St. Lucie Transportation Planning Organization

Coco Vista Centre
466 SW Port St. Lucie Blvd, Suite 111
Port St. Lucie, Florida 34953
772-462-1593 www.stlucietpo.org

TECHNICAL ADVISORY COMMITTEE (TAC)

Regular Meeting

Tuesday, September 17, 2024
1:30 pm

Public Participation / Accessibility

Participation in Person: Public comments may be provided in person at the meeting. Persons who require special accommodations under the Americans with Disabilities Act (ADA) or persons who require translation services (free of charge) should contact the St. Lucie TPO at 772-462-1593 at least five days prior to the meeting. Persons who are hearing or speech impaired may use the Florida Relay System by dialing 711.

Participation by Webconference (not intended for Committee Members): Using a computer or smartphone, register at https://attendee.gotowebinar.com/register/6114001973157924189. After the registration is completed, a confirmation will be emailed containing instructions for joining the webconference. Public comments may be provided through the webconference chatbox during the meeting.

Written and Telephone Comments: Comment by email to TPOAdmin@stlucieco.org; by regular mail to the St. Lucie TPO, 466 SW Port St. Lucie Boulevard, Suite 111, Port St. Lucie, Florida 34953; or call 772-462-1593 until 1:00 pm on September 17, 2024.

AGENDA

1. Call to Order

2. Roll Call

3. Comments from the Public

4. Approval of Agenda

5. Approval of Meeting Summary
   - *July 23, 2024 Regular Meeting*

6. Action Items

   6a. US-1 Corridor Congestion Study Scope of Services: Review of the US-1 Corridor Congestion Study draft Scope of Services.

   Action: Recommend approval of the draft Scope of Services, recommend approval with conditions, or do not recommend approval.

6b. Florida Shared-Use Nonmotorized (SUN) Trail Port Connector Feasibility Study: Review of the draft Preferred Alternatives of the SUN Trail Port Connector Feasibility Study.

Action: Recommend endorsement of the Preferred Alternatives, recommend endorsement with conditions, or do not recommend endorsement.

6c. 2020 Federal Roadway Functional Classification Map: Review of the draft 2020 Federal Roadway Functional Classification Map for the TPO area.

Action: Recommend approval of the draft 2020 Federal Roadway Functional Classification Map for the TPO area, recommend approval with conditions, or do not recommend approval.

7. Discussion Items

7a. Autonomous Vehicle Study Update: Presentation of an update to the Autonomous Vehicle Study.

Action: Discuss and provide comments.

7b. St Lucie County Sustainable Mobility Infrastructure Study: Presentation of the St Lucie County Sustainable Mobility Infrastructure Study.

Action: Discuss and provide comments.

8. Recommendations/Comments by Members

9. Staff Comments

10. Next Meeting: The next St. Lucie TPO TAC meeting is a joint meeting with the Citizens Advisory Committee and the Bicycle-Pedestrian Advisory Committee scheduled for 1:30 pm on Tuesday, November 19, 2024.

11. Adjourn

NOTICES

The St. Lucie TPO satisfies the requirements of various nondiscrimination laws and regulations including Title VI of the Civil Rights Act of 1964. Public participation is welcome without regard to race, color, national origin, age, sex, religion, disability, income, or family status. Persons wishing to express their concerns about nondiscrimination should contact Marceia Lathou, the Title VI/ADA Coordinator of the St. Lucie TPO, at 772-462-1593 or via email at lathoum@stlucieco.org.

Items not included on the agenda may also be heard in consideration of the best interests of the public's health, safety, welfare, and as necessary to protect every person's right of access. If any person decides to appeal any decision made by the St. Lucie TPO Advisory Committees with respect to any matter considered at a meeting, that person shall need a record of the proceedings, and for such a purpose, that person may need to ensure that a verbatim record of the proceedings is made which includes the testimony and evidence upon which the appeal is to be based.

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.

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TECHNICAL ADVISORY COMMITTEE (TAC)

REGULAR MEETING

DATE: Tuesday, July 23, 2024

TIME: 1:30 pm

MEETING SUMMARY

1. Call to Order

The meeting was called to order at 1:40 pm.

2. Roll Call

The roll was conducted via sign-in sheet, and a quorum was confirmed with the following members present:

Members Present	Representing
Benjamin Balcer	St. Lucie County Planning
Lt. Jesse Almand	St. Lucie County Fire District
Antonio Balestrieri	Port St. Lucie Public Works
Edmund Bas	St. Lucie County Public Works
Robert Driscoll	Independent Public Transportation Operator
Selena Griffett	Fort Pierce Engineering
Tracy Jahn	St. Lucie County Transit Management
Mary Savage-Dunham	Port St. Lucie Planning

Others Present	Representing
Kyle Bowman	St. Lucie TPO
Peter Buchwald	St. Lucie TPO
Yi Ding	St. Lucie TPO
Marceia Lathou	St. Lucie TPO
Rachel Harrison	Recording Specialist
Sandra Bogan	St. Lucie County

Kelly Budhu	Florida Department of Transportation (FDOT)
Rob Cursey (via web)	Benesch
Jacquelyn Burrows (via web)	FDOT
Steve Infanti	Benesch
Michael Leo	Florida's Turnpike
Tony Norat	FDOT
Victoria Peters	FDOT
Henry Pinzon	Florida's Turnpike
Diana Spriggs (via web)	City of Port St. Lucie
Andrew Velasquez	Florida's Turnpike
Victoria Williams	Florida's Turnpike

Mr. Buchwald explained that the Chairperson and Vice Chairperson had both been unable to attend the day's meeting, necessitating that an interim Chairperson be elected to preside over the proceedings. He then invited the Recording Specialist to conduct the election.

* MOTION by Ms. Griffett to nominate Mr. Balcer to serve as Interim TAC Chairman.

** SECONDED by Mr. Driscoll

There were no other nominations and the nominations were closed.

** MOTION to elect Mr. Balcer to serve as Interim TAC Chairman.
Carried UNANIMOUSLY

3. Comments from the Public – None.

4. Approval of Agenda

* MOTION by Ms. Savage-Dunham to approve the agenda.

** SECONDED by Mr. Driscoll Carried UNANIMOUSLY

5. Approval of Meeting Summary
   - May 21, 2024 Regular Meeting

* MOTION by Ms. Savage-Dunham to approve the Meeting Summary.

** SECONDED by Mr. Driscoll Carried UNANIMOUSLY

6. Action Items

6a. Project Development and Environment Study (PD&E) for Widening Florida's Turnpike from State Route 70 (Okeechobee Road) to State Route 60 (Yeehaw Junction): An update by Florida's Turnpike on the PD&E for the widening of the Turnpike from State Route 70 to State Route 60.

Mr. Buchwald described the phasing of the Turnpike's efforts to widen the mainline corridor in St. Lucie County before explaining the significance of the PD&E to the overall project development process. He then introduced Mr. Leo, who described the geographical limits of the Turnpike segment included in the PD&E under discussion, displayed diagrams of the existing and planned design of the mainline facility, and explained why the widening had been identified as a need. Mr. Leo presented the two alternatives under consideration for the redesign of the interchange at State Route 60 and reported on the status of the proposed Northern Connector interchange. He concluded with an outline of the schedule for the widening project.

At Mr. Buchwald's request, Mr. Pinzon clarified that the proposed Northern Connector Turnpike interchange was feasible in terms of engineering but not in terms of funding given the projected traffic volumes and the uncertainty of the developer initially involved with the project. Mr. Buchwald summarized the development of the Northern Connector project to date, reporting that a corridor alignment study had been initiated to provide a connection to St. Lucie Boulevard from the planned I-95 interchange. Mr. Pinzon indicated that the Turnpike might consider funding the Turnpike interchange if there was both a public roadway connecting the proposed site to the planned I-95 interchange and a favorable cost/benefit ratio. Ms. Savage-Dunham inquired about the potential impact of the airport expansion plans on the Turnpike's evaluation of the need for an interchange, and Mr. Pinzon elaborated on how the development of the interchange might proceed if the necessary conditions were met.

* MOTION by Ms. Savage-Dunham to recommend endorsement of the PD&E alternatives.

** SECONDED by Mr. Driscoll Carried UNANIMOUSLY

6b. Congestion Management Process (CMP) Major Update: Review of the draft CMP Major Update.

Mr. Buchwald introduced Mr. Ding, who explained how the Congestion Management Process (CMP) was funded and updated. He invited Mr. Infanti to continue, and Mr. Infanti began by describing the purpose and components of the CMP. He provided an overview of the scope of the Major Update, identified the members of the Working Group assembled to facilitate it, and defined the CMP network. Mr. Infanti described how several corridors within the network had been identified as needing improvements and subsequently prioritized before noting the recommended project phasing and implementation timeline.

Mr. Bas inquired about CMP project funding, and Mr. Infanti indicated that it should be allocated toward the construction phases of development.

In response to Ms. Savage-Dunham's question, Mr. Buchwald clarified the roles of the TPO, FDOT, and local jurisdictions with respect to the planning, programming, and implementation of CMP projects, citing several recently completed projects as examples. Mr. Buchwald subsequently described how FDOT's process for reviewing and programming CMP projects allowed for a degree of flexibility in terms of implementation timelines and explained that the goal of the present discussion was to identify any needs that had potentially been overlooked.

Mr. Infanti explained that St. Lucie West Boulevard had not been included in the CMP needs list despite general concern over congestion because the cause of that congestion, namely the consistent multi-directional traffic flow at many of the corridor's intersections, could not easily be mitigated using CMP strategies. He reported that operational improvements had already been made to the corridor's intersections in combination with the widening of the bridge over I-95 and that overall traffic volumes had been decreasing the past several years.

Mr. Balestrieri commended the presentation and the recommendations made therein on behalf of the City of Port St. Lucie, expressing his appreciation especially for the bicycle/pedestrian opportunities afforded by the CMP projects.

* MOTION by Mr. Balestrieri to recommend adoption of the draft CMP Major Update.

** SECONDED by Ms. Savage-Dunham Carried UNANIMOUSLY

7. Discussion Items

7a. Transportation Asset/Service Vulnerability Assessment Update: A presentation on the development of the St. Lucie County Community Resilience Plan.

Mr. Buchwald recounted the history of the TPO's involvement in the county-wide efforts to plan for the impacts of climate change and natural disasters, explaining that several grants had been received for the purpose of assessing and mitigating those impacts. He invited Ms. Bogan to provide an update on the Vulnerability Assessments and Regional Resilience Plan, and she began with an explanation of community resilience and resilience planning. Ms. Bogan identified the agency partners participating in the Resilience Steering Committee, noted the objectives and funding sources for the planning efforts, and presented several statistics demonstrating the potential impacts of environmental stressors on local facilities. She described possible adaptation strategies along with the Florida Transportation Plan Focus Areas and then outlined the project schedule.

8. Recommendations/Comments by Members – None.

9. Staff Comments – Mr. Buchwald thanked the members for their comments and suggestions and noted that they could request that an item be placed on a future agenda in cases where inter-jurisdictional collaboration and public outreach would be beneficial.

10. Next Meeting: The next St. Lucie TPO TAC meeting is a regular meeting scheduled for 1:30 pm on Tuesday, September 17, 2024.

11. Adjourn – The meeting was adjourned at 2:40 pm.

Respectfully submitted:

_____
Rachel Harrison
Recording Specialist

Approved by:

_____
Adolfo Covelli
Chairman

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AGENDA ITEM SUMMARY

Board/Committee:	Technical Advisory Committee (TAC)
Meeting Date:	September 17, 2024
Item Number:	6a
Item Title:	US-1 Corridor Congestion Study Scope of Services
Item Origination:	Unified Planning Work Program (UPWP)
UPWP Reference:	Task 2.3 - Traffic Count Program Management
Requested Action:	Recommend approval of the draft Scope of Services, recommend approval with conditions, or do not recommend approval.
Staff Recommendation:	Based on the scope and cost being consistent with Task 2.3 of the UPWP, it is recommended that the US-1 Corridor Congestion Study Scope of Services be recommended for approval.

Attachments

- Staff Report
- US-1 Corridor Congestion Study Scope of Services

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MEMORANDUM

TO: Technical Advisory Committee (TAC)

THROUGH: Peter Buchwald
Executive Director

FROM: Yi Ding
Transportation Systems Manager

DATE: September 10, 2024

SUBJECT: US-1 Corridor Congestion Study Scope of Services

BACKGROUND

As part of the 2025 Traffic Count Management Program (Program), the US-1 Corridor Congestion Study (Study) is programmed for FY 2024/25 in Task 2.3 of the TPO's Unified Planning Work Program (UPWP). As part of the Study, additional traffic count data will be collected through the Program and analyzed to quantify the level of congestion on US-1 from Prima Vista Boulevard to the Martin County Line and on nearby parallel corridors. Based on the analysis, strategies will be developed to reduce the traffic congestion on this segment of US-1 for project development and programming.

ANALYSIS

The attached draft Scope of Services for the Study was prepared by Benesch, one of the TPO's General Planning Consultants. Benesch has provided the traffic count collection and Traffic Count Data Management System (TCDMS) maintenance services since the inception of the Program. Benesch also completed the recent Major Update to the Congestion Management Process.

The draft Scope of Services is consistent with the scope outlined in the adopted UPWP. Benesch proposes a cost of $19,994 for the Study which is within the UPWP task budget.

RECOMMENDATION

Based on the scope and cost being consistent with Task 2.3 of the UPWP, it is recommended that the US-1 Corridor Congestion Study Scope of Services be recommended for approval.

ST. LUCIE COUNTY

TRAFFIC COUNT PROGRAM MANAGEMENT

U.S. 1 CORRIDOR CONGESTION STUDY

SCOPE OF SERVICES

Prepared For:
St. Lucie Transportation Planning Organization
Coco Vista Center
466 SW Port St. Lucie Boulevard
Port St. Lucie, FL 34953
ph (772) 462-1593

Prepared By:

100 W. Cypress Creek Road, Suite 980
Fort Lauderdale, FL 33309
ph (954) 641-5680

August 31, 2024

INTRODUCTION

As part of the 2025 Traffic Count Management Program, additional traffic count data will be collected and analyzed to quantify the level of congestion on U.S. 1 from Prima Vista Boulevard to the Martin County Line and nearby parallel corridors. Strategies will be developed to reduce the traffic congestion on the segment of U.S. 1 based on the analysis for project development and programming. This activity is included in Task 2.3 – Traffic Count Program Management of the St. Lucie TPO 2024/25 – 2025/26 UPWP.

The study will be accomplished through the following tasks:

Task 1 **Traffic Data Collection and Gathering:** Benesch will compile all available traffic data within the US-1 study segment and parallel corridors. This will include current and historic traffic data from the Traffic Count Data Management System (TCDMS) and the Florida Department of Transportation (FDOT) for the purpose of performing detailed congestion analysis and track trends. Benesch will also compile data from RITIS and REPLICA to measure and analyze congestion within the corridor.

Task 2 **Daily and Peak Hour Congestion Analysis:** Daily Level-of-Service (LOS) will be calculated, the peak period will be determined, and peak-period LOS will be determined. Delay, speed, and queue lengths will be reviewed as available from RITIS. REPLICA will be the primary source in determining origins and destination of trips observed along the U.S. 1 corridor. These are other available sources will be used to gain insight into trip making and travel characteristics.

Task 3 **Develop Strategies to Reduce Traffic Congestion:** Benesch will develop recommended strategies to reduce congestion on U.S. 1. The strategies considered will be consistent with those utilized in the TPO's Congestion Management Process. The anticipated traffic reduction of recommended strategies will be quantified, and planning level cost estimates will be developed. Benesch will research, review, and consider impacts to congestion of any existing and planned projects by FDOT, the TPO, and other local implementing agencies.

Task 4 **Documentation:** Benesch will prepare a technical memorandum to document the analysis, findings, and recommendations. A draft version will be submitted to the TPO for review. A final technical memorandum will be produced which incorporates comments from the TPO.

Task 5 **Presentations:** Benesch will prepare a PowerPoint presentation which summarizes the study process, findings, and recommendations. Benesch will participate in presenting to the TPO committees and Board.

Budget:

The services described herein shall be completed at a not to exceed cost of $19,993.30 based on the effort estimate included herein as Attachment 1. Invoices shall be based on the percentage of completion of work accomplished and as documented in the project status report.

Schedule:

The tasks shall be completed by June 30, 2025.

Attachment 1

U.S. 1 Corridor Congestion Study

ACTIVITY		Principal-in-Charge $ 269.00	Project Manager $ 229.84	Senior Planner $ 127.44	Senior Engineer $ 196.95	Engineer $ 102.86	Planner $ 81.34	Engineer Tech. $ 57.35	Admin/ Clerical $ 68.29	TOTAL HOURS	COST BY ACTIVITY
	Conduct U.S. 1 Corridor Congestion Study	2	20	34	22	40	14	14	2	148	$ 19,993.30
Task 1	**Traffic Data Collection and Gathering:** Benesch will compile all available traffic data within the US-1 study segment and parallel corridors. This will include current and historic traffic data from the Traffic Count Data Management System (TCDMS) and the Florida Department of Transportation (FDOT) for the purpose of performing detailed congestion analysis and track trends. Benesch will also compile data from RITIS and REPLICA to measure and analyze congestion within the corridor.		2	2	2	4	6	4		20	$ 2,237.34
Task 2	**Daily and Peak Hour Congestion Analysis:** Daily Level-of-Service (LOS) will be calculated, the peak period will be determined, and peak-period LOS will be determined. Delay, speed, and queue lengths will be reviewed as available from RITIS. REPLICA will be the primary source in determining origins and destination of trips observed along the U.S. 1 corridor. These are other available sources will be used to gain insight into trip making and travel characteristics.		2	8	2	4	4	4		24	$ 2,839.30
Task 3	**Develop Strategies to Reduce Traffic Congestion:** Benesch will develop recommended strategies to reduce congestion on U.S. 1. The strategies considered will be consistent with those utilized in the TPO's Congestion Management Process. The anticipated traffic reduction of recommended strategies will be quantified, and planning level cost estimates will be developed. Benesch will research, review, and consider impacts to congestion of any existing and planned projects by FDOT, the TPO, and other local implementing agencies.		4	4	12	16		4		40	$ 5,667.68
Task 4	**Documentation:** Benesch will prepare a technical memorandum to document the analysis, findings, and recommendations. A draft version will be submitted to the TPO for review. A final technical memorandum will be produced which incorporates comments from the TPO.	2	4	4	4	16			2	32	$ 4,537.26
Task 5	**Presentations:** Benesch will prepare a PowerPoint presentation which summarizes the study process, findings, and recommendations. Benesch will participate in presenting to the TPO committees and Board.		8	16	2		4	2		32	$ 4,711.72
Total Hours:		2	20	34	22	40	14	14	2	148	
Total Labor:		$ 538	$ 4,597	$ 4,333	$ 4,333	$ 4,114	$ 1,139	$ 803	$ 137	$ 19,993	$ 19,993.30
										TOTAL COSTS:	$ 19,993.30

benesch

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AGENDA ITEM SUMMARY

Board/Committee:	Technical Advisory Committee (TAC)
Meeting Date:	September 17, 2024
Item Number:	6b
Item Title:	Florida Shared-Use Nonmotorized (SUN) Trail Port Connector Feasibility Study
Item Origination:	Unified Planning Work Program (UPWP)
UPWP Reference:	Task 3.5 – Bicycle Pedestrian / Complete Streets Planning
Requested Action:	Recommend endorsement of the Preferred Alternatives, recommend endorsement with conditions or do not recommend endorsement.
Staff Recommendation:	Based on the feasibility of and the endorsement by the Fort Pierce City Commission of the Preferred Alternatives, it is recommended that the Preferred Alternatives be recommended for endorsement.

Attachments
- Staff Report
- Presentation

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MEMORANDUM

Board/Committee:	Technical Advisory Committee (TAC)
THROUGH:	Peter Buchwald Executive Director
FROM:	Stephanie M. Torres Bicycle Pedestrian Program Manager
DATE:	September 10, 2024
SUBJECT:	Shared-Use Nonmotorized (SUN) Trail Port Connector Feasibility Study

BACKGROUND

The Florida Shared-Use Non-Motorized (SUN) Trail Program allocates $50 million annually for the development of a statewide paved trail system benefiting bicyclists and pedestrians across Florida. By 2026, the SUN Trail Program, in collaboration with the Florida Department of Transportation (FDOT), will have invested over $20 million toward completing the Statewide SUN Trail Network and extending the East Coast Greenway throughout St. Lucie County.

The East Coast Greenway (ECG) is a multi-purpose path spanning 15 states and connecting 450 cities and towns over 3,000 miles from Florida to Maine. Within St. Lucie County, three ECG segments have been completed: Indian Hills Recreation Area, a portion of the Savannas Recreation Area, and the multi-use path along Green River Parkway connecting St. Lucie and Martin Counties. Additionally, two projects, known as the Savannas Gap Trail, linking the Green River Parkway to the Savannas Recreation Area are currently under construction and managed by FDOT. The first segment is from Walton Road to Kitterman Road, and the second segment is from Lennard Road to the Savannas Recreation Area. Both are estimated to be completed in the Fall of 2025.

Collaboration between the St. Lucie Transportation Planning Organization (TPO) and St. Lucie County resulted in successful SUN Trail funding for a

Feasibility Study for the SUN Trail Port Connector Project. The proposed SUN Trail Port Connector aims to cross the Florida East Coast (FEC) Railroad corridor, enhancing connectivity and accessibility for residents and visitors alike.

Because Kimley-Horn has completed several other SUN Trail feasibility studies in the past, including the feasibility studies in the TPO area for the Florida East Coast Railroad Overpass and the Savannas Gap Trail, they were tasked with completing the Feasibility Study. The Study includes identifying alignments for the SUN Trail, identifying and mitigating environmental impacts, preparing proposed typical sections, providing construction cost estimates for each alternative and determining the preferred alternatives. The Preferred Alternatives of the Feasibility Study are being provided to the TPO Advisory Committees for review, comment, and recommendation.

ANALYSIS

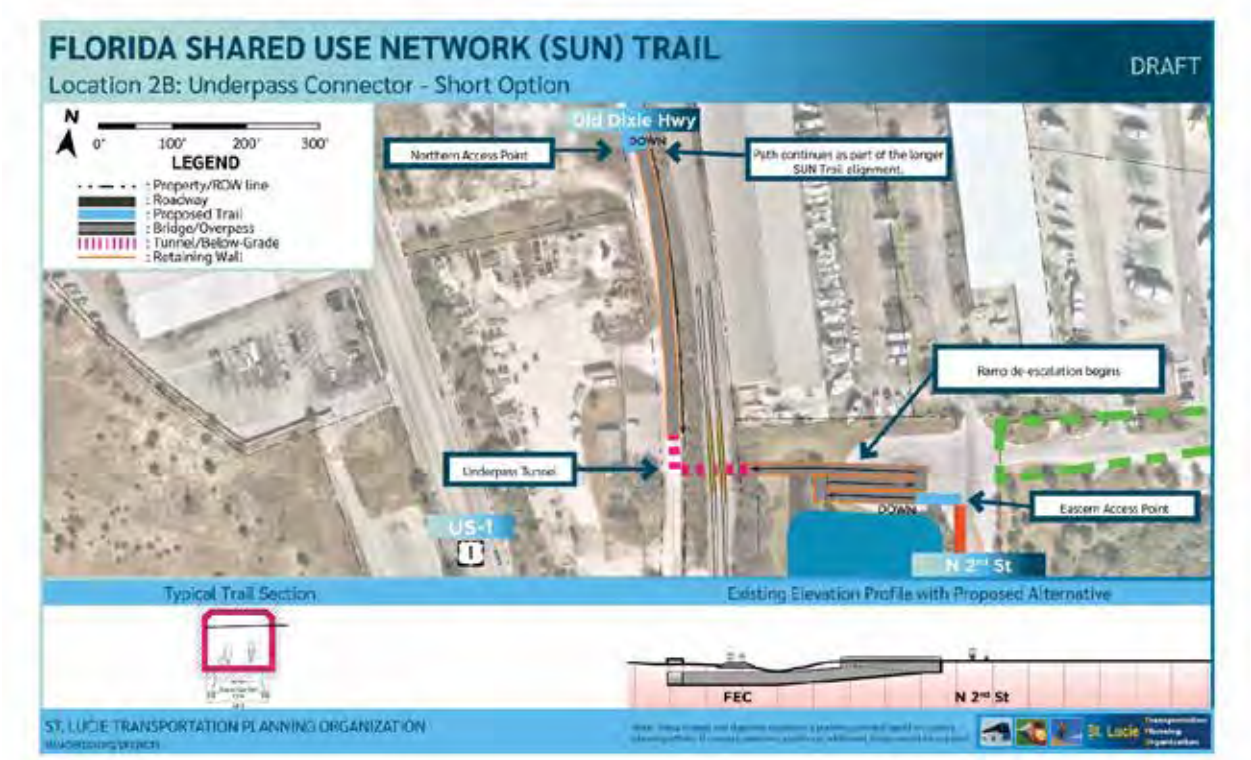
The Preferred Alternatives were developed with comprehensive community input and collaboration. The public outreach efforts included:

- Regular Meetings: Ongoing discussions between the interagency working group to ensure coordinated efforts.
- Stakeholder Input: Gathering valuable feedback from key stakeholders to guide project development.
- Community Workshop: A workshop held in February 2024 to engage with the community and gather their insights.
- US Mail: Sending community engagement information via traditional mail to reach a broader audience.
- Social Media: Social Media posts directing users to an online survey to collect widespread community feedback.

