) Part 667

- Evaluate options for facilities that have been repaired/reconstructed 2+ times due to emergency events

The increasing
GLOBAL INTEGRATION *of Florida's economy means our*
TRADE, TOURISM, & OTHER INDUSTRIES
can be impacted by recessions, instability, and supply chain disruptions around the world

According to the Florida Chamber Foundation, the likelihood of a
RECESSION WITHIN
9 MONTHS
has been **INCREASING** *since May of* **2019**

There is an estimated
$1.2 TRILLION NATIONAL GAP
in **TRANSPORTATION INFRASTRUCTURE NEEDS** *through* **2050**, *even before considering climate impacts*

LONG-HAUL FREIGHT
is expected to **INCREASE**
40% *by* **2040**

FDOT

COMMONALITIES IN STATE DOT RESILIENCE PLANNING

- **DOT involvement often begins with a cabinet-level, multi-agency initiative**

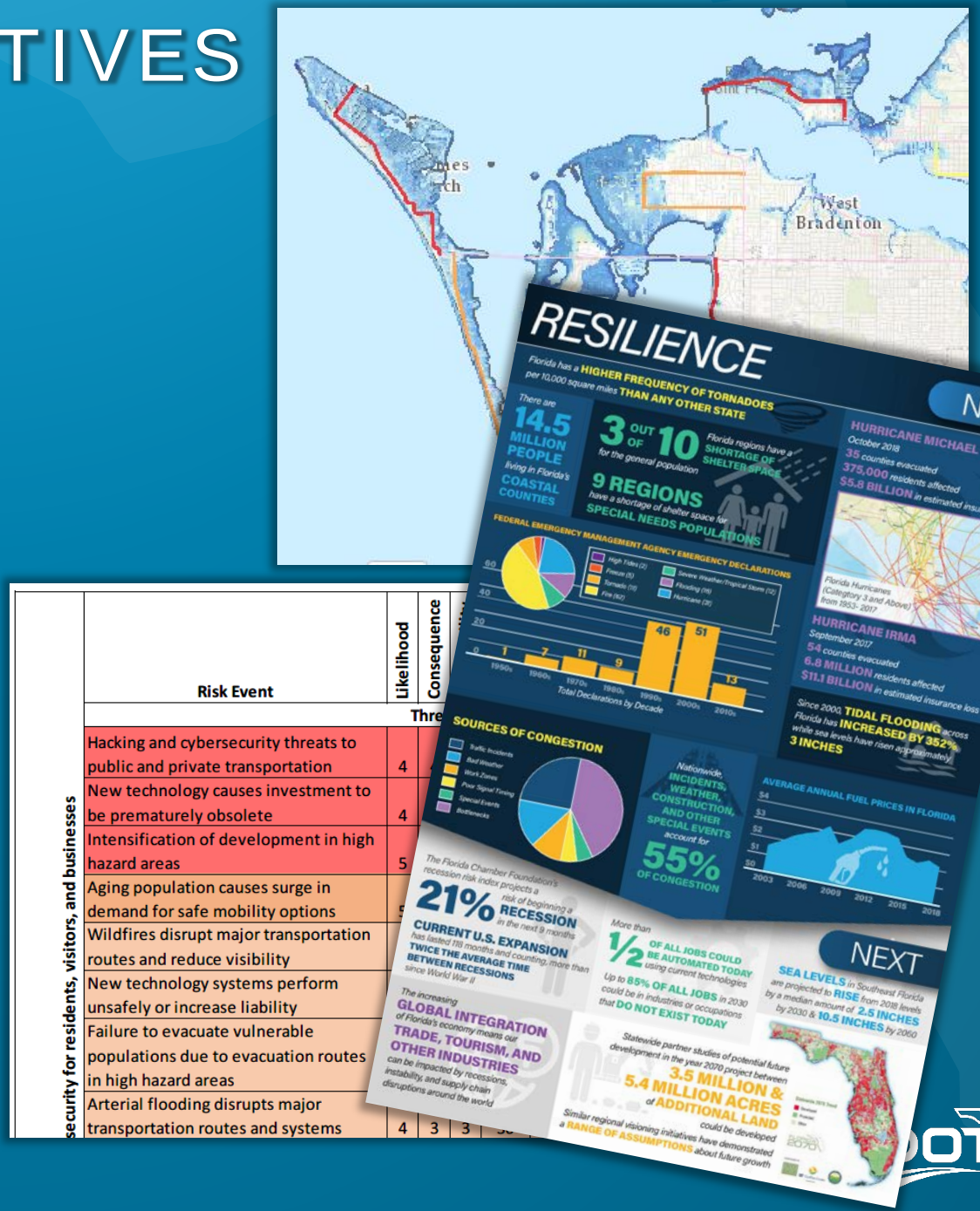
- **Most common resilience activities involve**
  - » Vulnerability assessments
  - » Development of data resources (geospatial data)
  - » Development of design guidelines
  - » Outreach and grants to localities to address transportation resilience

- **Resilience and reliability are often combined to address the planning requirement**

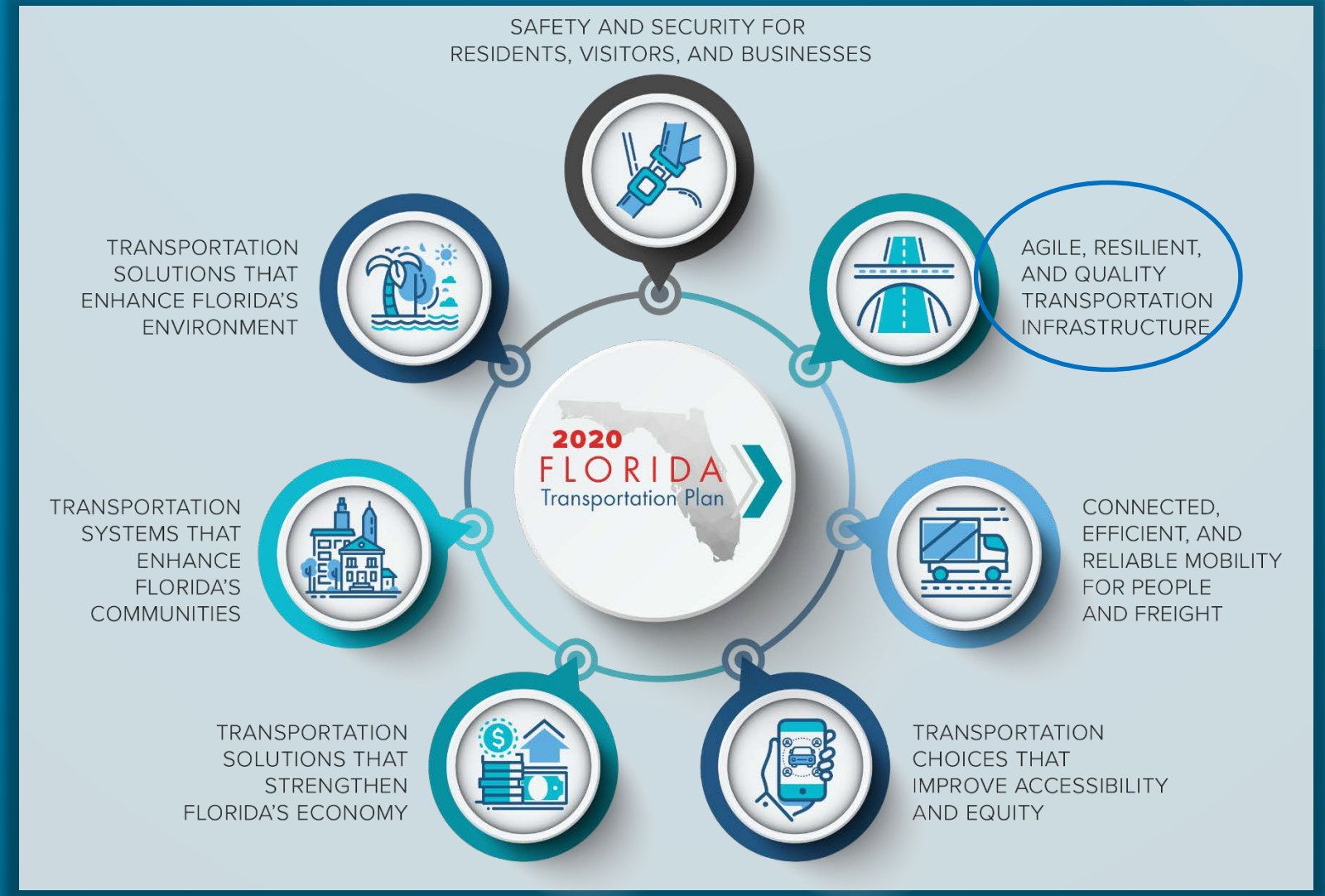
- **Many MPOs have advanced resilience planning in their 2045 LRTPs.**

FDOT RESILIENCE INITIATIVES

- **Statewide Planning**
  - » Florida Transportation Plan
  - » Freight Mobility and Trade Plan
- **FDOT Resilience Policy**
- **SIS Vulnerability Assessment**
- **Tools, Guidance, Standards**
  - » Guidance for MPOs
  - » Sea Level Scenario Sketch Planning Tool
  - » Case Studies/Adaptation Planning
- **Research**
- **Interagency Coordination/Collaboration**
- **Projects**



FLORIDA TRANSPORTATION PLAN

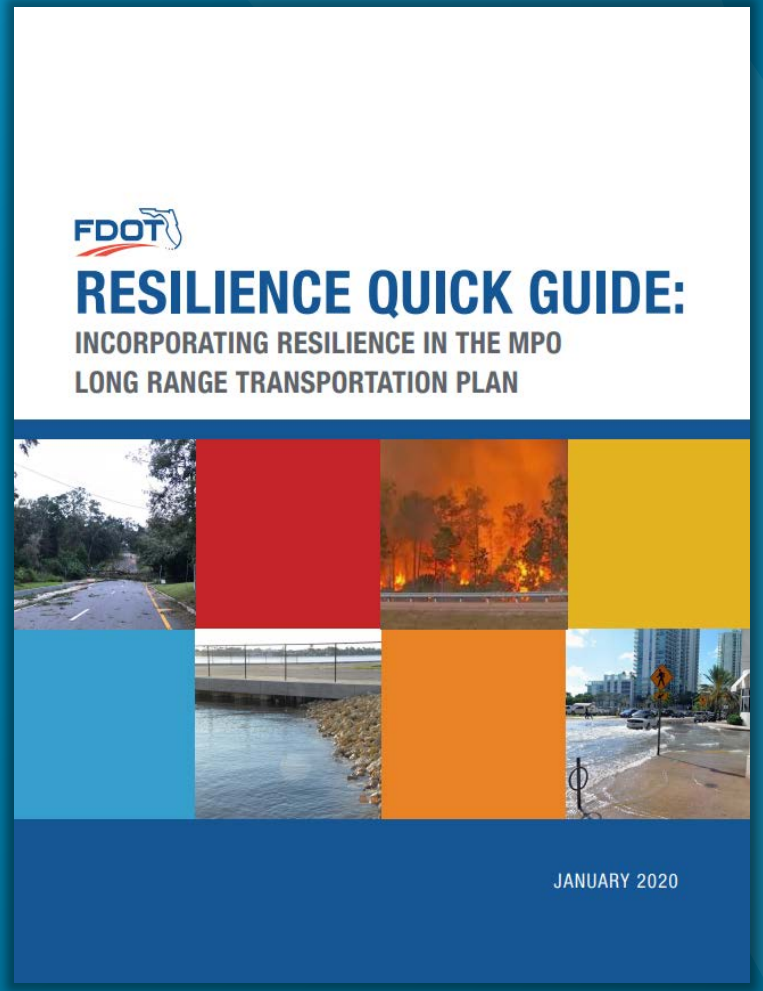


www.floridatransportationplan.com

STRATEGIC INTERMODAL SYSTEM (SIS) VULNERABILITY ASSESSMENT

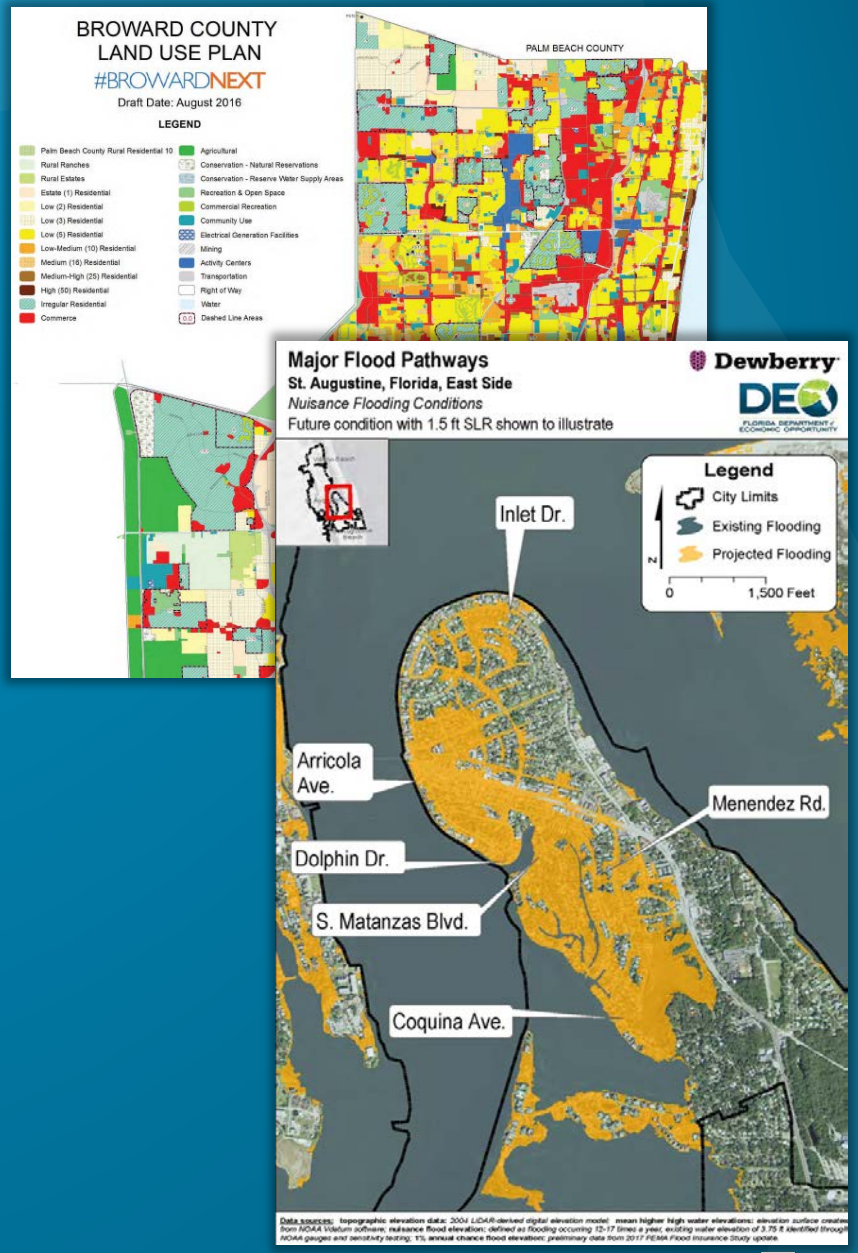
LRTP RESILIENCE QUICK GUIDE

- **Opportunities to incorporate resilience into the LRTP**
  - » Goals and Objectives
  - » Defining Performance Measures & Targets
  - » Assessing Risks/Vulnerabilities
  - » Creating Needs Plan
  - » Cost Feasible Plan: Investment & Prioritization
- **Focus on Resilience**
  - » Discussion of aspects of resilience
- **Noteworthy Practices**
  - » Florida & National Example



INTERAGENCY COORDINATION

- **Florida Resilient Coastlines Program (DEP)**
- **Office of Energy (DACS)**
- **Comprehensive Planning Peril of Flood (& Sea Level Rise) Planning (DEO)**
- **U.S. Army Corps of Engineers**
- **Regional Resilience Collaboratives**
- **MPOs, Local Planning**



REGIONAL COLLABORATIVES

- **Southeast Florida Regional Climate Change Compact**
- **Tampa Bay Regional Resiliency Coalition**
- **East Central Florida Regional Resilience Collaborative**
- **Northeast Florida Regional Council**

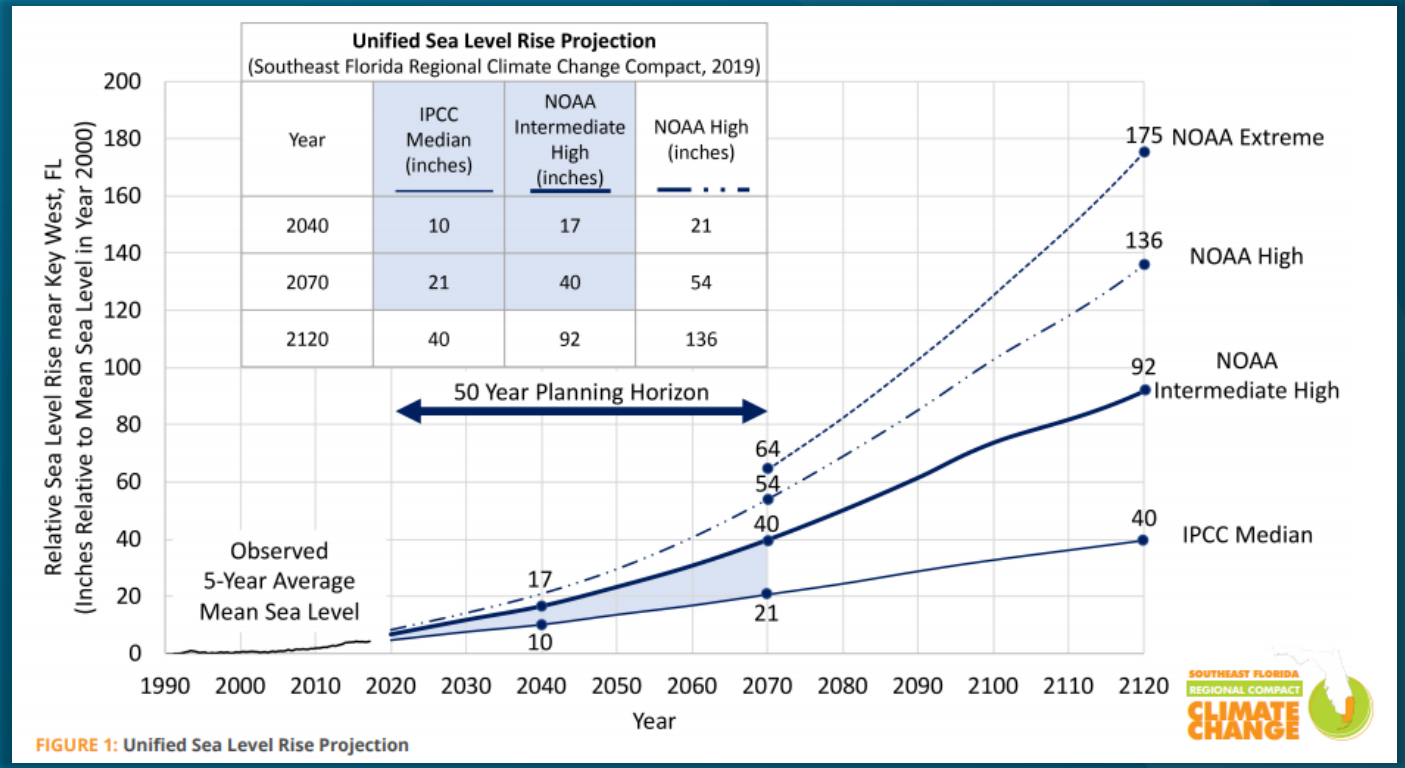
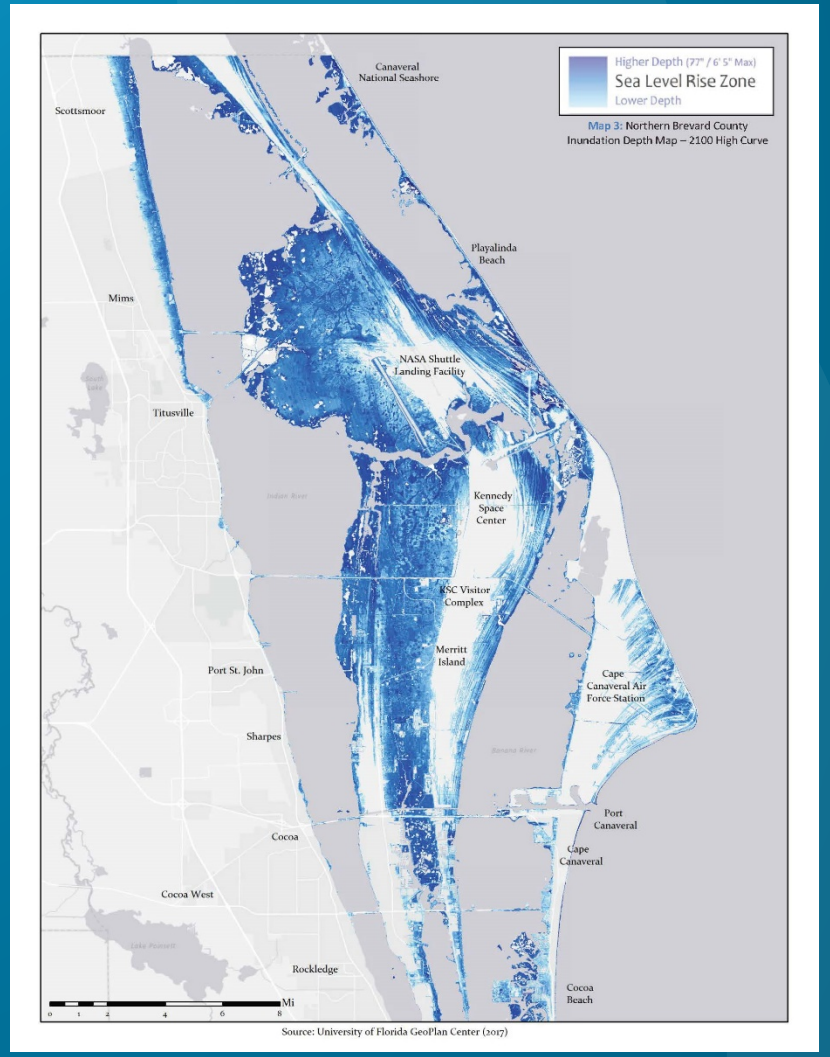