The feedback gathered reflected the need for roadway connectivity in part of the Port redevelopment activities expected to occur per the 2020 Port Master Plan. Additionally, providing non-motorized facility connections to Lincoln Park, and the residential communities near it, was mentioned to be a top priority to increase accessibility to Harbour Pointe Park.

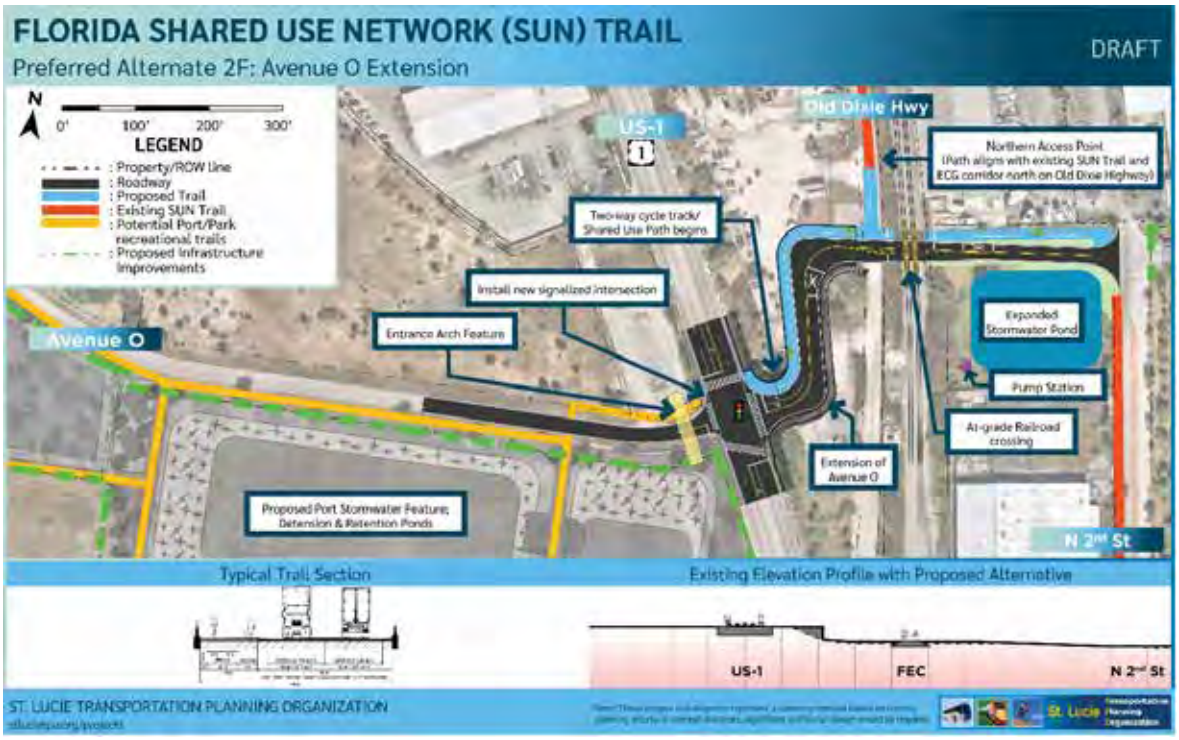
Six different alignment alternatives (A-E) explored overpass, underpass and at-grade facilities. From these alternatives the most viable overpass and underpass options were selected based on the analyses conducted and the feedback received to date.

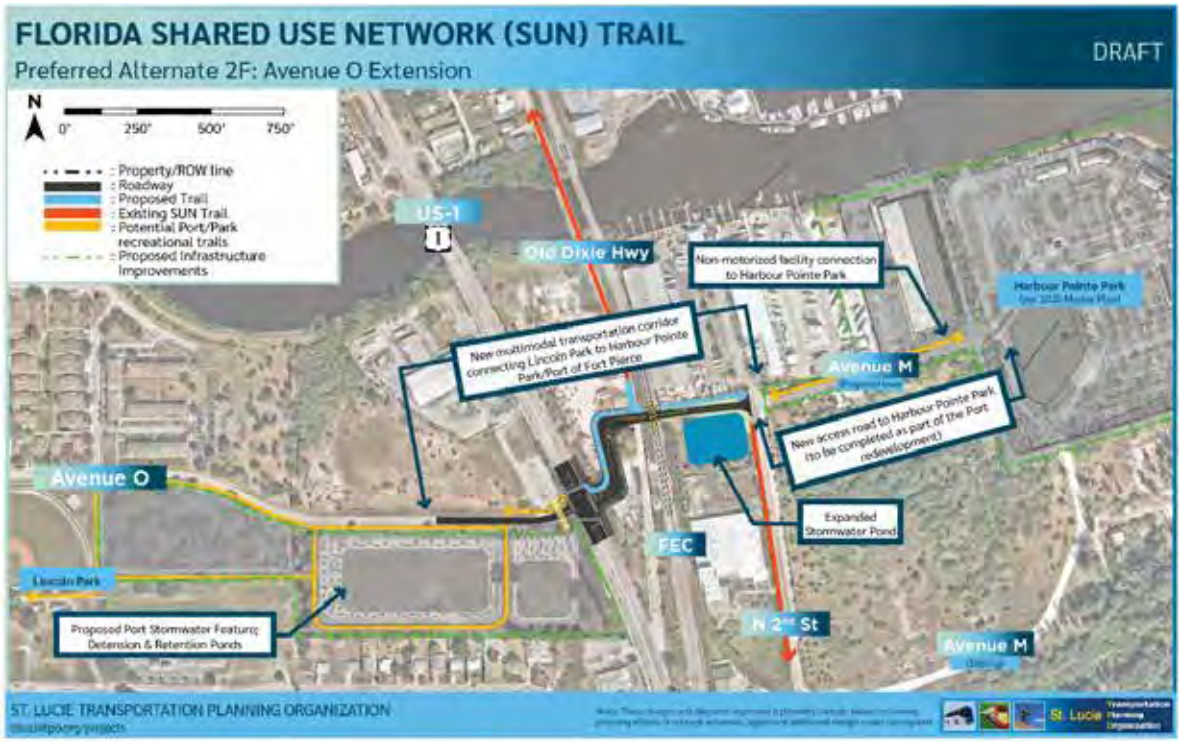
Alternative 2 B: Underpass Connector – Short Option (Phase 1)
Construction Cost: $14,730,000



Alternative 2B is a culvert underpass that provides a trail beneath the FEC Railroad connecting N 2nd Street with Old Dixie Highway. East of the FEC Railway, the underpass is aligned in the area north of the existing retention pond. The entrance to the underpass, and start of the de-escalation, begins west of N 2nd Street along the south side of the existing truck turnaround semi-circle. The underpass then completes a series of switchbacks to meet the required clearance distance below the FEC Railway and then continues west before passing beneath the railroad. After the pathway crosses beneath the FEC Railway it turns north along the east side of Old Dixie Highway where it eventually reaches ground level to connect to the existing SUN Trail alignment. Additionally, the underpass must include water treatment strategies to prevent flooding and pooling of water to ensure the overpass is always accessible. Pump systems can be installed within the retaining walls, adding approximately 2 feet of width on either side of the underpass. Additionally, using a pre-fabricated culvert can be an advantage that saves on construction costs associated with 2B.

Alternative 2F: Port to Parks Connector – At-Grade Crossing Option (Phase 2)
Construction Cost: $8,850,000.00





Alternative 2F extends the existing Avenue O roadway to the east through a new signalized intersection at US-1, intersecting with Old Dixie Highway, as well as crossing the FEC Railway at-grade, before continuing to connect to the existing North 2nd Street roadway to provide a gateway into the reimagined Harbour Pointe Regional Park. An at-grade sidewalk maintains separation from the road and motorists. Nonmotorized users can also access the path at any point along the Avenue O extension, adds a roadway network link for motorists traveling to and from the Port area, and is estimated to have the lowest project cost. The wedged parcel between US-1 and Old Dixie Highway provides adequate length for an at grade option to meet the elevation of US-1 without drastic slopes, allowing users to traverse the trail more comfortably. It will incorporate several new crosswalks, asphalt paving, median striping, railway indicators on the road as well as at the FEC crossing. This alternative achieves connectivity to the communities and recreation facilities west of US-1, while also providing a direct connection into the gateway corridor envisioned for the new Harbour Pointe Park, noted in the Port of Fort Pierce Master Plan.

Because Alternative 2F is a concept that requires coordination across several entities that could exceed the FDOT programmed design funding timeframe, Alternative 2B (short-option underpass) was determined to be the Phase 1 Preferred Alternative for a shared-use underpass below the FEC Railway and Alternative 2F (at-grade option) was determined to be the Phase 2 Preferred Alternative. Alternative 2B is a grade-separated crossing of the FEC railroad providing non-motorized access to the northern area of Harbour Pointe Park. The alignment of the underpass at the northern end of the port creates a direct connection into Harbour Pointe Park at North 2nd Street to link users from the SUN Trail network into a regional recreation destination. Unlike Alternative 2F, the concept does not rely on the acquisition of the land parcel between Old Dixie Highway and US-1.

The Florida Department of Transportation (FDOT) has allocated $1.1 million in Fiscal Year 2024/25 for the design of the Preferred Alternative Phase 1 which the City of Fort Pierce agreed to manage at the September 9, 2024, City Commission Meeting. In addition, the City Commission endorsed the Preferred Alternatives at the Meeting.

RECOMMENDATION

Based on the feasibility of and the endorsement by the Fort Pierce City Commission of the Preferred Alternatives, it is recommended that the Preferred Alternatives be recommended for endorsement.

St. Lucie Transportation Planning Organization

Florida Shared-Use Network (SUN) Trail

Port of Fort Pierce Connector Feasibility Assessment

Prepared By:

Kimley»Horn

September 2024

SUN Trail Design Criteria

Path width
- 10-14 feet

Path surface
- ADA-compliant hard surface pavement

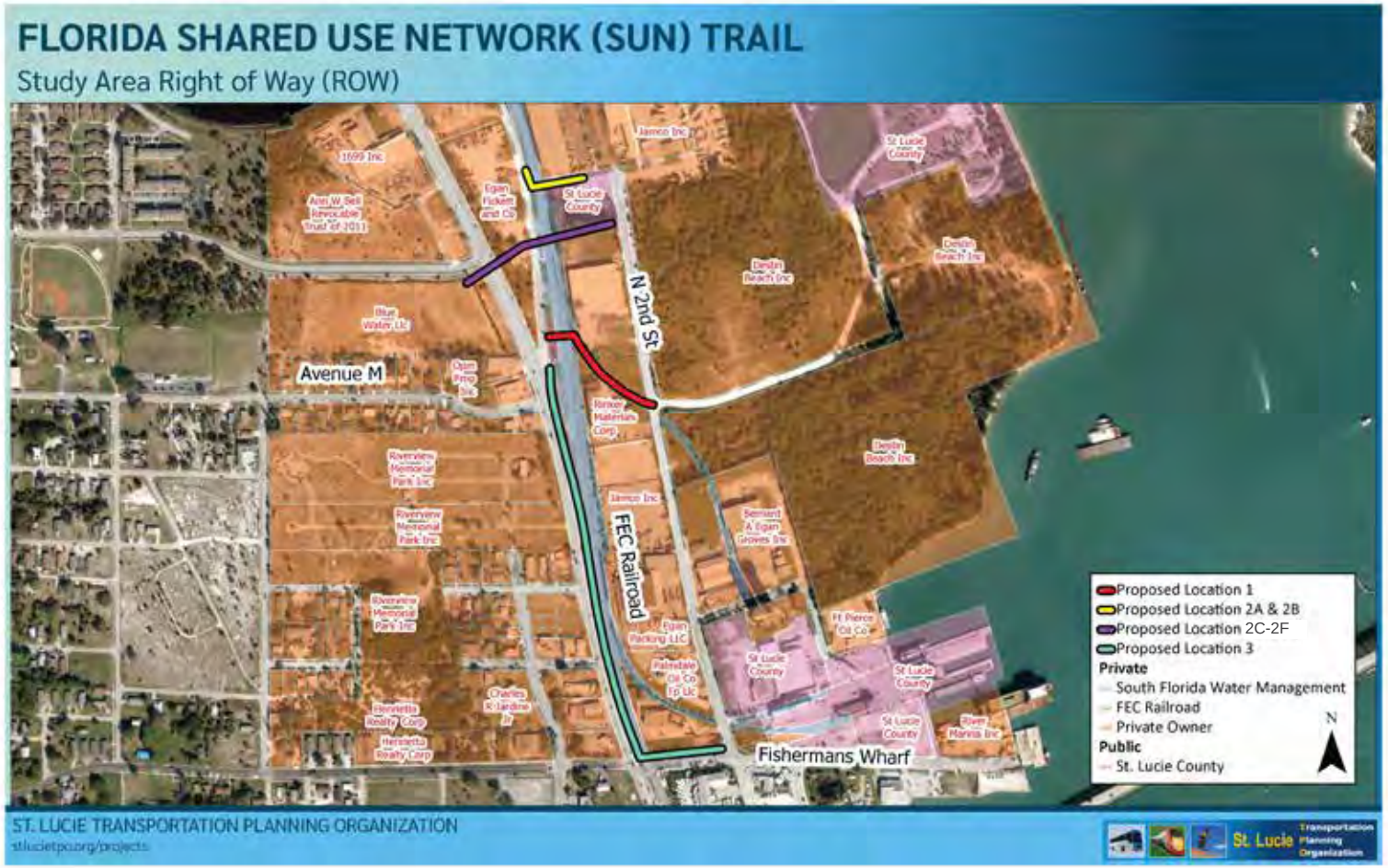
Vertical clearance
- 10 feet minimum
- 12 feet preferred

Horizontal clearance
- 4 feet from edge of pavement

Grades
- Up to 5% running slope
- Short distances of steeper grades may be provided when necessary

Potential Connector Locations

- Rail spur
- Truck turnaround
- Fisherman's Wharf to US-1

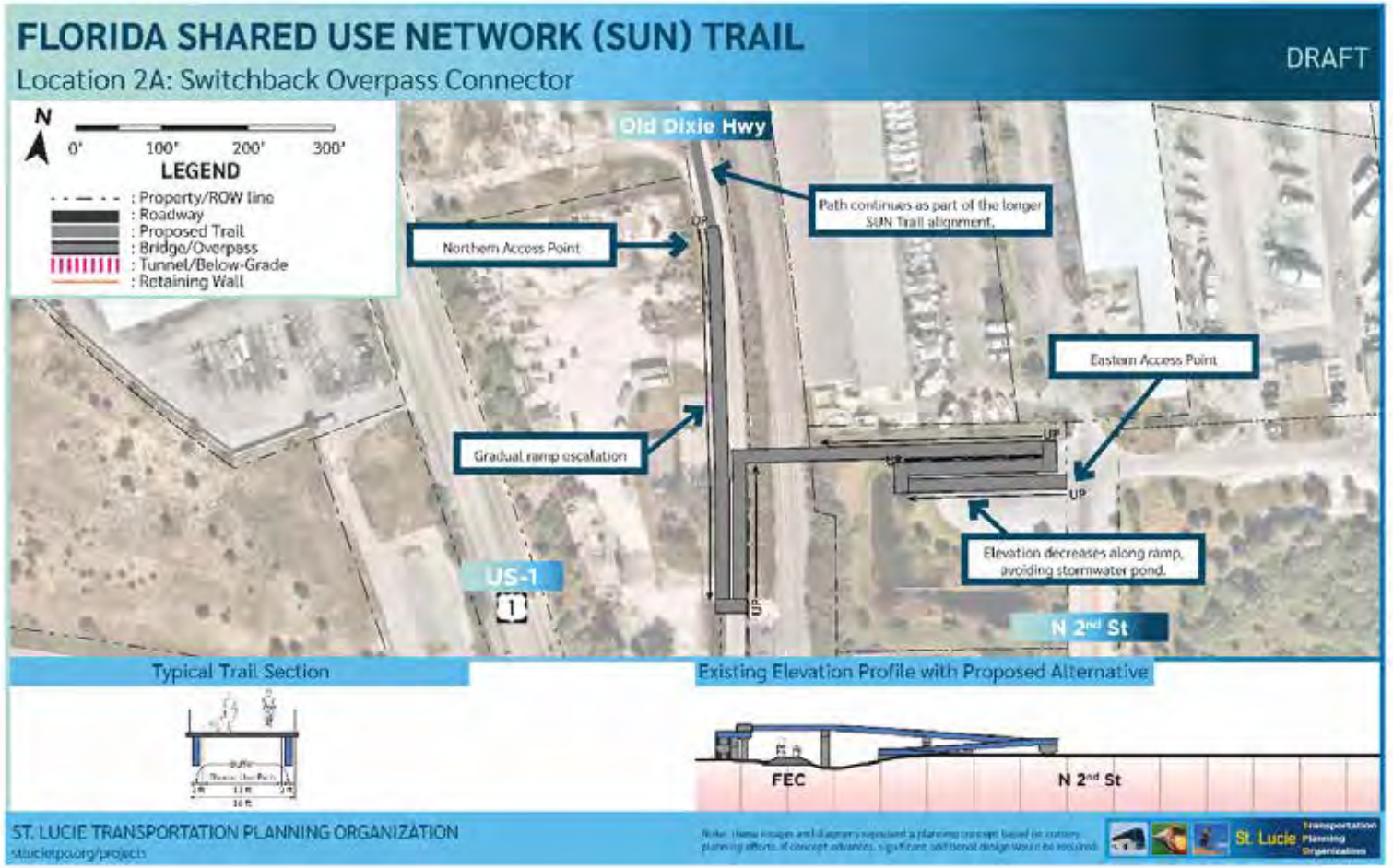


Truck Turnaround / Retention Pond Alt.

- Primary focus for alternatives analysis
  - General location for alternatives 2A-2F
- Public Ownership of retention pond
- Wedge parcel west of Old Dixie Highway currently privately owned

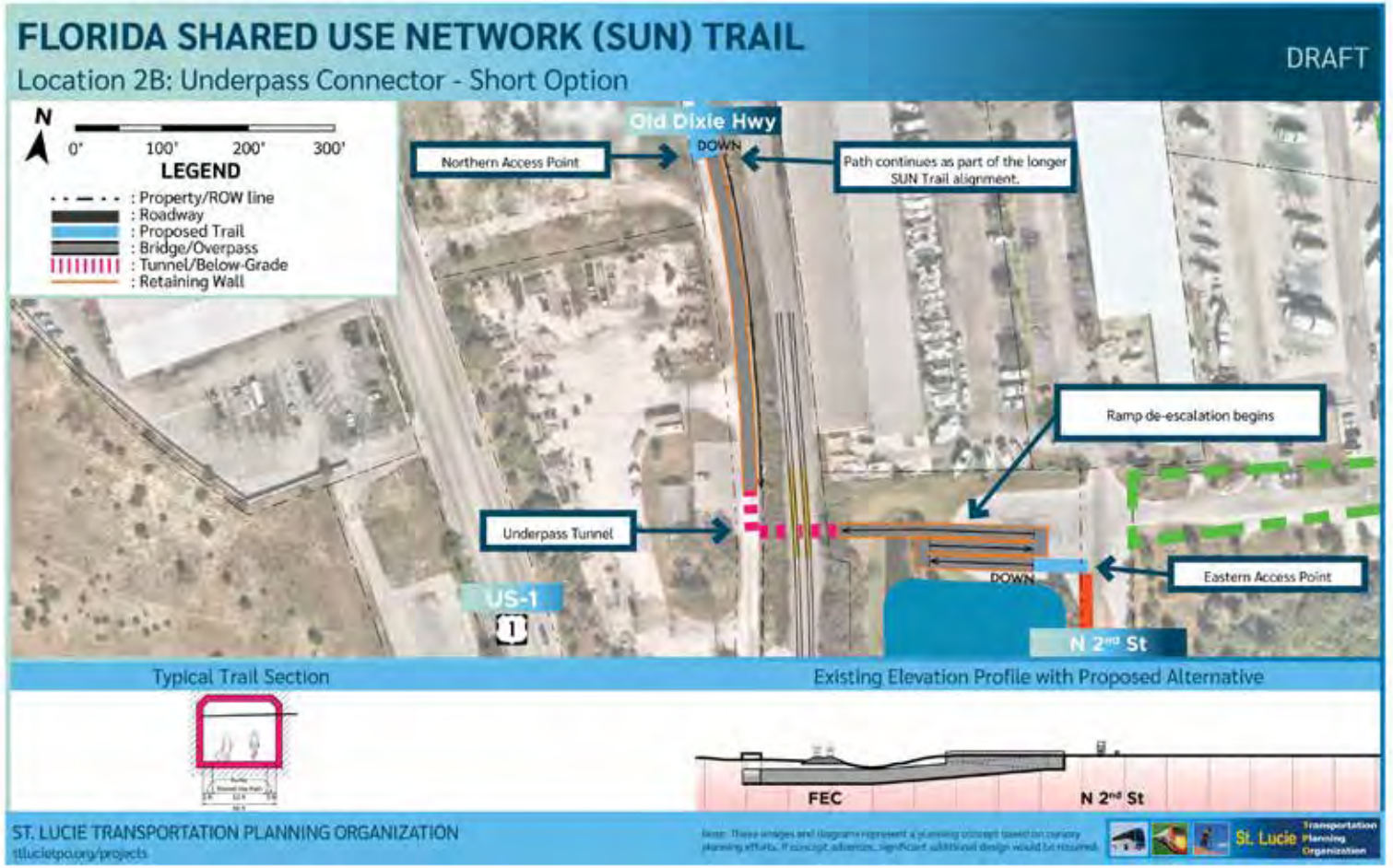
2A – Switchback Overpass Connector

- Elevated trail from N 2nd St to Old Dixie Hwy, over FEC Railway
- Switchbacks necessary to achieve accessible slope standards (max 5%)
- Eastern entrance aligns with envisioned entrance into Harbour Pointe Park



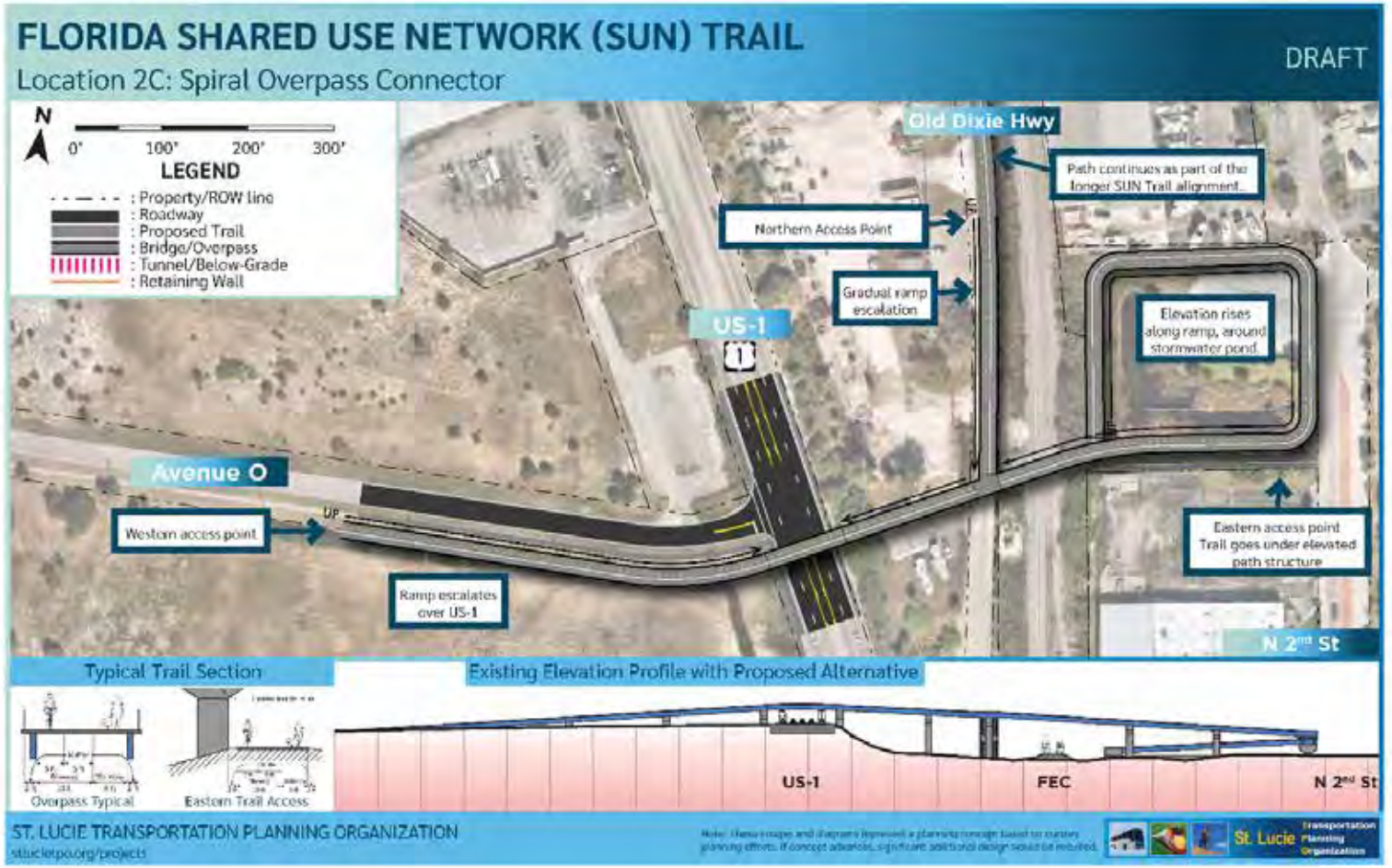
2B – Underpass Connector – Short Option

- Culvert-style underpass that would connect N 2nd St with Old Dixie Highway
  - Connection with planned shared-use path along Old Dixie Highway (also the current SUN Trail alignment)
- De-escalation begins along N 2nd Street to meet accessible slope standards (max 5%)



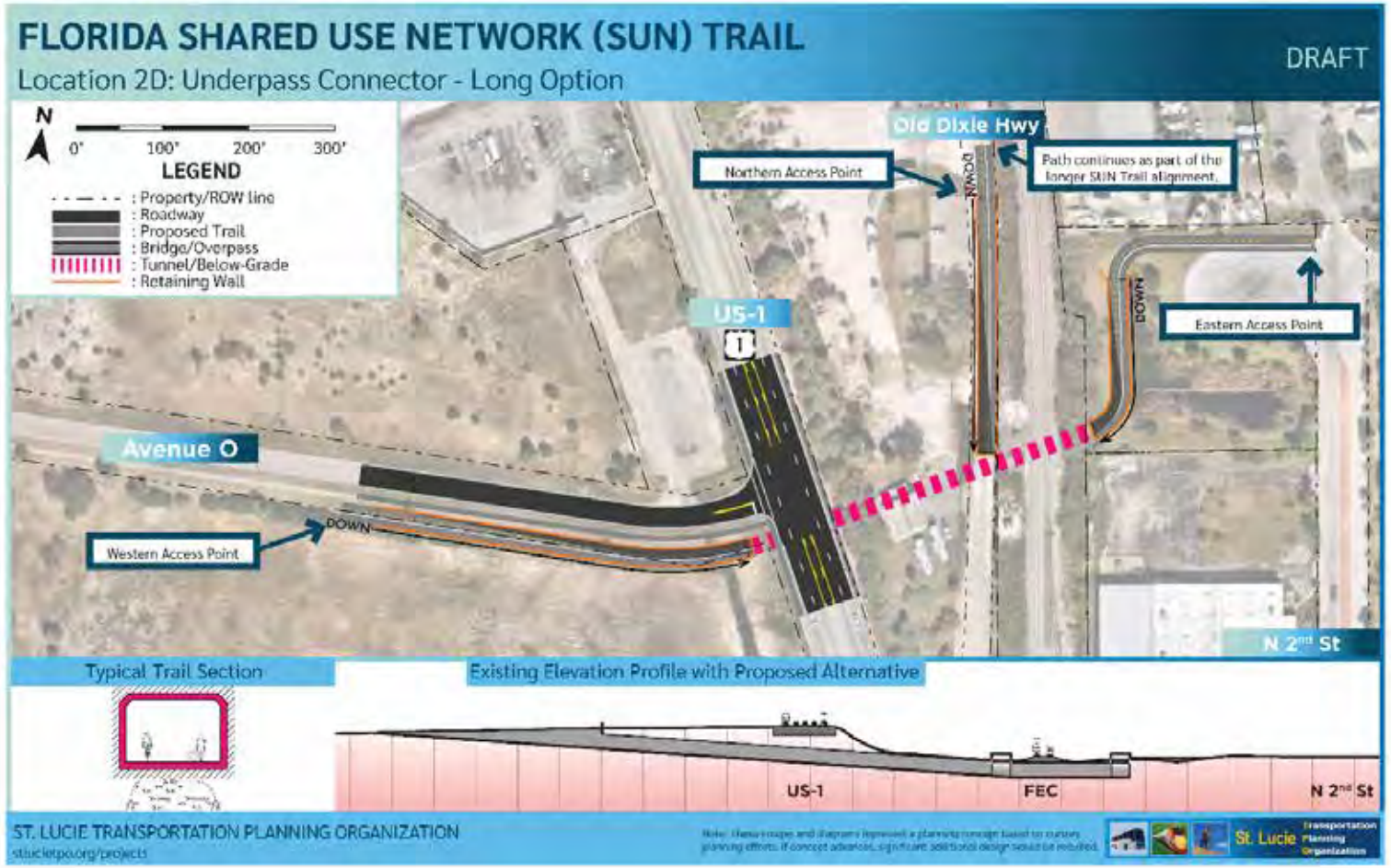
2C – Spiral Overpass Connector

- Connects N 2nd St to Avenue O, utilizing higher land elevation for an overpass
  - Path continues north to connect with existing SUN Trail alignment along Old Dixie Hwy
- Incorporates connectivity to the communities and recreation facilities west of US-1



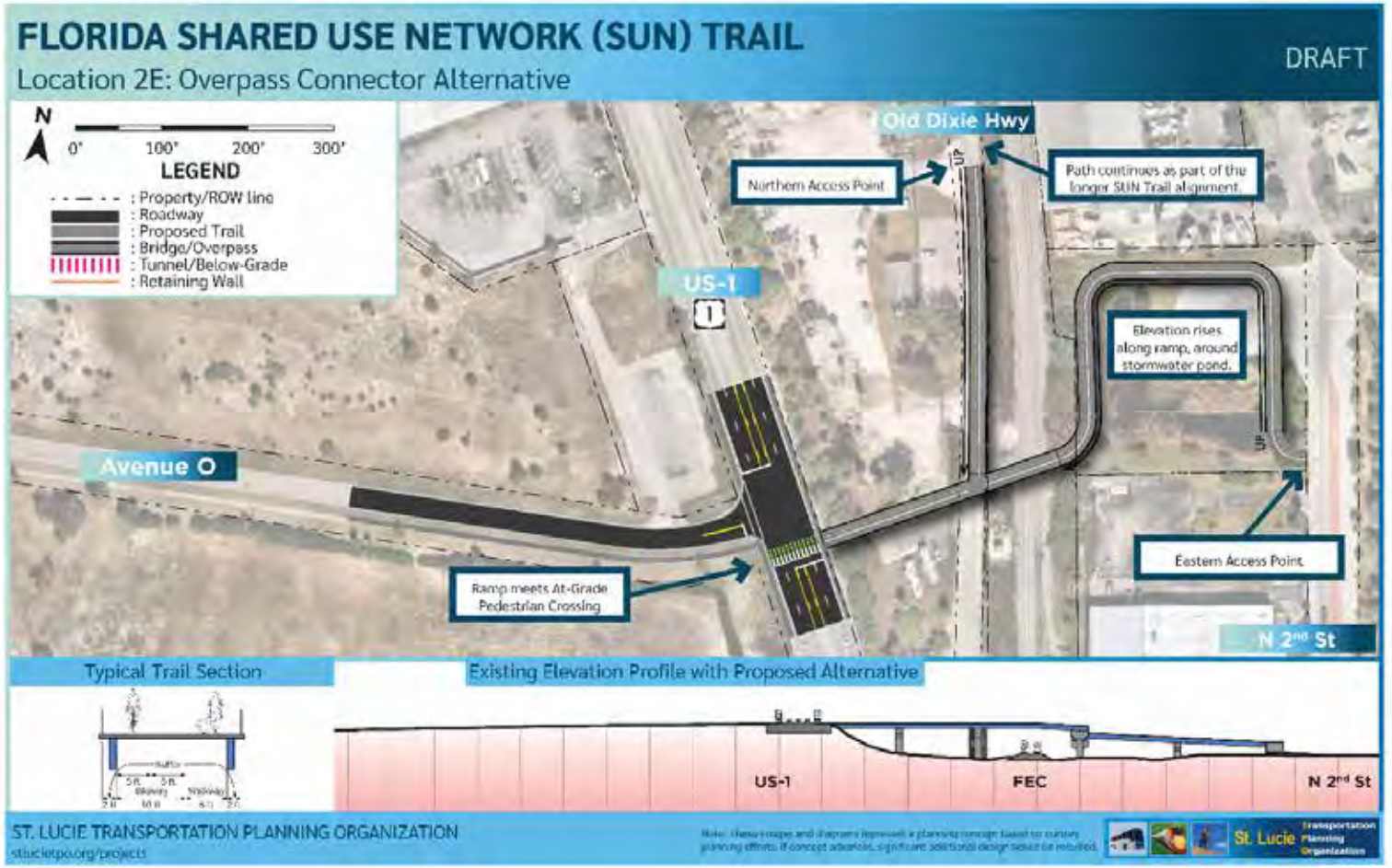
2D – Underpass Connector – Long Option

- Links to communities west of US-1 and connects to existing SUN Trail alignment along Old Dixie Hwy, and east to Harbour Pointe Park
- The elevation difference between US-1 and Old Dixie Highway requires a longer underground path to maintain accessibility



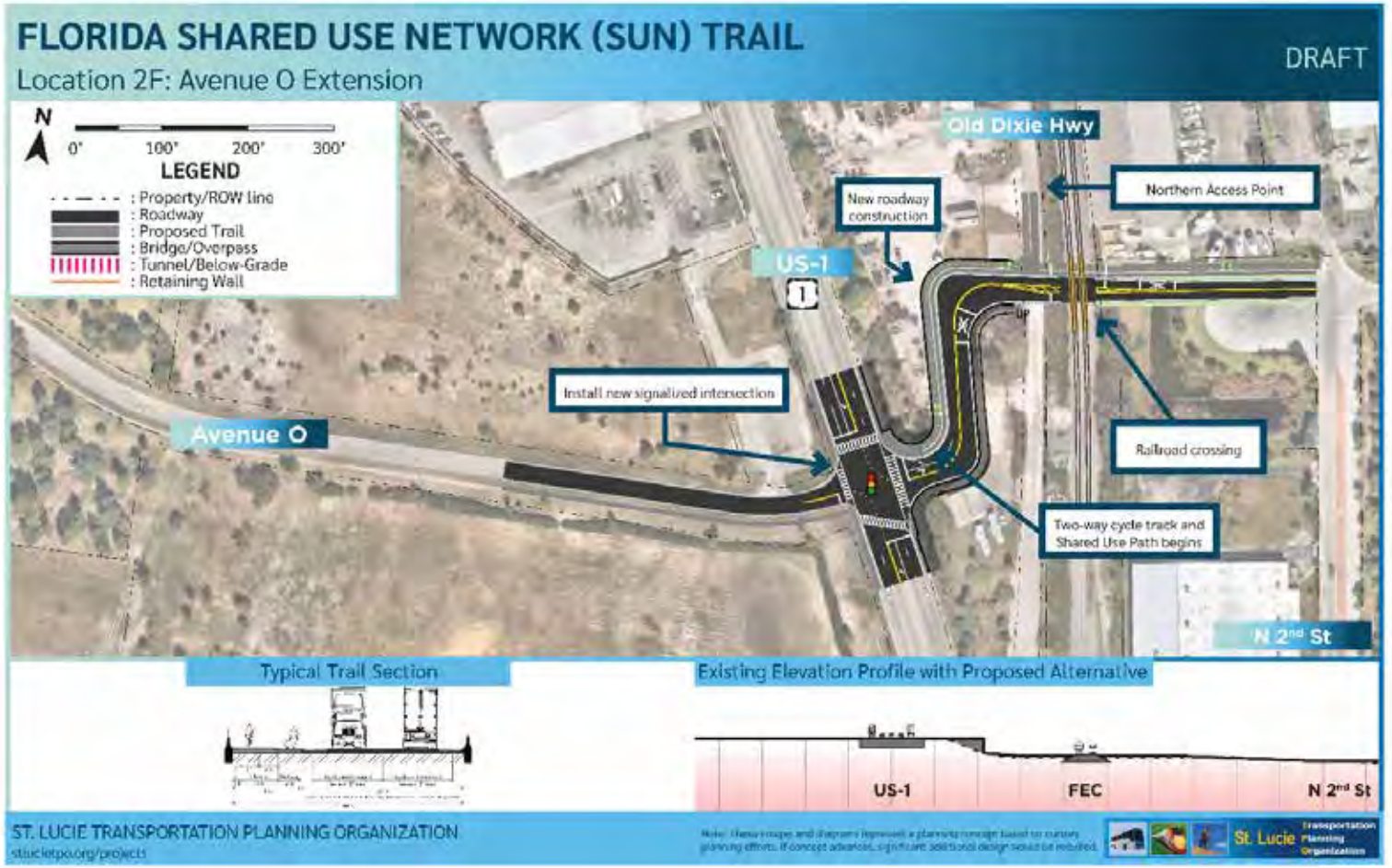
2E – Overpass Connector

- Medium-distance overpass concept that uses gradually sloped ramps to connect N 2nd St to US-1.
- Path features a more direct elevation to reach the minimum necessary vertical clearance over the FEC Railway
- Path meets US-1 at-grade and will include signalization at this intersection.
- 2E is approx. 550 feet shorter than 2C.



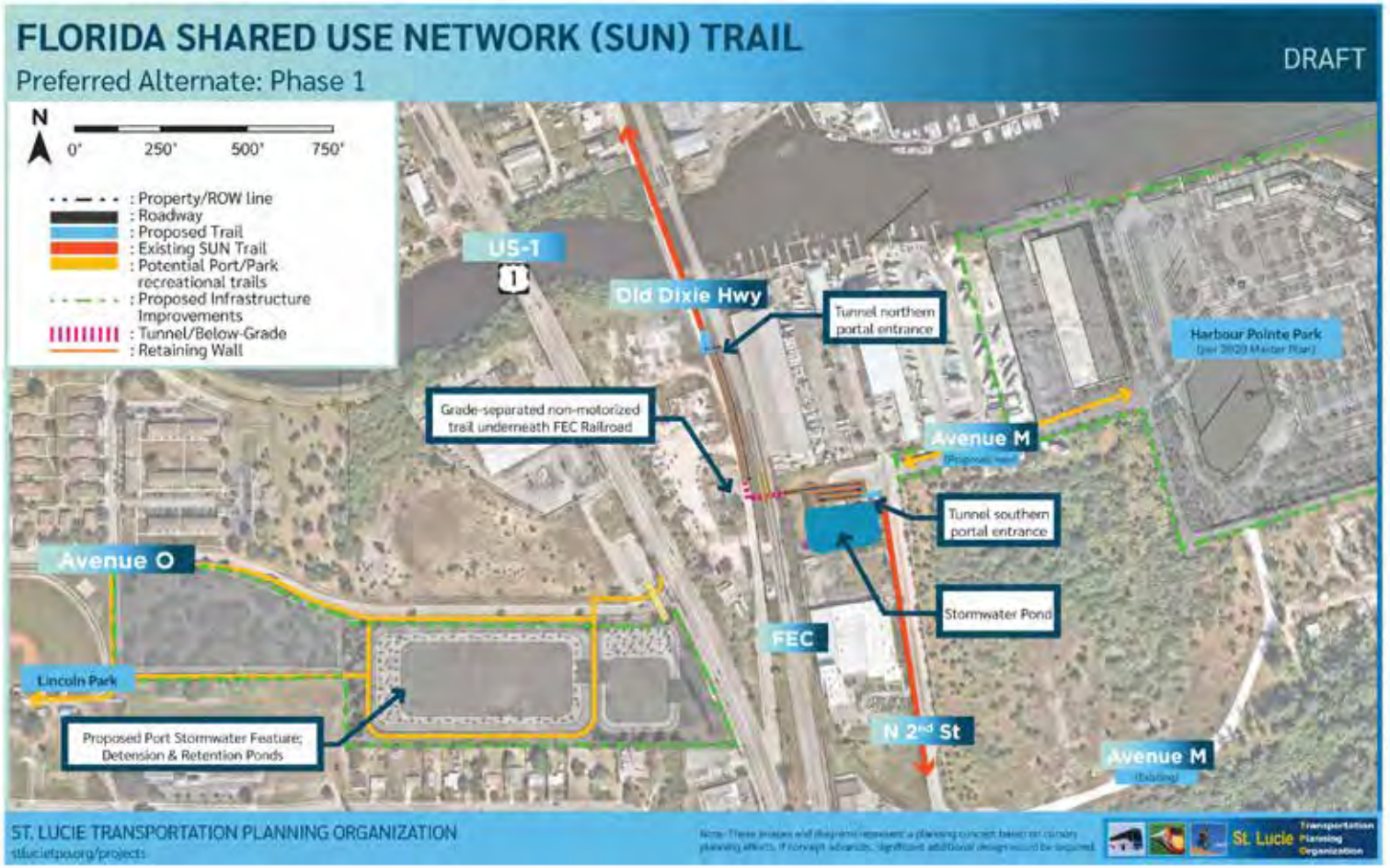
Additional Opportunity 2F – Avenue O Extension

- Extends the existing Avenue O roadway eastward, crossing the FEC Railway at-grade, and connecting to the existing N 2nd St roadway
- Includes an off-road 2-way cycle track/shared-use path running parallel to the Avenue O extension
- Provides bike/ped and vehicle access from Lincoln Park area to regional port destination
- **Challenge:** FEC requires 2 rail crossings to be closed for the opening of one new crossing



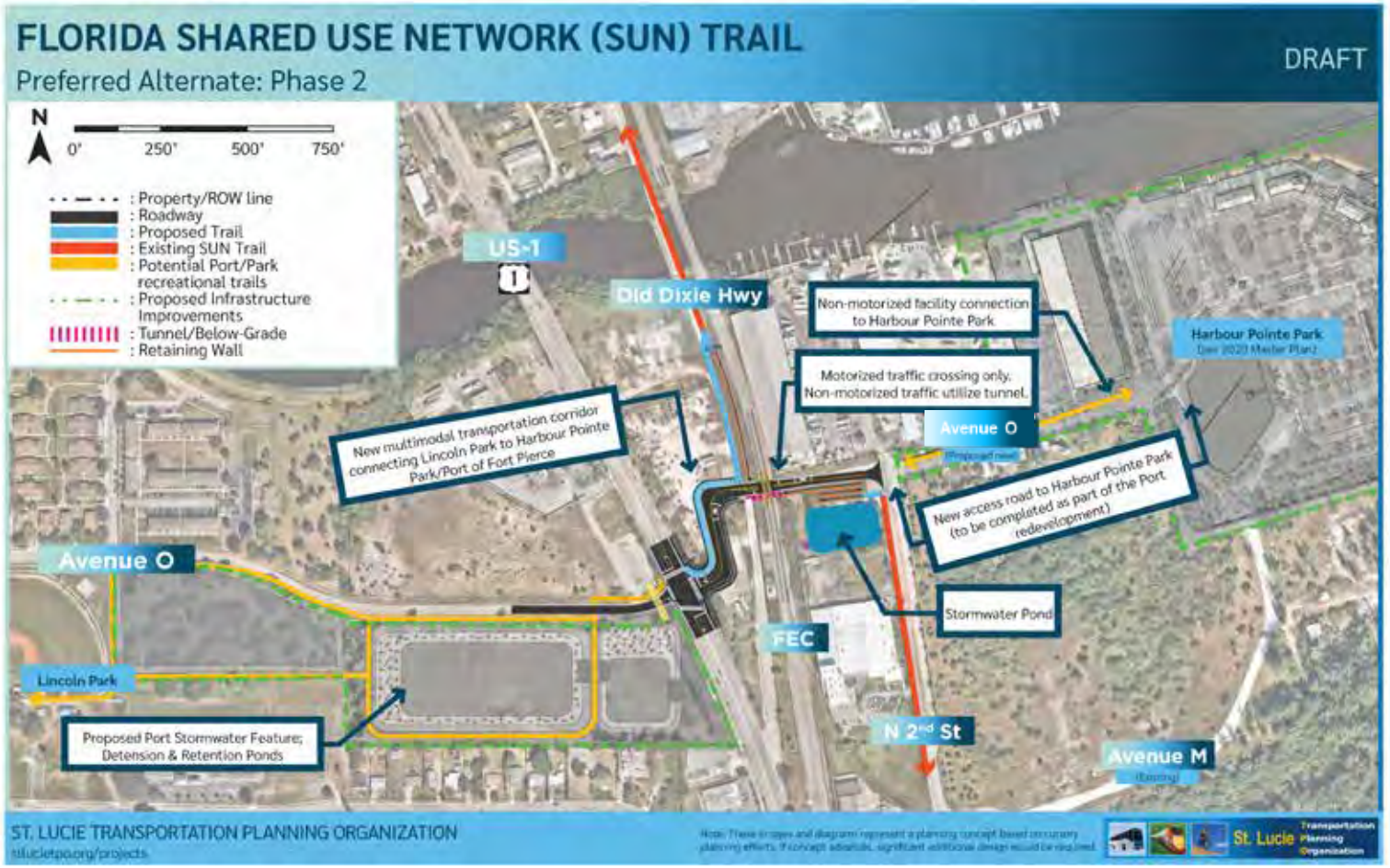
Preferred Alternative

- **Two-phased Implementation approach**
- Phase 1 includes the addition of Alternative 2B Underpass
- Phase 2 involves the addition of Alternative 2F
- Phasing allows for non-motorized grade separated connection under the FEC railroad while the Port to Parks Connector is being developed.



Preferred Alternative (Port to Parks Connector)

- Alternative 2F has slight modifications to accommodate both facilities
- **Benefits:**
  - Meets SUN Trail requirements (grade-separated 10ft. SUP)
  - Inclusion of Avenue O concept provides connectivity to communities west of US-1
  - Roadway extension provides essential road network addition as the port grows



PORT OF FORT PIERCE MASTER PLAN

MASTER PLAN & REINVESTMENT STRATEGY

FINAL / FEBRUARY, 2021

Thank You

Prepared By:

Kimley»Horn

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AGENDA ITEM SUMMARY

Board/Committee:	Technical Advisory Committee (TAC)
Meeting Date:	September 17, 2024
Item Number:	6c
Item Title:	2020 Federal Roadway Functional Classification Map
Item Origination:	Florida Department of Transportation (FDOT)
UPWP Reference:	Task 2.2 – GIS and Data Management
Requested Action:	Recommend approval of the draft 2020 Federal Roadway Functional Classification Map for the TPO area, recommend approval with conditions, or do not recommend approval.
Staff Recommendation:	Because the draft 2020 Federal Roadway Functional Classification Map addresses the TPO and local agency staff comments, it is recommended that the draft 2020 Federal Roadway Functional Classification Map for the TPO area be recommended for approval by the TPO Board.

Attachments

- Staff Report
- FHWA's Highway Functional Classification Concepts, Criteria, and Procedures Excerpts
- Draft 2020 Federal Roadway Functional Classification Map
- 2020 Summary of Changes

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MEMORANDUM

TO: Technical Advisory Committee (TAC)

THROUGH: Peter Buchwald
Executive Director

FROM: Yi Ding
Transportation Systems Manager

DATE: September 10, 2024

SUBJECT: 2020 Federal Roadway Functional Classification Map

BACKGROUND

In May 2023, as required by the Federal Highway Administration (FHWA), the Florida Department of Transportation District 4 (FDOT D4) initiated a review of the 2020 Adjusted Urban Area Boundary (UAB) following the release of the 2020 Decennial Census. The St. Lucie Transportation Planning Organization (TPO) coordinated this effort with FDOT D4 and the local jurisdictions within the TPO area. These adjustments were reviewed and concurred by the TPO Board in February 2024 before being submitted for FHWA approval.

FDOT District 4 has been working closely with the TPO and local partners to inventory roadways and update the Federal Roadway Functional Classifications for the TPO area. This update will need to be approved by the TPO before its submission to the FHWA for final approval.

ANALYSIS

The Federal Functional Classification system sets expectations for roadway design, speed, capacity, and the roadway's relationship to existing and future land uses. It also determines eligibility for funding under Federal-Aid highway programs.

Functional classification defines the role of a roadway segment in serving traffic within the overall network. Roadways are categorized into a hierarchy

of classifications based on the attached excerpts from FHWA's Highway Functional Classification Concepts, Criteria, and Procedures.

FDOT D4 reevaluated the 2010 Federal Roadway Functional Classification Map in accordance with FHWA's guidelines and prepared a draft 2020 Federal Roadway Functional Classification Map which was presented to local agency and TPO staffs on August 2, 2024, for comments. The attached draft 2020 Federal Roadway Functional Classification Map for the TPO area addresses the comments received from the local agency and TPO staffs. A 2020 Summary of Changes is attached that describes how the comments received from the local agency and TPO staffs were addressed.