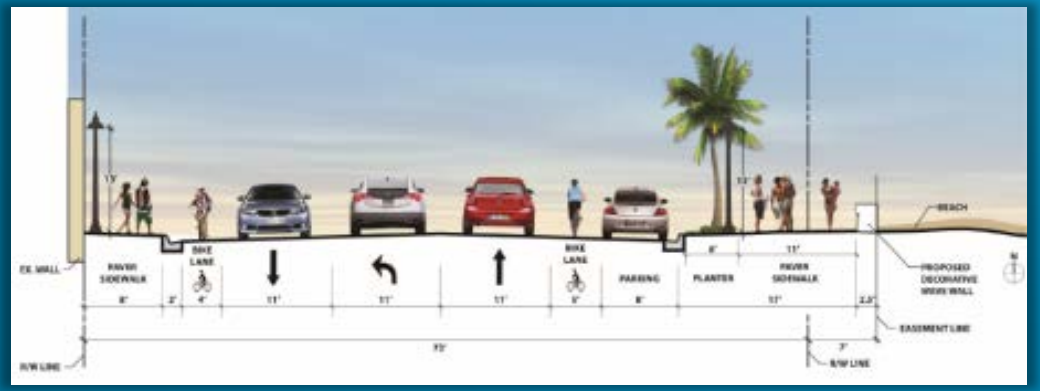
FIGURE 1: **Unified Sea Level Rise Projection**

KEY CHALLENGES IN MPO RESILIENCE PLANNING

- **Technical Capacity Building**
  - » Tools and resources
  - » Climate data and thresholds
  - » Complying with legislative requirements
  - » Monitoring and evaluation
- **Coordination with partner agencies**
- **Making a case for resilience improvements (value of resilience)**
- **Funding constraints**
- **Ways to operationalize vulnerability assessment results**
- **Inform project development**



EXAMPLE PROJECTS



Permanent Project Reflecting resiliency and Community: SR A1A in Fort Lauderdale

Jennifer Z. Carver, AICP
Office of Policy Planning
Florida Department of Transportation
Jennifer.Carver@dot.state.fl.us
(850) 414-4820

www.fdot.gov/planning/policy

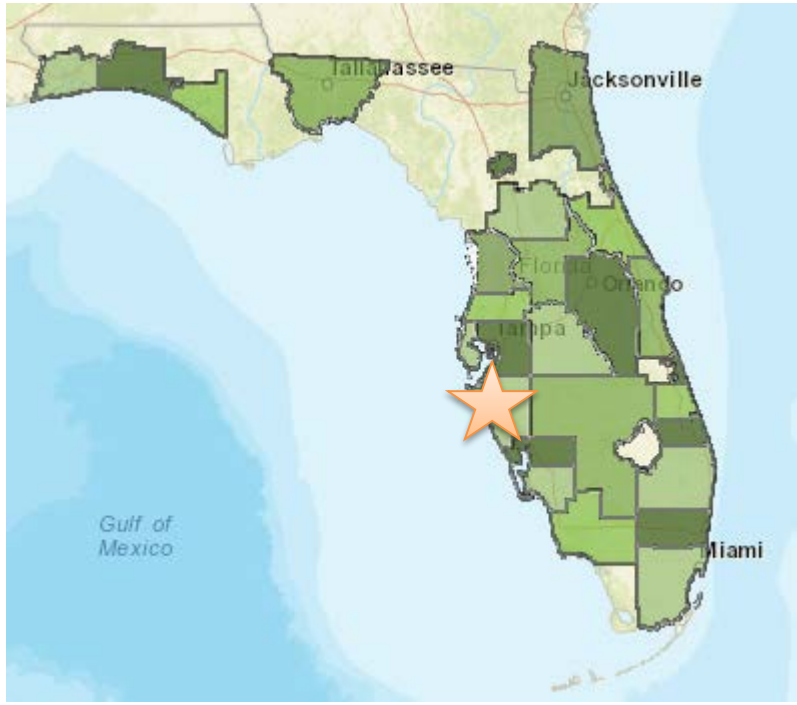
Lightning Round: Resilience Planning at Florida MPOs

LIGHTING ROUND GROUND RULES

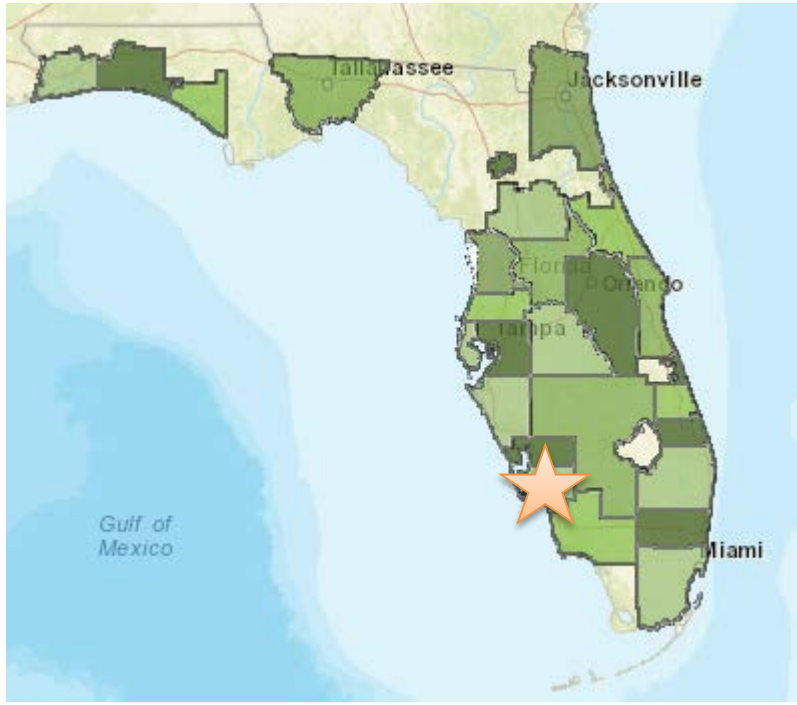
- 5 minutes each!

1-minute warning + Final warning in chat pod (make sure it’s visible)

Sarasota/Manatee MPO



Lee County MPO



Lee MPO

Peer Exchange on Resiliency

Development of the 2045 Long Range Plan

Examples of what is included in the goals this update:

- Transportation system that is sensitive to the changing environment
- Transportation system that improves resiliency and reliability of the system to keep people and goods moving

Examples of what is included in the objectives this update:

- To develop and implement multi-modal infrastructure improvements with the intent of improving resiliency and minimizing life cycle costs
- Improving the reliability of the transportation system by increasing awareness of and implementation of ITS, TDM programs and AV/CV

LRTP Project Priority Evaluation Criteria

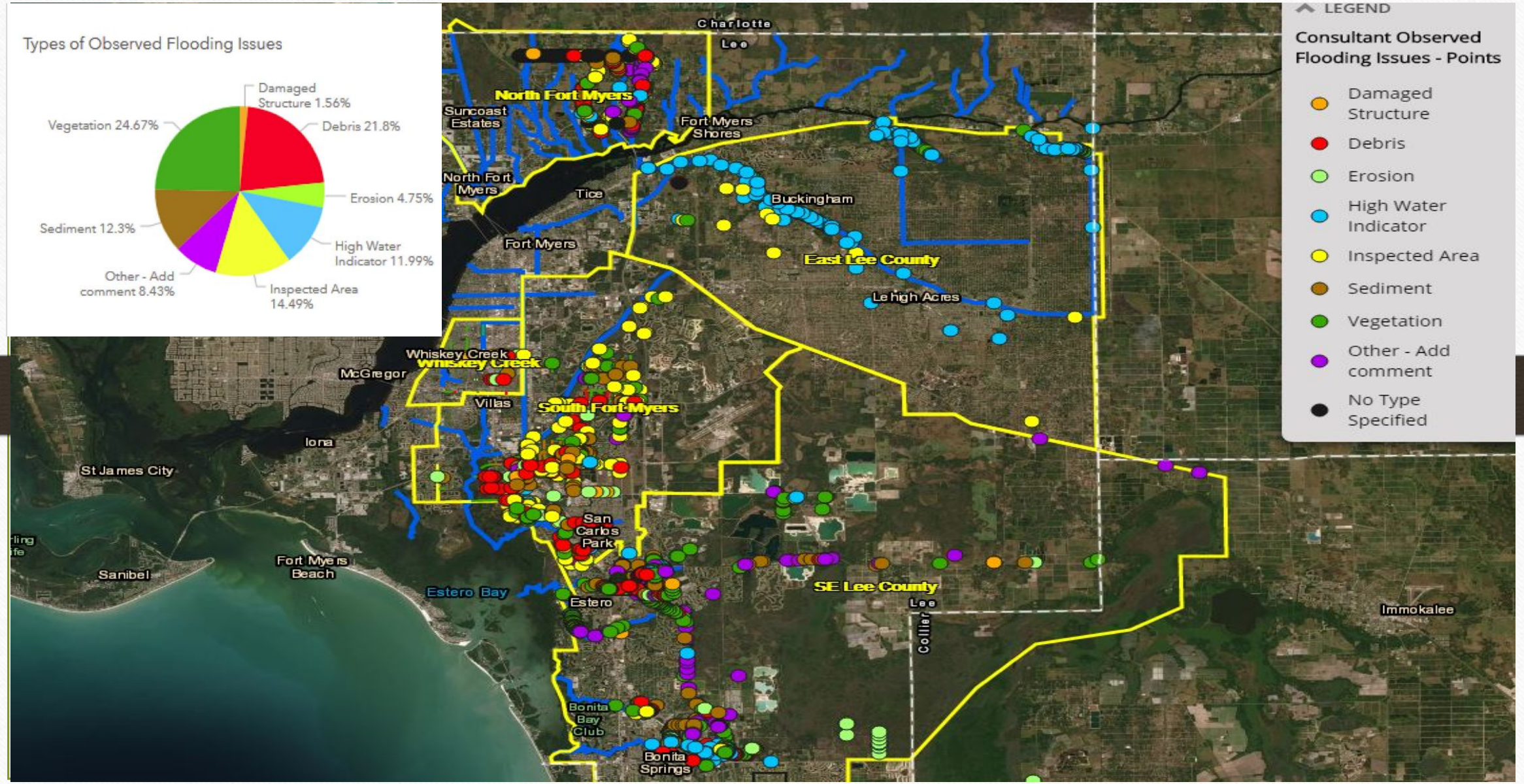
- One of the scoring criteria used this time is based on the repetitive impacts of flooding a facility has experienced over the last five years that impacts the safety, emergency access and evacuation – this analysis also includes what hurricane zone the facility is located in to account for the changing environment
- The proposed improvements are focused on solutions to resolve or improve re-occurring impacts

Developing a List of Impacted Roadway Sections

- Using media stories, comments from users and studies from our local partners we have begun tracking the closures of major roadways that include coverage area, time frames and available event information

Observations

- Often times the issues can be resolved through maintenance projects
- Recent local events in 2017 (tropical depression from Aug 25 to 28th with up to 16" of rain and Irma with average of 10' of rain two weeks later) led to a good analysis and identification of stormwater issues by the County


Types of Observed Flooding Issues
Damaged Structure 1.56%
Debris 21.8%
Erosion 4.75%
High Water Indicator 11.99%
Inspected Area 14.49%
Other - Add comment 8.43%
Sediment 12.3%
Vegetation 24.67%
LEGEND
Consultant Observed Flooding Issues - Points
Damaged Structure
Debris
Erosion
High Water Indicator
Inspected Area
Sediment
Vegetation
Other - Add comment
No Type Specified
Charlotte
Lee
North Fort Myers
Suncoast Estates
Fort Myers Shores
North Fort Myers
Tice
Buckingham
Fort Myers
East Lee County
Lehigh Acres
Whiskey Creek
Whiskey Creek
McGregor
Villas
South Fort Myers
Iona
St James City
San Carlos Park
Fort Myers Beach
Sanibel
Estero Bay
Estero
SE Lee County
Lee
Collier
Immokalee
Bonita Bay Club
Bonita Springs

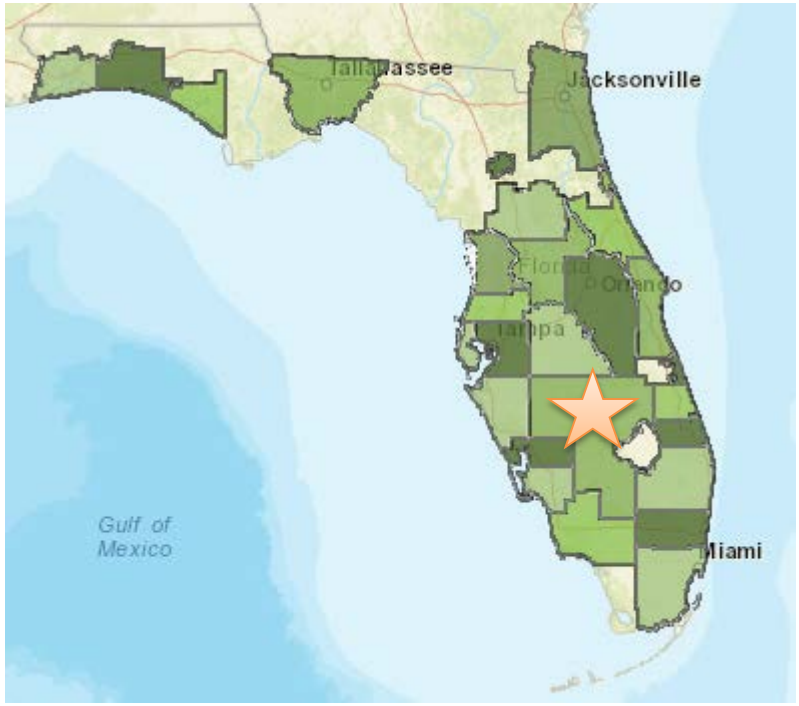
Challenges

- Getting a reliable list of issues to work from
- Funding and what is already committed means the improvements take too long
- Hard to quantify the impacts of improvements for public/political acceptance

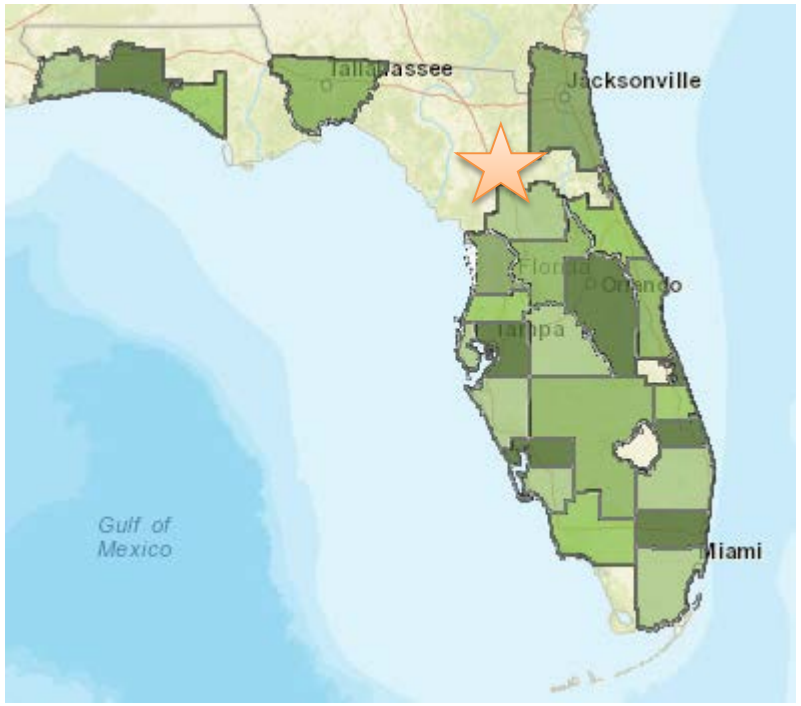
Questions and Comments

Heartland Regional TPO

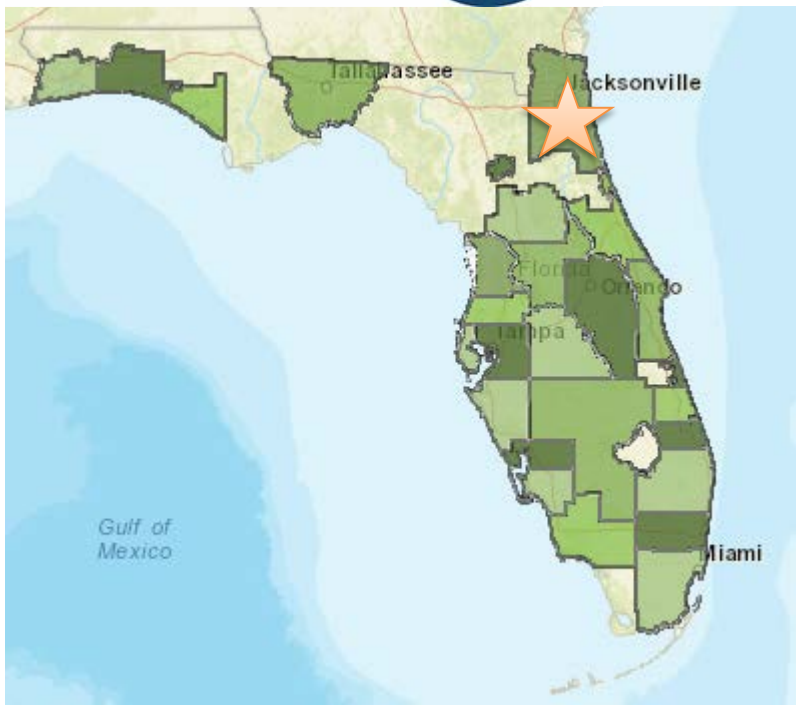
HRTPO
Heartland Regional
Transportation Planning Organization



Gainesville MTPO



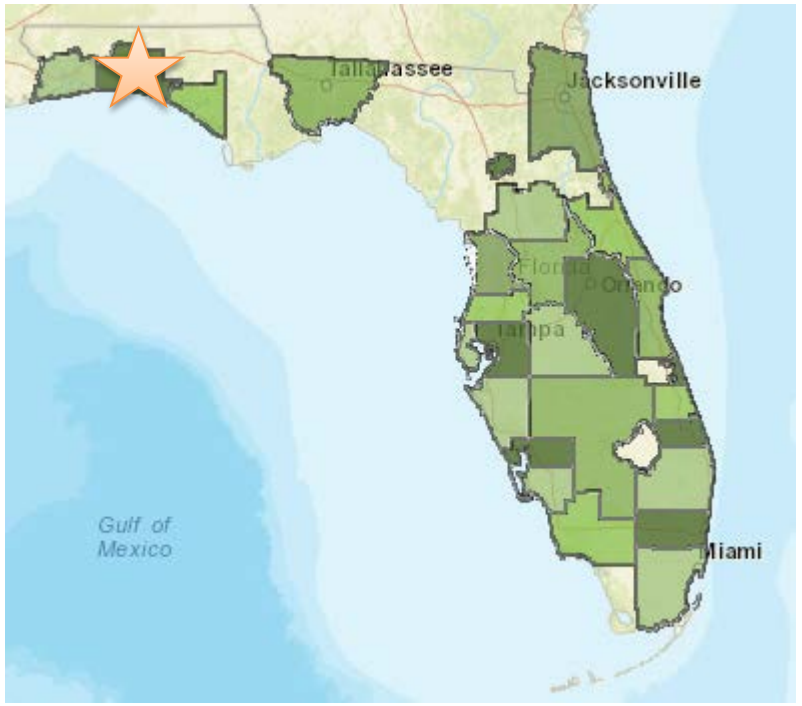
North Florida TPO



Break

+ Poll Everywhere

Emerald Coast RPC



EMERALD COAST REGIONAL COUNCIL

Resilience

EMERALD COAST PRESENTATION

Emerald Coast Regional Council

- Florida-Alabama TPO
- Okaloosa-Walton TPO
- Bay County TPO

EMERALD COAST REGIONAL COUNCIL

Resilience - Emerald Coast

- Resilience
  - Environmental
  - Economic
  - Resilience in Transportation is both
- MPO - LRTP
  - Goals and Objectives
    - Projects are awarded extra points for addressing resilience
- Regional Planning Council
  - Resilience Implementation
    - Economic Development Grants focused on Resilience of Public Infrastructure
    - Grants to cities/counties

EMERALD COAST REGIONAL COUNCIL

Resilience - Emerald Coast

- Pensacola International Airport
- (SIS facility)

EMERALD COAST REGIONAL COUNCIL

Resilience - Emerald Coast

- Panama City Port
- (SIS facility)