RECOMMENDATION

Because the draft 2020 Federal Roadway Functional Classification Map addresses the TPO and local agency staff comments, it is recommended that the draft 2020 Federal Roadway Functional Classification Map for the TPO area be recommended for approval by the TPO Board.

FHWA

Highway Functional Classification Concepts, Criteria and Procedures 2023 Edition

February 2023

U.S. Department of Transportation
Federal Highway Administration

SECTION 1. INTRODUCTION

The *Highway Functional Classification: Concepts, Criteria and Procedures, 2023 Edition*, describes the procedures and processes for assigning functional classifications to roadways and adjusting urban area boundaries. This document builds upon and modifies prior guidance documents.

Our nation's roadway system is a vast network that connects places and people within and across national borders. Planners and engineers have developed elements of this network with particular travel objectives in mind. These objectives range from serving long-distance passenger and freight needs to serving neighborhood travel from residential developments to nearby shopping centers. The functional classification of roadways defines the role each element of the roadway network plays in serving these travel needs.

Over the years, functional classification has come to assume additional significance beyond its purpose as a framework for identifying the role of a roadway in moving vehicles through a network of highways. Functional classification carries with it expectations about roadway design, including its speed, capacity and relationship to existing and future land use development. Federal legislation continues to use functional classification in determining eligibility for funding under the Federal-aid program. Transportation agencies describe roadway system performance, benchmarks and targets by functional classification. As agencies continue to move towards a more performance-based management approach, functional classification will be an increasingly important consideration in setting expectations and measuring outcomes for preservation, mobility and safety.

As a result of the decennial census, the US Census Bureau issues urban area boundary maps. Transportation agencies should review these census boundaries and either accept them as is or adjust them for transportation planning purposes.

This guidance document provides recommended practices for assigning functional classifications and adjusting urban area boundaries concerning roadways that Federal, State and local transportation entities own and operate. Assigning functional classifications and adjusting urban area boundaries requires work elements common to many large-scale business enterprises: there are technical methods and tools to create an efficient and cost-effective end product; there are also procedural elements that require coordination and negotiation across agencies and individuals. This guidance document encompasses both of these elements.

This guidance document also recognizes and describes the implications of how our roadway systems are configured, used and planned for today:

- The Federal-aid system has matured significantly. A significant proportion of new functional classification designations are likely to occur from improvements and modifications to existing roads and corridors, rather than from designations on new roadways and corridors.

- In conducting functional classification updates, State departments of transportation (DOTs) strive for consensus with potentially dozens of agencies, including metropolitan and rural planning agencies, local officials and FHWA Division Offices.
- Geospatial technologies and travel demand forecasting capabilities have advanced significantly, greatly lowering the cost of data storage and increasing analysis capabilities.
- Planners and engineers have expanded roadway design options significantly, especially in areas where providing for non-motorized travel is a priority. Transportation agencies have developed their own classification terms to describe these options.

1.1 Overview

This guidance document builds upon and updates the three most recent guidance documents circulated by FHWA, namely:

- Highway Functional Classification: Concepts, Criteria and Procedures, March 1989
- Updated Guidance for the Functional Classification of Highways Memorandum, October 14, 2008[1]
- Highway Functional Classification: Concepts, Criteria and Procedures, 2013

1. All functional classification categories exist in both urban and rural areas. Specifically, all Principal Arterial sub-categories and all Collector sub-categories are recognized in both urban and rural forms. The following functional classification categories should be used:
    a. Principal Arterial
        i. Interstate
        ii. Other Freeways & Expressways (OF&E) (**Figure 1-1**)
        iii. Other (OPA)
    b. Minor Arterial
    c. Collector
        i. Major Collector
        ii. Minor Collector
    d. Local

Figure 1-1: Principal Arterial - Other Freeways & Expressways

Source: Ohio Statewide Imagery Program

2. States should assign functional classifications according to how the roadway is functioning in the current year only. Regarding future routes, roads should be functionally classified with the existing system if they are included in an approved Statewide Transportation Improvement

[1] http://www.fhwa.dot.gov/policy/ohpi/hpms/fchguidance.cfm

Program (STIP) and are expected to be under construction within the STIP timeframe of 4 years or less. Where applicable, the same classification should be given to both the future route and the existing route it replaces until the future route is constructed.

Figure 1-2: HOV Lane on Interstate 95 in Woodbridge, VA

Source: www.roadstothefuture.com

3. Ramps and other non-mainline roadways are to be assigned the same functional classification as the highest functional classification among the connecting mainline roadways served by the ramp. (**Figure 1-2**)

Roadways that fall into the Principal Arterials- Other Freeways & Expressways category are limited-access roadways that serve travel in a similar way to the Interstates.

4. Principal Arterial roadways (**Figure 1-3**) serve a large percentage of travel between cities and other activity centers, especially when minimizing travel time and distance is important. For this reason, Arterials typically are roadways with high traffic volumes and are frequently the route of choice for intercity buses and trucks. The spacing of Arterials in urban areas is closely related to the trip-end density characteristics of activity centers in urban areas. The spacing of these facilities (in larger urban areas) may vary from less than 1 mile in highly developed central business areas to 5 miles or more in the sparsely developed urban fringes.

Figure 1-3: Other Principal Arterial in California

Source: Akos Szoboszlay

Transportation agencies apply a variety of treatments to preserve mobility and increase the person throughput of Urban Arterials, including ramp metering, high-occupancy-vehicle (HOV) lanes and high-occupancy toll lanes.

Principal Arterials play a unique role in providing a high degree of mobility and carrying a high proportion of travel for long distance trips. These facilities carry the major portion of trips entering and leaving an activity center, as well as the majority of through movements that either go directly through or bypass the area.

SECTION 2. CONCEPTS

2.1 Introduction

This section of the guidance document presents the concepts underlying the functional classification of roadways. It first introduces the two primary transportation functions of roadways, namely mobility and access, and describes where different categories of roadways fall within a continuum of mobility-access. In addition to mobility and access, other factors that can help determine the proper category to which a particular roadway belongs — such as trip length, speed limit, volume, and vehicle mix — are discussed in this section.

While Arterials, Collectors and Locals span the full range of roadway functions, the Federal functional classification scheme uses additional classification categories to describe these functions more precisely. Distinctions between access-controlled and full-access roadways; the urban and rural development pattern; and subtleties between "major" and "minor" sub-classifications are key considerations when determining the Federal functional classification category to which a particular roadway belongs. The process of determining the correct functional classification of a particular roadway is as much art as it is science. Therefore, a real-world example is presented to help make the discussion of functional classification more readily understood.

The flow of traffic throughout a roadway network is similar to the flow of blood through the human circulatory system or the trunk and branch system of a tree. The units moving through the system (blood cells, nutrients, vehicles, etc.) move through progressively smaller network elements as they approach their destination.

2.2 Functional Classification Concepts

Most travel occurs through a network of interdependent roadways, with each roadway segment moving traffic through the system towards destinations. The concept of functional classification defines the role that a particular roadway segment plays in serving this flow of traffic through the network. Roadways are assigned to one of several possible functional classifications within a hierarchy according to the character of travel service each roadway provides. Planners and engineers use this hierarchy of roadways to properly channel transportation movements through a highway network efficiently and cost effectively.

2.2.1 Access versus Mobility

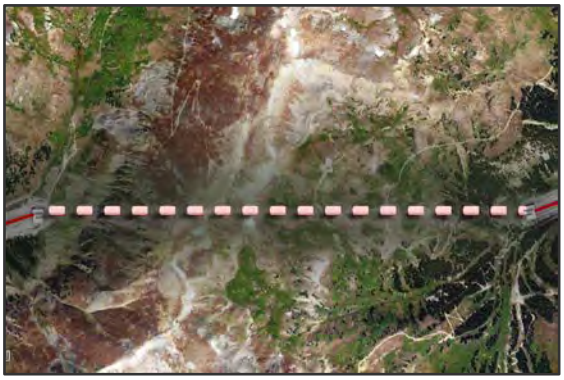
Roadways serve two primary travel needs: access to/egress from specific locations and travel mobility. While these two functions lie at opposite ends of the continuum of roadway function, most roads provide some combination of each.

- Roadway mobility function: Provides few opportunities for entry and exit and therefore low travel friction from vehicle access/egress
- Roadway accessibility function: Provides many opportunities for entry and exit, which creates potentially higher friction from vehicle access/egress

These two roles can be best understood by examining two extreme examples (**Figure 2-1** and **Figure 2-2**).

First, consider the Eisenhower Tunnel west of Denver, CO. Located along Interstate 70, the Eisenhower Tunnel runs under the Continental Divide in the Rocky Mountains and is one of the longest tunnels in the United States. Motorists that travel through the tunnel are en route to a distant location and are using the roadway completely to serve their "mobility" needs. There is no location that is immediately "accessible" to the roadway.

Figure 2-1: Aerial View of the Eisenhower (and Johnson) Tunnels along I-70, west of Denver, CO



Source: Google Earth Pro, June 27, 2012

Figure 2-2: View from Inside the Eisenhower Tunnel

Source: Creative Commons Attribution-Share Alike 2.0 generic license; Benjamin Clark

Next, consider the example of Eisenhower Court in North Platte, NE (**Figure 2-3**). This roadway is travelled almost exclusively by the individuals that live along the roadway. Hence, the roadway entirely provides "accessibility" and offers almost nothing in terms of mobility.

Figure 2-3: Aerial View of Eisenhower Court, North Platte, NE

Source: Google Earth Pro, June 27, 2012

Figure 2-4 depicts the neighborhood around Eisenhower Street in Carrollton, TX. This roadway serves both mobility needs (the residents that live along the side streets that intersect Eisenhower Street use it for some level of north/south mobility) and land access needs (there are both residential and commercial properties located along the roadway).

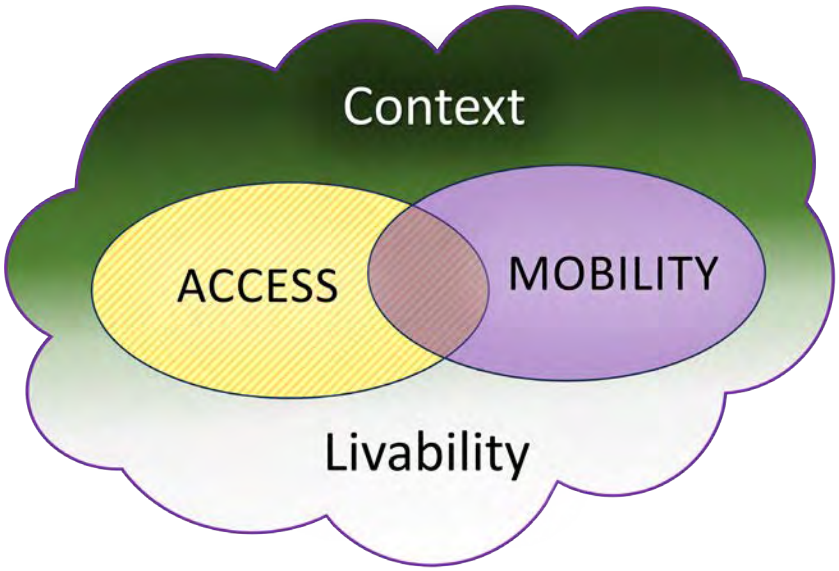
For nomenclature purposes, those roadways that provide a high level of mobility are called "Arterials"; those that provide a high level of accessibility are called "Locals"; and those that provide a more balanced blend of mobility and access are called "Collectors."

Figure 2-4: Aerial View of Eisenhower Street in Carrollton, TX

Source: Google Earth Pro, June 28, 2012

The relationship between mobility and land access is illustrated in **Figure 2-5**. Arterials provide mostly mobility; Locals provide mostly land access; and Collectors strike a balance between the two. Context Sensitivity and Livability form the environment through which Mobility and Access should be considered. These concepts are discussed in greater detail in Chapter 5.

Figure 2-5: Illustration of Access-Mobility Dynamic



Source: FHWA

While most roadways offer both "access to property" and "travel mobility" services, it is the roadway's primary purpose that defines the classification category to which a given roadway belongs.[2]

[2] The use of the term "Local" roadway in the context of functional classification is separate from the use of the term in a jurisdictional context. While it is true that roadways functionally classified as "Local" are often under the jurisdiction of a "local" entity (i.e., incorporated city), Local Roads are not always under local jurisdiction. Other roadway classifications, including Arterials, may also be under the jurisdiction of a local (i.e., non-state) entity.

A route is a linear path of connected roadway segments, all with the same functional classification designation. For example, the roadways along a given Arterial route may — and often do — comprise multiple named roadways or state numbered facilities. Similarly, different segments of a given named roadway, or even more likely a given state numbered route, may belong to different functional classification categories, depending on the character of travel service that each segment provides. In the example to the right, the minor Arterial "route" consists of a portion of Tyler Street and a portion of Dalton Avenue (shown in green). East of Dalton Avenue, Tyler Street (shown in brown) is a Minor Collector.

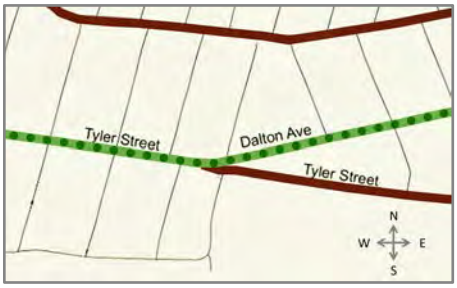
2.3 Other Important Factors Related to Functional Classification

The distinction between "mobility and accessibility" is important in assigning functional classifications to roadways. There are a few additional factors to consider, and these are discussed here.

Efficiency of Travel: Trip makers will typically seek out roadways that allow them to travel to their destinations with as little delay as possible and by the shortest travel time. Arterial roadways provide this kind of service, often in the form of fully or partially controlled access highways, with no or very few intersecting roadways to hinder traffic flow. Therefore, a high percentage of the length of a long-distance trip will be made on Arterials. In contrast, travelers making shorter trips tend to use Local and/or Collector roadways for a much higher proportion of the trip length than Arterial roads.

Collectors: As their name implies, Collectors "collect" traffic from Local Roads and connect traffic to Arterial roadways. Collector routes are typically shorter than Arterial routes but longer than Local Roads. Collectors often provide traffic circulation within residential neighborhoods as well as commercial, industrial, or civic districts (see **Figure 2-6**).

Figure 2-6: Collector Example



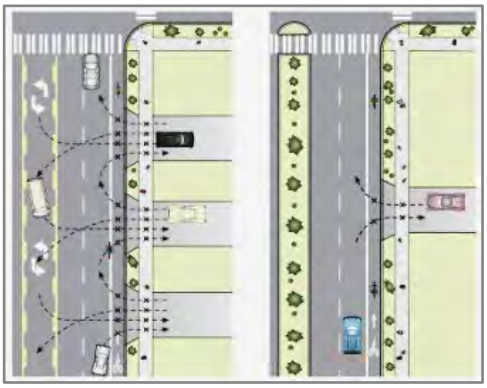
Source: CDM Smith

Access Points: Arterials primarily serve long-distance travel and are typically designed as either access controlled or partially access controlled facilities with limited locations at which vehicles can enter or exit the roadway (typically via on- or off-ramps). In instances where limited or partial access control is not provided, signalized intersections are used to control traffic flow, with the Arterial given the majority of the green time.

In growing urban areas, Arterial roadways often experience an ever-increasing number of driveway access points. This high degree of accessibility decreases mobility. To address this issue and restore the carrying capacity of through traffic on these roadways, transportation agencies apply access management principles, such as driveway consolidation and median installations (see **Figure 2-7**).

In contrast, roadways classified as "Local" provide direct access to multiple properties.

Figure 2-7: Example of Access Points



Source: Ohio DOT, http://www.ahtd.info/basic_bike-walk_facility_design

Speed Limit: In general, there is a relationship between posted speed limits and functional classification. Arterials typically have higher posted speed limits as vehicles encounter few or no at-grade intersections. The absence of cross-traffic and driveways allows for higher rates of speed, which provides mobility, especially for long-distance travel. In contrast, because their primary role is to provide access, Locals are lined with intersecting access points in the form of driveways, intersecting roadways, cross walks and transfer points for buses and other modes. Due to the frequency of traffic turns, speed limits are kept low to promote safe traffic operations. Speed limits on any non-access-controlled roadways are also influenced by the mix of vehicles and modes that use them.

Route Spacing: Directly related to the concept of channelization of traffic throughout a network is the concept of distance (or spacing) between routes. For a variety of reasons, it is not feasible to provide Arterial facilities to accommodate every possible trip in the most direct manner possible or in the shortest amount of time. Ideally, regular and logical spacing between routes of different classifications exists. Arterials are typically spaced at greater intervals than Collectors, which are spaced at much greater intervals than Locals. This spacing varies considerably for different areas; in densely populated urban areas, spacing of all route types is smaller and generally more consistent than the spacing in sparsely developed rural areas. Geographic barriers greatly influence the layout and spacing of roadways.

Usage (Annual Average Daily Traffic [AADT] Volumes and Vehicle Miles of Travel [VMT]): Arterials serve a high share of longer distance trips and daily vehicle miles of travel. In rural areas, Arterials typically account for approximately half of the daily vehicle miles of travel; in urban areas, this percentage is often higher. Collectors account for the next largest percentage of travel. Urban Area Collectors account for somewhat less (5 to 15 percent), while the percentage for Rural Area Collectors is typically in the 20 to 30 percent range. Lastly, by definition, Local Roads in rural areas typically serve very low density, dispersed developments with relatively low traffic volume. In contrast, the Urban Local Road network, with higher roadway centerline miles and higher density spacing, serves denser land uses and therefore accounts for a larger proportion of travel than its rural counterpart.

When determining the functional classification of a given roadway, no single factor should be considered alone. For example, US 290 runs through the heart of Giddings, TX. Within the city, the roadway has many intersecting roadways, provides direct access to a number of densely developed commercial and residential properties and has speed limits as low as 35 mph. However, because the roadway is one of the two most direct routes of travel between Austin and Houston and a large percentage of its traffic consists of longer distance trips, the roadway is best classified as an Arterial.

While there is a general relationship between the functional classification of a roadway and its annual average daily traffic volume, two roads that carry the same traffic volume may actually serve very different purposes and therefore have different functional classifications. Conversely, two roadways in different parts of a State may have the same functional classification but carry very different traffic volumes. This is particularly applicable among urban areas with very different populations — an Arterial within a remote city with a population of 50,000 is likely to have a much lower traffic volume than an Arterial within a city of 1 million people.

Traffic volumes, however, can come into play when determining the proper functional classification of a roadway "on the border" of a functional classification group (for example, trying to determine whether a roadway should be classified as a Collector or Local). Furthermore, AADT can often be used as a "tie-breaker" when trying to determine which of two (or more) similar and roughly parallel roadways should be classified with a higher (or lower) classification than the other. For example, suppose that two parallel roadways appear to serve the function of a Collector. Classifying both of them as a Collector could lead to undesirable redundancy in the functional classification network. All other things being equal, the roadway with the higher AADT would generally be given the Collector classification, while its companion would be given a Local classification (**Figure 2-8**).

*Exceptions to the "connectivity" guideline exist. There are locations where an Arterial can "dead end" and not connect to another Arterial. A common example is when an Arterial terminates at a regionally significant land use (such as an airport or military installation). Another example is a Collector that serves a major residential community and, for topological or other constraining reasons, does not connect at one end to another similarly or higher classified roadway. Many other examples can also be found within coastal communities. Wings Neck Road in Bourne, MA (**Figure 2-10**) is a good example. Other obvious examples are Interstate spur routes (the highest type of Arterial, to be discussed in the following section) that terminate at a city street in the downtown of an urban area.*

Number of Travel Lanes: Roadways are designed and constructed according to their expected function. If a roadway is expected to function as an Arterial, it is designed for high capacity, with multiple travel lanes. In general, Arterials are more likely to have a greater number of travel lanes than Collectors, and Collectors are more likely to have a greater number of travel lanes than Locals. It should also be noted that the relationship between functional classification and number of lanes is stronger in urban areas than it is in rural areas.

Regional and Statewide Significance: Highly significant roadways connect large activity centers and carry longer-distance travel between and through regions and States. Arterials carry the vast majority of trips that travel through a given State, while Local Roads do not easily facilitate statewide travel.

Table 2-1 summarizes the relationship between the factors previously described and the three broad categories of functional classification.

Table 2-1: Relationship between Functional Classification and Travel Characteristics

Functional Classification	Distance Served (and Length of Route)	Access Points	Speed Limit	Distance between Routes	Usage (AADT and DVMT)	Significance	Number of Travel Lanes
Arterial	Longest	Few	Highest	Longest	Highest	Statewide	More
Collector	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Local	Shortest	Many	Lowest	Shortest	Lowest	Local	Fewer

2.4 System Continuity

Because the roadway system is an interconnected network of facilities channeling traffic in both directions from Arterials to Collectors, then to Locals and back again, the concept of continuity of routes is important to recognize. A basic tenet of the functional classification network is continuity — a roadway of a higher classification should not connect to a single roadway of a lower classification.[3] Generally speaking, Arterials should only connect to other Arterials. However, there are exceptions to this guideline. Arterials can end or link to very large regional traffic generators or can connect to multiple parallel roads of lower functional classification that, together, provide the same function and capacity as an Arterial.

In **Figure 2-9**, the Arterials (represented by black lines) only connect to other Arterials. Collectors (represented by the red lines), only connect to Arterials or other Collectors. Lastly, Local Roads (represented by the green lines) can connect to any type of roadway.

Exceptions to the "connectivity" guideline exist. A Collector can serve a major residential community and — for topological or other constraining reasons —not connect at one end to another similar or higher classified roadway. Other examples can also be found, especially within coastal communities. Wings Neck Road in Bourne, MA (**Figure 2-10**) is a good example. **Figure 2-11** is an example of an Interstate spur terminating at a city street in Holyoke, MA.

[3] A higher functionally classified road can "split" its traffic between two lower-level roads, with different levels of access and mobility.

SECTION 3. CRITERIA

3.1 Definitions and Characteristics

The previous section provided a general overview of the functional classification categories of Arterial, Collector and Local. For Federal functional classification purposes, this section breaks these categories down further to stratify the range of mobility and access functions that roadways serve. Additionally, the physical layout and the official designation of some roadways dictate the classification of certain roadways.

Access control is a key factor in the realm of functional classification. All Interstates are "limited access" or "controlled access" roadways. The use of the word "access" in this context refers to the ability to access the roadway and not the abutting land use—these roadways provide no "access" to abutting land uses. Access to these roadways is controlled or limited to maximize mobility by eliminating conflicts with driveways and at-grade intersections that would otherwise hinder travel speed. Access to these roadways is limited to a set of controlled locations at entrance and exit ramps. Travelers use a much lower functionally classified roadway to reach their destination.

3.1.1 Interstates

Interstates are the highest classification of Arterials and were designed and constructed with mobility and long-distance travel in mind. (**Figure 3-1**) Since their inception in the 1950's, the Interstate System has provided a superior network of limited access, divided highways offering high levels of mobility while linking the major urban areas of the United States.

Figure 3-1: Example of Interstate

Source: CDM Smith

Determining the functional classification designation of many roadways can be somewhat subjective, but with the Interstate category of Arterials, there is no ambiguity. Roadways in this functional classification category are officially designated as Interstates by the Secretary of Transportation, and all routes that comprise the Dwight D. Eisenhower National System of Interstate and Defense Highways belong to the Interstate functional classification category and are considered Principal Arterials.

3.1.2 Other Freeways & Expressways

Roadways in this functional classification category look very similar to Interstates. While there can be regional differences in the use of the terms 'freeway' and 'expressway', for the purpose of functional classification the roads in this classification have directional travel lanes are usually separated by some type of physical barrier, and their access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections. Like Interstates, these roadways are designed and constructed to maximize their mobility function, and abutting land uses are not directly served by them.

3.1.3 Other Principal Arterials

Figure 3-2: Example of Other Principal Arterial

Source: CDM Smith

These roadways serve major centers of metropolitan areas, provide a high degree of mobility and can also provide mobility through rural areas. Unlike their access-controlled counterparts, abutting land uses can be served directly. Forms of access for Other Principal Arterial roadways include driveways to specific parcels and at-grade intersections with other roadways. (**Figure 3-2**) For the most part, roadways that fall into the top three functional classification categories (Interstate, Other Freeways & Expressways and Other Principal Arterials) provide similar service in both urban and rural areas. The primary difference is that there are usually multiple Arterial routes serving a particular urban area, radiating out from the urban center to serve the surrounding region. In contrast, a rural area of equal size would be served by a single Arterial.

Table 3-1 presents a few key differences between the character of service that urban and rural Arterials provide.

Table 3-1: Characteristics of Urban and Rural Arterials

Urban	Rural
• Serve major activity centers, highest traffic volume corridors and longest trip demands • Carry high proportion of total urban travel on minimum of mileage • Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area • Serve demand for intra-area travel between the central business district and outlying residential areas	• Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel • Connect all or nearly all Urbanized Areas and a large majority of Urban Areas with 25,000 and over population • Provide an integrated network of continuous routes without stub connections (dead ends)

3.1.4 Minor Arterials

Minor Arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system. In an urban context, they interconnect and augment the higher Arterial system, provide intra-community continuity and may carry local bus routes. **(Figure 3-3)**

Figure 3-3: Example of Urban Minor Arterial

Source: Unsourced photo

In rural settings, Minor Arterials should be identified and spaced at intervals consistent with population density, so that all developed areas are within a reasonable distance of a higher-level Arterial. Additionally, Minor Arterials in rural areas are typically designed to provide relatively high overall travel speeds, with minimum interference to through movement. The spacing of Minor Arterial streets may typically vary from 1/8- to 1/2-mile in the central business district (CBD) and 2 to 3 miles in the suburban fringes. Normally, the spacing should not exceed 1 mile in fully developed areas (see **Table 3-2**).

Table 3-2: Characteristics of Urban and Rural Minor Arterials

Urban	Rural
• Interconnect and augment the higher-level Arterials • Serve trips of moderate length at a somewhat lower level of travel mobility than Principal Arterials • Distribute traffic to smaller geographic areas than those served by higher-level Arterials • Provide more land access than Principal Arterials without penetrating identifiable neighborhoods • Provide urban connections for Rural Collectors	• Link cities and larger towns (and other major destinations such as resorts capable of attracting travel over long distances) and form an integrated network providing interstate and inter-county service • Be spaced at intervals, consistent with population density, so that all developed areas within the State are within a reasonable distance of an Arterial roadway • Provide service to corridors with trip lengths and travel density greater than those served by Rural Collectors and Local Roads and with relatively high travel speeds and minimum interference to through movement

3.1.5 Major and Minor Collectors

Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Within the context of functional classification, Collectors are broken down into two categories: Major Collectors and Minor Collectors. All Collectors, regardless of whether they are within a rural area or an urban area, may be sub-stratified into *major* and *minor*

categories. The determination of whether a given Collector is a Major or a Minor Collector is frequently one of the biggest challenges in functionally classifying a roadway network.

In the rural environment, Collectors generally serve primarily intra-county travel (rather than statewide) and constitute those routes on which (independent of traffic volume) predominant travel distances are shorter than on Arterial routes. Consequently, more moderate speeds may be posted.

The distinctions between Major Collectors and Minor Collectors are often subtle. Generally, Major Collector routes are longer in length; have lower connecting driveway densities; have higher speed limits; are spaced at greater intervals; have higher annual average traffic volumes; and may have more travel lanes than their Minor Collector counterparts. Careful consideration should be given to these factors when assigning a Major or Minor Collector designation. In rural areas, AADT and spacing may be the most significant designation factors. Since Major Collectors offer more mobility and Minor Collectors offer more access, it is beneficial to reexamine these two fundamental concepts of functional classification. Overall, the total mileage of Major Collectors is typically lower than the total mileage of Minor Collectors, while the total Collector mileage is typically one-third of the Local roadway network (see **Table 3-3**).

Table 3-3: Characteristics of Urban and Rural Major Collectors

MAJOR COLLECTORS	
Urban	**Rural**
• Serve both land access and traffic circulation in higher density residential, and commercial/industrial areas • Penetrate residential neighborhoods, often for significant distances • Distribute and channel trips between Local Roads and Arterials, usually over a distance of greater than three-quarters of a mile • Operating characteristics include higher speeds and more signalized intersections	• Provide service to any county seat not on an Arterial route, to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks and important mining and agricultural areas • Link these places with nearby larger towns and cities or with Arterial routes • Serve the most important intra-county travel corridors

MINOR COLLECTORS	
Urban	**Rural**
• Serve both land access and traffic circulation in lower density residential and commercial/industrial areas • Penetrate residential neighborhoods, often only for a short distance • Distribute and channel trips between Local Roads and Arterials, usually over a distance of less than three-quarters of a mile • Operating characteristics include lower speeds and fewer signalized intersections	• Be spaced at intervals, consistent with population density, to collect traffic from Local Roads and bring all developed areas within reasonable distance of a Collector • Provide service to smaller communities not served by a higher-class facility • Link locally important traffic generators with their rural hinterlands

3.1.6 Local Roads

Locally classified roads account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. Bus routes generally do not run on Local Roads. They are often designed to discourage through traffic. As public roads, they should be accessible for public use throughout the year.

Local Roads are often classified by default. In other words, once all Arterial and Collector roadways have been identified, all remaining roadways are classified as Local Roads (see **Table 3-4**).

Table 3-4: Characteristics of Urban and Rural Local Roads

Urban	Rural
• Provide direct access to adjacent land • Provide access to higher systems • Carry no through traffic movement • Constitute the mileage not classified as part of the Arterial and Collector systems	• Serve primarily to provide access to adjacent land • Provide service to travel over short distances as compared to higher classification categories • Constitute the mileage not classified as part of the Arterial and Collector systems

3.2 Putting it all Together

The functional classification system groups roadways into a logical series of decisions based upon the character of travel service they provide. **Figure 3-4** presents this process, starting from assigning the function of an Arterial by its level of access (limited or full) or Non-Arterial (full access).

2020 FEDERAL FUNCTIONAL CLASSIFICATION AND URBAN AREA BOUNDARIES MAP

ST. LUCIE COUNTY

2020_D4_Smoothed Urban Area

- Port St. Lucie UA
- Vero Beach -- Sebastian UA

***** Federal Functional Classifications *****

- 01 - Principal Arterial-Interstate RURAL
- 02 - Principal Arterial-Expressway RURAL
- 04 - Principal Arterial-Other RURAL
- 06 - Minor Arterial RURAL
- 07 - Major Collector RURAL
- 08 - Minor Collector RURAL
- 09 - Local RURAL
- 11 - Principal Arterial-Interstate URBAN
- 12 - Principal Arterial-Freeway and Expressway URBAN
- 14 - Principal Arterial-Other URBAN
- 16 - Minor Arterial URBAN
- 17 - Major Collector URBAN
- 18 - Minor Collector (Fed Aid) URBAN
- 19 - Local URBAN

0 0.75 1.5 3 4.5 6 7.5 Miles

Recommended By:

Draft Final

Florida Department of Transportation ***Date***

Transportation Planning Organization Chair ***Date***

Approved By:

Federal Highway Administration ***Date***

Prepared By:

FLORIDA DEPARTMENT OF TRANSPORTATION
in cooperation with the
US DEPARTMENT OF TRANSPORTATION

File Created:
09/03/2024

INSIDE	LOCAL_NM	FROM_	TO_	COMMENTS	URBAREA	FC_2024	NETL	FC_2024_DESC	CRITERIA_1	CRITERIA_2	JUSTIFY	REQ_BY	REQ_NUM	TYPE_CHG	CHG_JUMP	ID_DATE
County	Curtis King Blvd	St Lucie Blvd	Terminus before parking lot	Access to airport	Port St. Lucie, FL	18	0.246	URBAN – Minor Collector	5	-	Access to airports, seaports, and major rail terminals.	County	16	ADDITION		9/2/2024
County	Eleven Mile Rd	Midway Rd	Okeechobee Rd	Connect minor res to majr rd	RURAL	08	1.999	RURAL – Minor Collector	11	-	Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	10	ADDITION		9/2/2024
Ft Pierce	Juanita Ave (ext)	US-1	Old Dixie Hwy	Continuity and connection	Port St. Lucie, FL	17	0.133	URBAN – Major Collector	8	-	Interconnection of major thoroughfares.	County	3	ADDITION	Y	8/26/2024
County	Koblegard Rd	SR-814/Indrio Rd	Spanish Lakes Blvd	Minor Collector in nature - req Min Art	RURAL	18	0.247	URBAN – Minor Collector	11	-	Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	1	ADDITION		8/26/2024
Ft Pierce	N 2 St	Seaway Dr	Northern Terminus	Connect commercial, major pub	Port St. Lucie, FL	17	0.647	URBAN – Major Collector	5	-	Access to airports, seaports, and major rail terminals.	County	6	ADDITION	Y	8/26/2024
Port St Lucie	NE Lazy River Pkwy	NE St James Dr (S ent)	NE St James Dr (N ent)	connection to locals	Port St. Lucie, FL	18	0.940	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		3/19/2024
Port St Lucie	NW Bethany Dr	St. Lucie West Blvd	NW Blue Lake Dr	connection to locals	Port St. Lucie, FL	18	0.804	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		3/4/2024
Port St Lucie	NW Country Club Dr	St. Lucie West Blvd	NW California Blvd	connection to major roads	Port St. Lucie, FL	18	0.338	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Port St Lucie	NW St James Blvd	NW Selvitz Rd	NW St James Dr	onnection to major rds	Port St. Lucie, FL	18	0.545	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Ft Pierce/County	Peterson Rd	RA at Carlyle Way	S 33 St	connection to locals and minor rd	Port St. Lucie, FL	18	1.092	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		3/19/2024
County	S Brocksmith Rd	SR-70/Okeechobee Rd	CR-68/Orange Ave	Connect for new dev to maj rd	RURAL	07	3.395	RURAL – Major Collector	11	-	Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	9	ADDITION	Y	9/2/2024
County/Ft Pierce	S Market Ave	Oleander Ave	US-1	Connect mjr and commerce dev	Port St. Lucie, FL	18	0.506	URBAN – Minor Collector	11	-	Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	15	ADDITION		9/2/2024
Port St Lucie	SE Calais St	SE Brevard Ave	SE Mariposa Ave	connection to locals	Port St. Lucie, FL	18	0.251	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/1/2024
Port St Lucie	SE Calais St	SE Ibis Ave	SE Brevard Ave	connection to locals	Port St. Lucie, FL	18	0.211	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/1/2024
County	Silver Oak Dr	Easy St	E Midway Rd	Connection to res and minor rd	Port St. Lucie, FL	18	1.787	URBAN – Minor Collector	9	11	Interconnection of minor thoroughfares. | Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	8	ADDITION		9/2/2024

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County	Spanish Lakes Blvd	Kings Hwy/SR-713	Cll de Lagos	connection to locals	Port St. Lucie, FL	18	0.470	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		11/21/2023
County	Spanish Lakes Blvd	Koblegard Rd	Dulce Real Ave	Connects to locals - req Minor Art	RURAL	07	2.891	RURAL – Major Collector	11	-	Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	02a	ADDITION	Y	8/26/2024
County	Sunny Ln	US-1	Old US-1	New connect for diffused prop	Port St. Lucie, FL	18	0.103	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	County	12	ADDITION		9/2/2024
Port St Lucie	SW Academic Way	SW Community Blvd	SW Battle Lake Dr	connection to minor art and businesses	Port St. Lucie, FL	18	0.584	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Port St Lucie	SW Aledo Ln	SW Aledo Ln	SW Rosser Blvd	connection to locals	Port St. Lucie, FL	18	0.445	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		11/21/2023
Port St Lucie	SW Becker Rd	UAB	WS Village Pkwy	pending/connection to major/minor rds	Port St. Lucie, FL	18	1.134	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Port St Lucie	SW Brigantine Pl	SW Aledo Ln	SW Gatlin Blvd	connection to locals	Port St. Lucie, FL	18	0.211	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/28/2024
Port St Lucie	SW Discovery Way	SW Brookside Falls Way	SW Community Blvd	connection to minor rds	Port St. Lucie, FL	18	1.762	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Port St Lucie	SW East Park Ave	SW Meeting St	SW Academic Way	connection to locals	Port St. Lucie, FL	18	0.368	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/27/2024
Port St Lucie	SW Import Dr	SW Aledo Ln	SW Gatlin Blvd	connection to commercial	Port St. Lucie, FL	18	0.246	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/27/2024
Port St Lucie	SW Meeting St	SW Community Blvd	SW Batte Lake Dr	connection to Minor Art and businesses	Port St. Lucie, FL	18	0.665	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Port St Lucie	SW Rowley Way	RA for SW Community Rd	Village Pkwy	connection to locals	Port St. Lucie, FL	18	0.425	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/28/2024
Port St Lucie	SW Tradition Pkwy	RA for SW Stony Creek Way	RA for SW Creswell St	connection to locals	Port St. Lucie, FL	18	1.367	URBAN – Minor Collector	8	9	Interconnection of major thoroughfares. | Interconnection of minor thoroughfares.	FDOT		ADDITION		6/21/2024
Port St Lucie	SW West Park Ave	SW Rowley Way	SW Meeting St	connection to locals	Port St. Lucie, FL	18	0.745	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/27/2024
Port St Lucie	SW Westcliffe Ln	RA for SW Tremonte Ave	End of PVMT	connection to locals	Port St. Lucie, FL	18	0.800	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/27/2024
County	Tilton Rd	Prima Vista Blvd	Silver Oaks Dr	connecting new res	Port St. Lucie, FL	18	0.451	URBAN – Minor Collector	11	-	Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	5	ADDITION		9/2/2024

INSIDE	LOCAL_NM	FROM_	TO_	COMMENTS	URBAREA	FC_2024	NETL	FC_2024_DESC	CRITERIA_1	CRITERIA_2	JUSTIFY	REQ_BY	REQ_NUM	TYPE_CHG	CHG_JUMP	ID_DATE
Ft Pierce/County	Tropical Isle Way	Federal Highway/US-1	Tropical Isles Cir	connection to locals	Port St. Lucie, FL	18	0.242	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	FDOT		ADDITION		2/27/2024
County	Ulrich Rd	Oleander Ave	US-1	Connectivity to minor rd	Port St. Lucie, FL	18	0.513	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	County	4	ADDITION		9/2/2024
Ft. Pierce	W Weatherbee Rd	Oleander Ave	US-1	Connection to major rd and res	Port St. Lucie, FL	18	0.505	URBAN – Minor Collector	8	11	Interconnection of major thoroughfares. | Access to rural diffused property use areas and lower density urban residential and commercial/industrial areas.	County	07a	ADDITION		8/26/2024
Ft. Pierce	W Weatherbee Rd	Sunrise Blvd	W Weatherbee Rd	Residential	Port St. Lucie, FL	18	0.297	URBAN – Minor Collector	9	-	Interconnection of minor thoroughfares.	County	07b	ADDITION		8/26/2024

St. Lucie Transportation Planning Organization

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AGENDA ITEM SUMMARY

Board/Committee:	Technical Advisory Committee (TAC)
Meeting Date:	September 17, 2024
Item Number:	7a
Item Title:	Autonomous Vehicle (AV) Study Update
Item Origination:	Unified Planning Work Program (UPWP)
UPWP Reference:	Task 3.10 – Automated/Connected/Electric/ Shared-Use (ACES) Vehicles Planning
Requested Action:	Discuss and provide comments to Staff.
Staff Recommendation:	It is recommended that comments be provided regarding the AV Study Update.

Attachments

- Staff Report
- AV Study Update

St. Lucie Transportation Planning Organization

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MEMORANDUM

TO: Technical Advisory Committee (TAC)

THROUGH: Peter Buchwald
Executive Director

FROM: Marceia Lathou
Transit/ACES Program Manager

DATE: September 10, 2024

SUBJECT: Autonomous Vehicle (AV) Study Update

BACKGROUND

Transportation planning implies a focus on the future. Many experts believe the future of transportation is Autonomous Vehicles (AVs). AVs, also known as driverless cars, are already being tested on city streets and freeways in major U.S. cities. According to the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA), "The continuing evolution of automotive technology aims to deliver even greater safety benefits than earlier technologies."

Transformative technologies are characterized by inflection points – time periods that signal significant change. Inflection points often occur when innovation, economics, and regulatory frameworks converge. Despite significant progress, AVs have not yet reached an inflection point of mass adoption. Nevertheless, due to the speed of technological advancements, governments must factor AVs into the planning process.

The TPO has developed several plans and studies related to AVs including the *ACES (Automated/Connected/Electric/Shared-Use) for Transit Vehicles* study, the *Electric Vehicle Charging Station Plan*, the *Sustainable Transportation Plan*, and the *Micro-Mobility Plan* among others. The TPO's FY 2024/25 – 2025/26 Unified Planning Work Program (UPWP) calls for an AV Study Update.

ANALYSIS

The AV Study Update analyzes trends in autonomous trucking, robo-taxis/AV shuttles, and Advanced Driver Assistance technologies. The following are selected takeaways:

- Autonomous trucks are poised to become the first driverless vehicles deployed in significant numbers on public roads.

- Waymo and Cruise, leaders in the AV space, are deploying robo-taxis on city streets and freeways.

- Tesla is scheduled to make an announcement regarding its robo-taxi initiative soon.

- NHTSA wants to make certain automated features mandatory in new vehicles.

- A driverless shuttle operates in the Tradition area of Port St. Lucie.

- AV technology adoption is supported by many of the goals outlined in the TPO's SmartMoves 2045 Long Range Transportation Plan (LRTP).

- The benefits of AVs generally outweigh the disadvantages.

- Governments can help shape the future of AVs.

The TPO has kicked off the development of its 2050 LRTP, which will include an in-depth consideration of the role of AVs in the future of the transportation system in the TPO area.

RECOMMENDATION

It is recommended that comments be provided regarding the AV Study Update.

Autonomous Vehicle (AV)

Study Update

September 2024

DRAFT

Prepared by the St. Lucie TPO

Prepared by the St. Lucie Transportation Planning Organization (TPO)

Contact: Marceia Lathou
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CONTENTS

AUTONOMOUS VEHICLES (AVs)

AVs have merged into the transportation system at a slower than anticipated pace. In 2021, the U.S. Department of Transportation (DOT) prepared the *Autonomous Vehicle Comprehensive Plan* to help stakeholders prepare for a revolution. Fast forward to 2024, and the complexity of AV technology is characterized by baby steps instead of revolutionary strides.

Major automakers who once pledged to produce AVs have walked back on these commitments. No automaker has produced a fully autonomous vehicle for mass consumption although many manufacturers are producing higher levels of automation. Following is a list of AV hierarchies:

Level 0 No driving automation, though the vehicle may have some automated features.

Level 1 Limited driver assistance. The car can control either speed or steering, but not both at the same time. An example is cruise control.

Level 2 Automated cars can control both speed and steering at the same time, but only under certain conditions. The driver must remain ready to take over driving if needed.

Level 3 The car is able to drive on its own under certain conditions but will alert the driver of the need to take control.

Level 4 The car is able to handle most normal driving conditions. If the car encounters a situation it cannot handle, the car will pull over or stop.

Level 5 The car can drive itself in all conditions.

Currently, the most advanced passenger AVs exist in the form of robo-taxis.

ROBO-TAXIS

Robo-taxis are generally Level 4 autonomy vehicles travelling within geofenced areas relying on maps provided by a transportation company. These maps are kept current with assistance from the vehicle itself, which reports back on roadway conditions.

Waymo and Cruise are leading players in the field of robo-taxis. The companies are at different stages of deployment and have different approaches to technology and testing.

Waymo, a subsidiary of Alphabet Inc., has been testing autonomous vehicles for over a decade. These vehicles have accumulated millions of miles in both simulated and real-world conditions. Waymo vehicles are equipped with an array of sensors, including LiDAR, radar, and cameras, and use a sophisticated AI (artificial intelligence) system to navigate and make decisions. As Waymo describes the process, the robo-taxi dubbed Waymo Driver ". . . understands how a car moves differently than a cyclist, pedestrian, or other object, and then predicts the many possible paths that the other road users may take, all in the blink of an eye."

Cruise, owned by General Motors, is also heavily invested in autonomous vehicle technology and has been testing its vehicles extensively, particularly in San Francisco. Cruise vehicles also use a comprehensive suite of sensors and AI to navigate and operate safely.

Cruise is known for its focus on urban environments and complex driving scenarios. Because Cruise has been actively testing its vehicles in dense urban areas, unique challenges arise. Consequently, the company has reported a variety of safety incidents.

Cruise recently paused all its driverless operations after a series of safety incidents in California. The California Department of Motor Vehicles (DMV) subsequently suspended Cruise's autonomous vehicle deployment and driverless testing permits. The DMV provided Cruise with the steps needed to apply to reinstate its suspended permits. Cruise has since resumed operations in cities outside California, albeit with enhanced safety procedures. Uber recently announced a partnership with Cruise.

Waymo has reported relatively low numbers of safety incidents and has an extensive safety and testing program. Waymo currently offers rides in driverless passenger cars in several major cities, mostly on city streets, but testing is occurring on freeways as well.

Tesla is poised to enter the robo-taxi space with Elon Musk, Tesla's CEO, touting a major announcement coming in early October 2024.

Musk has spoken about Tesla's potential to launch an autonomous ride-hailing service. This service would allow Tesla owners to earn income by having their vehicles operate as self-driving taxis when not in use. Tesla's robo-taxi concept would rely on Tesla's FSD (Full Self Driving) technology and is aimed at creating a network of autonomous vehicles that can provide transportation services on demand.

AV SHUTTLES

Whereas robo-taxis operate similar to Uber or Lyft, AV shuttles operate more like fixed-route buses, running along specified routes and stopping at specified locations. AV shuttles operate throughout the nation including in St. Lucie County. The St. Lucie County shuttle is called TIM (Tradition in Motion).

Tradition in Motion (TIM)

TIM operates in the Tradition area of Port St. Lucie, which is west of I-95 generally between Crosstown Parkway and Becker Road. Tradition is a master planned community consisting mostly of single-family homes and townhouses with several large apartment complexes, and commercial plazas. The TIM network is part of Tradition's larger plan called the T-Trail, which will consist of miles of trailheads for shuttle riders, bicyclists and pedestrians.

TIM's vehicles are staffed by tour guides. Beep, the operator of TIM, is an autonomous mobility solutions provider of driverless shuttles and fully managed services in both private and public communities. According to Beep's website, the personnel in Beep's Command Center located in Orlando continuously monitor the movement and operation of the shuttle using cameras installed inside and outside the shuttle. The attendant can communicate with the command center at any time should the need arise.

TIM vehicles are 100-percent electric. The shuttle has no steering wheel or pedals. The shuttle can travel up to 15mph.

AUTONOMOUS TRUCKING

The first widespread deployment of driverless technology was initially assumed to be ride-hailing but self-driving trucks are now poised to become the first driverless vehicles deployed in significant numbers on public roads.

Whereas robo-taxis generally start out with a human operator onboard, autonomous trucks tend to be operated remotely, controlled from other sources such as satellites and GPS. A device implanted in the truck allows a human operator to “see” and control the truck’s movements.

Economic incentives exist to develop autonomous trucking, among them a shortage of truck drivers, a shortage that is forecast to worsen. A factor in this shortage is the challenge of being away from home for extended periods on long-haul routes. Although autonomous trucking is expected to benefit long-haul trucking there is expected to remain a need for drivers to deliver goods and services locally.

Autonomous trucks are already appearing on highways in some stage of testing. According to the National Conference of State Legislators, Florida is one of 29 states that have enacted legislation related to testing autonomous trucks.

Autonomous technology will create efficiencies by allowing for truck platooning: convoys of trucks spaced much closer together than would be permitted with full human control. According to a Library of Congress research guide, “By 2027 fully autonomous trucks, including truck platoons of two or more trucks in which all trucks have a driver, but only the driver of the lead truck has full control of the vehicle, are anticipated to appear on highways.”

A few companies are frequently cited as front-runners in the autonomous trucking space. These include Aurora, Plus.ai, Gatik, and Kodiak Robotics. Each of these companies is leading in different aspects of autonomous trucking technology, and their leadership status can vary based on specific criteria such as technology readiness, deployment scale, and industry partnerships. As technology continues to evolve, these leaders may shift, as new contenders enter the field and existing contenders drop out. Both Aurora and Kodiak Robotics claim they will have driverless trucks on highways within the next year.

Texas, a hub of AV trucking, can provide lessons learned to other states in their acceptance of the technology. Many factors have drawn AV trucking operators to Texas. These include business-friendly regulations, workforce capabilities, vast highway infrastructure, multimodal freight activities, strong research and development community, encouragement of public-private partnerships, and favorable weather conditions.

Texas embraced AV innovation early on. The state legislature passed its first regulation of autonomous vehicle technology in 2017. A statewide task force was created that provides Texans with a single, unified source of information regarding the coordination and advancement of automated technologies across the state. Members of the task force include representatives from other state agencies and public entities, as well as key industry stakeholders. The statewide task force now boasts numerous subcommittees.

Texas' location as a traditional transportation hub is yet another factor attracting autonomous trucking. The state is home to several truck routes between major cities that cannot be completed in a single day due to driver hours-of-service limitations. Such truck routes are especially suited for AV trucking.

DRIVER ASSISTANCE TECHNOLOGIES

Many of today's new vehicles feature "driver assist" capabilities that increase safety for drivers, passengers, and pedestrians. These technologies can steer, accelerate, and brake a vehicle autonomously. Some features are designed to warn of a crash while others are designed to take action to avoid a crash.

Today's driver assist technologies are designed with the assumption that the driver will continuously monitor the driving environment and will be prepared to take control of the vehicle as needed. According to the National Highway Traffic Safety Administration (NHTSA) "There are no vehicles available for purchase today that allow drivers to disengage from the driving task. Vehicles with partial automation capabilities are the highest level of automation that the public can purchase today."