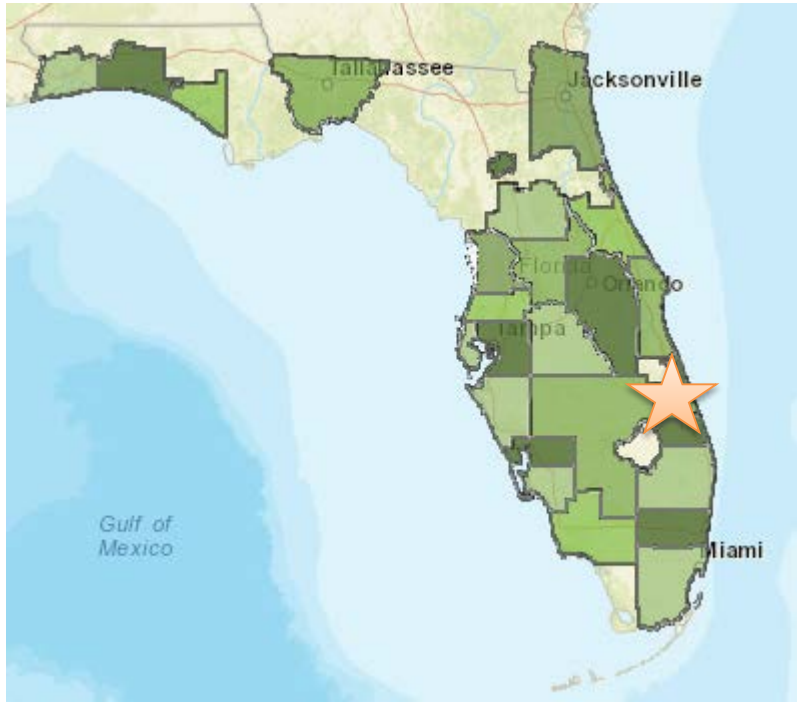
EMERALD COAST REGIONAL COUNCIL

Broward MPO


Broward MPO
Metropolitan Planning Organization
Tallahassee
Jacksonville
Orlando
Tampa
Gulf of Mexico
Miami

St. Lucie TPO


St. Lucie
Transportation
Planning
Organization


Tallahassee
Jacksonville
Orlando
Tampa
Gulf of
Mexico
Miami

U.S. Department of Transportation
Federal Highway Administration

FDOT

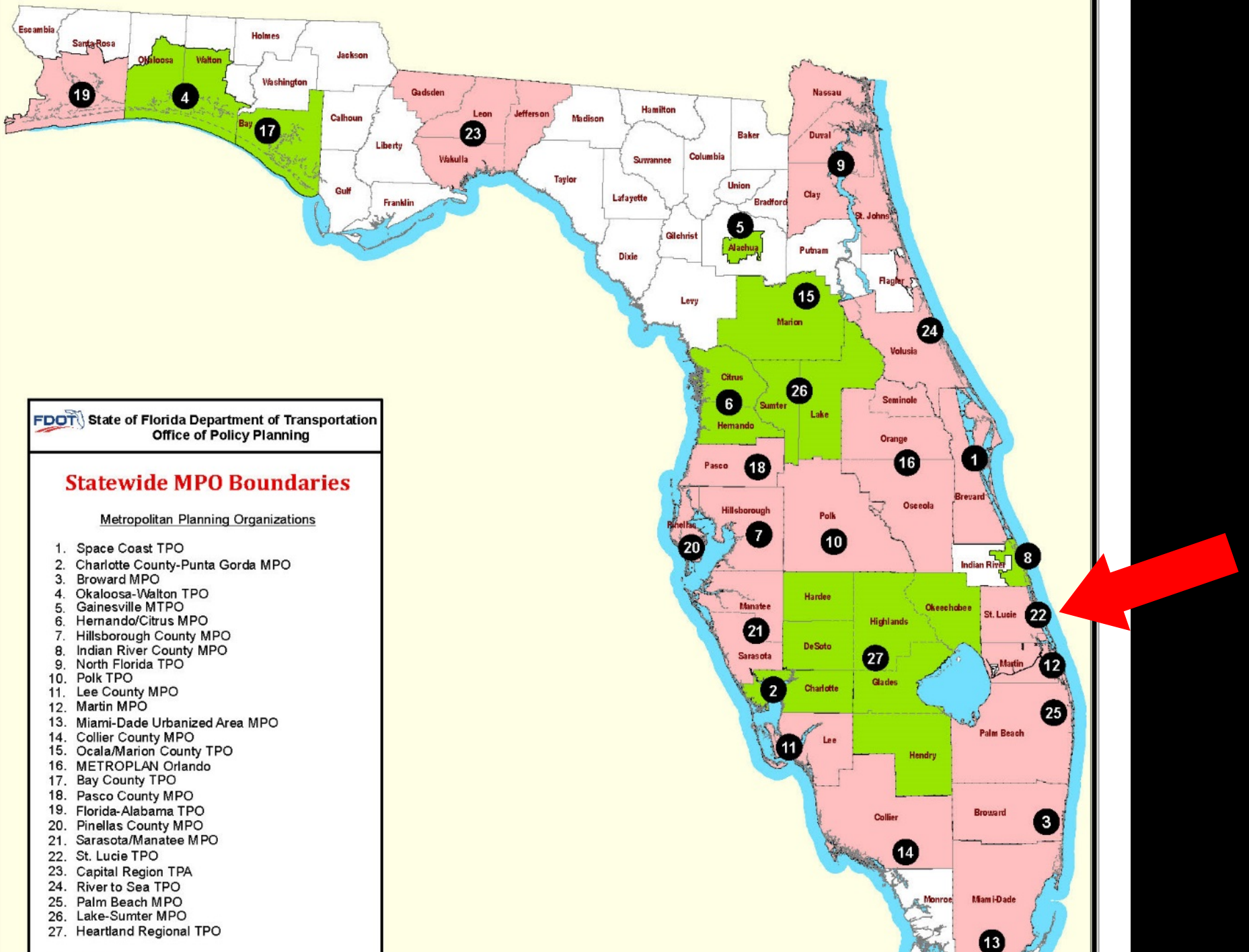
Peer Exchange: Using the MPO Planning Process to Increase Transportation System Resilience

Lightning Round: Resilience Planning at Florida MPOs



St. Lucie Transportation Planning Organization

Transportation Planning for Fort Pierce, Port St. Lucie, St. Lucie Village and St. Lucie County

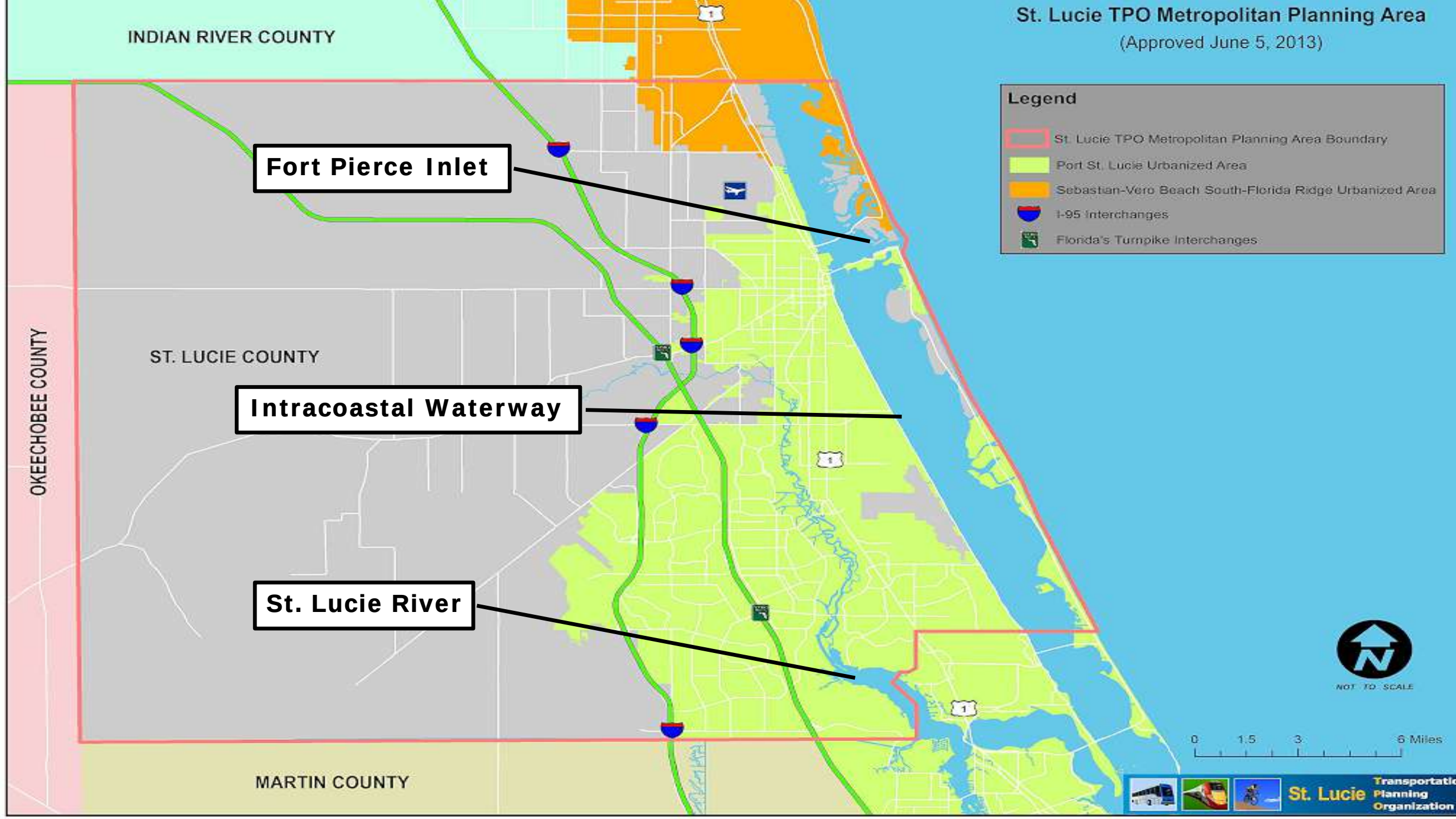


FDOT State of Florida Department of Transportation
Office of Policy Planning

Statewide MPO Boundaries

Metropolitan Planning Organizations

1. Space Coast TPO
2. Charlotte County-Punta Gorda MPO
3. Broward MPO
4. Okaloosa-Walton TPO
5. Gainesville MTPO
6. Hernando/Citrus MPO
7. Hillsborough County MPO
8. Indian River County MPO
9. North Florida TPO
10. Polk TPO
11. Lee County MPO
12. Martin MPO
13. Miami-Dade Urbanized Area MPO
14. Collier County MPO
15. Ocala/Marion County TPO
16. METROPLAN Orlando
17. Bay County TPO
18. Pasco County MPO
19. Florida-Alabama TPO
20. Pinellas County MPO
21. Sarasota/Manatee MPO
22. St. Lucie TPO
23. Capital Region TPA
24. River to Sea TPO
25. Palm Beach MPO
26. Lake-Sumter MPO
27. Heartland Regional TPO


St. Lucie TPO Metropolitan Planning Area
(Approved June 5, 2013)
Legend
St. Lucie TPO Metropolitan Planning Area Boundary
Port St. Lucie Urbanized Area
Sebastian-Vero Beach South-Florida Ridge Urbanized Area
I-95 Interchanges
Florida's Turnpike Interchanges
INDIAN RIVER COUNTY
ST. LUCIE COUNTY
OKEECHOBEE COUNTY
MARTIN COUNTY
Fort Pierce Inlet
Intracoastal Waterway
St. Lucie River
NOT TO SCALE
0 1.5 3 6 Miles
St. Lucie Transportation Planning Organization

Special Report 299

A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy

Prepublication Copy · Uncorrected Proofs

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

TRANSPORTATION RESEARCH
CIRCULAR

Number E-C152 June 2011

Adapting Transportation to the Impacts of Climate Change

State of the Practice 2011

TRANSPORTATION RESEARCH BOARD
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U.S. Department of Transportation
Federal Highway Administration

THE FEDERAL HIGHWAY ADMINISTRATION'S

CLIMATE CHANGE & EXTREME WEATHER VULNERABILITY ASSESSMENT FRAMEWORK

DRAFT

NOVEMBER 2012

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

Unified Sea Level Rise Projection Southeast Florida

2019 UPDATE

Prepared by the

Southeast Florida Regional Climate Change Compact's Sea Level Rise Ad Hoc Work Group

Florida Department of Transportation Research

Development of a Geographic Information System (GIS) Tool for the Preliminary Assessment of the Effects of Predicted Sea Level and Tidal Change on Transportation Infrastructure, BDK75 977-63

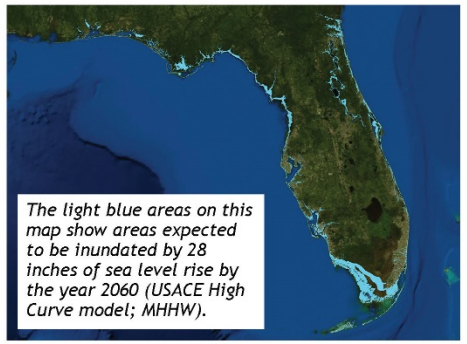
The longest record of sea levels in the Western Hemisphere began in 1846 in Key West, Florida. It shows a steady and gradually accelerating sea level rise (SLR) — nine inches since 1900. The increasing rate of recent years has implications for Florida, with its long coastline, hurricane history, and low-lying coastal zones, and as a major infrastructure builder and manager, the Florida Department of Transportation (FDOT) must understand possible impacts of SLR on the state's transportation system.

In this project, University of Florida researchers developed a sketch planning tool to assess the vulnerability of transportation facilities to SLR, building on previous FDOT-sponsored research (BDK79 977-01; 2012). That project recommended two short-term actions: (1) Apply the U.S. Army Corps of Engineers (USACE) methodology to develop statewide and regional projections of SLR; and (2) Develop a sketch planning tool to identify potentially vulnerable infrastructure. These actions are addressed in this project.

The researchers' objective was to construct an interactive framework incorporating various GIS data, such as elevation data, tide gauge data, and some FDOT repositories: Roadway Characteristics Inventory (RCI), Strategic Intermodal System (SIS), and Unified Basemap Repository (UBR). Together, this information could produce inundation maps.

The sketch planning tool, which provides a preliminary identification of at-risk facilities, was created using ESRI ArcGIS. The tool comprises three tools which accommodate varying expertise: a Map Viewer, GIS data layers, and a Sea Level Change Inundation Surface Calculator.

Based on parameters such as SLR projection scenarios (low, intermediate, and high), time period (decadal from 2040 to 2100), and two tidal datums (Mean Sea Level (MSL) and Mean Higher High Water (MHHW)), the Map Viewer displays SLR inundation maps and affected transportation infrastructure.



The light blue areas on this map show areas expected to be inundated by 28 inches of sea level rise by the year 2060 (USACE High Curve model; MHHW).

The Map Viewer can export tabular data for affected infrastructure to Excel or similar programs. The Map Viewer needs no special software, only an Internet connection and Web browser. Experienced GIS users can download inundation and affected infrastructure data layers from the project website (sls.geoplan.ufl.edu). These can be overlaid with others, such as local infrastructure, transit, and floodplains. Advanced GIS users can use the Sea Level Change Inundation Surface Calculator to create custom inundation surfaces, choosing a Florida tide station, a USACE projection scenario, decade, tidal datum, and digital elevation map (DEM).

The Florida Sea Level Scenario Sketch Planning Tool includes statewide and regional data: SLR projections, a 5-meter horizontal resolution DEM, inundation surfaces, and various transportation layers from the FDOT repositories. The 5-meter resolution does not provide local and site-specific features such as roadway and bridge elevations, gullies, ditches, dikes, levees, and culverts. Though the selection procedure and small scale of analysis may overestimate affected infrastructure, the sketch planning tool is valuable for planners and engineers who need preliminary assessments of the SLR impacts under various scenarios.

Project Manager: Maria Cahill, AICP, FDOT Planning Office
Principal Investigator: Alexis Thomas, University of Florida
For more information, visit http://www.dot.state.fl.us/research-center

FDOT

RESILIENCE QUICK GUIDE:

INCORPORATING RESILIENCE IN THE MPO LONG RANGE TRANSPORTATION PLAN

JANUARY 2020

Goals	Objectives	Proposed Plan Performance Measures	Proposed Project Ranking Criteria	Score
Choices	Improve bike/pedestrian and public transportation networks.	% of roadways with sidewalks and bike lanes	Is project on bike/ped needs network? Yes	5
		% of transit stops with sidewalk access	Is project adjacent to a transit stop? Yes/No	5
	Provide for transportation needs of transportation disadvantaged that may include use of automated vehicles.	Miles of fixed route transit service	Is project a new transit route? Yes	5
		% of low-income, older adults, persons with disabilities within ¼ mile of transit route	Is project in an EJ area? Yes	5
Existing Assets and Services	Maintain condition of existing transportation assets.	Pavement condition, 70 or less	Does project improve pavement condition? Yes	2
		Bridge condition, 50 or less	Does project improve bridge condition? Yes	2
		Percent transit fleet beyond useful life	Does project replace aging fleet? Yes	5
	Improve efficiency of existing transportation services.	VMT of roads operating at adopted LOS	Does project improve multimodal LOS? Yes	5
		Passenger trips per vehicle mile of service	Does project increase ridership? Yes	5
Cooperation	Facilitate unified transportation decision-making through intergovernmental cooperation.	Attendance at TPO meetings	Is project supported by a public-private partnership? Yes	4
		Collaboration opportunities with local and resource agencies	Is project supported by local and resource agencies? Yes	1
	Ensure community participation is representative.	Collaboration opportunities with community and public groups	Is project supported by community and public groups? Yes	1
		Opportunities for engagement in traditionally underserved areas	Is project supported by groups from traditionally-underserved areas? Yes	2
Health and Environment	Support healthy living strategies, programs, and improvements.	Community Walkscores	Does project add a sidewalk? Yes	5
		Number of bicycle riders	Does project add a bike lane? Yes	5
	Make transportation investments that minimize impacts to natural environment and allocate resources toward mitigation.	Number of additional roadway lane miles of impacting environmentally-sensitive areas	Is project not in an environmentally-sensitive area depicted in Go2040 LRTP? Yes	5
		Increase transit frequency and span of service	Does project increase service hours or frequency? Yes	5
Safety and Security	Improve safety of transportation system that may include incorporation of infrastructure in support of automated vehicles.	Number and rate of fatalities/serious Injuries, motorized	Does project address a motorized safety issue? Yes	5
		Number of fatalities/serious Injuries, non-motorized	Does project address a non-motorized safety issue? Yes	5
	Improve transportation system's stability/resiliency in event of climate change, emergencies, or disasters.	Number of projects permanently inundated by Mean Sea Level (MSL + 5 inches)	Is project resilient or does it provide stability/ resiliency in event of climate change, emergencies, or disasters? Yes	5

In addition, TPO staff coordinate with local governme
taping and airing TPO meetings, where the UPWP is di
government and public access television channels. TPO
for viewing via a link from the TPO website and are
impaired.

Consistency with Other Plans

The UPWP is developed to be consistent with all applic
management plans of the local governments within th
and tasks are designed to assist local governments by
and maps that can be utilized in the comprehensive pla
contribute to and support local and state governme
individual work tasks included in the UPWP. In addition
continued through the TAC, CAC, BPAC and LCB.

Planning Factors and Task Matrix

MAP-21 identifies the metropolitan planning process for
provide for consideration of projects and strategies that

1. Support the economic vitality of the metropoli
   global competitiveness, productivity, and efficien
2. Increase the safety of the transportation system
   users.
3. Increase the security of the transportation systen
   users.
4. Increase the accessibility and mobility of people
5. Protect and enhance the environment, promote
   quality of life, and promote consistency between
   State and local planned growth and economic de
6. Enhance the integration and connectivity of the t
   between modes, for people and freight.
7. Promote efficient system management and opera
8. Emphasize the preservation of the existing trans

The recently-enacted FAST Act carries forward the abov
provides for consideration of projects and strategies tha

9. Improve the resiliency and reliability of the trans
10. Reduce or mitigate stormwater impacts of surfac
11. Enhance travel and tourism.