NHTSA highlights the following types of driver automation assistance:

Forward Collision Warning

Detects a potential collision with a vehicle ahead and provides a warning to the driver. This is a NHTSA recommended safety technology.

Lane Departure Warning

Monitors the vehicle's position within the driving lane and alerts the driver as the vehicle approaches or crosses lane markers. This is a NHTSA recommended safety technology.

Rear Cross Traffic Warning

Warns the driver of a potential collision, while in reverse, that may be outside the view of the backup camera.

Blind Spot Warning

Warns of a vehicle in the driver's blind spot.

In addition to the above-described systems, there are partially automated systems that include features like adaptive cruise control and lane assist technologies.

According to a recent press release, NHTSA is developing proposed rule-making that would require automatic emergency braking (AEB) and pedestrian AEB systems on passenger cars and light trucks.

As described in the press release, an AEB system uses various sensor technologies and sub-systems that work together to detect when the vehicle is close to crashing, and then automatically applies the vehicle brakes if the driver has not done so or applies more braking force to supplement the driver's braking as necessary to avoid or mitigate the severity of the crash.

The proposed rule is expected to dramatically reduce crashes under certain conditions. NHTSA projects that this rule, if finalized, would save at least 360 lives a year and reduce injuries by at least 24,000 annually. In addition, these AEB systems would result in significant reductions in property damage caused by rear-end crashes. Many crashes would be avoided altogether, while others would be less destructive.

Source: GAO (photo). | GAO-24-106255

LONG RANGE TRANSPORTATION PLAN (LRTP) COMPLIANCE

AVs could lead to reductions in traffic congestion, increased mobility for all, and connectivity among vehicles and infrastructure. To reap these benefits, AV pilot programs are being established throughout the country.

The University of Oregon developed *Autonomous Vehicles: A Guidebook for Cities* as a tool to help stakeholders prepare for and respond to autonomous vehicle testing, pilots, and deployments in their respective jurisdictions. Stakeholders include the public, AV developers, state and local governments, and nonprofit organizations.

A key takeaway from the University's guidebook is that before launching any AV pilot program, stakeholders must determine if their goals and their community's vision align with AVs. In other words, do not adopt technology for technology's sake. The following section analyzes goals in the TPO's SmartMoves 2045 Long Range Transportation Plan (LRTP) which align with AV deployment.

Goal One: Support Economic Activities

Autonomous Trucking

Trucking supports local economies, and AVs would facilitate trucking. AV trucks could improve supply chain management and could allow vehicles to operate in complex environments 24/7.

Congestion is one of the highest costs for freight movement, and AVs could dramatically reduce congestion by enabling truck platooning which could reduce energy costs as well.

AV trucking could reduce labor expenses which could make business operations more productive.

Robo-taxis/AV Shuttles

AV shuttles/robo-taxis could promote increased access to goods and services.

The ability of AVs to reduce car accidents, injuries and fatalities could itself result in economic savings.

AVs will impact land use. Currently, a significant amount of land is needed for parking traditional autos when not in use. This land could be freed up for more productive purposes.

Since AVs tend to drive more efficiently than humans, AV shuttles/robo-taxis could potentially reduce traffic congestion. According to auto insurer Progressive, the most common causes of traffic congestion are car accidents, road debris, road construction, rush hours, and phantom traffic jams. Reduced traffic congestion generally leads to economic growth.

Driver Assistance Technologies

Driver assistance technologies hold the potential to reduce traffic crashes and save thousands of lives each year, the economic benefits of which are enormous. These benefits can be quantified in terms of insurance savings, reduced healthcare costs, and reallocation of emergency-related resources, among others.

Goal Two: Provide Travel Choices

Autonomous Trucking

Autonomous trucking will allow freight companies to operate vehicles 24/7 thus enabling them to avoid rush hours whenever possible. Fewer trucks on the road would lead to reductions in traffic congestion. Less traffic congestion would improve the range of travel times available to non-freight movement.

Robo—taxis/AV Shuttles

AVs could enable commuters to be productive while traveling, consequently resulting in greater control of personal time and choices for where people choose to work. With their abilities to operate 24/7, AVs would result in more flexibility in travel times and less congestion during commute hours, thus improving travel time reliability for all users.

Driver Assistance Technologies

Based on their improvements to safety, driver assistance technologies would support drivers in travelling during all hours of the day. For example, many senior drivers choose not to drive at night due to glare from oncoming headlights or streetlights or even during the day due to blinding sun. Driver assistance technologies also support drivers whose capacity to drive is diminished, for instance through fatigue or distraction.

Goal Three: Maintain the Transportation System

Autonomous Trucking

Most AVs are electric vehicles (EVs). A drawback of EVs is they generally weigh more than gas-powered vehicles, thus producing more wear and tear on roadways. This could result in greater deterioration of roadway surfaces and could also impact bridges, parking garages, parking lots, and driveways.

Robo-taxis/AV Shuttles

Robo-taxis/AV shuttles, being EVs, will produce more wear and tear on roadway infrastructure because EVs are generally heavier in weight than gas-powered vehicles. However, robo-taxis/AV shuttles could reduce the overall number of vehicles on the road, thus mitigating the impact of the added weight.

Driver Assistance Technologies

Driver Assistance Technologies will make driving easier, more efficient, safer, and more accessible. As driving becomes more efficient and safer more drivers will opt to drive, leading to greater deterioration of roadway surfaces.

Goal Four: Provide Equitable, Affordable, and Sustainable Urban Mobility

Autonomous Trucking

To the extent driverless trucks reduce shipping costs and to the extent those savings are passed on to consumers, driverless trucks could contribute to equity and affordability.

The sustainability aspect of driverless trucks relates to the potential for decreased gas consumption in their capacity as EVs.

In general, technology becomes more affordable as it matures, and it is conceivable that small trucking companies could eventually have driverless trucks in their fleets.

Because no human is needed behind the wheel to drive or operate these trucks and because there is a shortage of truck drivers, autonomous trucks could lead to goods being distributed in rural areas that previously were not served.

Robo—taxis/AV Shuttles

AVs could provide greater freedom for persons with disabilities, those without driver's licenses, older adults who can no longer drive, and for persons who simply choose not to drive.

In terms of affordability, owning a personal car is more expensive than the occasional use of Uber/Lyft, which in turn is more expensive than public transit.

AV shuttles, if more cost efficient than traditional transit, could benefit residents of rural areas, where the operation of traditional transit is cost prohibitive.

In terms of sustainability, in general, EVs are more environmentally friendly than their gas-powered counterparts.

Driver Assistance Technologies

A safer driving environment could encourage walking and bicycling, especially in historically disadvantaged communities where studies show that crashes involving vulnerable road users are more prevalent.

Automobile crashes themselves create huge economic burdens across a wide spectrum of society. Reducing this burden would be a social benefit.

Goal Five: Improve Safety and Security

Autonomous Trucking

Common causes of truck accidents are driver fatigue or driver distraction. By eliminating human factors, autonomous trucking could improve roadway safety. Autonomous trucks, being newer vehicles, also would benefit from the latest tech advances in safety that assist in crash avoidance and prevention.

Technology presents the challenges of cybersecurity and privacy concerns. Vehicle connectivity exacerbates these concerns. Vehicle connectivity is expected to be a hallmark of autonomous trucking. Connected vehicles use vehicle-to-vehicle, vehicle-to-infrastructure, and infrastructure-to-vehicle communication to exchange information between vehicles, drivers, the roadside, bicyclists and pedestrians. To earn public trust, cybersecurity and privacy concerns due to vehicle connectivity must be addressed.

Robo-taxis/AV Shuttles

AVs could improve safety by eliminating human error, the main cause of car accidents. Robo-taxis/AV shuttles could further enhance roadway safety by virtue of getting more cars and drivers off the roads.

Security is more problematic. AVs are expected to be connected vehicles, a connectivity which relies on computer software. All software is vulnerable to interference by bad actors. On the other hand, gas-powered vehicles are becoming increasingly connected, so this vulnerability would not be limited to AVs.

Driver Assistance Technologies

Automobile manufacturers are making continuous improvements in safety, resulting in newer vehicles being safer than older vehicles. When driver assistance technologies are made mandatory, the safety gap between older and newer vehicles will widen.

The extent to which driver assistance technologies are wireless could present cybersecurity issues. These issues could be mitigated by proactive security enhancements.

AV BENEFITS/DISADVANTAGES

Autonomous trucking benefits:

- Cost savings due to more efficient deliveries
- Reduced pollution due to more efficient deliveries
- Increased safety due to reduced chance of human error
- Reduced fuel consumption due to truck platooning which reduces wind resistance
- 24/7 operations
- Connectivity among vehicles and infrastructure

Autonomous trucking disadvantages:

- Job losses in certain categories
- Implementation expense
- Obsolescence due to rapid changes in technology
- Cybersecurity risks
- Computer malfunction risks
- Delays resulting from AV's inability to react appropriately under novel driving conditions

Robo-taxis/AV Shuttles advantages:

- Help seniors stay independent
- Help persons with disabilities achieve independence
- Reduce the number and duration of traffic jams
- Improve safety since most traffic accidents result from human error
- Decreased fuel consumption since most AVs are electric
- Lower transportation costs due to reductions in human labor costs
- Improved connectivity among vehicles and infrastructure
- Reduced strain on the healthcare system due to fewer traffic accidents

Robo-taxis/AV Shuttles disadvantages:

- Elimination of certain jobs
- Social isolation for passengers who value driver interaction
- Delays since AVs may not react appropriately under novel driving conditions
- Potential disruptions to emergency vehicles
- Cybersecurity risks
- Higher initial costs

Driver Assistance Technologies benefits:

- Improved traffic safety
- Reduced fuel consumption in their capacity as newer vehicles
- Decreased insurance costs
- Increased mobility

Driver Assistance Technologies disadvantages:

- Decreased driver awareness of surroundings
- Potential for computer malfunctions
- Increased manufacturing costs
- Potential for distracted driving

RECOMMENDATIONS

Although AV deployment is driven by the private sector, governments are partners in the process. Governments can provide guidance, implement best practices, conduct research, initiate pilot programs, and develop assistance to help stakeholders plan and make the investments needed to be proactive about technology.

Technology, especially in its beginning stages, has its fair share of issues and concerns. Even in its mature stages, technology solves certain problems and creates others. Therefore, the pros, cons, and unintended consequences of AVs must be monitored. Considerations that merit further study by governments include:

- Safety for all road users
- Shifts in travel behavior and mode choice
- Environmental justice and affordability
- Transportation network impacts
- Land use impacts
- Energy use
- Emergency services impacts
- Workforce impacts

St. Lucie Transportation Planning Organization

Coco Vista Centre
466 SW Port St. Lucie Blvd, Suite 111
Port St. Lucie, Florida 34953
772-462-1593 www.stlucietpo.org

AGENDA ITEM SUMMARY

Board/Committee:	Technical Advisory Committee (TAC)
Meeting Date:	September 17, 2024
Item Number:	7b
Item Title:	St. Lucie County Sustainable Mobility Infrastructure Study
Item Origination:	Unified Planning Work Program (UPWP)
UPWP Reference:	Task 3.9 - Environmental Planning Task 4.2 - Intergovernmental Planning and Coordination
Requested Action:	Discuss and provide comments
Staff Recommendation:	It is recommended that the Study is discussed and input and comments are provided.

Attachments
- Staff Report
- Presentation

St. Lucie Transportation Planning Organization

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MEMORANDUM

TO: Technical Advisory Committee (TAC)

FROM: Peter Buchwald
Executive Director

DATE: September 10, 2024

SUBJECT: St. Lucie County Sustainable Mobility Infrastructure Study

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BACKGROUND

St. Lucie County received a Federal grant through the Community Development Block Grant Mitigation Program (CDBG-MIT) to conduct a Sustainable Mobility Infrastructure Study incorporating land use planning, comprehensive planning, regional mitigation planning, and resiliency planning. The Corradino Group was retained by the County to complete the Study and will provide a presentation for input and comments as part of the public participation efforts of the Study.

ANALYSIS

One of the outcomes of the Study pertinent to the St. Lucie Transportation Planning Organization will be to revise the County Right-of-Way Protection Map based on sea level rise projections, the need for and the locations of stormwater capacity, elevated street sections, and public infrastructure mitigation.

RECOMMENDATION

It is recommended that the Study is discussed and input and comments are provided.

St. Lucie County

Sustainable Mobility Infrastructure Study

St. Lucie TPO
September 17th & 19th 2024

St. Lucie Transportation Planning Organization
466 SW Port St. Lucie Boulevard, #111
Port St. Lucie, Florida 34953

Purpose of the Study

Federal Project Description:

- Develop a Countywide Mobility Infrastructure Plan incorporating: land use planning, comprehensive planning, regional mitigation planning, and resiliency planning

Funding:

- funding to St. Lucie County via State of Florida Department of Economic Opportunity (DEO), now incorporated as a division of the Florida Department of Commerce
- federally funded by Community Development Block Grant Mitigation Program (CDBG-MIT)
- federal funding to St. Lucie County is $210,000 with $40,000 match by St. Lucie County

Federal and County Outcome:

- Revise the County Right-of-Way Protection Map, based on: sea level rise projections, need for and location of stormwater capacity, elevated street sections, public infrastructure mitigation.

Transportation Resiliency: Climate & Growth to Year 2100

Planning Horizon	Climate Projections	Growth and Transportation Projections
	Natural Systems: • long-term effects • small short-term human effect	**Human Systems:** • in-migration, outmigration, birth rate, life expectancy • policy dependencies • technological dependencies • macro socio-behavioral dependencies
2045	• sea-level rise forecasts • storm event tidal surge forecast • rainfall inundation forecasts	• population forecasts • employment forecasts • trip generation trends • modal split trends • existing + committed development
2070	• sea-level rise forecasts • storm event tidal surge forecast • rainfall inundation forecasts *pervious area can be affected by land use changes*	• population forecasts out of range • employment forecasts out of range • modal split unknows – range of modes undefined • land development dependent on policy and economics
2100		

Planning Methods

Planning Horizon	Climate Projections (Natural Systems)	Growth and Transportation Projections (Human Systems)
2045	• sea level rise, hurricane tidal surge, and storm event rainfall quantity and frequency based on regional models	population, employment, trip generation, modal split, trip distributions and roadway network assignments based on: • St. Lucie Comprehensive Plan Future Land Use Map • St. Lucie Long Range Transportation Plan (LRTP)
2070	• sea level rise, hurricane tidal surge, and storm event rainfall quantity and frequency based on regional models • rainfall flooding is also dependent on impervious ground cover policy from land use scenario • what level of climate catastrophe to mitigate for?	review trend, identify scenario, and identify policy to guide outcomes for: • land use intensity and geography • population growth: number and distribution • employment growth: sectors and location • generalized trip pattern impacts • adoption support for mobility technology
2100		

Climate Change

ROW Plan Dependencies - Natural

Flood Height Scenarios							
		2040		2070		2100	
Sea Level Rise	NOAA Sea Level Rise (SLR) Projections Virginia Key	Intermediate Low 0.69 ft.	Intermediate High 1.41 ft.	Intermediate Low 1.25 ft.	Intermediate High 3.28 ft.	Intermediate Low 1.77 ft.	Intermediate High 6.00 ft.
High Tide	NOAA tidal gage Cape Canaveral Station #8721604 5-Year High (height: NAVD)	4.55 ft.	4.55 ft.	4.55 ft.	4.55 ft.	4.55 ft.	4.55 ft.
Non-Event Height	SLR + High Tide	5.25 ft.	5.96 ft.	5.80 ft.	7.83 ft.	6.32 ft.	10.55 ft.
Storm Surge	NOAA SLOSH Model Maximum of Minimum (MOM) South Florida Basin (2016) Category 5 Hurricane (NAVD)	15.80 ft.	15.80 ft.	15.80 ft.	15.80 ft.	15.80 ft.	15.80 ft.
Event Height	SLR + Hurricane Surge	16.49 ft.	17.21 ft.	17.05 ft.	19.08 ft.	17.57 ft.	21.80 ft.
100-Year Storm 72-Hour Rainfall Event	South Florida Water Management District (SFWMD) and USGS "*Future Extreme Rainfall Change Factors*"	50th percentile 1.20 intensification factor 17.76 inches maximum		75th percentile 1.45 intensification factor 21.46 inches maximum		100th percentile 1.45 intensification factor 21.46 inches maximum	

Sea Level Rise (SLR) Projections

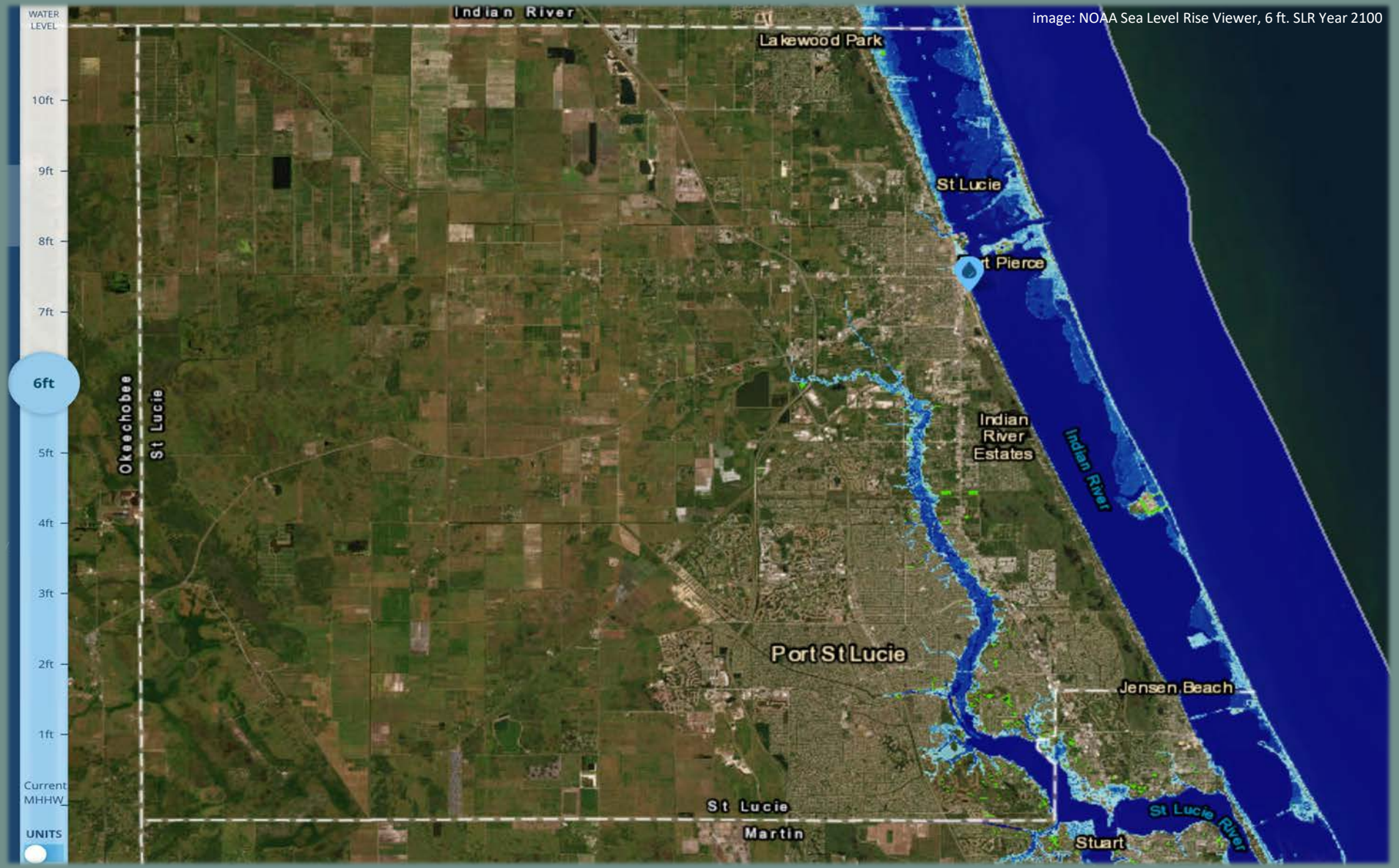
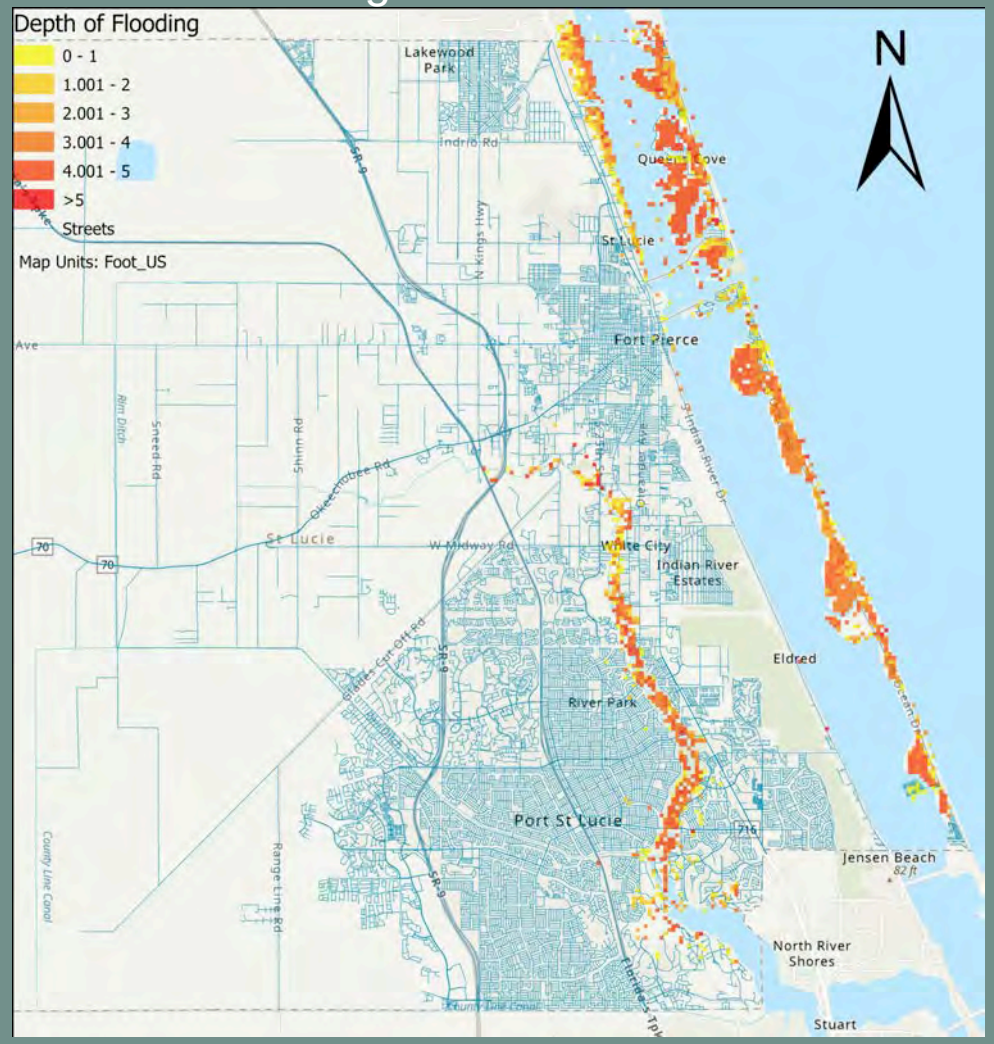


image: NOAA Sea Level Rise Viewer, 6 ft. SLR Year 2100

Sea Level Rise (SLR) Projections

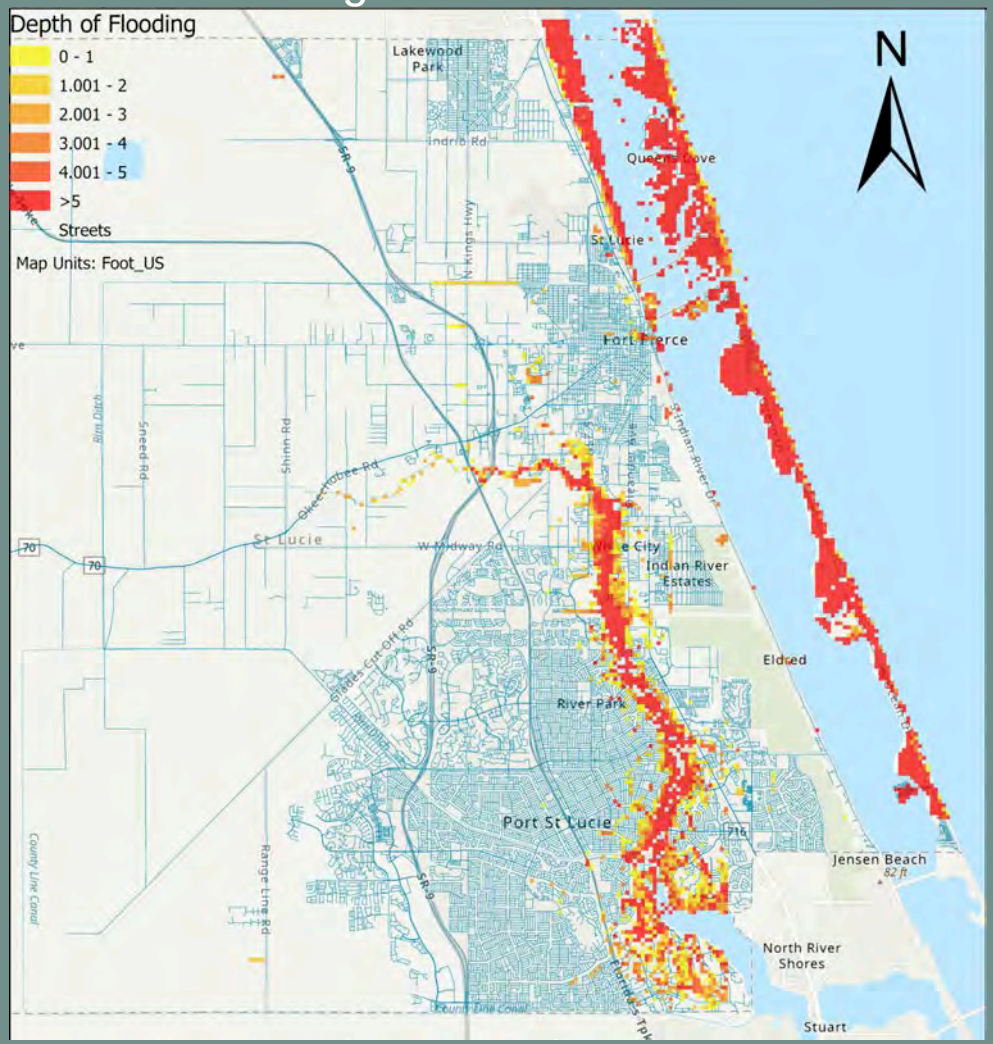
Base Year 2025

Maximum High Tide Elevation 4.55 ft.



Horizon Year 2100

Maximum High Tide Elevation 10.55 ft.

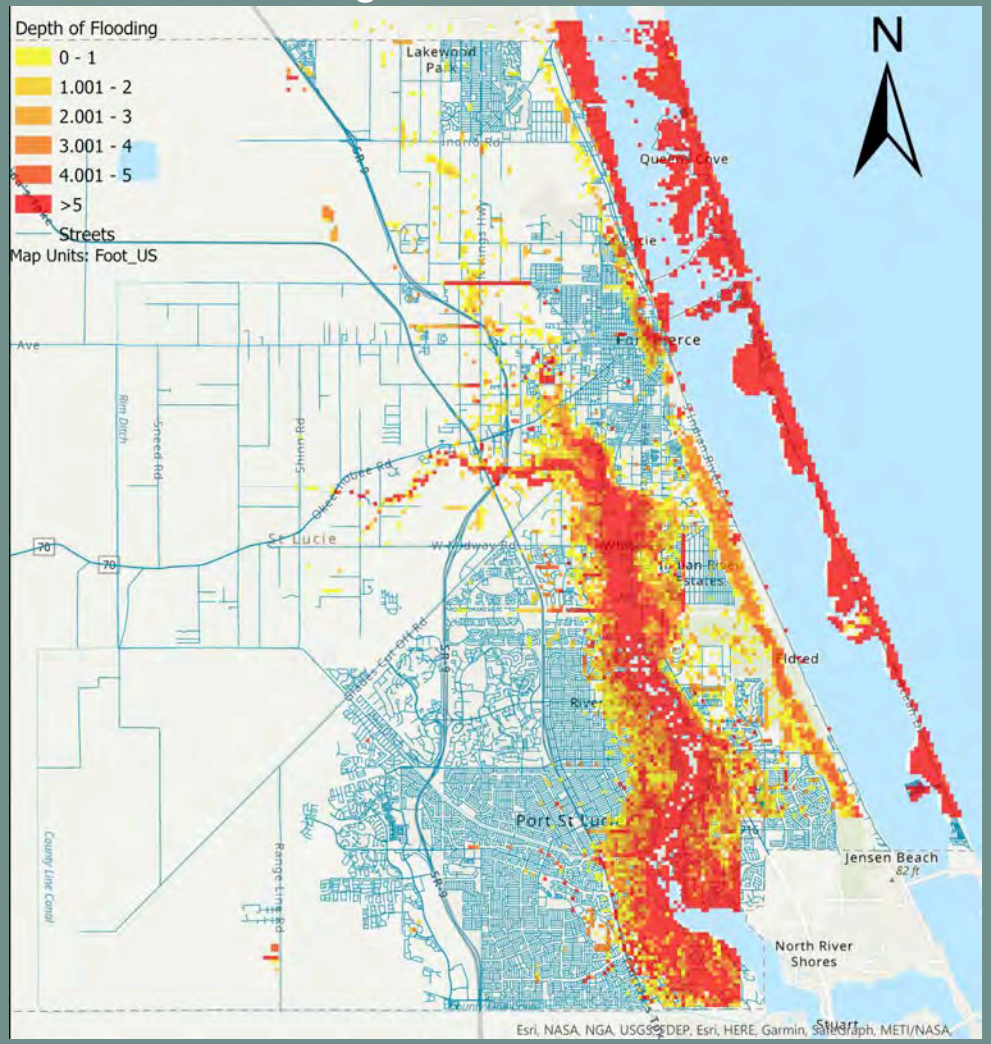


Storm Surge Projections

Storm Surge, Category 5 Hurricane

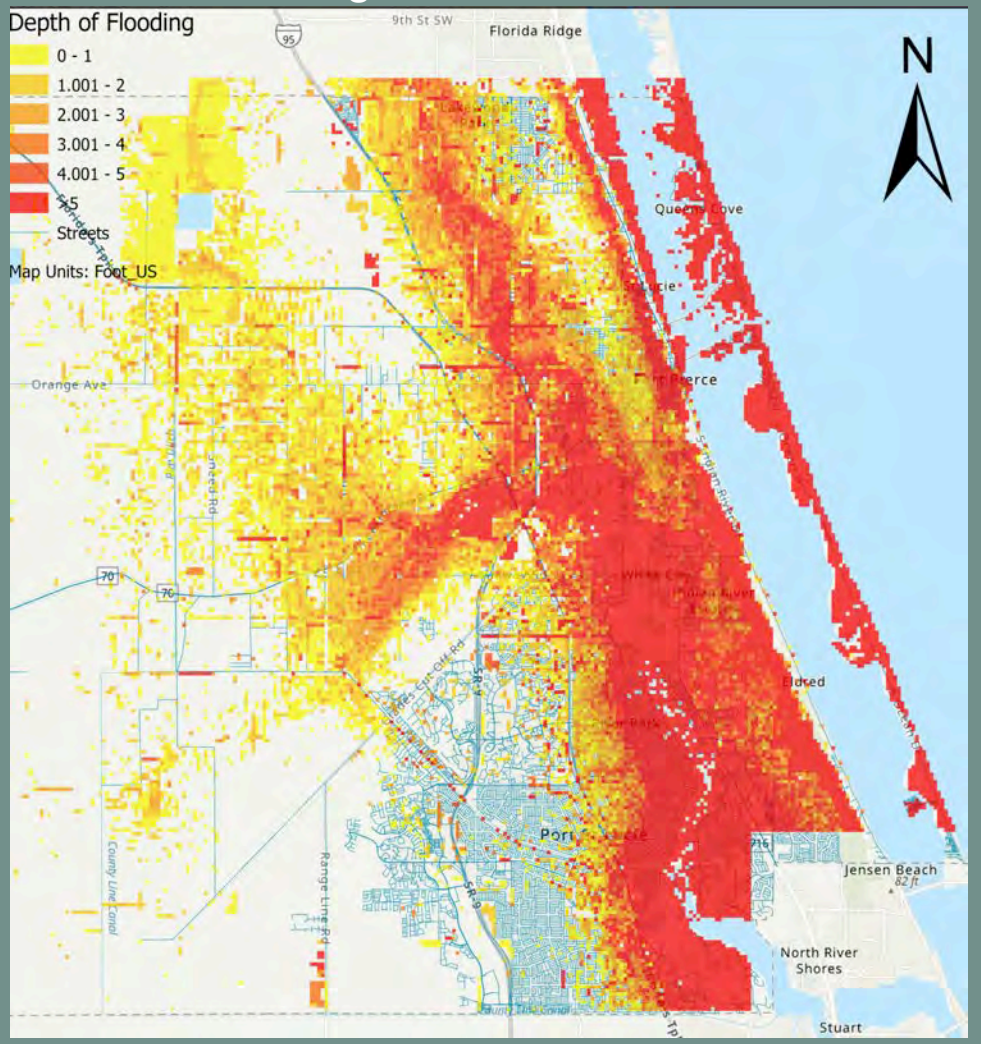
Base Year 2025

SLR + Storm Surge Water Elevation 15.80 ft.



Horizon Year 2100

SLR + Storm Surge Water Elevation 21.80 ft.

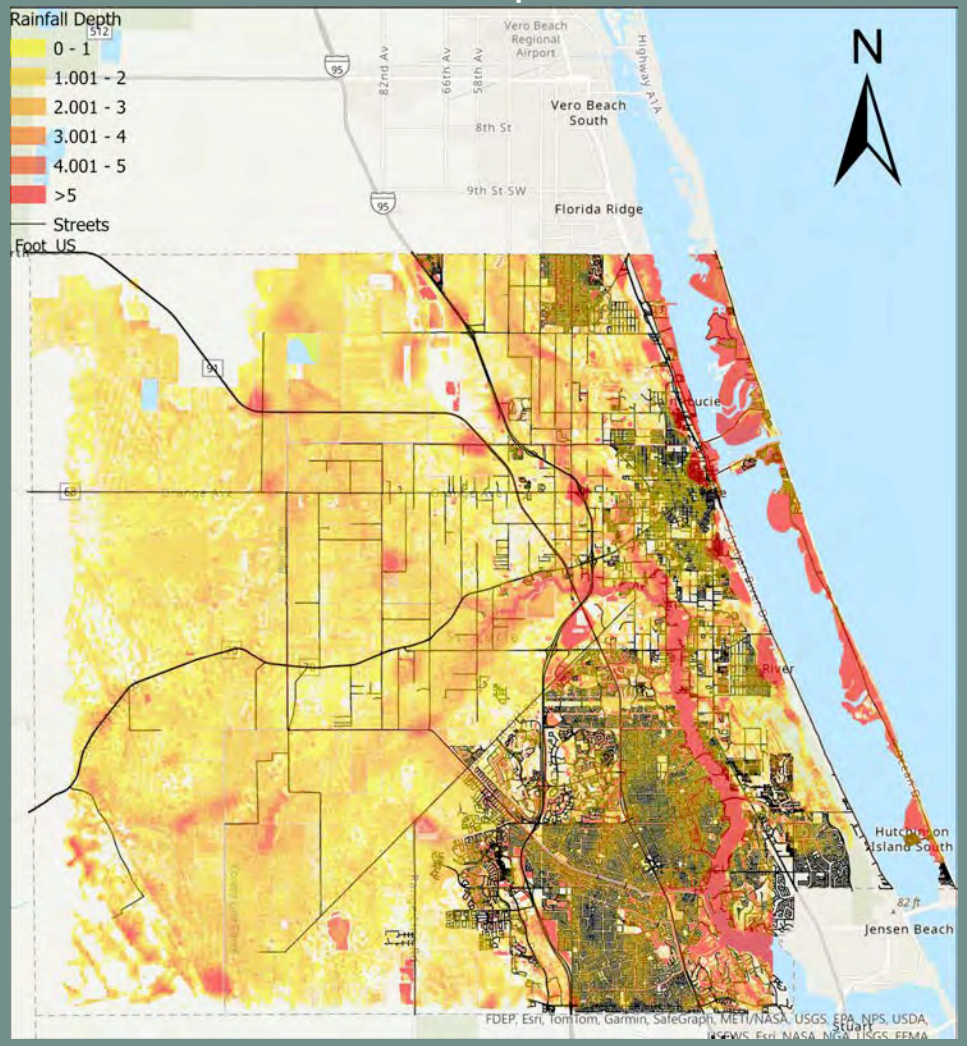


Extreme Rainfall Severity Projections

Extreme Rainfall Projections

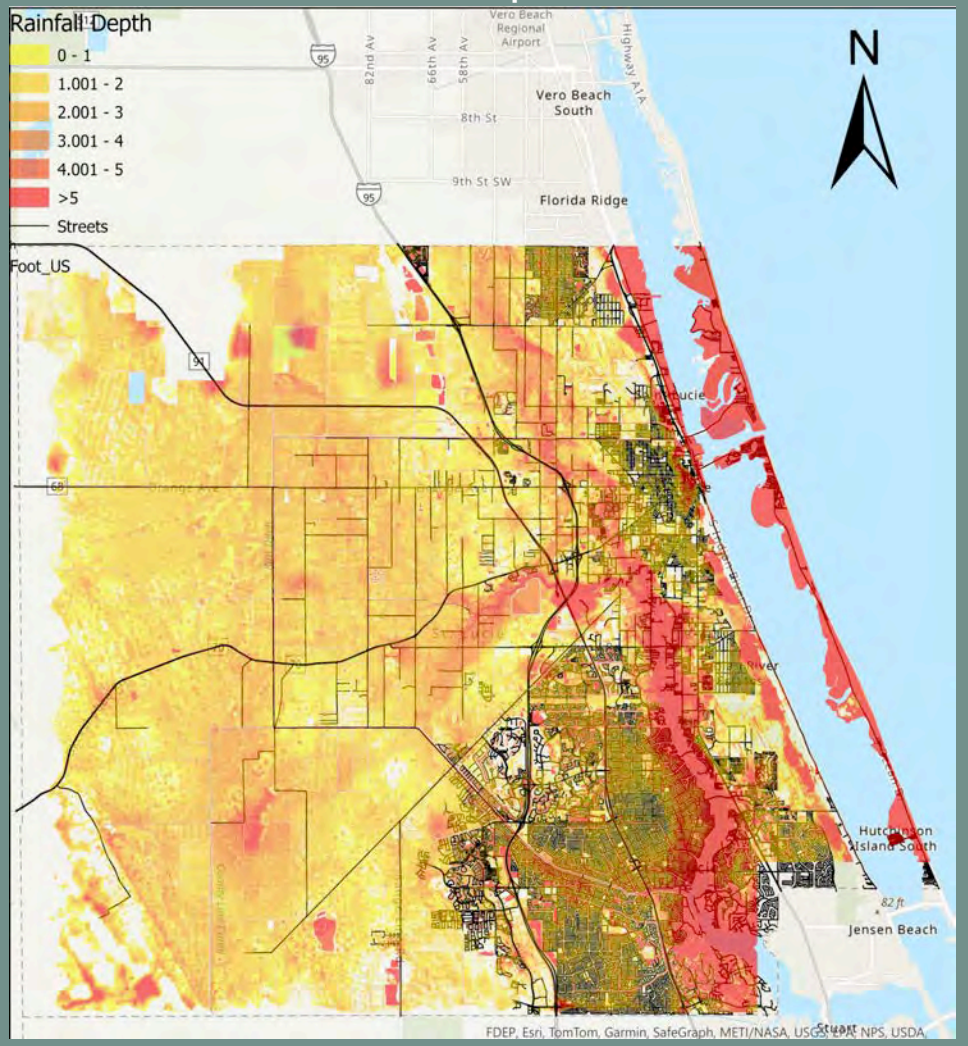
Base Year 2025

100-Year Strom Rainfall Depth for 72-Hours 14.80 in.



Horizon Year 2100

100-Year Strom Rainfall Depth for 72-Hours 21.46 in.



Land Use & Growth

Plan Input Dependencies - Human

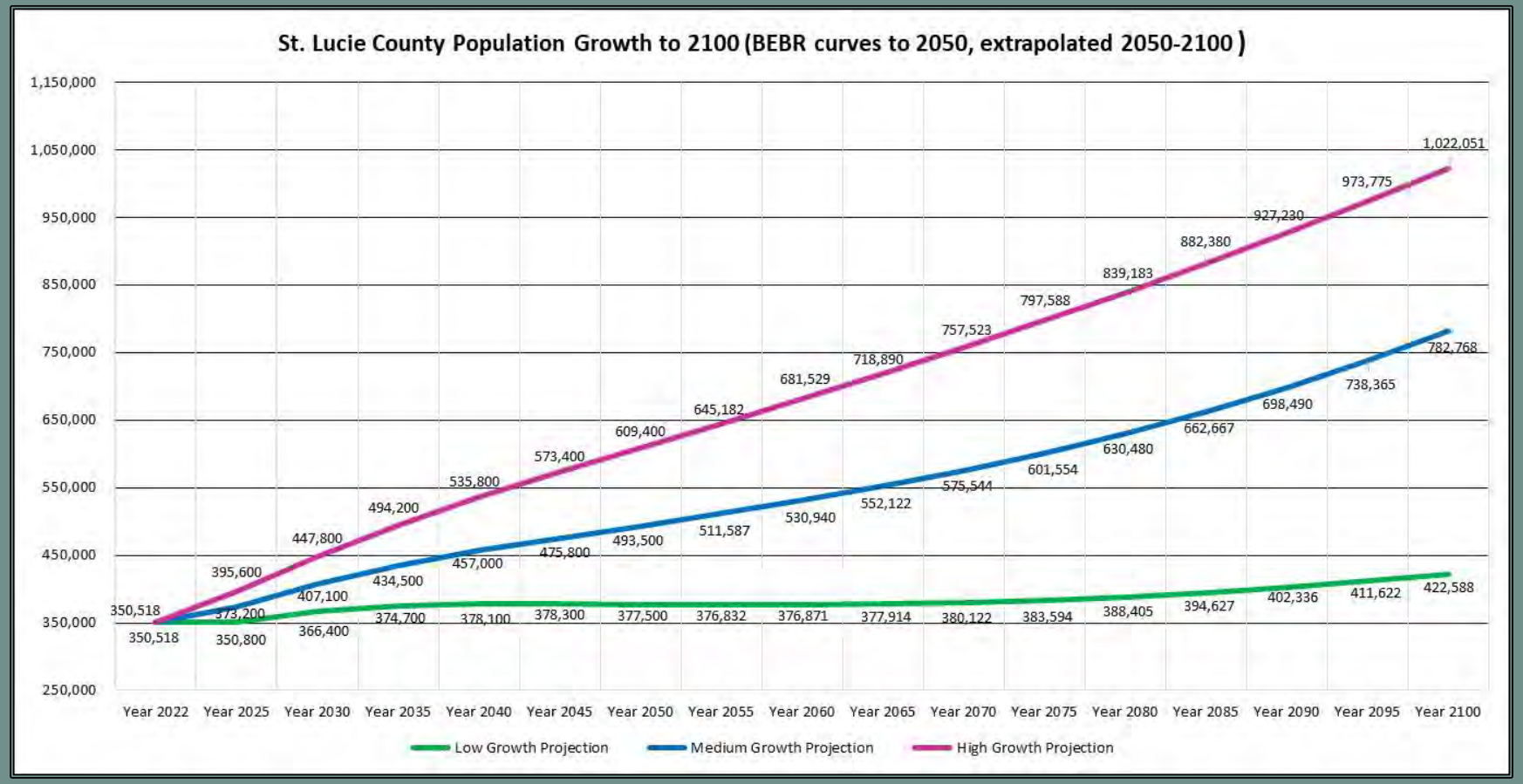
Scenario	Effect	2045	2070	2100
Lane Miles	based on *St. Lucie LRTP* and demand forecast	1,100	to be determined	to be determined
Directional Links	based on *St. Lucie LRTP* and demand forecast	4,256	to be determined	to be determined
Population	based on *Treasure Coast Regional Planning Model (TCRPM)*	based on St. Lucie Transportation Model inputs	extrapolate mid-line 2045 growth curve	extrapolate mid-line growth curve from 2070
Employment	based on *Treasure Coast Regional Planning Model (TCRPM)*	based on St. Lucie Transportation Model inputs	extrapolate mid-line 2045 growth curve	extrapolate mid-line growth curve from 2070
Planned Development	LRTP + approved DRI's – based on *2045 Revised Land Use Data Report, March 2023*	Visions at Indrio, LTC Ranch, Oak Ridge Ranch, Verano, Western Grove, Southern Grove, Riverland, & Wilson Grove	extrapolate mid-line 2045 growth curve and apply to TAZ per density and MU criteria below.	extrapolate mid-line 2070 growth curve and apply to TAZ per density and MU criteria below.
High Density Development	*TPO Carbon Footprint Reduction Strategies Report, May 2023*.	reduction of VMT of 0.37% with projected growth	need to identify TAZ to apply to, and use extrapolated growth curve – apply only to new development – still suburban – see MU	
Mixed-Use Development	*TPO Carbon Footprint Reduction Strategies Report, May 202*3. Increased population growth above projection with increase of VMT	population same as LRTP with reallocation to 68 TAZs at 10 DU/ac. and 15 DU/ac with Mixed Use (VMT reduced 0.67%)	need to identify TAZ to apply to and use more aggressive density / intensity and more aggressive extrapolated growth curve that reflect policy requirements and LDR that implement it.	

Plan Input Dependencies - Human

Scenario	Effect	2045	2070	2100
Multi-Modalism (transit)	*TPO Carbon Footprint Reduction Strategies Report, May 2023*.	reduction of VMT of 0.71% with projected growth.	the 2070 projection goes beyond planned transit improvements. Should use policy mode split for target year, with policy focused on significantly higher mode split for new and existing high density mixed-use areas, and areas with ACES network hubs	
Telecommuting (HBW, HBSch, HBO, NHB, NHBW)	*TPO Carbon Footprint Reduction Strategies Report, May 2023.* Reduction of VMT with projected growth	reduction of VMT of 6.0% with projected growth.	extrapolate curve with some high-level research on max limit to determine 2100.	
Automated Transportation Management (V2I, V2V)	incrementally reduced impact on VMT due to improved mobility sharing and links to transit. increase in roadway capacity when critical mass of automated vehicles and infrastructure is reached	*TPO Carbon Footprint Reduction Strategies Report, May 2023* identified reduction of carbon emissions but not VMT	project effect of ACES network of automated and connected intermodal technologies - - need to research and estimate at high level.	
Urban Services Boundary (USB) Expansion	increases the need for new roadways and provides opportunities for high-density, mixed-use development with additional ACES infrastructure.	1. South of Midway, north of Glades Cut-Off, west of I-95 to approx. Carlton / Ideal Holding Road 2. East of I-95 north of Indrio Road	to be determined (Header Canal Rd longitudinal parallel?)	to be determined (Sneed / Carlton Road / C-24 Canal - longitudinal parallel)
New Roads, Lanes other Links		to be determined	to be determined	to be determined

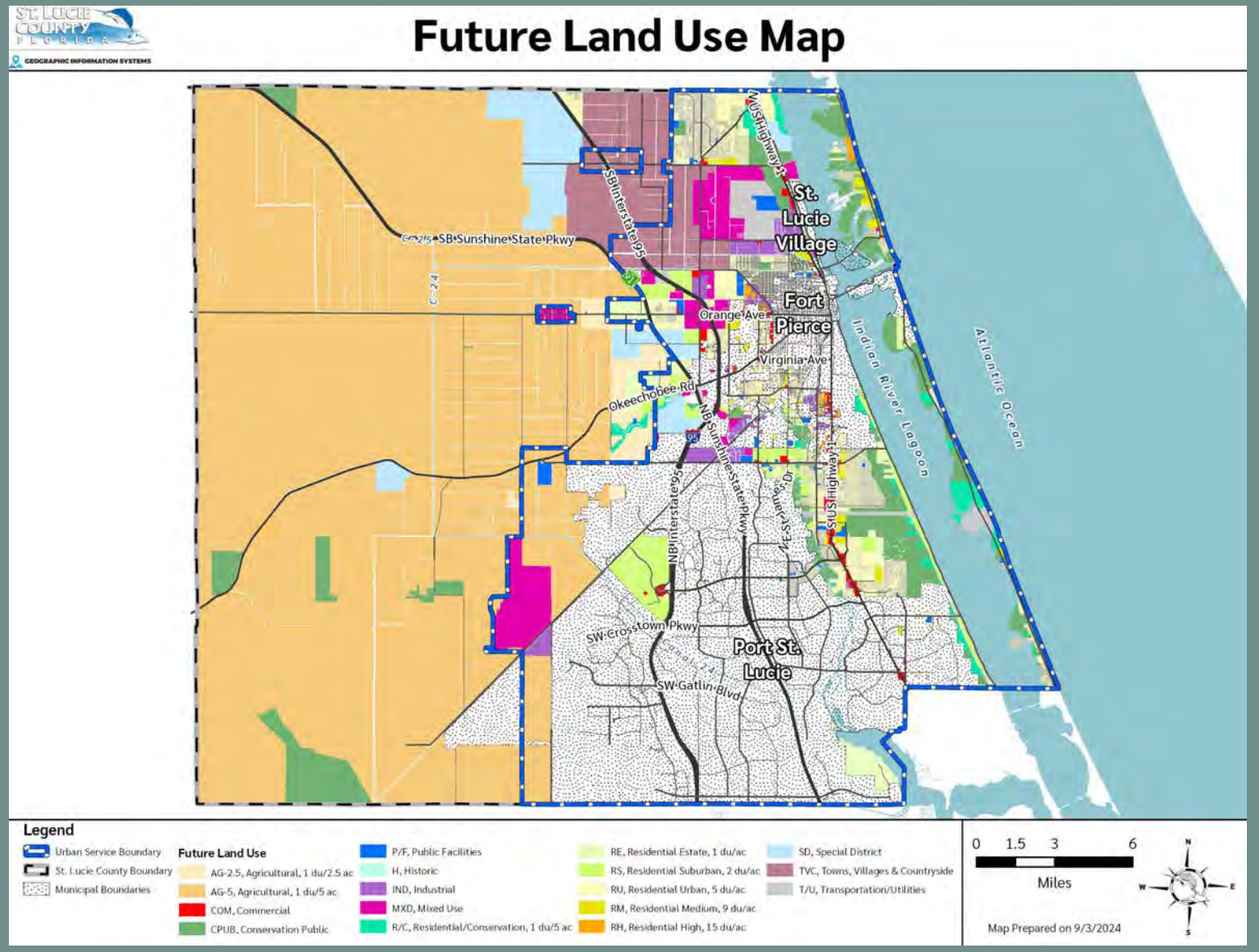
Population Growth

- projecting beyond 2050 accelerates divergence
- disruptive change in economic cycles, impact land development and in-migration beyond forecasts



Future Land Use Map

- maintains resource land for agriculture, energy generation, groundwater recharge
- preserves habitats and other environmentally sensitive areas
- provides limits for water and stormwater infrastructure
- implies limits to the high-capacity mobility network



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Urban Services Boundary

- changes to USB westward impacts mobility network
- future growth affected by:
  - infrastructure
  - development density
  - resource land (agriculture, energy production, environmental management)
- generally not affected by sea-level rise and tidal flooding

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Alternative Development – Sustainability Hubs

- **concentrated high-density development at nexuses of mobility infrastructure**
- downtown or Regional Activity Centers
- mixed-use and internally walkable
- self-contained ecosystems for daily needs
- includes inter-modal support systems to enable travelers change modes, and have long distance travel support
- includes all support systems for region during natural disasters and emergencies
- lowest impact on land consumption
- outlined in the St. Lucie TPO “Automated Connected Electric and Shared (ACES) Transportation Plan” July 2023.