The inclusion of MAP-21 and FAST Act planning factors in
planning process is demonstrated through the use of th

Task 3.9 Environmental Planning		
Purpose:		
To continue the integration of environmental considerations into the TPO's metropolitan planning program		
Previous Work:		
The Go2040 LRTP incorporates environmental mitigation strategies from a system-wide perspective and considers environmental mitigation strategies in consultation with State, Tribal, and local agencies. The TPO continued to link planning with the National Environmental Policy Act (NEPA) with the preparation of a Purpose and Need Statement for a new project conceived by the Go2040 LRTP. A base map of environmentally-sensitive areas was developed in the Go2040 LRTP which identifies environmental features such as major hydrology, environmental lands, and Special Emphasis Areas identified by local stakeholders such as the St. Lucie Conservation Alliance and the St. Lucie County Environmental Management Department. As a member of the Environmental Technical Advisory Team (ETAT), the TPO participated in the FDOT Efficient Transportation Decision Making (ETDM) process to further integrate consideration of potential project effects on the cultural, socio-cultural, and natural environments into transportation decision-making and continue early coordination with resource agencies in addressing mitigation activities. The TPO participated in the PD&E process for its Priority Projects where the environmental mitigation activities were further refined. The TPO supported the establishment of the Florida Ecological Greenways Network (FEGN) which prioritizes a functionally-connected statewide network of public and private conservation lands to conserve and maintain ecological greenway connectivity and protect, connect, and conserve Florida's native wildlife and natural systems. In addition, the TPO supported the effort to define a statewide conservation network of wildlife and natural areas with the Florida Fish and Wildlife Conservation Commission's Cooperative Conservation Blueprint (CCB) and the State Wildlife Action Plan to sustain the broad range of wildlife in Florida. As extreme weather and changes in environmental conditions continue to present significant and growing risks to the nation's vital transportation systems, the TPO initiated efforts to utilize FHWA's Vulnerability Assessment and Adaptation Framework to assess vulnerabilities of transportation assets and services to extreme weather and other environmental conditions and for identifying ways to improve the climate adaptation/resiliency of the assets and services. In addition, The TPO hosted a technical training workshop offered by the University of Florida GeoPlan Center on the Sea Level Scenario (SLS) Sketch Planning Tool.		
Required Activities:		
• Update and maintain the Base Map of Environmentally-Sensitive Areas • Participate as ETAT member in ETDM Planning and Programming Screens • Coordinate with State and local agencies responsible for natural resources, environmental protection, conservation, and historic preservation • Integrate FEGN, CCB, and State Wildlife Action Plan into transportation plans • Complete local sea level rise mapping using the SLS Sketch Planning Tool to identify transportation infrastructure exposed to current and future flooding • [illegible] Asset/Service Vulnerability Assessment		
End Product:	**Completion Date:**	**Responsible Agencies:**
Sea Level Rise Mapping	December 2019	St. Lucie TPO
Transportation Asset/Service Vulnerability Assessment	June 2020	**Participating Agencies:** FDOT, St. Lucie County

ıpolitan transportation planning process shall be
ensive, and provide for consideration and
d services that will address the following factors

e metropolitan area, especially by enabling global
iciency;
ion system for motorized and non-motorized users;
ation system for motorized and non-motorized users;
people and freight;
:, promote energy conservation, improve the quality
een transportation improvements and State and local
oment patterns;
rity of the transportation system, across and between

t and operation;
isting transportation system;
of the transportation system and reduce or mitigate
ortation; and

rs in the UPWP and in the metropolitan planning
of the following matrix:

	MAP-21/FAST Act Planning Factors									
	1	2	3	4	5	6	7	8	9	10
	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X	X	X
		X	X	X	X		X		X	
		X	X	X	X		X		X	
	X	X		X	X		X		X	
ting	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X	X	X
)	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X		X	X	X	X
	X	X		X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X	X	
		X	X						X	X
m	X	X		X	X	X	X		X	X
	X	X	X	X	X	X	X	X	X	X

University of Florida GeoPlan
Technical Training Wor

SEA LEVEL
SKETCH PLA

The University of Florida GeoPlan Center is offering a technical training workshop on the Sea Level Scenario (SLS) Sketch Planning Tool, a set of publicly accessible GIS tools (sls.geoplan.ufl.edu) intended to help identify transportation infrastructure exposed to current and future flooding.

This workshop is free!
But space is limited to 30 per session.

Participants will need to bring a

Port St. Luc
Tuesday, Oct
9:00am -
St. Luc
466 SW Port St. Lucie Blvd #
Click here

For other workshop locations, see:

Who Should Attend? *MPO/TPO/TPA staff, municipal staff and community partners i resiliency efforts, a*

For more information, contact Cryst

UF GEOPLAN CENTER FD

St. Lucie Transportation Planning Organization

Sea Level Rise Mapping

Using the Sea Level Scenario Sketch Planning Tool and NOAA Coastal Flood Exposure Mapper

Prepared by the St. Lucie Transportation Planning Organization

Contact: Yi Ding
St. Lucie Transportation Planning Organization
466 SW Port St. Lucie Boulevard, Suite 111
Port St. Lucie, Florida, 34953
Telephone: (772) 462-1593
Email:dingy@stlucieco.org

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Kreyol Ayisyen: Si ou ta renmen resevwa enfòmasyon sa a nan lang Kreyòl Aysiyen, tanpri rele nimewo 772-462-1593.

Español: Si usted desea recibir esta informaciòn en español, por favor llame al 772-462-1593.

Florida Coastal Management Program | Florida Department of Environmental Protection | National Oceanic and Atmospheric Administration U.S. Department of Commerce NOAA | United States Army Corps of Engineers

enario Sketch Planning Tool

ch Planning Tool is to help identify transportation ood risks. The tool analyzes and visualizes current flood ricane storm surge zones) as well as future flood risks Army Corps of Engineers (USACE) and the National)/ National Climate Assessment.

University of Florida GeoPlan Center with funding from cenarios were recently updated and a new map viewer ected transportation facilities. The SLS Sketch Planning uture sea level rise may impact the transportation

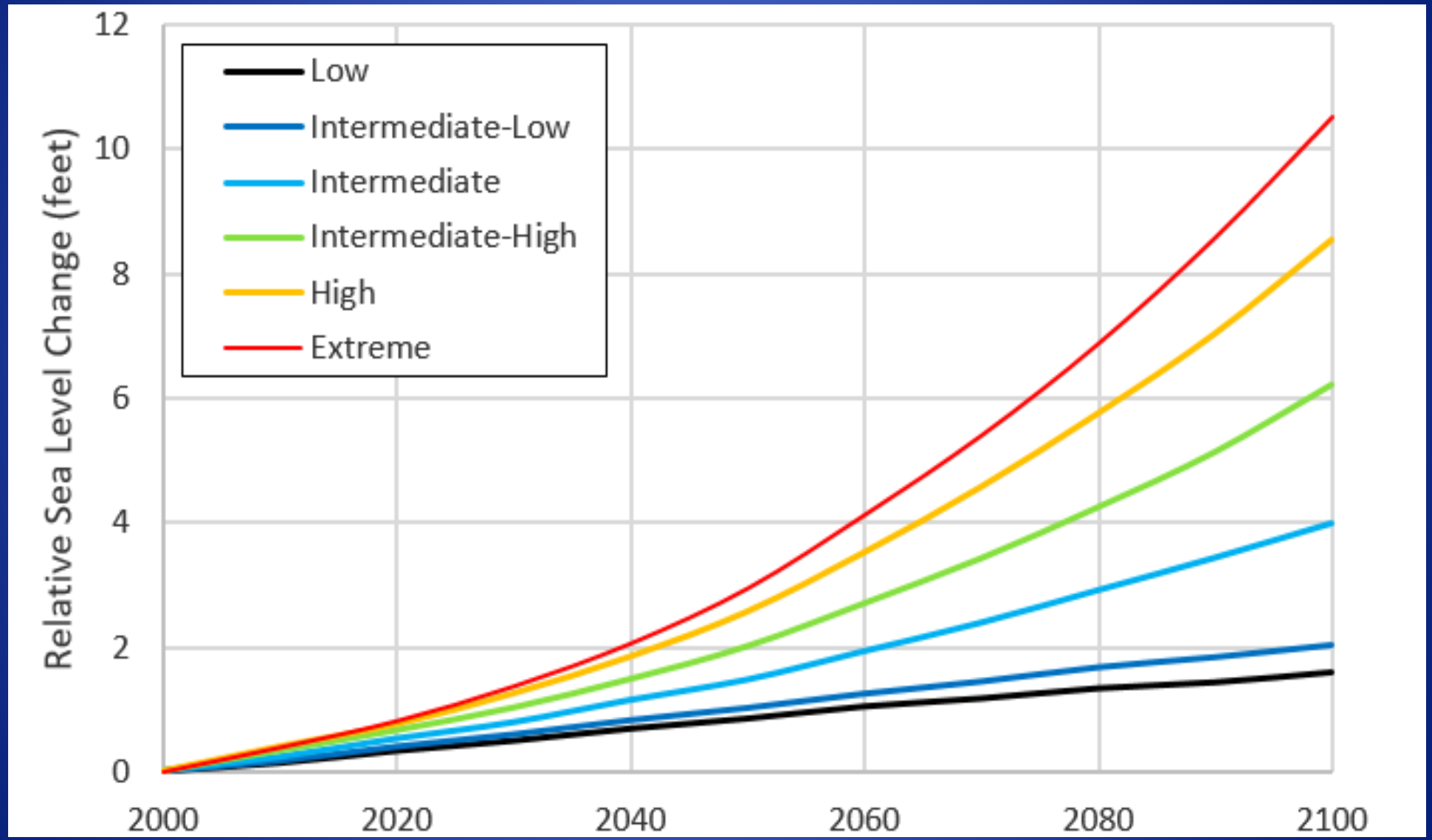
future flood risk under SLR scenarios and potentially ta layers of SLR inundation and affected transportation; of SLR inundation.

shop Agenda

ne
ives evel Rise and SLR projections anning Tool / Policy Issues
l Components
ercises: Using the Online Map Viewer
uct a vulnerability assessment
rcise findings) and closing

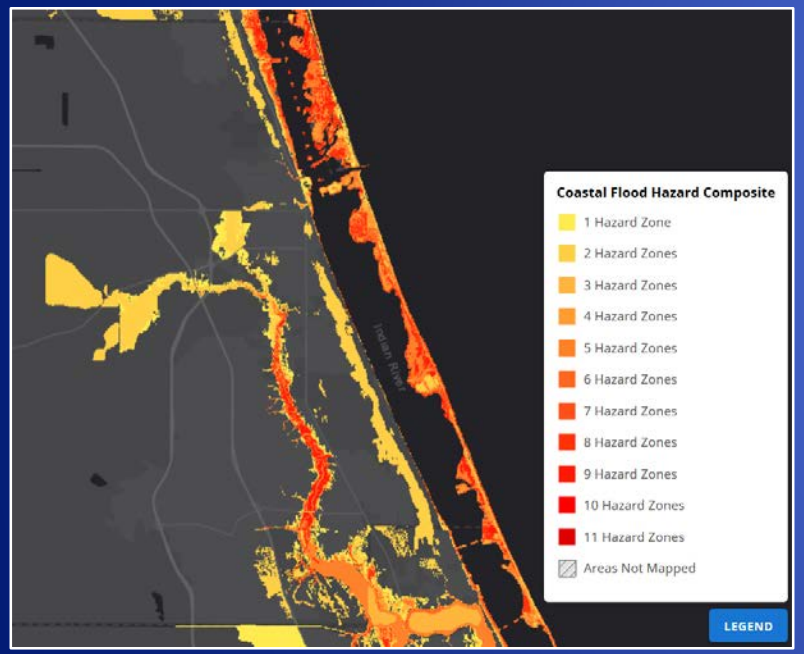
onse to local and statewide needs for a ormation Systems (GIS). The UF GeoPlan l environmental planning in the State of e, data, training, and education to the /www.geoplan.ufl.edu

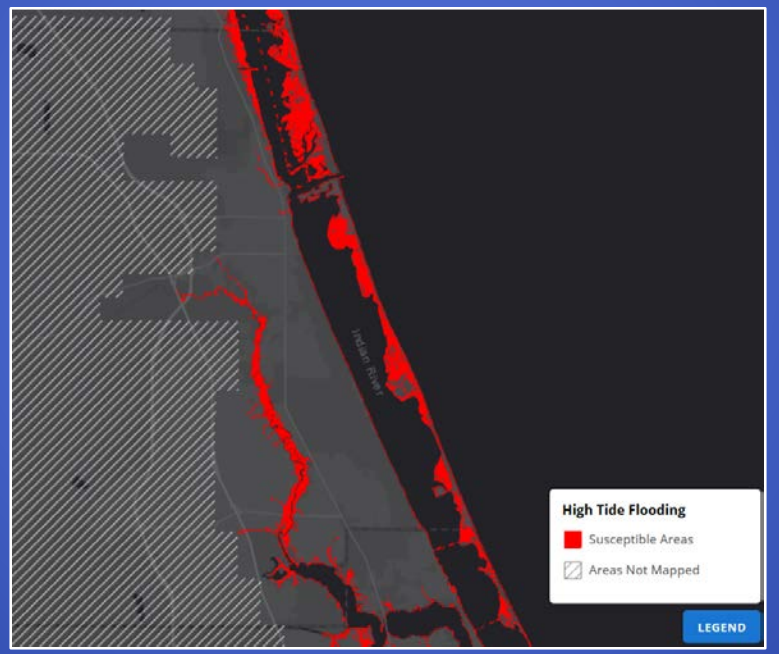
Sea Level Rise Scenarios

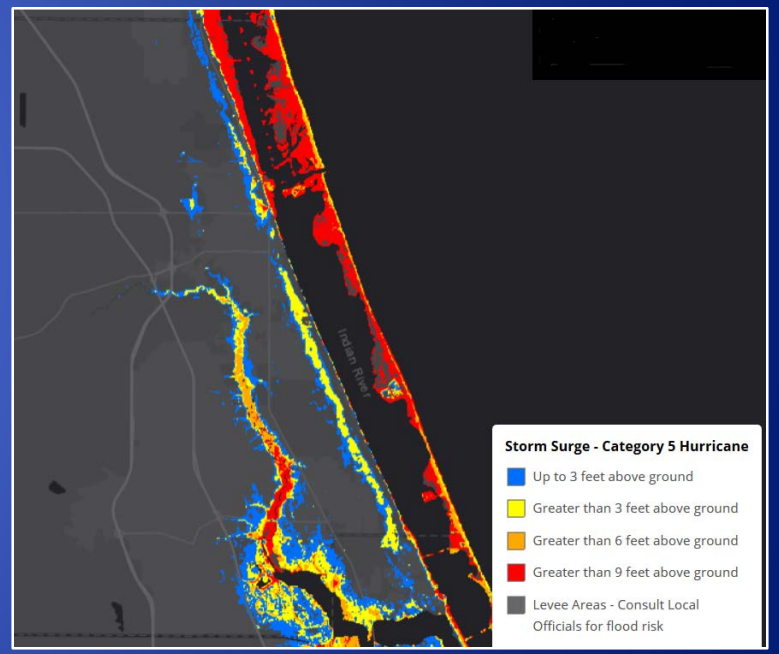


Sea Level Rise Mapping

NOAA Coastal Flood Exposure Mapper

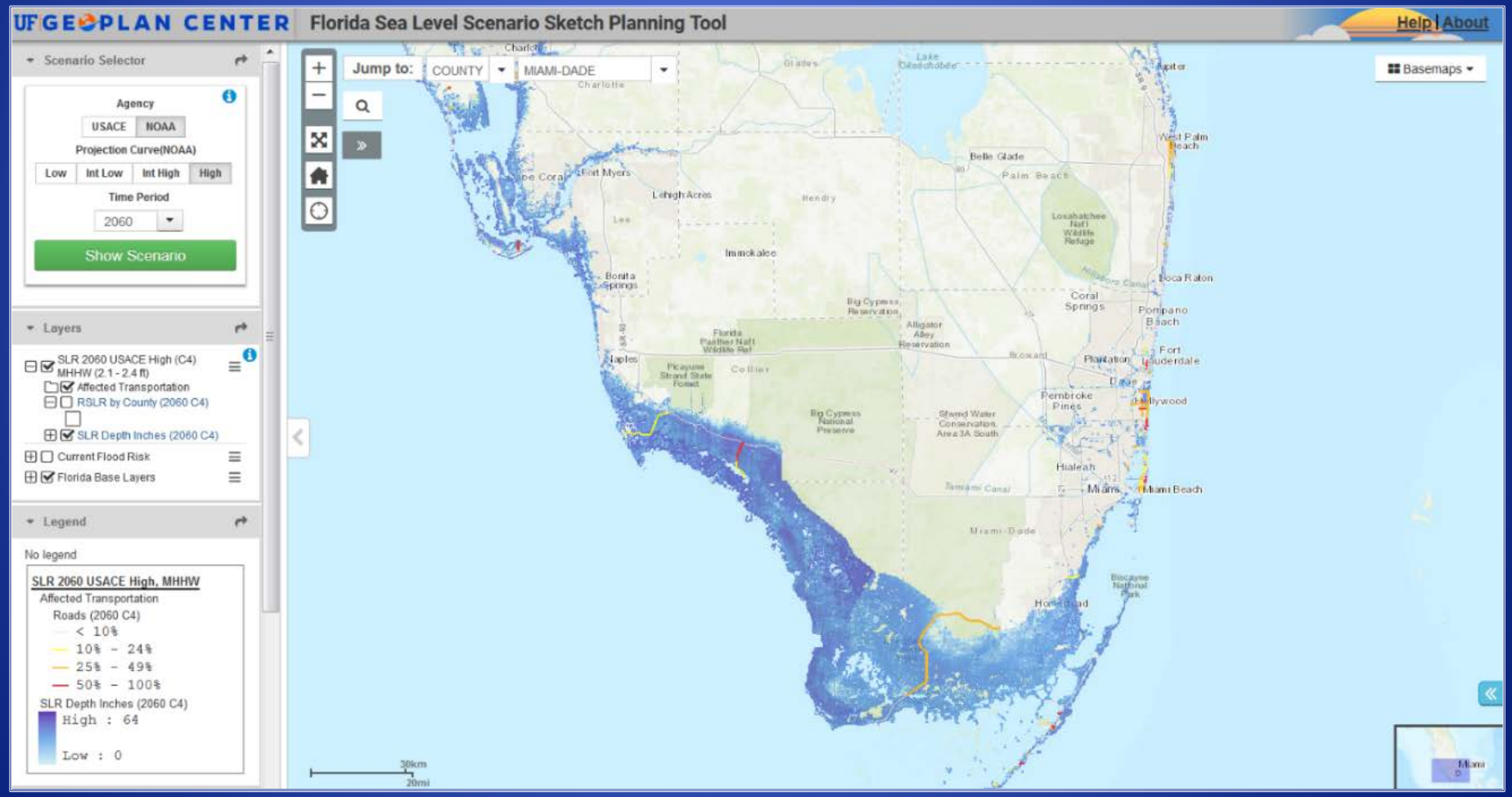






Sea Level Rise Mapping

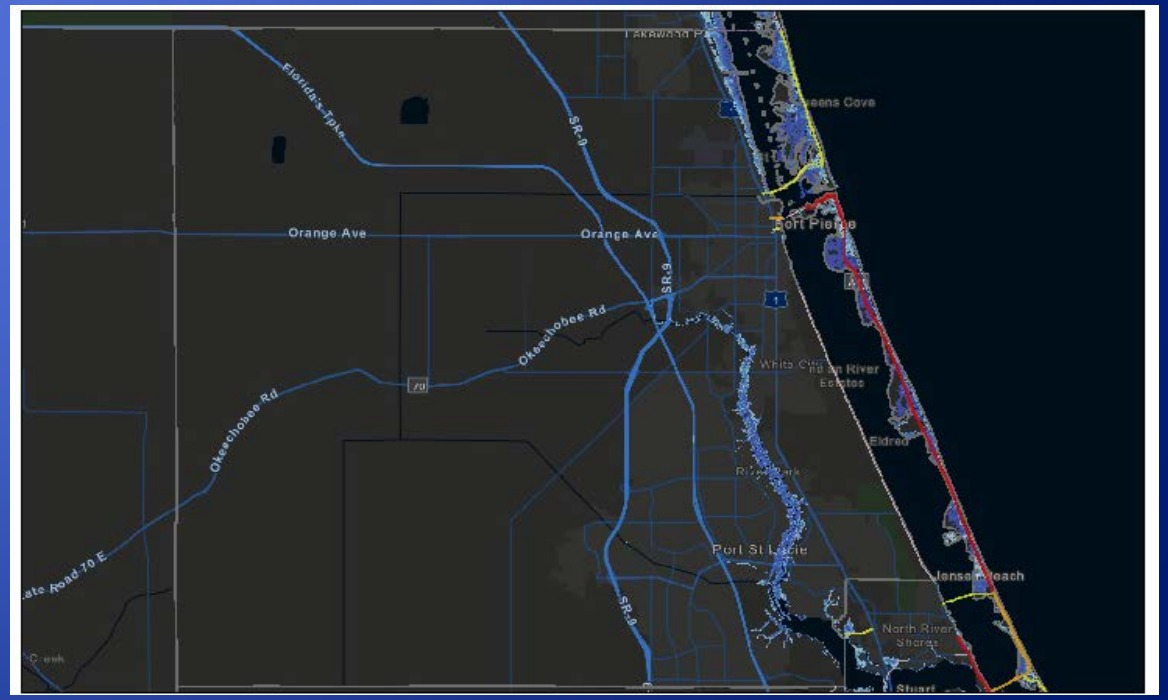
Sea Level Scenario (SLS) Sketch Planning Tool



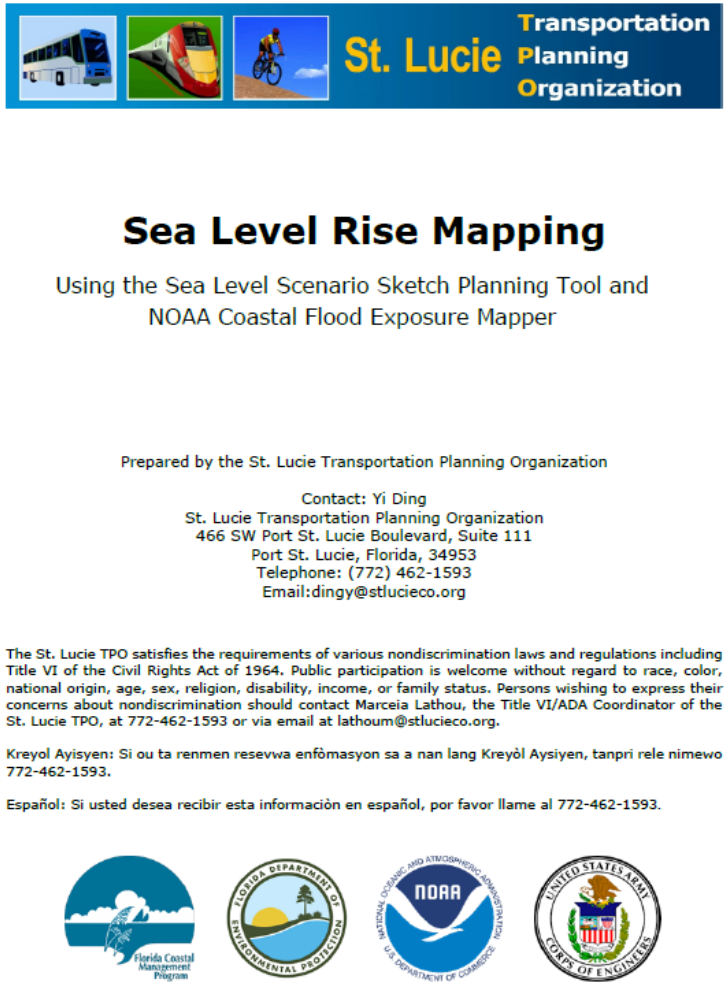
Findings for TPO Area

- SLR begins to show impacts by 2080 (2.6 miles of roadway will experience inundation)
- 14 miles of roadway of inundation by 2100
- Temporal flooding caused by high tide/heavy rain may need more attention
- Next Step - Transportation Asset/Service Vulnerability Assessment

2080 NOAA Int High Projection					
Road Name	From	To	Length of Segment (ft)	Feet Affected	% Affected
N. BEACH CSWY	US-1	Indian River County Line	40852	2337	6%
BINNEY DR	Seaway Dr.	S. Ocean Dr.	3870	640	17%
S. OCEAN DR	Harbour Isle Dr.	Martin County Line	88333	10754	12%
Total			133056	13731	10%
2100 NOAA Int High Projection					
Road Name	From	To	Length of Segment (ft)	Feet Affected	% Affected
S. INDIAN RIVER DR	Savannah Rd.	Martin County Line	61421	366	1%
AVE H	N. 7th St.	Coast	2032	838	41%
AVE C	US-1	N. Indian River Dr.	1197	196	16%
N. BEACH CSWY	US-1	Indian River County Line	40852	8336	20%
BINNEY DR	Seaway Dr.	S. Ocean Dr.	3870	3001	78%
S. OCEAN DR	Harbour Isle Dr.	Martin County Line	88333	61010	69%
SEAWAY DR	US-1	Harbour Isle Dr.	6569	255	4%
Total			204275	74002	36%



Sea Level Rise (SLR) Vulnerability



St. Lucie Transportation Planning Organization

Sea Level Rise Mapping

Using the Sea Level Scenario Sketch Planning Tool and NOAA Coastal Flood Exposure Mapper

Prepared by the St. Lucie Transportation Planning Organization

Contact: Yi Ding
St. Lucie Transportation Planning Organization
466 SW Port St. Lucie Boulevard, Suite 111
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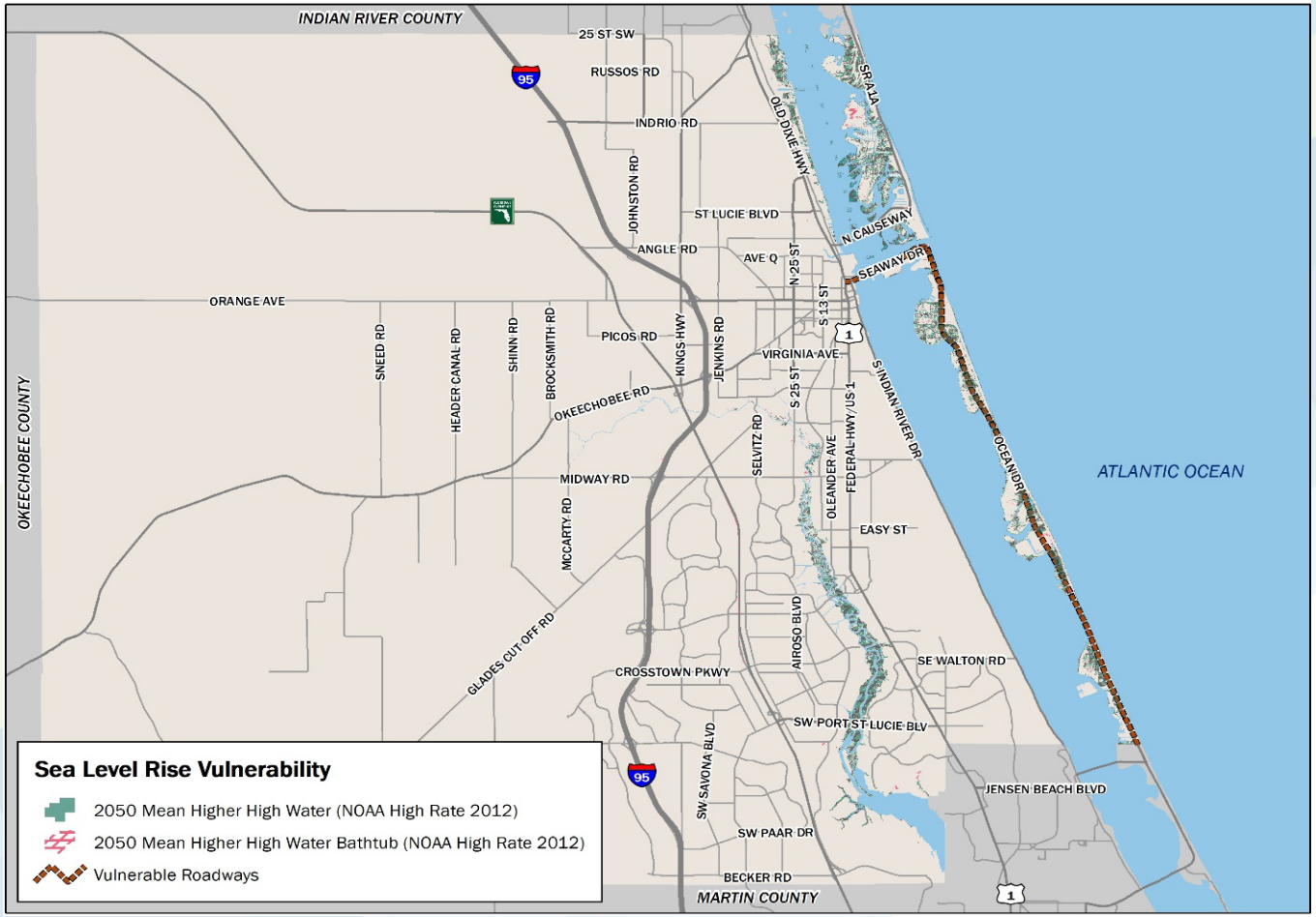
- *In the past 50 years, mean sea level has risen 5.5 inches in the Treasure Coast and Southeast Florida according to National Oceanic and Atmospheric Administration (NOAA) tide gauge data.*
- SLR vulnerability data was done using the University of Florida Sea Level Scenario Sketch Planning Tool and NOAA Coastal Exposure Mapper.

Sea Level Rise (SLR) Vulnerability

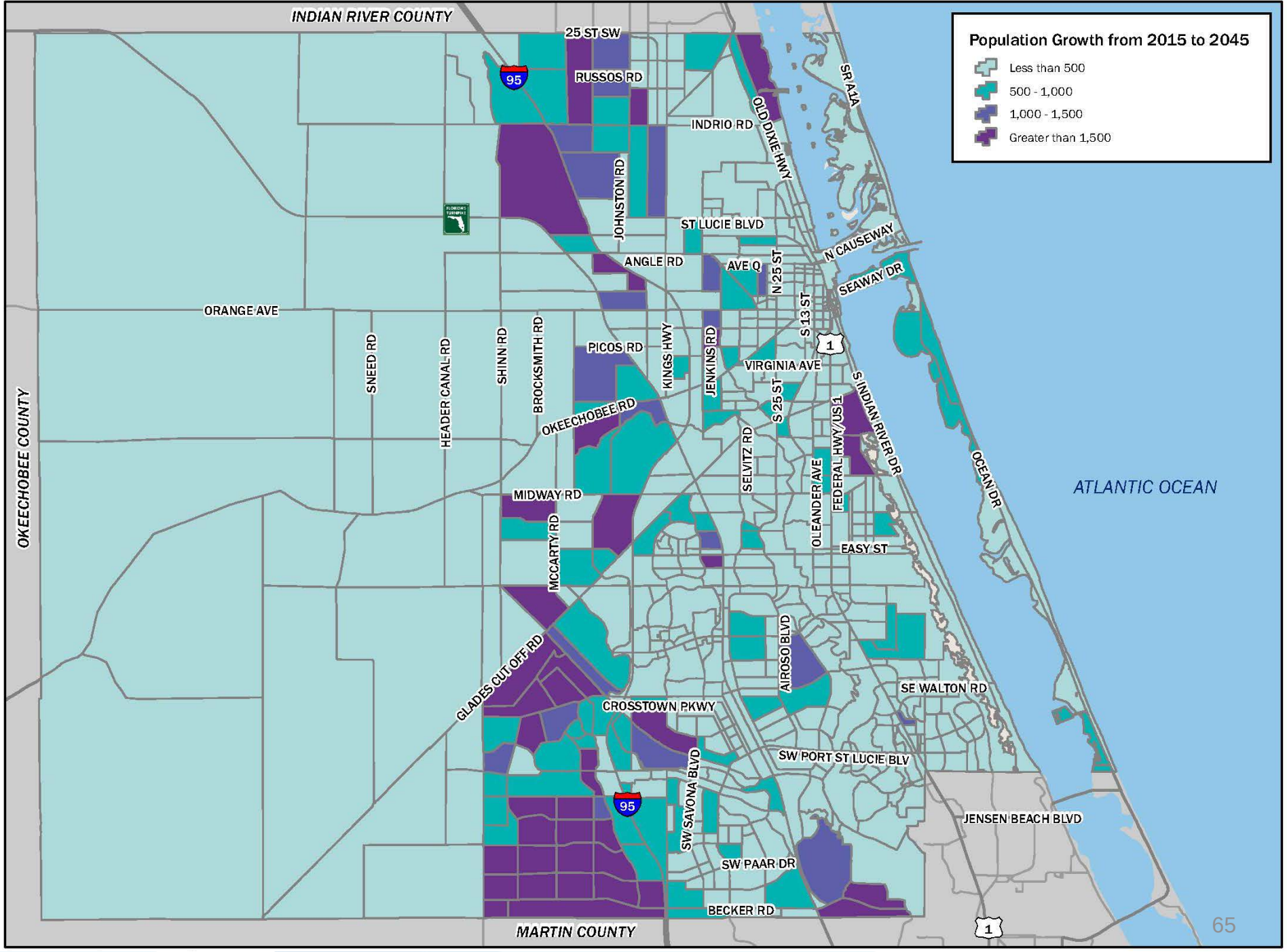
- The 2012 NOAA High Rate, the *most aggressive projection*, was utilized.
- In the year **2050**, minor impacts to the County's roadways could be experienced.
- Less aggressive projections prepared by NOAA and USACE showed little to impact on the County's roadways projected by 2050.



Goal 4: Provide Equitable, Affordable, & Sustainable Urban Mobility

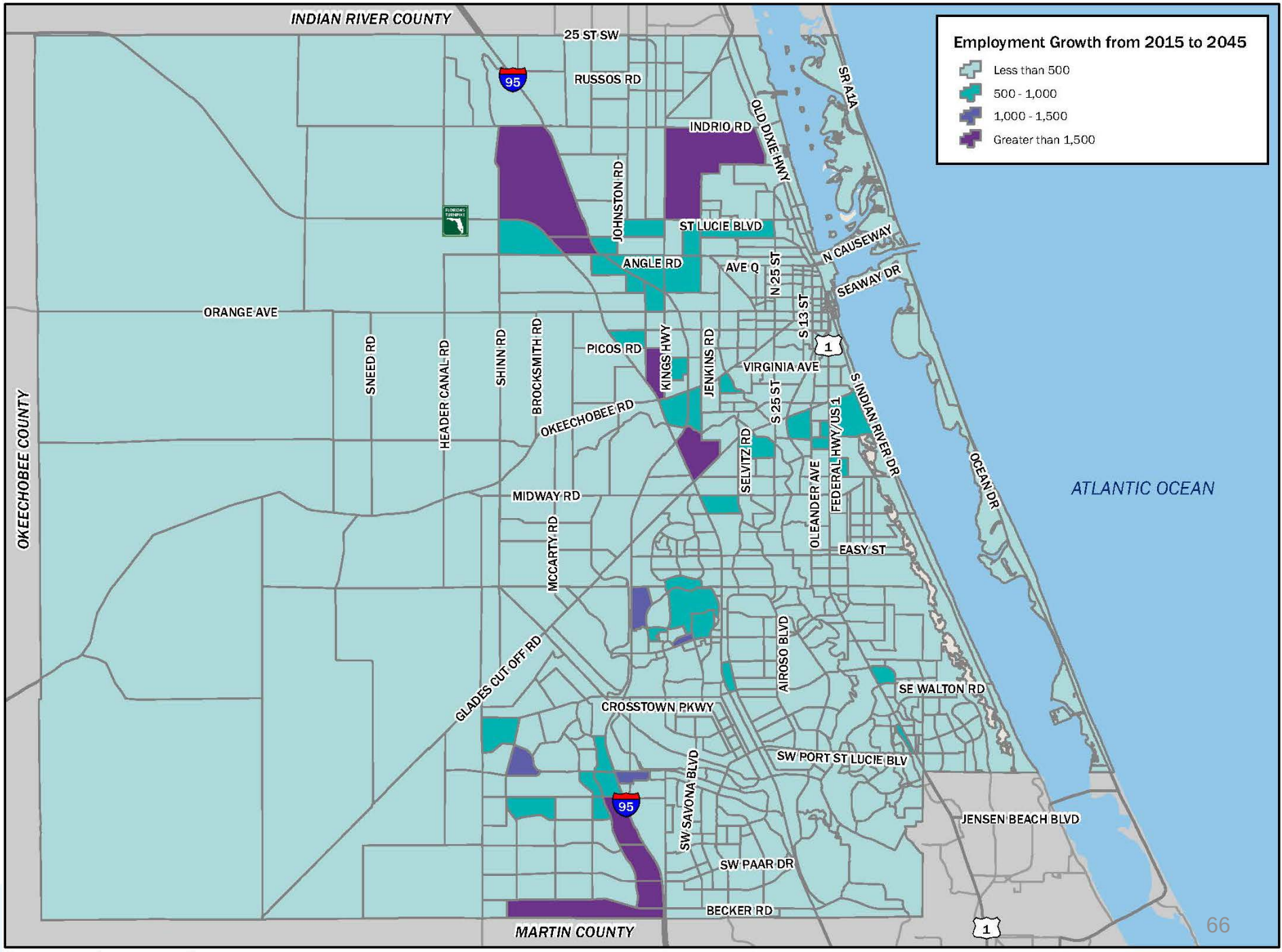
Objectives	Performance Measures
Support healthy living strategies, programs, and improvements to create more livable communities	Walking modal share
	Bicycle modal share
	Transit modal share
Ensure community participation is representative	Opportunities for engagement in traditionally underserved areas
Provide for transportation needs of transportation disadvantaged	% of low-income, older adults, persons with disabilities within ¼ mile of transit route
Make transportation investments that minimize impacts to natural environment and allocate resources toward mitigation	Number of additional roadway lane miles of impacting environmentally-sensitive areas
Improve transportation system's stability/resiliency in event of climate change, emergencies, or disasters	% of roadway lane miles subject to climate change impacts

Population Growth from 2015 to 2045



SMART MOVES 2045

Employment Growth from 2015 to 2045

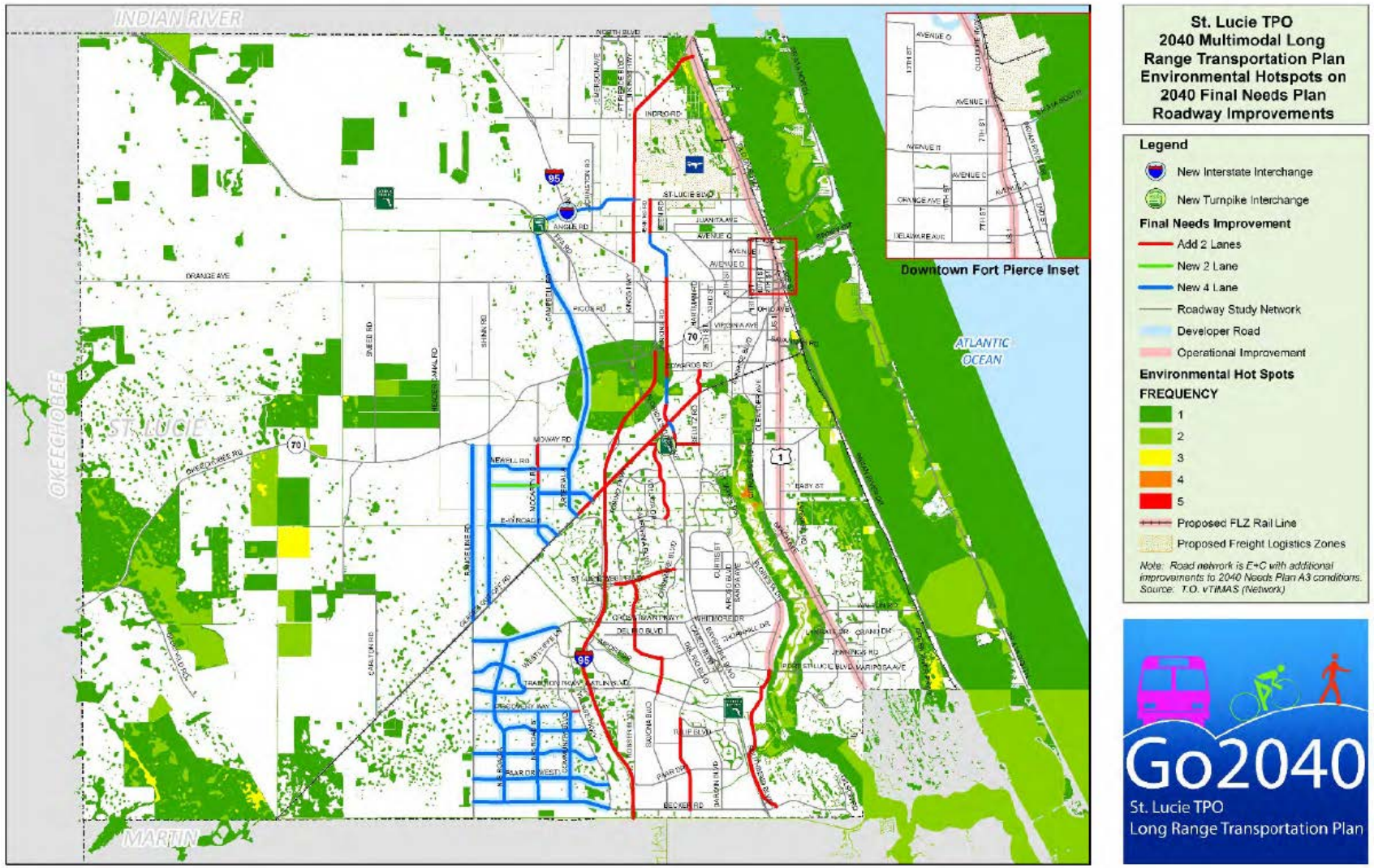


SMART MOVES 2045

Project Ranking Criteria

Goals	Objectives	Project Ranking Criteria	Score
Support Economic Activity	Enable the efficient movement of people and goods on the roadway network	0.85 - 1.00 volume-to-capacity ratios 1.00 - 1.20 volume-to-capacity ratios Greater than 1.20 volume-to-capacity ratios	1 3 5
		Is the project on the Designated Freight Network? Yes	5
	Optimize the management and operations of the transportation system	Is the project on the TSM&O Strategic Network/ATMS Network? Yes	4
	Maximize the efficiency and effectiveness of the current transit system and improve access to destinations that support economic growth	Does project increase service hours or frequency? Yes	3
		Is the project within ¼ mile of a Major Activity Center(s)? Yes	3
Provide travel choices	Encourage walking, cycling, and other micromobility options	Does project fill a gap/enhance existing sidewalk infrastructure? Yes	4
		Does project fill a gap/enhance existing multi-use pathways infrastructure? Yes	4
		Does project fill a gap/enhance existing bike lanes infrastructure? Yes	4
	Improve transit accessibility	Is the project on a transit route? Yes	4
		Is the project within 1/4 mile of a shared bike locations and/or within the area for designated areas for e-scooter riding? Yes	4
Maintain the transportation system	Maintain condition of existing roadway transportation assets	Does project improve pavement condition? Yes	10
		Does project improve bridge condition? Yes	5
	Maintain condition of existing transit assets	Does project replace aging fleet? Yes	5
Provide equitable, affordable, and sustainable urban mobility	Support healthy living strategies, programs, and improvements to create more livable communities	Does project add a sidewalk/multi-use pathways? Yes	3
		Does project add a bicycle lane? Yes	3
		Does project increase service hours or frequency? Yes	3
	Ensure community participation is representative	Attendance in public engagement from an Environmental Justice area? Yes	2
	Provide for transportation needs of transportation disadvantaged	Is project in an Environmental Justice area? Yes	5
	Make transportation investments that minimize impacts to natural environment and allocate resources toward mitigation	Project is not in an environmentally-sensitive area Project is in environmentally-sensitive area	2 1
	Improve transportation system's stability/resiliency in event of climate change, emergencies, or disasters	Is project a vulnerable roadway due to sea level rise? Yes	2
Improve safety and security	Improve safety and security in the Highway System	Does project address a motorized safety issue? Yes	10
	Improve safety and security in the Transit System (if applicable)		
	Improve safety and security in the Non-Motorized Sy	Does project address a non-motorized safety issue? Yes	10

Map 3-13: LRTP Roadway Needs Projects with Potential Impacts to Environmentally-Sensitive Areas



St. Lucie TPO 2040 Multimodal Long Range Transportation Plan Environmental Hotspots on 2040 Final Needs Plan Roadway Improvements

Legend

- New Interstate Interchange
- New Turnpike Interchange

Final Needs Improvement

- Add 2 Lanes
- New 2 Lane
- New 4 Lane
- Roadway Study Network
- Developer Road
- Operational Improvement

Environmental Hot Spots

FREQUENCY

- 1
- 2
- 3
- 4
- 5

- Proposed FLZ Rail Line
- Proposed Freight Logistics Zones

Note: Road network is E+C with additional improvements to 2040 Needs Plan A3 conditions.
Source: T.O. vTIMAS (Network)

Go2040
St. Lucie TPO
Long Range Transportation Plan

Transportation Asset/Service Vulnerability Assessment

- Coordinate with local agencies
- Update the environmentally-sensitive areas

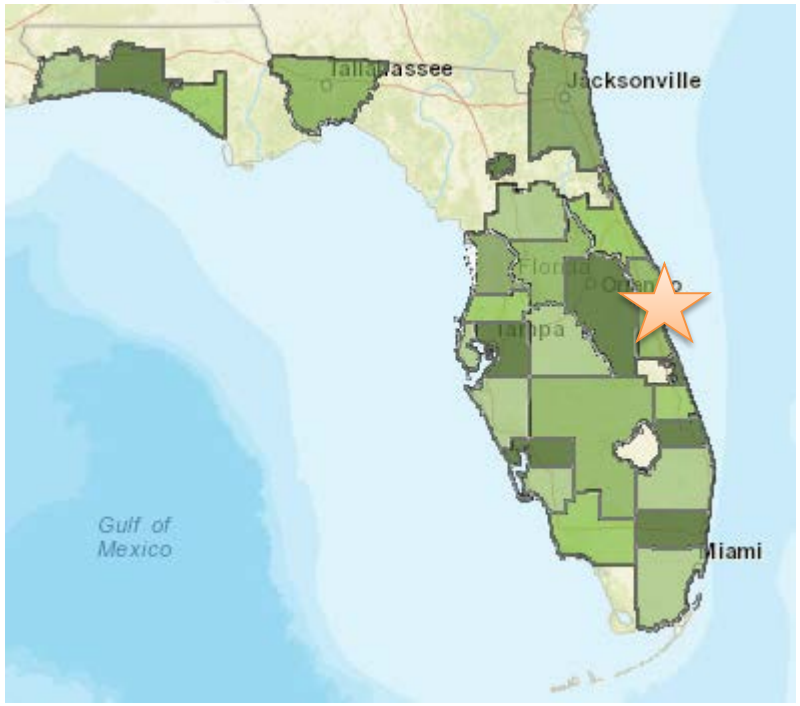


St. Lucie Transportation Planning Organization

Thank You!