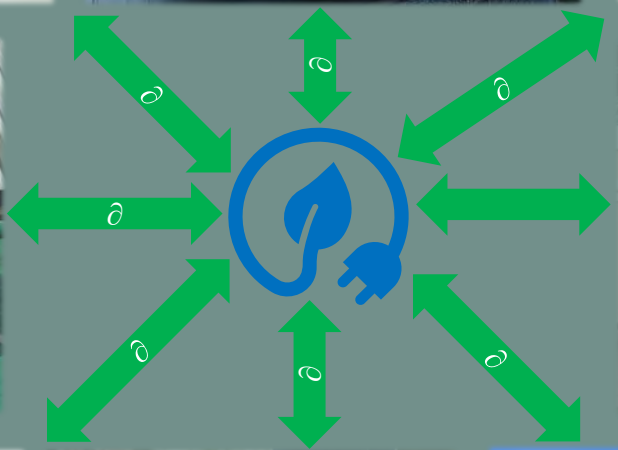
Mobility Network & Street Sections 101

Effort:

- finalize multi-modal needs
- finalize modal split, trip demand

Result – Map Series

- Years 2045, 2070, 2100
- vehicular master grid
- mass transit master grid
- bicycle &micro-mobility grid
- pedestrian master street grid
- freight movement master grid
- ACES multi-modal master grid



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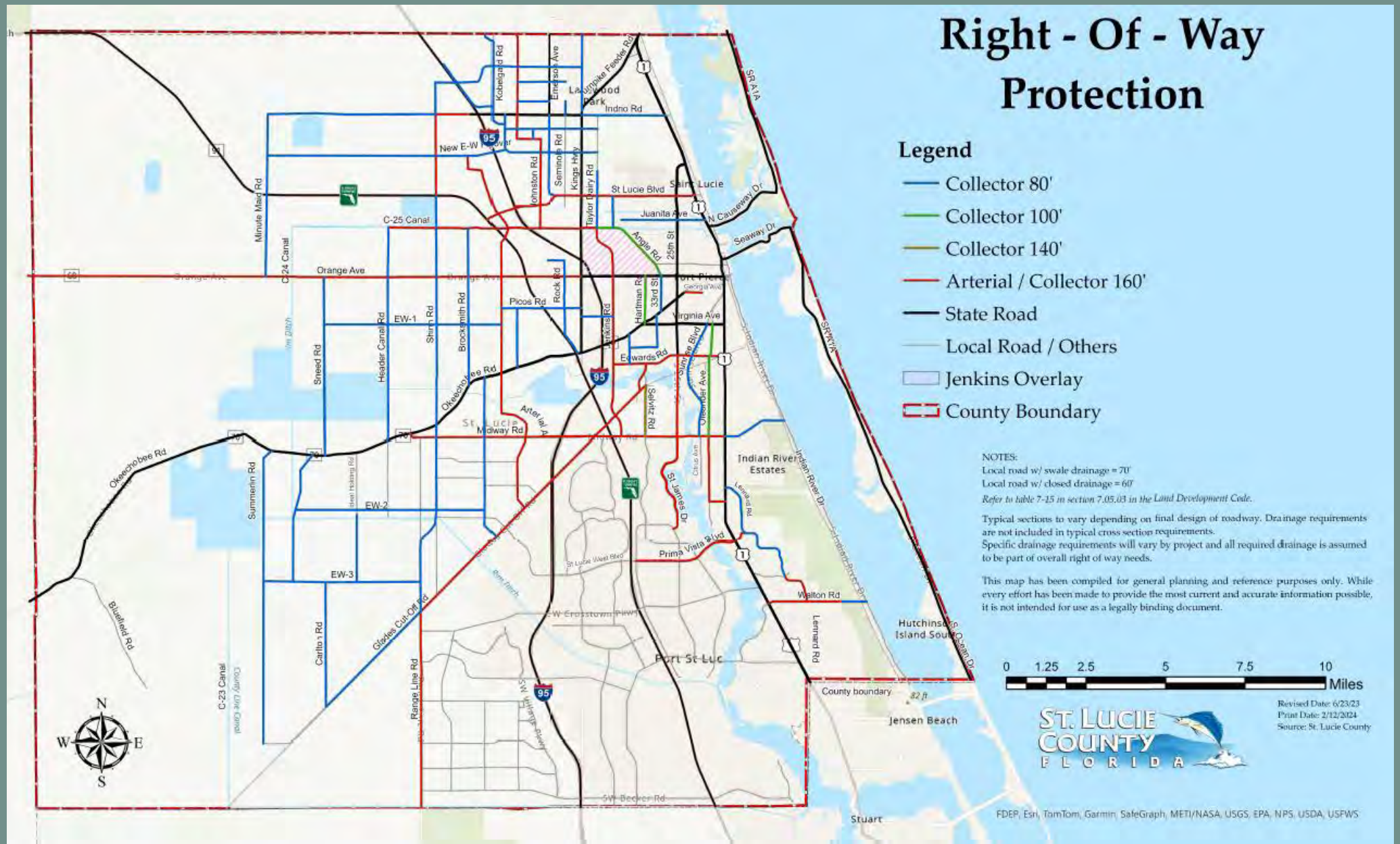
Right of Way Reservations

Right-of-Way Reservations



Infrastructure Technology

Urban:

- constrained rights-of-way
- curb-and-gutter
- roadway elevation challenged by development
- multi-modal infrastructure integrates w/ vehicles

Suburban / Rural:

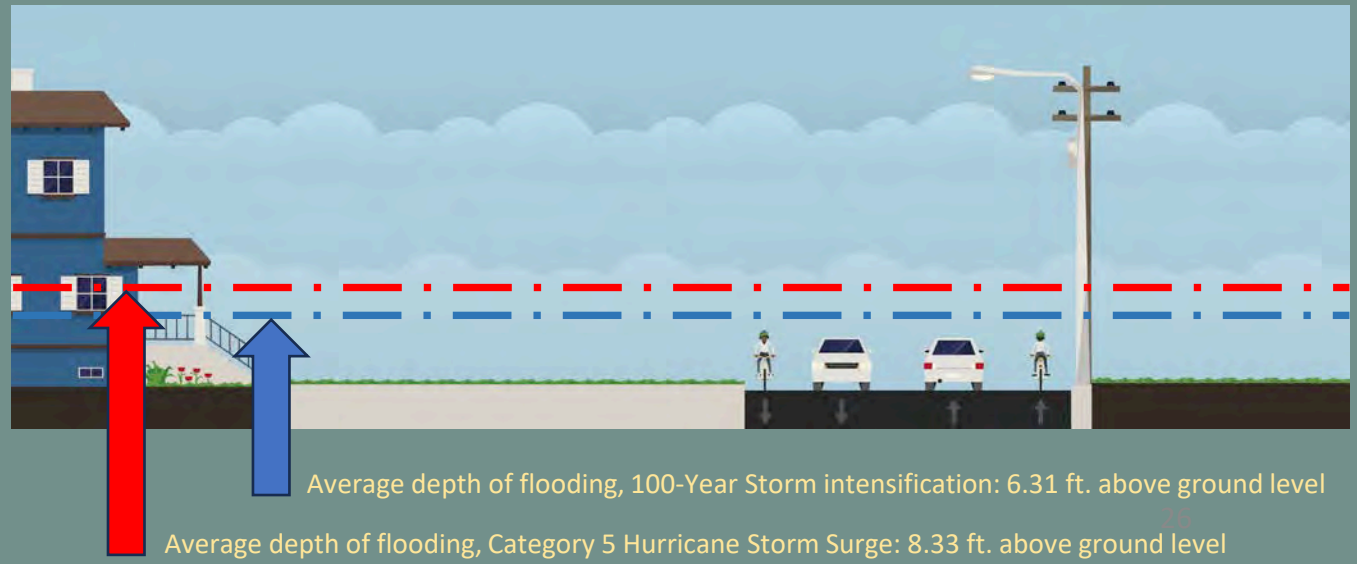
- potential to reserve rights-of-way
- swale drainage and areas for retention
- roadway elevation more possible
- room for dedicated multi-modal lanes

ROW Outcomes, Sample Sections

Suburban ROW Climate Resiliency

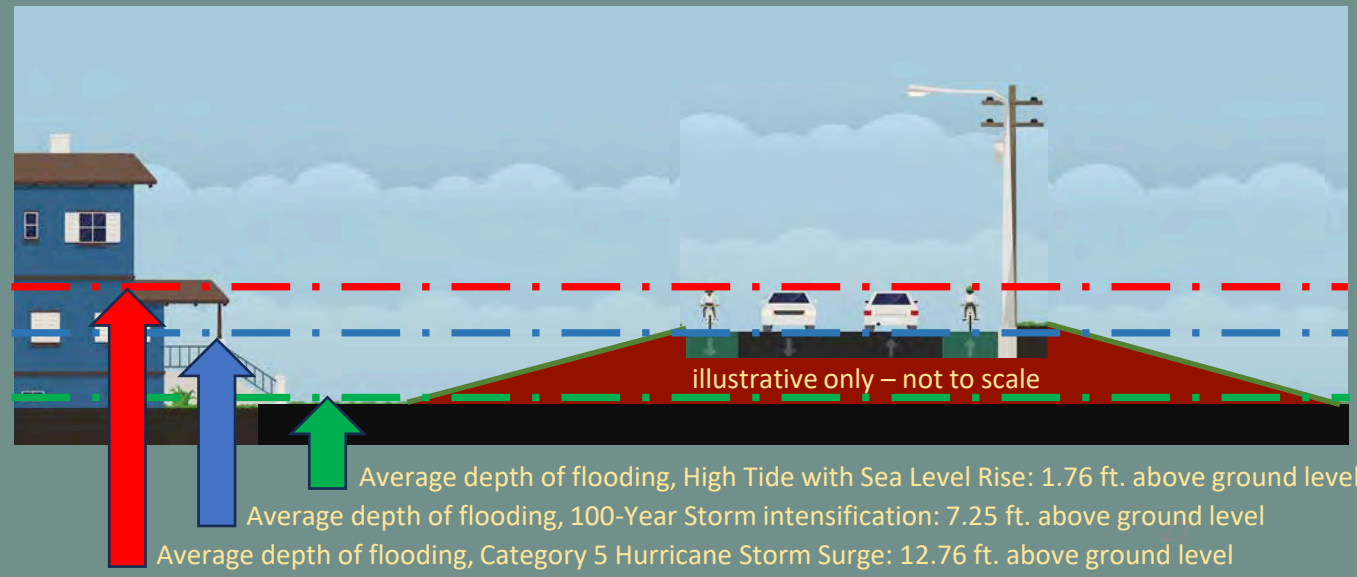
Edwards Road, Selvitz to S 25 St. Year 2045

Edwards Road Segment	Selvitz Road to S. 25th Street
Functional Classification	minor arterial
Right-of-Way Section	60 ft.
Vehicular Travel Lanes	two 11 ft. travel lanes LT lanes at intersections
Bicycle Lanes	undesignated 4 ft. each side
Sidewalks	none
Transit	none
Vehicle Capacity (FDOT generalized LOS, urban)	1,481/ hr. (peak hour, two-way)
People Capacity, all modes	2,161/ hr. (bike lanes: 680)
Drainage	swale
Environment	suburban low density
Street Elevation (average of NAVD by TAZ)	11.32 ft. (TAZ 591, 593, 597, 598)
Sea Level Rise High Tide (max of TAZ)	- 6.52 ft.
Category 5 Hurricane Storm Surge (max of TAZ)	+ 8.33 ft.
100-Year Rainfall Event (max of TAZ)	+ 6.31 ft.
Mitigation Strategies (least impact appropriate to context)	increase road elevation w 4% swale, drainage engineering, increase BFE & freeboard (LDR)
Right-of-Way Reservation	at 9 ft. roadway elevation increase, 60 feet existing plus 212 ft each side



Edwards Road, Selvitz to S 25 St. Year 2100

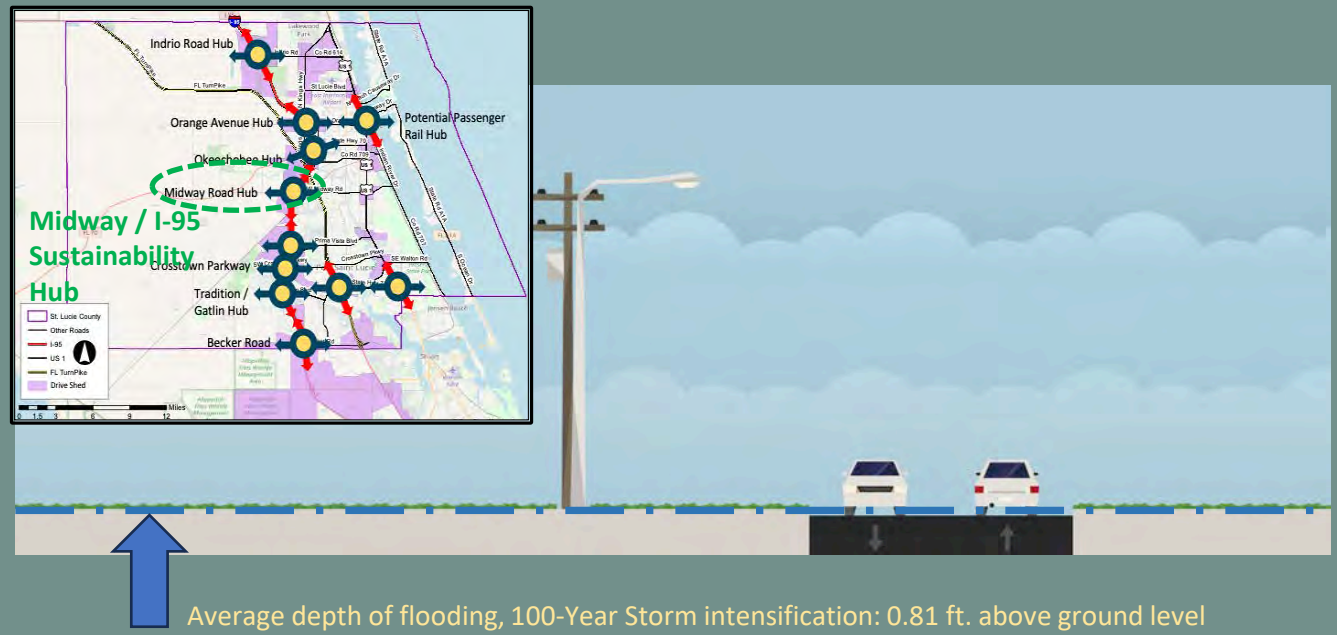
Edwards Road Segment	Selvitz Road to S. 25th Street
Functional Classification	minor arterial
Right-of-Way Section	60 ft.
Vehicular Travel Lanes	two 11 ft. travel lanes LT lanes at intersections
Bicycle Lanes	undesignated 4 ft. each side
Sidewalks	none
Transit	none
Vehicle Capacity (FDOT generalized LOS, urban)	1,481/ hr. (peak hour, two-way)
People Capacity, all modes	2,161/ hr. (bike lanes: 680)
Drainage	swale
Environment	suburban low density
Street Elevation (average of NAVD by TAZ)	11.32 ft. (TAZ 591, 593, 597, 598)
Sea Level Rise High Tide (max of TAZ)	+ 1.76 ft.
Category 5 Hurricane Storm Surge (max of TAZ)	+ 12.76 ft.
100-Year Rainfall Event (max of TAZ)	+ 7.25 ft.
Mitigation Strategies (least impact appropriate to context)	increase road elevation w 4% swale, drainage engineering, increase BFE & freeboard (LDR)
Right-of-Way Reservation	at 9 ft. roadway elevation increase, 60 feet existing plus 212 ft. each side



Suburban ROW Resiliency to Growth

Midway Road west of Selvitz Rd. Year 2045

Midway Road Segment	Selvitz Rd to Glades Cut Off Rd
Functional Classification	major arterial
Right-of-Way Section	160 ft.
Vehicular Travel Lanes	two 12 ft. travel lanes LT & RT lanes at intersections; currently being expanded to 4 lane, divided section
Bicycle Lanes	none
Sidewalks	none
Transit	none
Vehicle Capacity (FDOT generalized LOS, urban)	1,481/ hr. (peak hour, two-way)
People Capacity, all modes	2,161/ hr.
Drainage	swale – to be curb & gutter
Environment	suburban
Street Elevation (average of NAVD by TAZ)	19.72 ft. (TAZ 638, 705, 666, 1018, 1029)
Sea Level Rise High Tide (max of TAZ)	-15.49 ft.
Category 5 Hurricane Storm Surge (max of TAZ)	- 0.12 ft.
100-Year Rainfall Event (max of TAZ)	+ 0.81 ft.
Mitigation Strategies (least impact appropriate to context)	drainage engineering for severe storm rainfall events, and 1 ft. road elevation
Right-of-Way Reservation	160 ft. – no increase



Midway Road west of Selvitz Rd. Year 2100

Midway Road Segment	Selvitz Rd to Glades Cut Off Rd
Functional Classification	major arterial
Right-of-Way Section	160 ft.
Vehicular Travel Lanes	two 12 ft. travel lanes LT & RT lanes at intersections; currently being expanded to 4 lane, divided section
Bicycle Lanes	none
Sidewalks	none
Transit	none
Vehicle Capacity (FDOT generalized LOS, urban)	3,040/ hr. (peak hour, two-way)
People Capacity, all modes	19,000+ / hr.
Drainage	swale – to be curb & gutter
Environment	suburban
Street Elevation (average of NAVD by TAZ)	19.72 ft. (TAZ 638, 705, 666, 1018, 1029)
Sea Level Rise High Tide (max of TAZ)	- 6.37 ft.
Category 5 Hurricane Storm Surge (max of TAZ)	+ 3.90 ft.
100-Year Rainfall Event (max of TAZ)	+ 1.09 ft.
Mitigation Strategies (least impact appropriate to context)	elevate roadway 2 to 4 ft., drainage engineering for severe storm rainfall events
Right-of-Way Reservation	160 ft. + up to 50 ft. increase

infrastructure to support sustainable growth network
Midway / I-95 Sustainability Hub

Average depth of flooding, 100-Year Storm intensification: 6.31 ft. above ground level

Average depth of flooding, Category 5 Hurricane Storm Surge: 8.33 ft. above ground level

ROW Acquisition

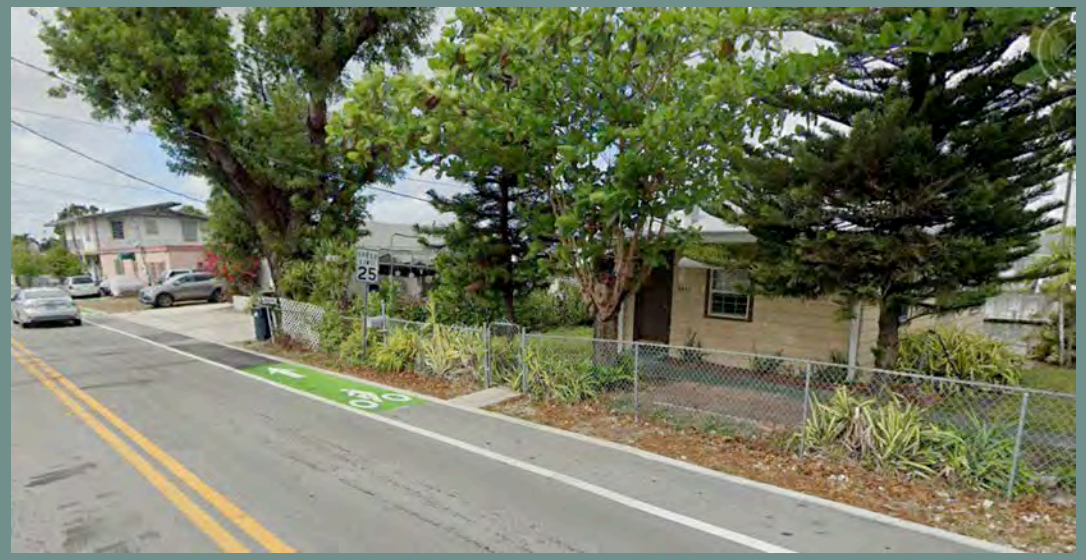
ROW Acquisition Process

	Identify Alternatives	Alternative Benefits	Environmental Impacts	Safety Impacts	Consistency with Long Range Planning	Planning / Zoning	Purchase Cost	Tax Revenue Impact
Purchase	review per County CIP requirements	review per County CIP requirements	review	review	review	review and negotiate	negotiated price	tax revenue reduced
Eminent Domain	required analysis	required analysis	required analysis	required analysis	required analysis	can't leave legally non compliant	assessed cost may have to take the whole property	tax revenue reduced
Development Agreement	not required	not required	review	review	review	by agreement	no purchase cost	may have parity
Transfer of Development rights	not required	not required	review	review	review	by agreement	no purchase cost	may have parity
Right-of-Way Dedication	not required	not required	review	review	review	by agreement	no purchase cost	tax revenue reduced
Easement Dedication	not required	not required	review	review	review	by agreement	no purchase cost	neutral

ROW Acquisition by Location

Urban Areas:

- Functionally constrained with buildings and high-value investments near right-of-way / property lines.
- Long term planning to acquire upon redevelopment
- Coordinate with local jurisdiction and their redevelopment efforts



Suburban Areas:

- Very difficult where single-family homes are affected.
- Commercial is less problematic, especially if parking
- Coordinate with local jurisdiction redevelopment efforts, and need to change zoning code

Exurban Areas:

- large property owners in agriculture, energy, other production and resource management
- acquisitions are generally less difficult

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What's Ahead
Public Meetings

Public Participation

Public Input

1. St. Lucie County	March 20, 2024	County Commission Chamber
2. St. Lucie TPO staff meeting	April 18, 2024	St. Lucie TPO Board Room
3. St. Lucie County Commission – informal	September 10, 2024	County Commission Chamber
4. St. Lucie TPO Citizens Advisory Committee	September 17, 2024	St. Lucie TPO Board Room
5. St. Lucie TPO Technical Advisory Committee	September 17, 2024	St. Lucie TPO Board Room
6. St. Lucie TPO Bicycle & Pedestrian Advisory Committee	September 19, 2024	St. Lucie TPO Board Room
7. Public Workshop: *introduction, information, Q&A*	September 24, 2024, 6pm	Riverwalk Center, 600 N. Indian River Drive
8. Public Workshop: *workshop - future scenarios*	October 2024	

Plan Adoption

9. Draft Mobility Infrastructure Plan	October 2024
10. Final Mobility Infrastructure Plan	November 2024
11. St. Lucie County Commission Presentation	December 2024

Workshop Decisions

to develop future scenario & make policy recommendations

1. Geography of Growth
2. Technological Accommodation
3. Level of Climate Mitigation