Peter Buchwald, AICP
Executive Director
buchwaldp@stlucieco.org
(772) 462-1593

Space Coast TPO



RESILIENCY & THE SPACE COAST TPO

Sarah Kraum

Space Coast Transportation Planning Organization

SEA LEVEL RISE VULNERABILITY ASSESSMENT (FEB 2018)

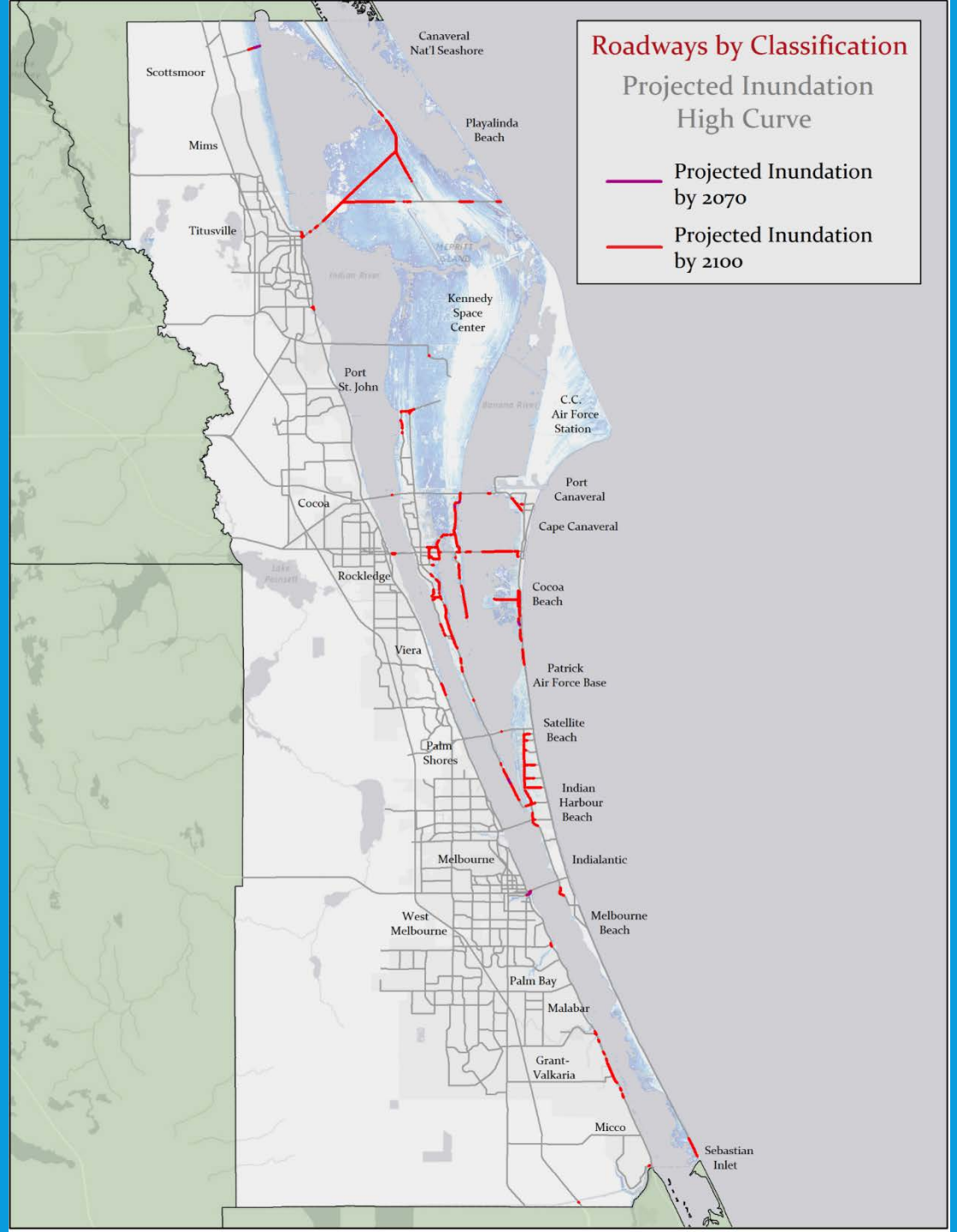
- Project Objectives:
  - Assess vulnerabilities of transportation infrastructure to increasing sea levels
  - Qualitative discussion of the potential stormwater impacts
  - Provide recommendations for incorporating resiliency and sea level scenarios into transportation plans

STATE OF FLORIDA · DEPARTMENT OF TRANSPORTATION

UF GEOPLAN CENTER

WHY?

- Coastal Community
- Trains, Planes, Automobiles, Rockets and Boats!
- Roads are for more than cars
- Planning and Implementation can take years
- Better provide insight and recommendations to locals and state
- Conversation Starter



Most Impacted Roadways

SR 3

SR 520

SR A1A

Beach Rd.

N Banana River Dr.

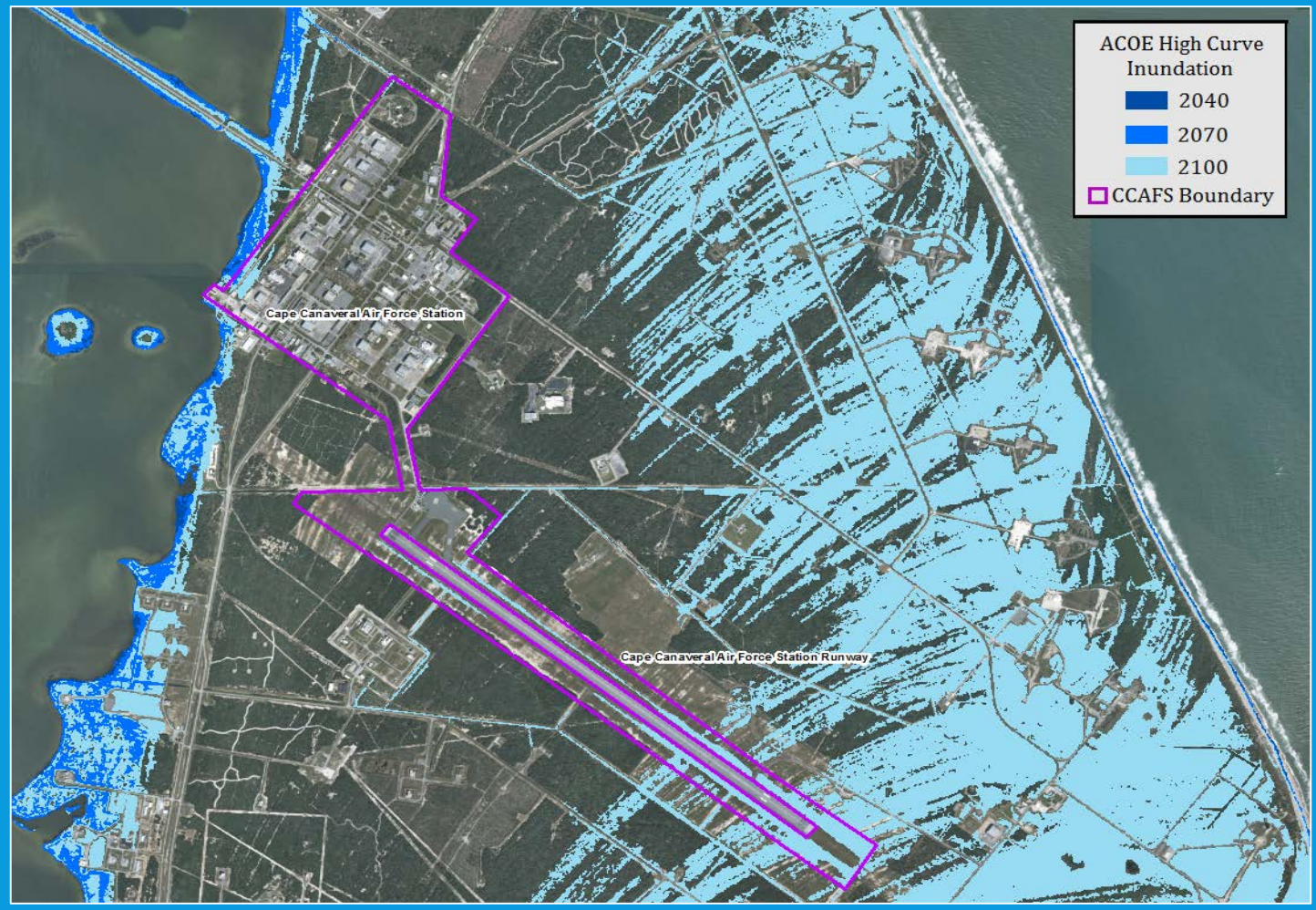
Newfound Harbor

S. Patrick Drive

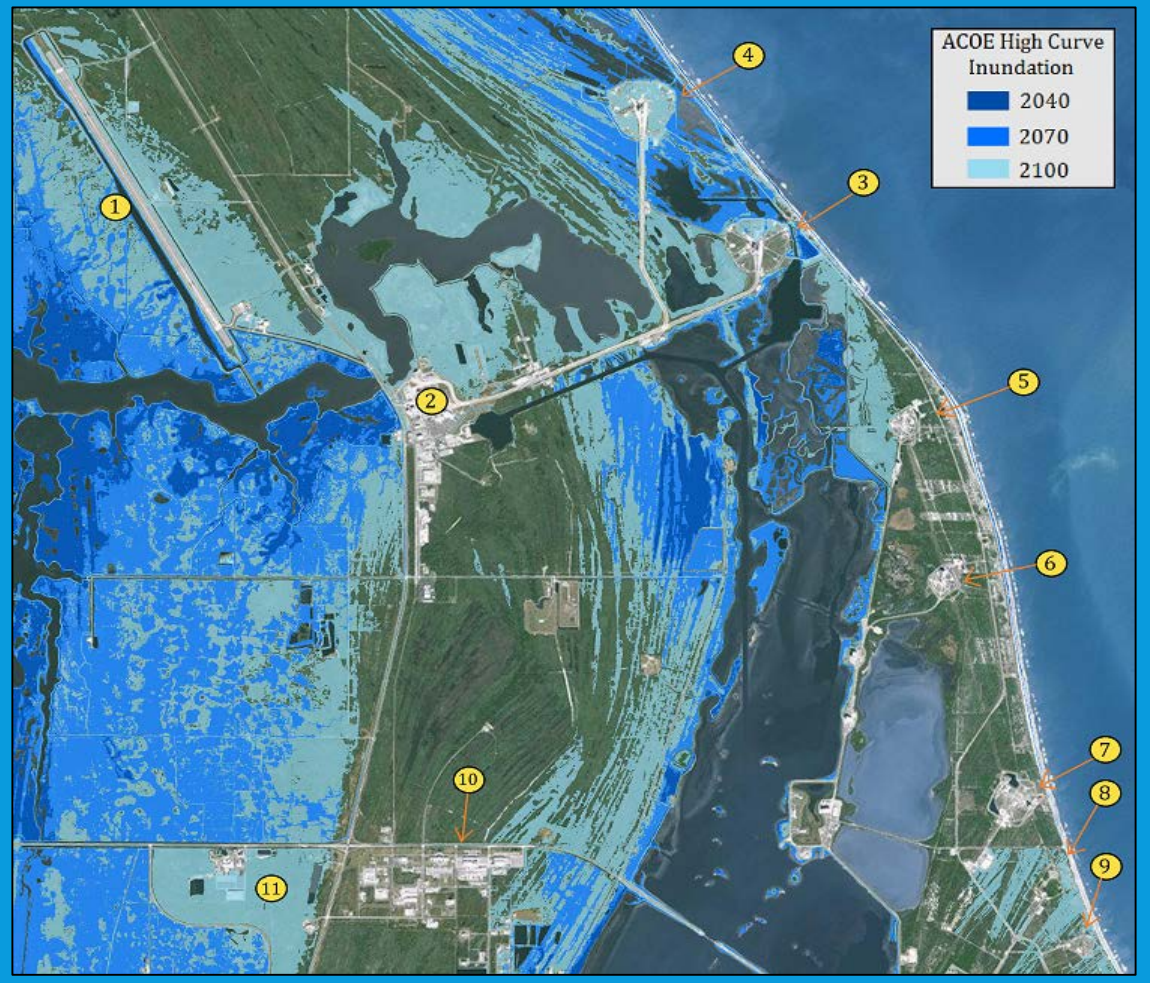
S. Tropical Drive

S. Courtenay Pkwy.

CANAVERAL AIR FORCE BASE



KENNEDY SPACE CENTER



2045 LONG RANGE TRANSPORTATION PLAN
(TO BE ADOPTED SEPTEMBER 2020)

- Goals & Objectives
- Needs List Prioritization Methodology
- Environmental Resource Coordination
- Assessment of Potential Environmental Issues on Needs List
- Process for Regular Engagement of Environmental Stakeholders

Metric	Cell Color/Text
Environmental resource outside of project influence area	not within influence area or N/A
Environmental resource within 3,000' of project	within potential influence area
Environmental resource within 1,000' of project	near/in proximity

NEXT STEPS FOR THE SPACE COAST TPO

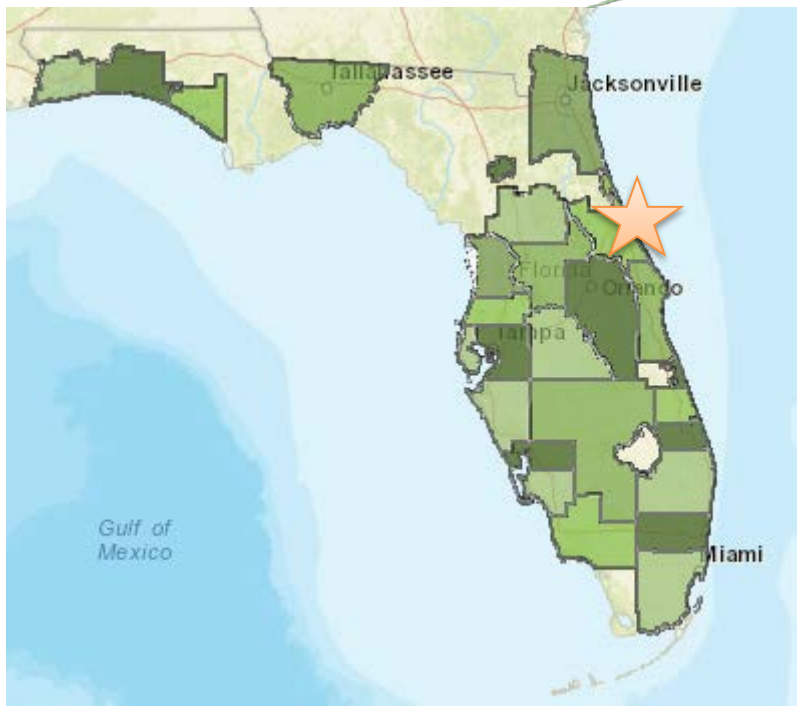
- Space Coast TPO Resilient Transportation Master Plan (Scope approval in October)
- Project Prioritization Methodology
- Continued focus in Board Strategic Plan
- Future Training Opportunities
- Public Engagement Opportunities

- Regional Coordination via the East Central Florida Regional Planning Council
  - East Central Florida Regional Resiliency Action Plan
  - East Central Florida Regional Resiliency Collaborative

Break

+ Poll Everywhere

River-to-Sea TPO



The River to Sea

Transportation Planning Organization

Peer Exchange Series:

Using the MPO Planning Process to Increase Transportation System Resilience

Lightning Round: Resilience Planning at Florida MPOs

August 27, 2020

Role of the River to Sea TPO

- **Planning area includes Volusia & Flagler Counties**
  (just over 600k population)
- **Geography**
  - **65 miles of Atlantic coastline**
  - **Intracoastal Waterway**
  - **St. Johns River to the East**
  - **High points are 58 to 120 feet**
    (most areas are under 40 feet)
  - **Environmental corridor**
- **Development – coastal/southwest**

Partnerships

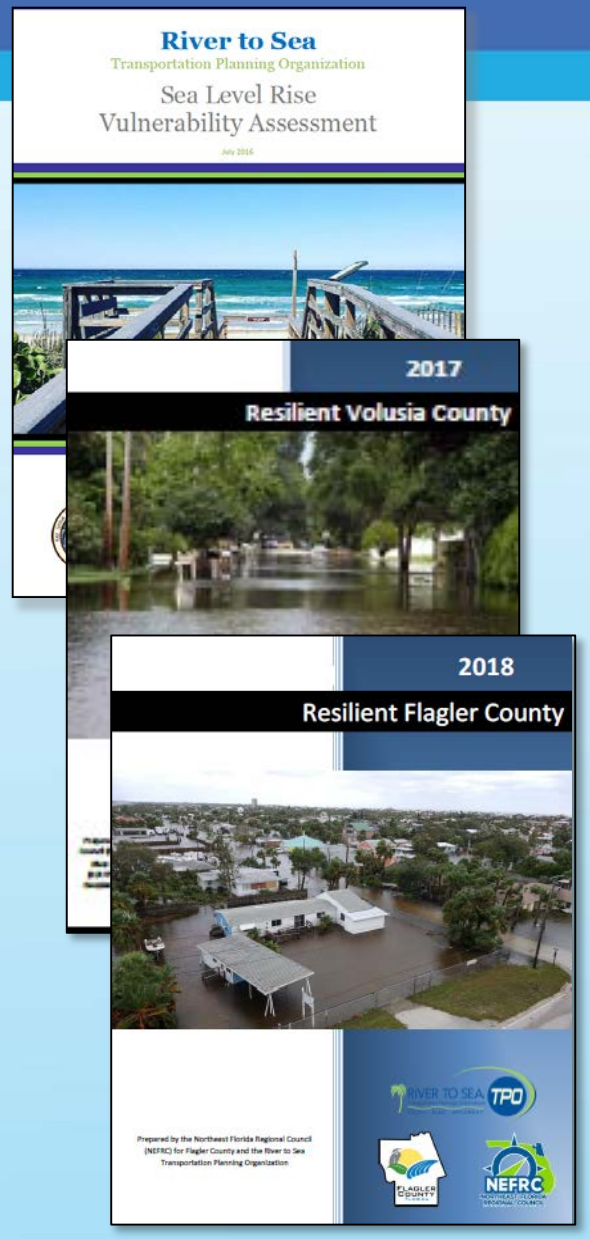
East Central Florida Regional Planning Council

- North East Florida RPC
- Flagler & Volusia County Governments *(Emergency Operations /Growth Management)*
- University of Florida GeoPlan Center
- Florida Department of Environmental Protection
- Florida Department of Transportation
- Florida Sea Grant
- Stetson University

3-C Planning

CONNECT2045
YOUR COMMUNITY TRANSPORTATION PLAN

Activity / Event	Date Completed
Sea Level Rise Vulnerability Assessment – Phase 1	September, 2016
Annual Planning Retreat – *"Proactive Strategies to Deal with Sea Level Rise"*	March, 2017
Resilient Volusia County Assessment - Phase 2	September 2017
Resilient Flagler County Assessment - Phase 3	September 2018
Connect 2045 Long Range Transportation Plan - Resiliency Alternative & Major Theme Emphasis	September 2020

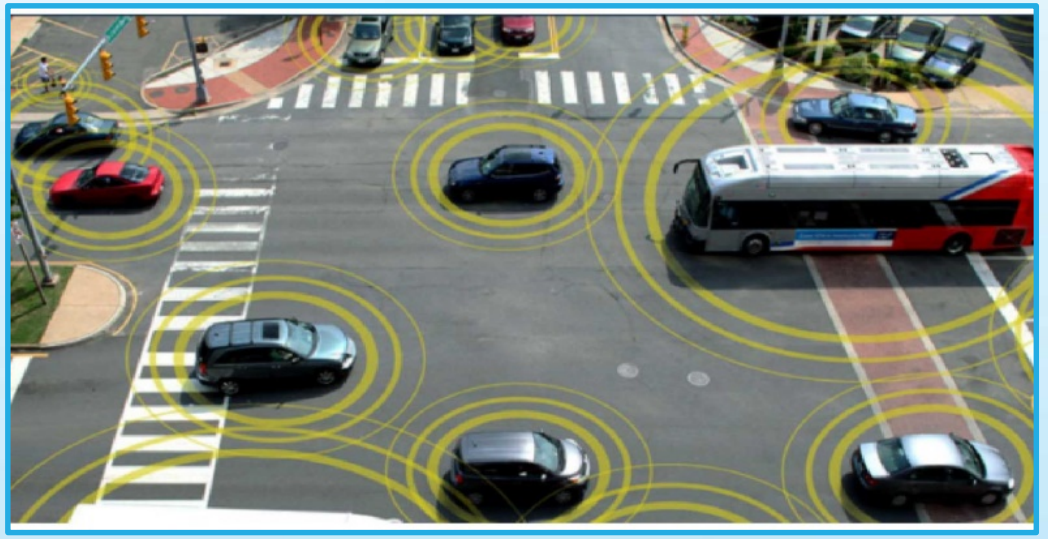


Ongoing Participation in the East Central Florida Regional Resiliency Collaborative

Three Focus Areas

CONNECT2045 YOUR COMMUNITY TRANSPORTATION PLAN

- Technology
- Resiliency
- Funding



Planning Considerations

CONNECT2045 YOUR COMMUNITY TRANSPORTATION PLAN

Resiliency…

- Preservation of the *existing* system is becoming more costly
  - Existing facilities are subject to damage (flooding, extreme temperatures)
  - Construction costs increase (developing parallel facilities is costly and funding is limited)
  - Stormwater systems are more substantial
  - Events are Unpredictable – causing diversion of funding
- Construction costs for *new* highways & bridges is increasing
- Some proactive measures have negative impacts on funding
  - Electric & fuel efficient vehicles reduce revenue

Resiliency

CONNECT2045 YOUR COMMUNITY TRANSPORTATION PLAN

- Florida has been impacted by **40% of all U.S. hurricanes**
- **Six million people evacuated** during Hurricane Irma, the largest evacuation in U.S. history
- Tidal flooding across Florida has i**ncreased by more than 350%** since 2000
- Inland flooding is estimated to result in average **damages of up to $1.4 billion to U.S. bridges** by 2050
- Nationally, the total annual cost from temperature and precipitation related **damage to paved roads is estimated to be $20 billion**

Next Steps

CONNECT2045 YOUR COMMUNITY TRANSPORTATION PLAN

1

Continue to address critical funding shortfalls

2

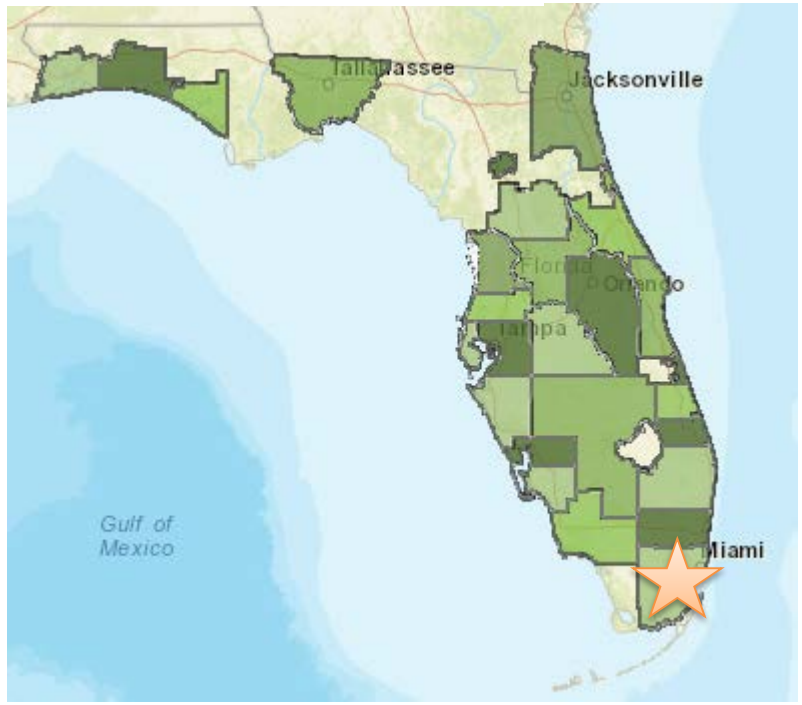
Expand discussions from adaptation to prevention

"It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."

Charles Darwin

Miami-Dade TPO

Miami-Dade Transportation Planning Organization



Resilience Planning Efforts Miami-Dade TPO

Lisa Colmenares, AICP
Program Development Manager
August 27, 2020

Miami-Dade Transportation Planning Organization

AGENDA

- 2045 LRTP Goals
- Resiliency, Environment, Sustainability, Livability and Climate Change Considerations in the 2045 LRTP
- Major Resiliency Efforts
- The SMART Plan

2045 LRTP Goals

GOAL 1

Maximize Mobility Choices Systemwide

GOAL 2

Increase the Safety of the Transportation System for all Users

GOAL 3

Increase the Security of the Transportation System for all Users

GOAL 4

Support economic vitality

GOAL 5

Protect and Preserve Environment and Quality of Life and Promote Energy Conservation

GOAL 6

Enhance the Integration and Connectivity of the System, Across & Between Modes, for People and Freight

GOAL 7

Optimize Sound Investment Strategies for System Improvement and Management /Operations

GOAL 8

Improve and Preserve Existing Transportation System

Considerations in the 2045 LRTP

- Resiliency
- Environment
- Sustainability
- Livability
- Climate Change

Major Resiliency Efforts

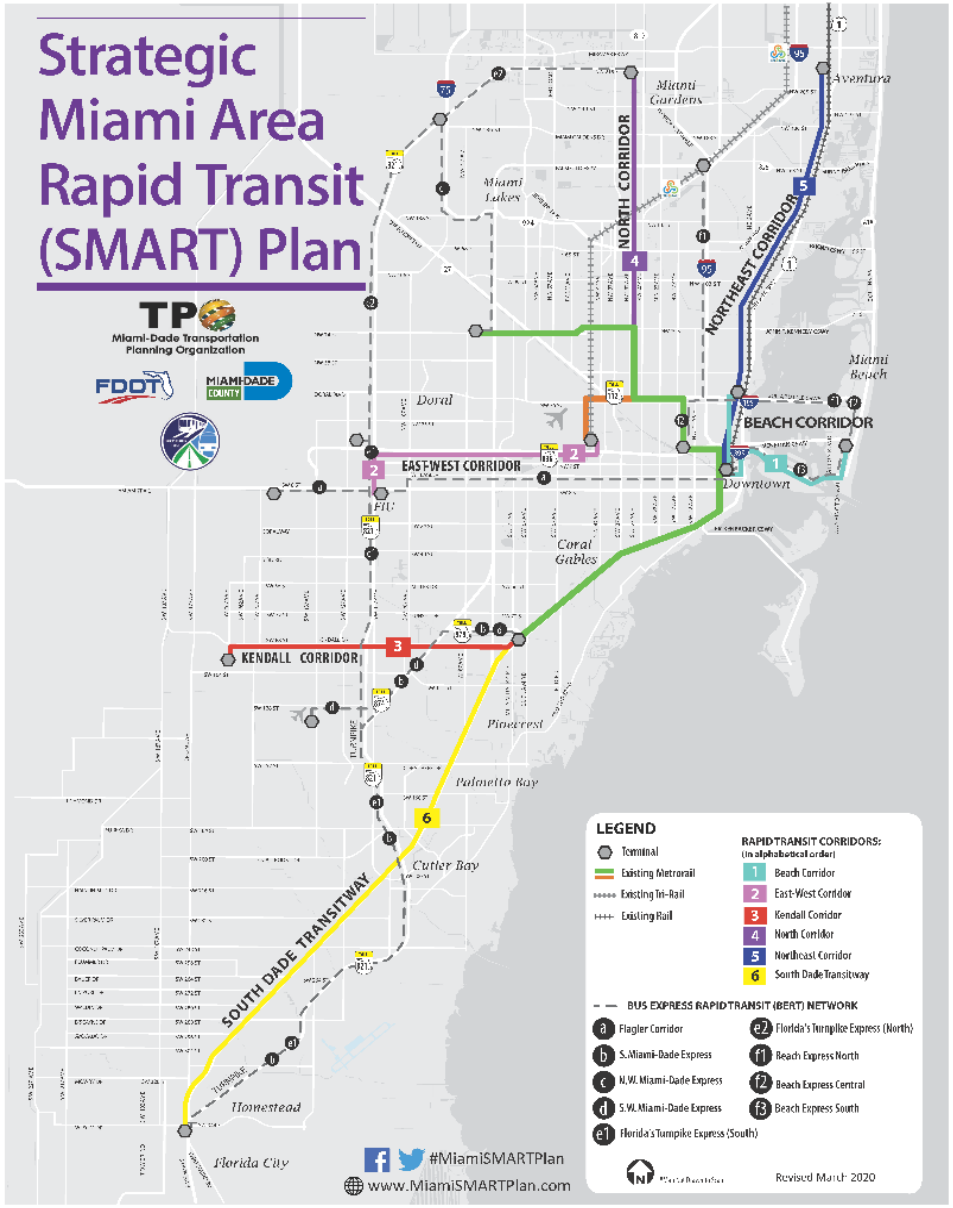
- Resilient 305: Miami's Strategy to Effective Tackle Emerging Global Challenges and Trend
- Miami-Dade GreenPrint: Miami-Dade's design for a Sustainable Future
- FHWA Climate Resilience Pilot Program: South Florida The Area's Significant Transportation System and its Vulnerability to Climate Stressors

Photo: City of Miami and Miami Beach: 2018 Champion City Mayor Bloomberg's Challenge

Greater Miami and the Beaches Resiliency Strategy Report: Discovery Areas

The SMART Plan: Responsible Land Use and Transportation Strategies

- Regional strategic vision
- Multiple transportation options
- Integrate technology planning and prioritize investments
- Support existing communities and value neighborhoods
- Increase first-last mile connections
- Increase transit ridership
- Improve connectivity and mobility on the existing system
- Supports the future population and employment growth anticipated in our region



"We are one region and we address our needs best, when we address them together."

Honorable Oliver G. Gilbert III, Miami-Dade TPO Chairman

Questions?

Lisa Colmenares, AICP
Program Development Manager
Lisa.colmenares@mdtpo.org
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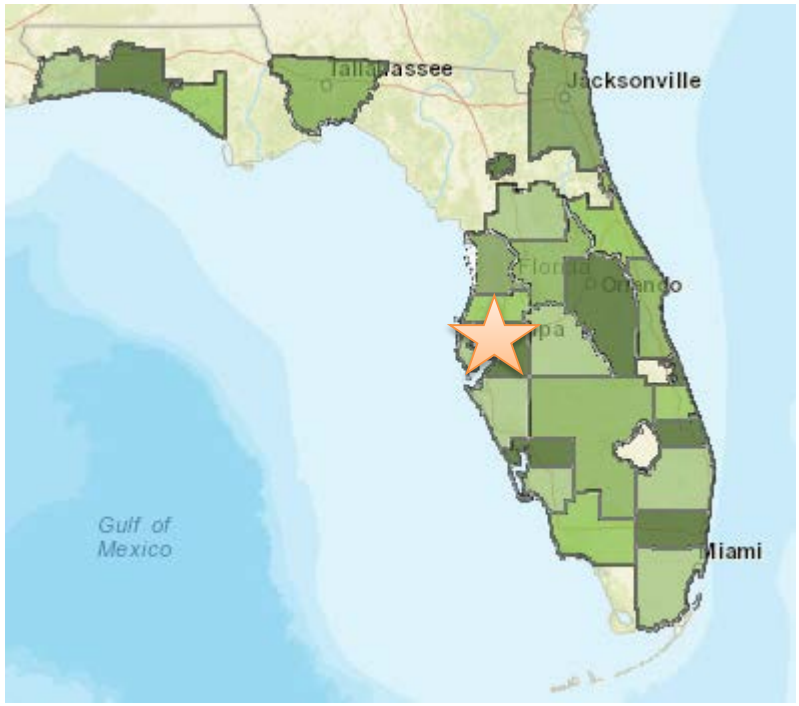
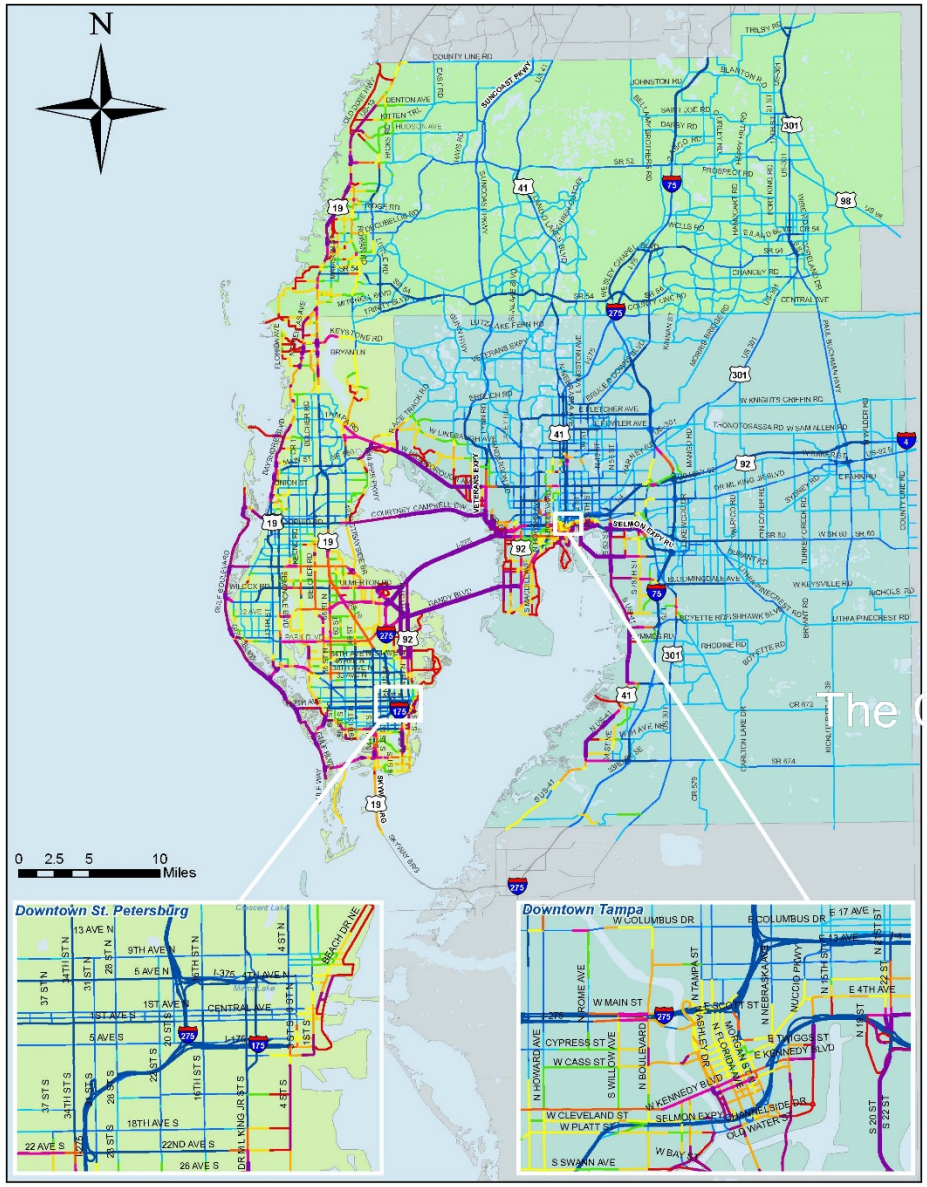
Hillsborough MPO

Hillsborough MPO
Metropolitan Planning
for Transportation



Hillsborough MPO
Metropolitan Planning
for Transportation

Hillsborough MPO
Metropolitan Planning
for Transportation



High Criticality:

- Regional mobility
- Connectivity
- Equity
- Emergency operation

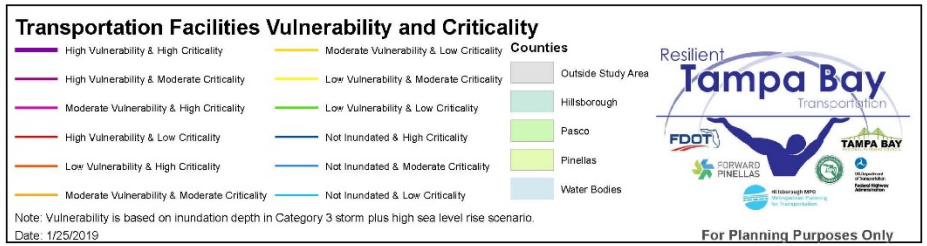
High Vulnerability:

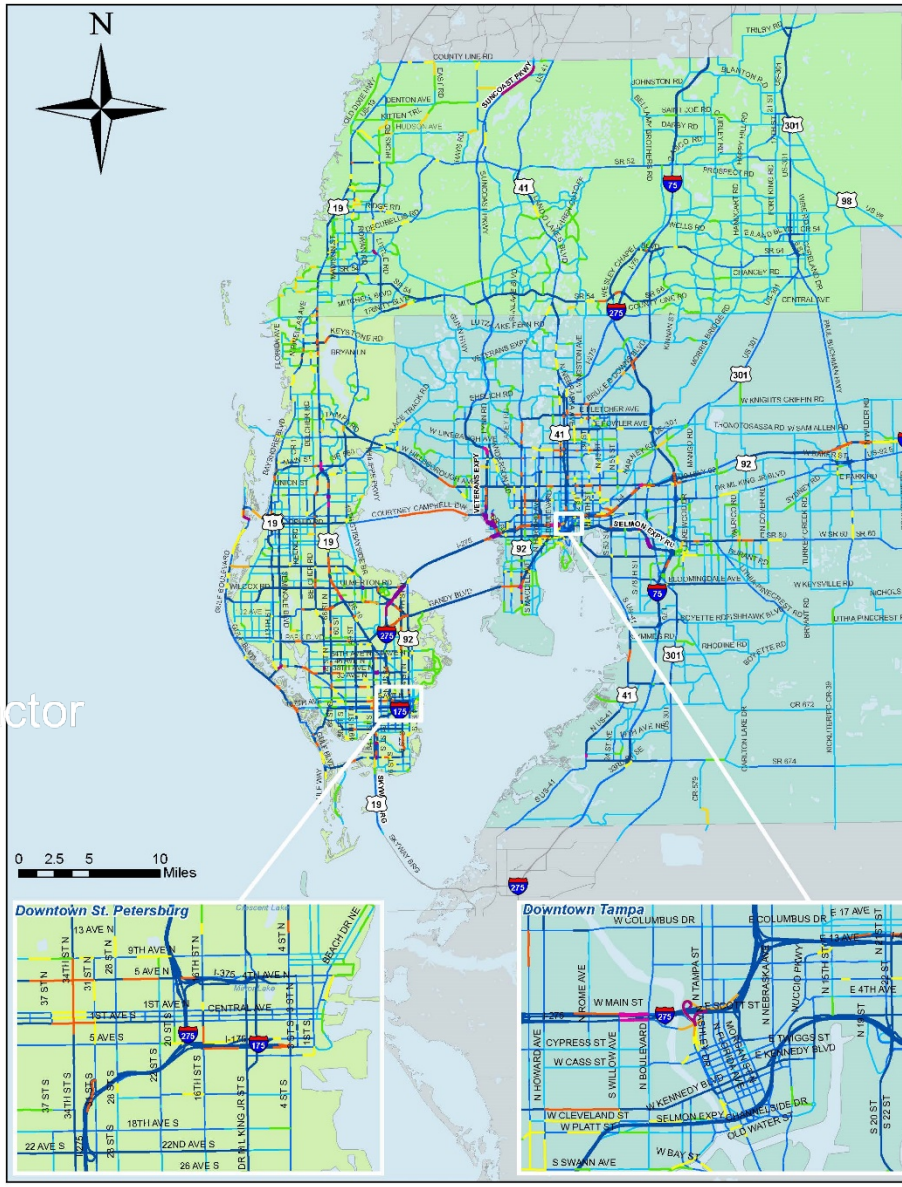
Inundation greater than or equal to **11 feet** for either

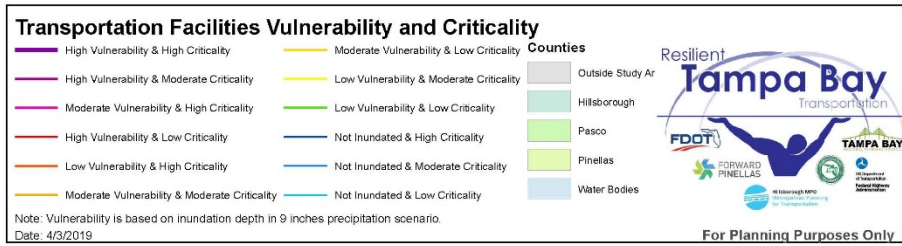
- Category 3 storm plus high sea level rise scenario
- 9 inches precipitation scenario

A community's tolerance to risk is important.

The Community's Risk Tolerance is a factor



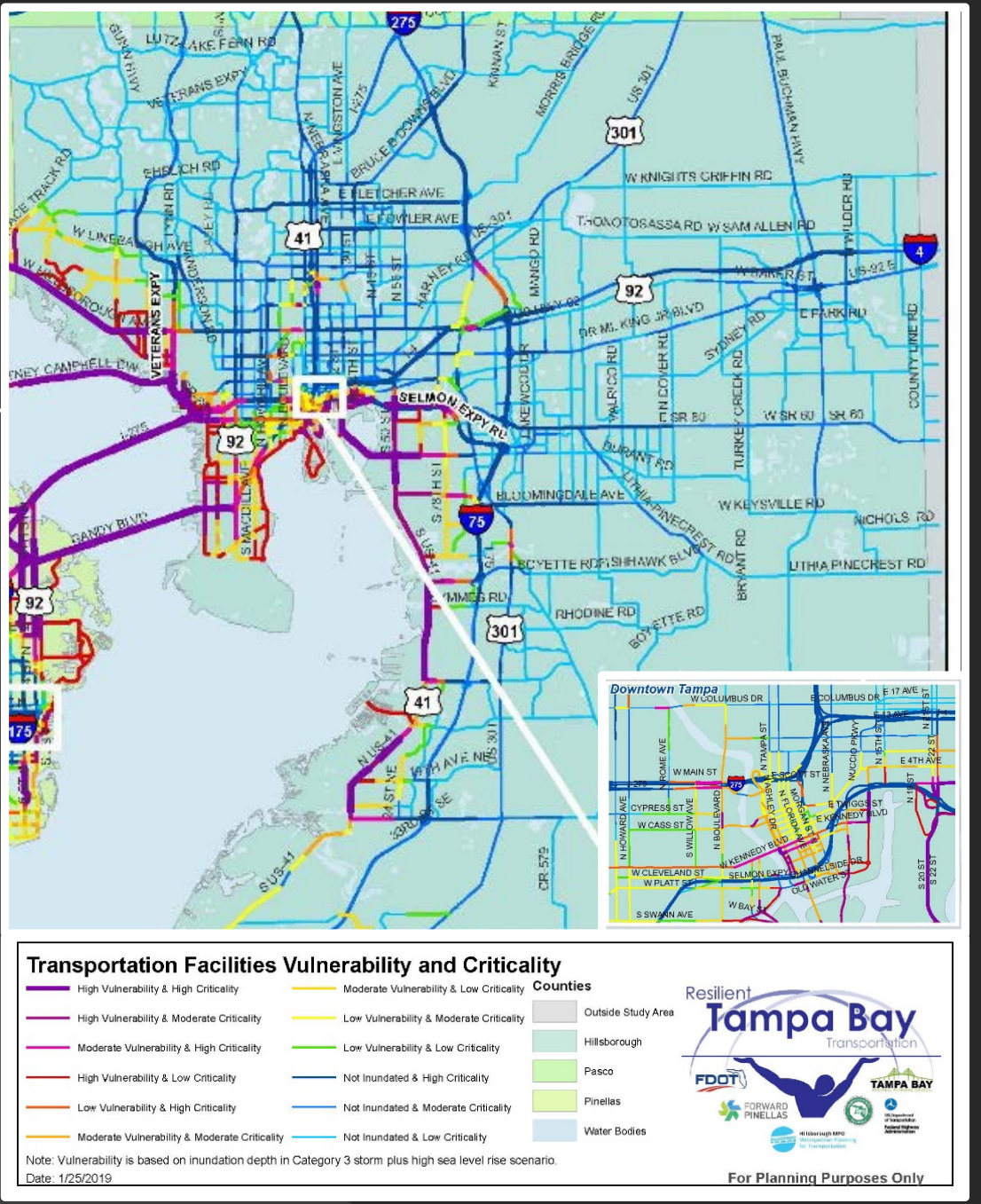




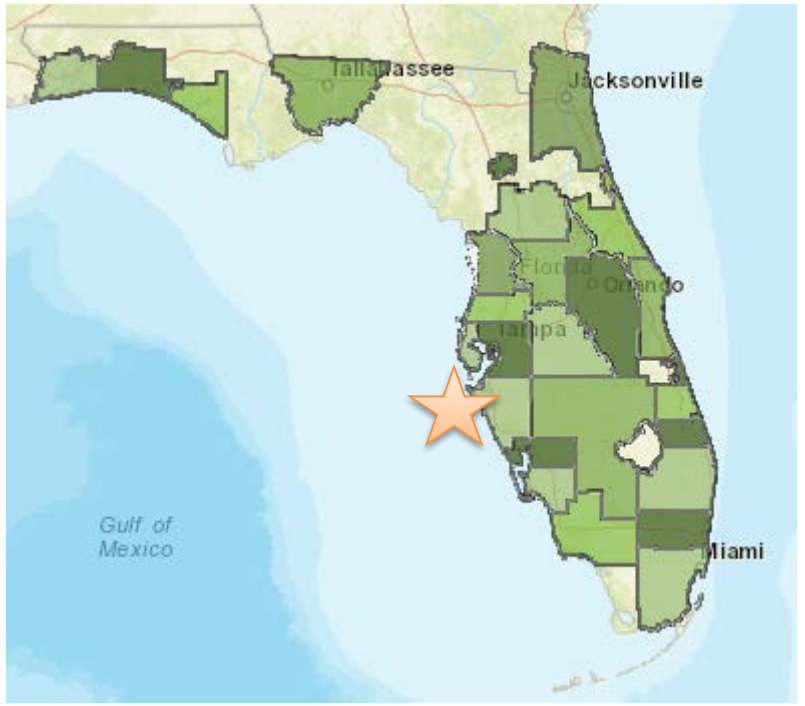
Resiliency to Major Storms

Funding for Stormwater Improvements

- Current Funding: $46m/yr
  - Local government CIPs & FDOT work program
- Additional Funding for Resilience:
  - Additional stormwater drainage would require investment of $22m/yr
  - Pavement, profile, wave attenuation would require investment of $72m/yr



Forward Pinellas



FORWARD PINELLAS
Integrating Land Use & Transportation

Lightning Round: Resilience Planning at Forward Pinellas

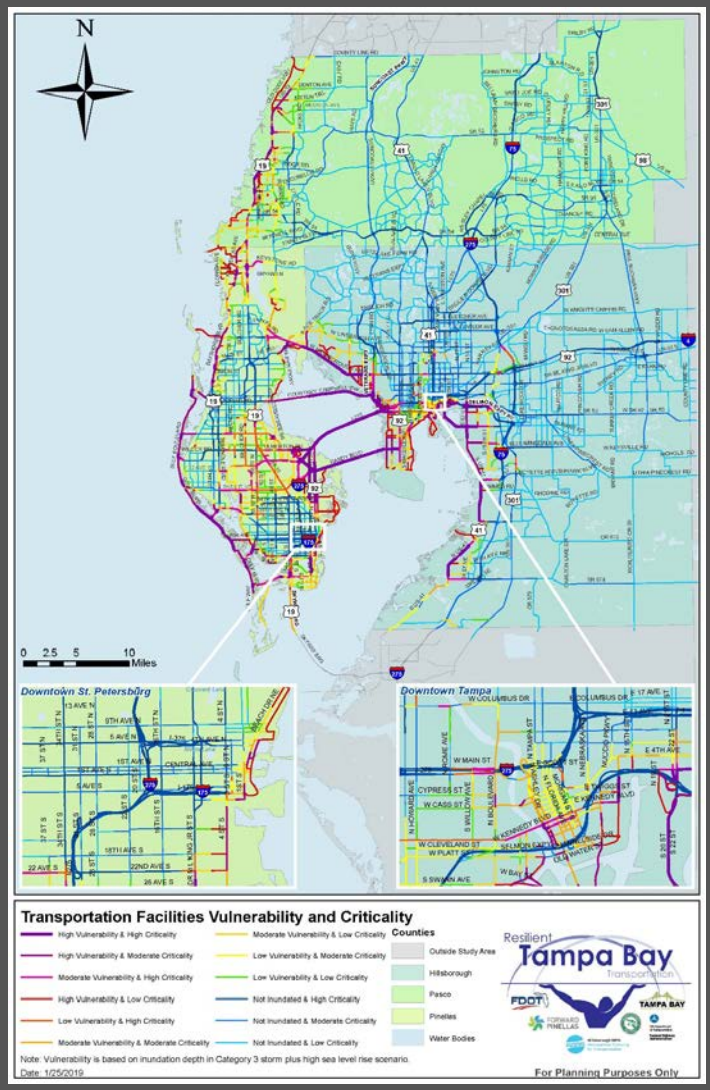
Peer Exchange: Using the MPO Planning Process to Increase Transportation System Resilience

August 27, 2020

Resilience Planning at Forward Pinellas

- Resilient Tampa Bay: Transportation Study findings incorporated in the Advantage Pinellas Plan
  - Incorporated adaptation measure costs into 2 planned projects that were located on highly vulnerable and highly critical corridors

- Forward Pinellas Board recently adopted changes to the Multimodal Project Prioritization Criteria to better align funding priorities with the Advantage Pinellas Plan
  - 10% of point total is awarded to projects that address various aspects of climate resilience



Resilience Planning at Forward Pinellas

- Gateway/Mid-County Master Plan
  - Addressed resiliency through a Triple Bottom Line Analysis and Adaptation Toolkit

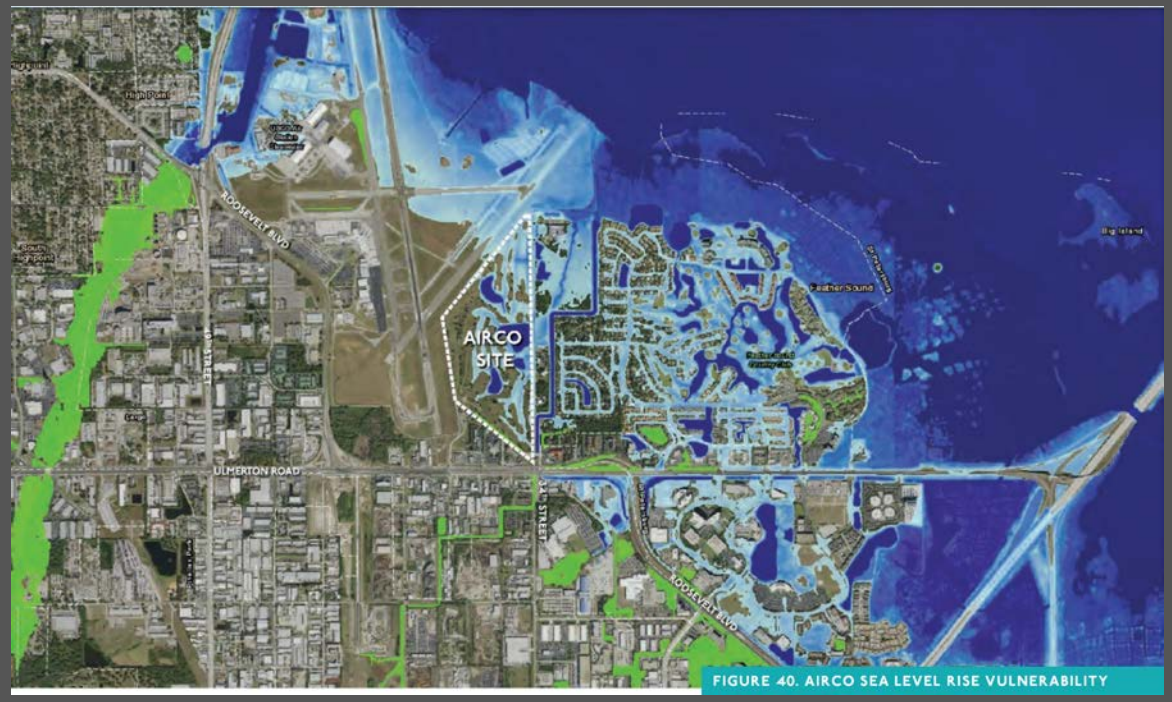


FIGURE 40. AIRCO SEA LEVEL RISE VULNERABILITY

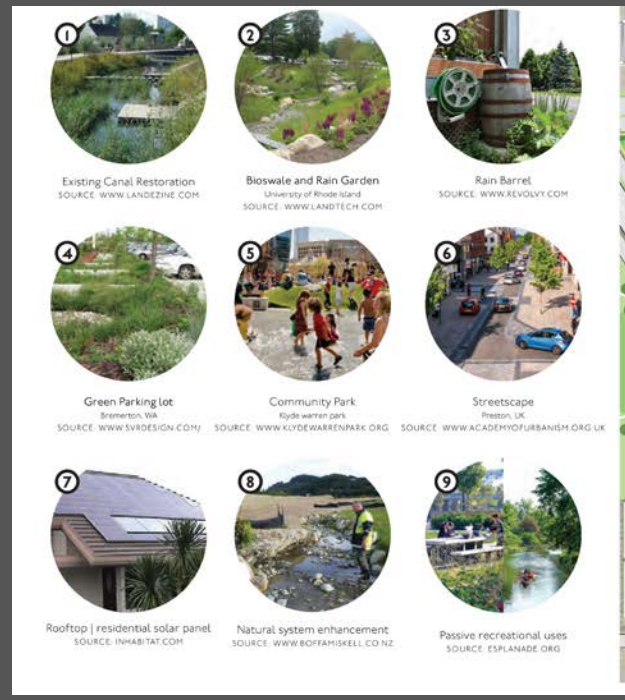
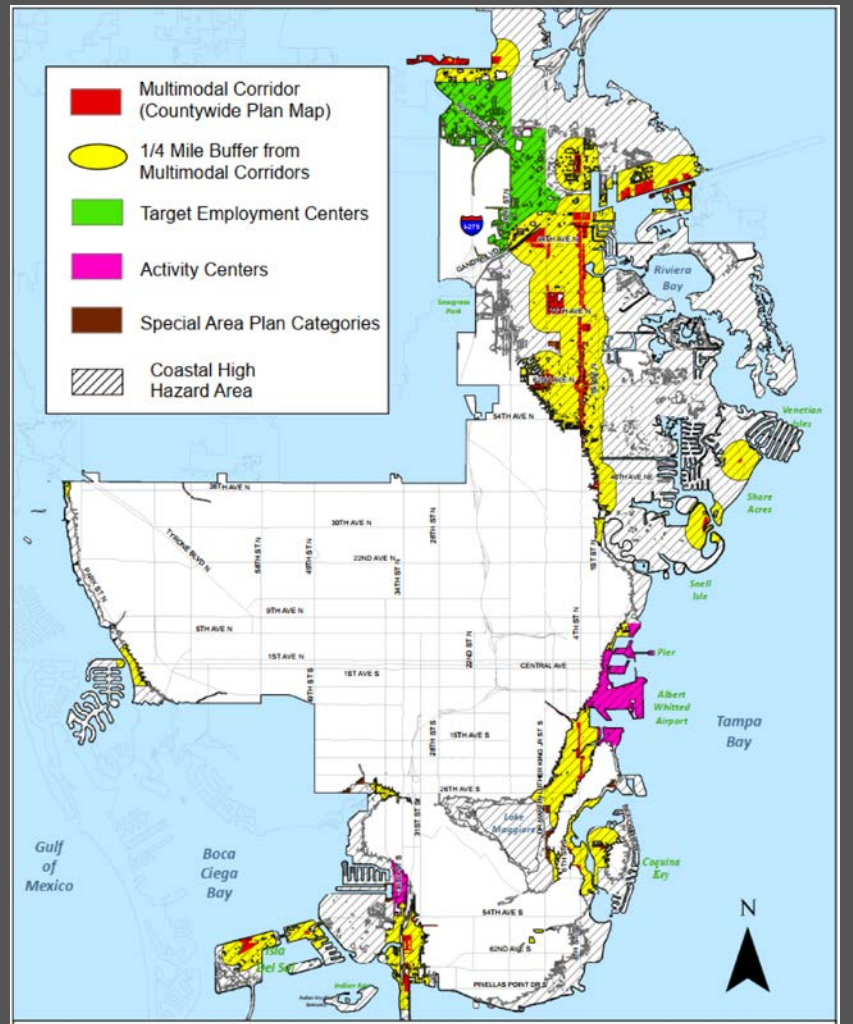


FIGURE 56. LIVE-WORK FOCUS AREA CONCEPTUAL DESIGN

Resilience Planning at Forward Pinellas

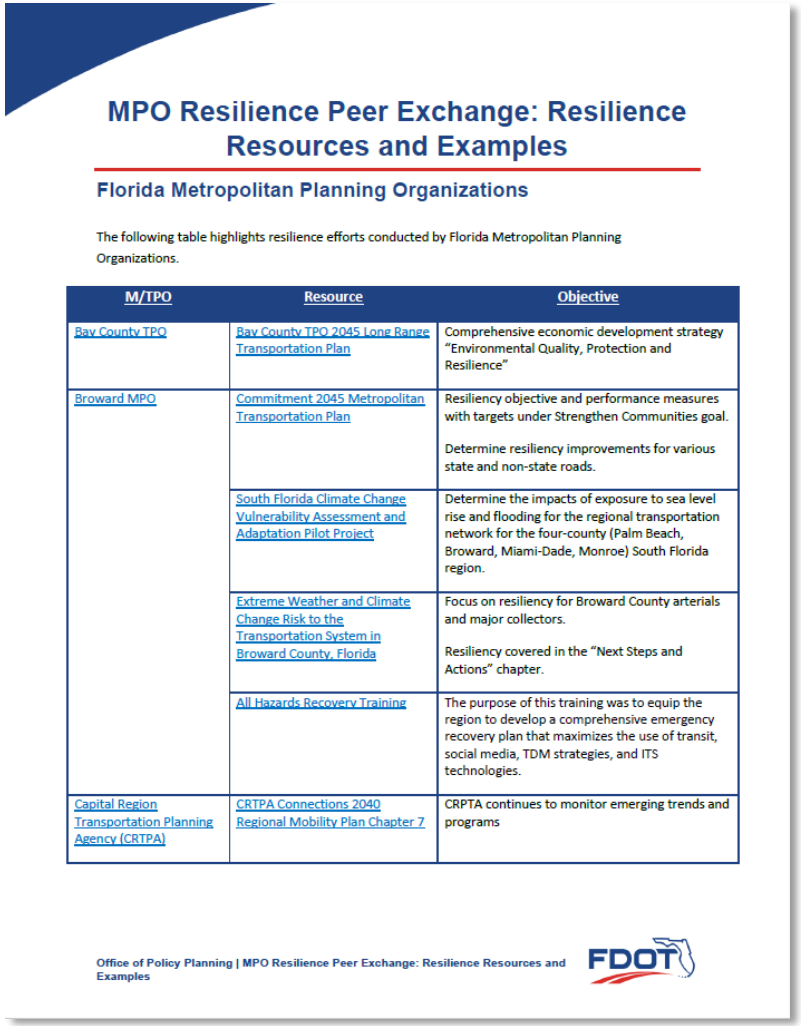
- Convened a Coastal High Hazard Area (CHHA) Mitigation Strategy Working Group that included Emergency Management and several coastal communities
  - Working Group explored actionable strategies to allow resilient development in vulnerable areas
  - Effort resulted in the City of St. Petersburg moving forward with adopting elevated development standards for multi-family development within the CHHA
  - Other coastal communities are following St. Petersburg's progress and may adopt a similar mitigation framework



1/4 Mile Buffer around Multimodal Corridors, Activity Centers, Target Employment Centers and Special Area Plan Categories within the CHHA

WRAP UP

- **Additional information and examples from around Florida in reference document**



MPO Resilience Peer Exchange: Resilience Resources and Examples

Florida Metropolitan Planning Organizations

The following table highlights resilience efforts conducted by Florida Metropolitan Planning Organizations.

M/TPO	Resource	Objective
Bay County TPO	Bay County TPO 2045 Long Range Transportation Plan	Comprehensive economic development strategy "Environmental Quality, Protection and Resilience"
Broward MPO	Commitment 2045 Metropolitan Transportation Plan	Resiliency objective and performance measures with targets under Strengthen Communities goal. Determine resiliency improvements for various state and non-state roads.
	South Florida Climate Change Vulnerability Assessment and Adaptation Pilot Project	Determine the impacts of exposure to sea level rise and flooding for the regional transportation network for the four-county (Palm Beach, Broward, Miami-Dade, Monroe) South Florida region.
	Extreme Weather and Climate Change Risk to the Transportation System in Broward County, Florida	Focus on resiliency for Broward County arterials and major collectors. Resiliency covered in the "Next Steps and Actions" chapter.
	All Hazards Recovery Training	The purpose of this training was to equip the region to develop a comprehensive emergency recovery plan that maximizes the use of transit, social media, TDM strategies, and ITS technologies.
Capital Region Transportation Planning Agency (CRTPA)	CRTPA Connections 2040 Regional Mobility Plan Chapter 7	CRPTA continues to monitor emerging trends and programs

Office of Policy Planning | MPO Resilience Peer Exchange: Resilience Resources and Examples

WRAP UP

- **Later Today: Session 2 Resilience Needs and Strategies**
  - Metropolitan Transportation Council (MTC)
  - Wilmington Area Planning Council (WILMAPCO)
  - Rockingham Planning Commission (RPC)

Reminder: Each session is a unique Teams meeting link

- **Tomorrow: Session 3 Resilience Investments**
  - Houston-Galveston Area Council (H-GAC)
  - North Jersey Transportation Planning Authority (NJTPA)
  - Volpe Center
  - Hampton Roads TPO

- **Monday: Session 4 Lessons Learned**